K.S. Rangasamy College of Technology (Autonomous)



Curriculum & Syllabi

for

B.Tech. Computer Science and Business Systems

(For the batch admitted in 2024 – 2025)

R 2022

Courses Accredited by NAAC with A++ grade, Approved by AICTE, Affiliated to Anna University, Chennai.

KSR Kalvi Nagar, Tiruchengode – 637 215. Namakkal District, Tamil Nadu, India.

COMPUTER SCIENCE AND BUSINESS SYSTEMS

VISION

To produce skilled professionals to the dynamic needs of the industry with innovative computer science Professionals associate with managerial services

MISSION

- To promote student's ability through innovative teaching in computer science to compete globally as an engineer
- To inculcate management skills to meet the industry standards and augment human values and life skills to serve the society

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- **PEO1:** Graduates will provide effective solutions for software and hardware industries by applying the Concepts of basic science and engineering fundamentals.
- PEO2: Graduates will be professionally competent and successful in their career through Life-long Learing
- PEO3: Graduates will contribute individually or as member of a team in handling projects and demonstrate Social responsibility and professional ethics.

PROGRAMME OUTCOMES (POs)

Engineering Graduates will be able to:

- PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems. Graduates will contribute individually or as member of a team in handling projects and demonstrate social responsibility and professional ethics.
- **PO2:** Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. Graduates will contribute individually or as member of a team in handling projects and demonstrate social responsibility and professional ethics.
- **PO3:** Design /development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. Graduates will contribute individually or as member of a team in handling projects and demonstrate social responsibility and professional ethics
- PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. Graduates will contribute individually or as member of a team in handling projects and demonstrate social responsibility and professional ethics.
- **PO5**: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
- **PO6:** The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.



BoS Chairman

- **PO7:** Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- **PO8:** Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. Graduates will contribute individually or as member of a team in handling projects and demonstrate social responsibility and professional ethics.
- **PO9:** Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. Graduates will contribute individually or as memberof a team in handling projects and demonstrate social responsibility and professional ethics
- **PO10: Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- **PO11: Project management and finance**: Demonstrate knowledge and understanding of the engineering andmanagement principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **PO12:** Life-long learning: Recognize the need for, and have the preparation and ability to engage inindependent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

Engineering Graduates will be able to:

- **PSO1:** Apply analytical and technical skill of computer science to provide justifiable solution for real world applications
- **PSO2:** Analyze various managerial skills and business disciplines to improve the industry growth and Development

MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES (PEOs) WITH PROGRAMME OUTCOMES (POs)

The B.Tech. Computer Science and Business systems Programme outcomes leading to the achievement of the objectives are summarized in the following Table.

Programme					Pi	rogram	me Outo	comes				
Objectives	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12
PEO1	3	1	3	2	2	1	1	1	2	2	3	1
PEO2	3	3	3	2	2	1	1	1	2	2	3	1
PEO3	3	2	3	2	2	1	1	1	3	2	3	1

Contributions: 1-low, 2- medium, 3-high



MAPPING-UG-COMPUTER SCIENCE AND BUSINESS SYSTEMS

Year	Sem	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
I	I	Business Communication and Value Science I	-	-	-	-	-	-	-	-	-	3	2	3	2	3	-
		Statistics and probability	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
		Fundamentals of Physics	3	3	-	3	-	-	-	3	3	2	2	2	2	-	-
		Computer Programming	3	3	3	-	3	-	-	-	2	2	-	2	3	3	-
		Principles of Electrical Engineering and Lab	3	3	-	-	2	2	2	-	-	-	3	3	2	1	-
		Environmental Studies and Climate Change	3	2	2	2	2	2	3	2	-	-	-	2	2	3	-
		Hertiage of Tamil	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
		Computer Programming Lab	3	3	3	-	3	-	-	-	2	2	-	2	3	3	-
		Fundamentals of Physics Lab	3	-	-	-	-	-	-	-	2	-	-	-	2	-	-
I	II	Business Communication and Value Science II	-	-	-	-	-	-	-	-	-	3	2	-	3	3	3
		Fundamentals of Economics	-	-	-	-	-	-	-	3	2	2	3	3	-	3	-
		Statistical Modeling	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
		Computer Organizationand Architecture	3	3	2	2	3	-	-	-	-	2	2	2	3	-	-
		Object Oriented Programming	3	3	3	-	-	-	-	-	2	2	-	2	-	-	2
		Tamil and Technology	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
		Fabrication and Reverse Engineering Laboratory	3	2	3	-	-	2	2	-	3	-	-	3	-	3	3
		Object Oriented Programming Lab	3	2	3	2	2	-	-	1	2	-	-	1	3	-	-





		Career Skill	_	-	-	-	-	-	-			•					
		Development - I								2	3	3	2	3	2	2	-
11		Introduction to Innovation,IP Management and Entrepreneursh	2	2	2	3	2	2	2	3	2	1	3	2	-	3	-
		IP Operational															
		Statistics	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
		Automata and Compiler Design	3	3	-	2	2	-	-	2	-	1	2	2	-	-	-
		Database Management Systems	3	2	2	-	-	-	2	1	-	2	-	1	3	-	-
		Data Structures	3	3	3	2	1	-	-	-	2	-	-	-	3	-	-
		Software Engineering	3	3	3	2	1	-	2	2	2	2	2	2	2	3	-
		Database Management Systems Lab	1	3	2	-	2	-	-	-	2	1	-	2	3	-	-
		Data Structures Lab	3	3	3	2	3	-	-	-	2	-	-	-	3	-	-
		Career Skill Development –II	-	-	-	-	-	-	-	2	3	3	2	3	2	2	-
11	IV	Optimization Techiques	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
		Operating Systems	3	3	3	3	-	-	2	-	-	2	-	2	3	-	-
		Design and Analysis of Algorithms	3	2	3	2	3	-	-	-	-	-	-	-	3	-	-
		Software Design with UML	2	3	3	2	2	-	-	-	2	2	2	2	3	-	-
		MERN Stack	3	3	3	2	2	-	-	-	2	2	2	2	3	-	-
		Universal Human Values	-	-	-	-	-	3	3	3	3	3	2	3	-	2	-
		Operating Systems Lab	3	3	3	3	-	-	3	-	-	2	-	2	3	-	-
		Design and Analysis of Algorithms Lab	3	3	3	2	3	-	-	-	-	-	-	-	3	-	-
		Career Skill Development III	3	3	3	3	-	2	-	-	-	2	3	3	2	3	-
	V	Computer Networks	2	3	-	-	2	-	-	-	-	-	-	3	-	-	-
		C# and .NET Programming	2	-	3	2	2	1	-	1	3	-	-	1	3	-	-
		Artificial Intelligence	3	2	2	-	-	-	2	1	-	2	-	1	-	2	-
		Design Thinking	2	3	2	2	3	2	1	1	1	2	3	2	3	2	-
		Start-ups and	3	3	3	2	2	2	2	2	1	2	2	2	-	2	-



		Entrepreneurship															
		Computer Networks Laboratory	2	3	-	-	2	-	-	-	-	-	-	3	-	-	-
		C# and .NET Programming Laboratory	2	-	3	2	2	1	-	1	3	-	-	2	2	-	-
		Career Skill Development IV	-	-	-	-	-	-	-	2	3	3	2	3	2	3	-
III	VI	Business Strategy	2	3	3	3	2	2	2	2	3	2	3	3	2	3	-
		Financial and Cost Accounting	3	2	2	3	2	2	2	3	2	2	3	2	2	3	-
		Machine Learning	3	3	3	2	2	2	2	-	3	3	2	3	2	-	-
		Usability Design of Software Applications	2	2	2	2	2	-	-	-	-	-	-	-	2	2	2
		Machine Learning Laboratory	3	3	3	2	2	2	2	-	3	3	2	3	2	-	-
		Usability Design of Software Applications Laboratory	3	3	3	2	3	-	-	-	3	-	2	-	2	-	-
		Mini Project	2	3	2	2	3	2	1	1	1	2	3	2	3	2	2
IV	VII	Human Resource Management	3	2	3	2	2	-	-	3	3	3	3	2	-	2	-
		Cloud Application Development	3	2	3	2	3	-	-	-	-	-	-	-	2	-	-
		Data Analytics	2	2	1	2	2	1	1	-	1	1	1	2	2	2	2
		Software Testing and Automation	3	2	1	1	3	-	-	-	-	-	-	-	2	2	-
		NCC/NSS/NSO/YR C/RRC/Fine Arts*	3	2	1	1	3	3	3	3	3	3	-	-	-	-	-
		Research Methodology	2	2	2	2	3	2	2	3	3	3	-	3	-	-	-
		Data Analytics Laboratory	2	2	2	2	1	-	-	-	2	2	2	2	2	3	-
		Project Work Phase-I	3	3	3	3	3	2	2	3	3	3	3	3	2	2	3
	VIII	Project Work Phase-II	3	3	3	3	3	2	2	3	3	3	3	3	2	2	3



S No	Category			Cre	edits Pe	r Semes	ster			Total	Percentage
ontor		I	II	III	IV	V	VI	VII	VIII	Credits	/0
1.	HS	2	5	3	-	-	6	3	-	19	11.6
2.	BS	9	5	4	4	-	-	-	-	22	13.4
3.	ES	4	2	-	-	-	-	-	-	6	3.7
4.	PC	5	8	17	16	16	10	11	-	83	50.6
5.	PE	-	-	-	-	3	3	6	3	15	9.1
6.	OE	-	-	-	3	3	3	-	-	9	5.5
7.	CG	-	CSD I	CSD II	CSD III	CSDIV	-	2	8	10	6.1
8.	MC	MC I	-	-	MCII	MCIII	-	-	-	-	-
9.	AC	-	-	-	-	-	-	AC	-	-	-
10.	GE	GE I	GE II	-	-	-	-	-	-	02*	-
	Total	20	20	24	23	22	22	22	11	164	100

K.S. RANGASAMY COLLEGE OF TECHNOLOGY

Credit Distribution for B.Tech (CSBS) Programme-2024 - 2025 Batch

*General Elective – Extra credit is offered HS – HUMANITIES AND SOCIALSCIENCES

- **BS BASIC SCIENCE**
- **ES ENGINEERING SCIENCES**
- **PC PROFESSIONAL CORE**
- **PE PROFESSIONAL ELECTIVES**
- **MC MANDATORY COURSES**
- **AC AUDIT COURSES**
- **OE OPEN ELECTIVES**
- **CG–CAREER GUIDENCE COURSES**
- **GE GENERAL ELECTIVE COURSES**
- Open Electives are courses offered by different departments that do not have any prerequisites and could be of interest to students of any branch



K.S. RANGASAMY COLLEGE OF TECHNOLOGY, TIRUCHENGODE - 637 215

(An Autonomous Institution affiliated to Anna University)

S.No.	Course Code	Course Title	Category	Contact Periods	L	т	Ρ	С	Prerequisite
1.	60 EN 003	Business Communication and Value Science -I	HS	2	2	0	0	2	Basic knowledge of reading and writing in English
2.	60 EN 004	Business Communication and Value Science -II	HS	2	2	0	0	2	Basic knowledge of reading and writing in English and should have Completed Professional English I
3.	60 HS 001	Fundamentals of Economics	HS	3	3	0	0	3	Basic knowledge of Economics
4.	60 HS 004	Introduction to Innovation, IP Management and Entrepreneurship	HS	3	3	0	0	3	Basic Knowledge on Management, entrepreneurship, technology and innovation
5.	60 HS 005	Business Strategy	HS	3	3	0	0	3	Basic Knowledge on Business objectives, target audience and strategic Management
7.	60 HS 006	Financial & Cost Accounting	HS	3	3	0	0	3	Basic knowledge of Accounting
8.	60 HS 007	Human Resource Management	HS	3	3	0	0	3	Basic Knowledge of Human Resource Management
9.	60 AB 001	National Cadet Crops (Air Wing)	HS	4	2	0	2	3	Applicant should demonstrate a good and healthy moral character.
10.	60 AB 002	National Cadet Crops (ArmyWing)	HS	4	2	0	2	3	Applicant should demonstrate a good and healthy moral character.

HUMANITIES AND SOCIAL SCIENCE (HS)

BASIC SCIENCE (BS)

S.No.	Course Code	Course Title	Category	Cont act Periods	L	т	Ρ	С	Prerequisite
1.	61 PH 008	Fundamentals of Physics	BS	3	3	0	0	3	Basic Science Knowledge , Mathematics, Familiarity with Basic

									Physical Concepts
2.	60 PH 0P3	Fundamentals of Physics Lab	BS	4	0	0	4	2	Basic Science Knowledge , Familiarity with Basic Physical Concepts
3.	60 MA 002	Statistics and probability	BS	5	3	1	0	4	Basic knowledge of Higher Secondary Mathematics: Probability Distributions
4.	60 MA 005	Statistical Modeling	BS	7	3	1	2	5	Statistics and Probability
5.	60 MA 013	Computational Statistics	BS	5	3	0	2	4	Statistics and Probability
6.	60 MA 018	Optimization Techniques	BS	5	3	1	0	4	Statistics and Probability

ENGINEERING SCIENCES (ES)

S.No.	Course Code	Course Title	Category	Contact Periods	L	т	Ρ	С	Prerequisite
1.	60 ME 0P1	Fabrication and Reverse Engineering Laboratory	ES	4	0	0	4	2	Basic Understanding of mechanics, thermodynamics, and structural analysis, Mathematics, Physics
2.	60 EE 003	Principles of Electrical Engineering and Lab	ES	5	3	0	2	4	Fundamentals of Physics

PROFESSIONAL CORE (PC)

S.No	Course Code	Course Title	Category	Contact Periods	L	Т	Ρ	С	Prerequisite
1.	61 CB 101	Computer Programming	PC	3	3	0	0	3	Basic Computer Knowledge, Mathematics.
2.	60 CB 1P1	Computer Programming Lab	PC	4	0	0	4	2	Basic Computer Knowledge.
3.	60 CB 201	Computer Organization and Architecture	PC	3	3	0	0	3	Foundations of Computer Design
4.	61 CB 202	Object Oriented Programming	PC	3	3	0	0	3	С
5.	61 CB 2P1	Object Oriented Programming Lab	PC	4	0	0	4	2	C++
6.	60 CB 301	Automata and	PC	4	3	1	0	4	Programming





		Compiler Design							Languages.
7.	60 CB 302	Database Management Systems	PC	3	3	0	0	3	Relational Algebra, Data Structure, Java Programming
8.	60 CB 3P1	Database Management Systems Lab	PC	4	0	0	4	2	Relational Algebra, Data Structure, Java Programming
9.	60 CB 303	Data Structures	PC	3	3	0	0	3	С
10.	60 CB 3P2	Data Structures Lab	PC	4	0	0	4	2	С
11.	60 CB 304	Software Engineering	PC	3	3	0	0	3	UML Concepts
12.	60 CB 401	Operating Systems	PC	3	3	0	0	3	Computer Fundamentals
13.	60 CB 4P1	Operating Systems Lab	PC	4	0	0	4	2	Good knowledge of C, Computer Organization and Architecture, x86 Assembly level programming.
14.	60 CB 402	Design and Analysis of Algorithms	PC	3	3	0	0	3	Basic knowledge of programming and mathematics
15.	60 CB 4P2	Design and Analysis of Algorithms Lab	PC	4	0	0	4	2	Basic knowledge of programming and mathematics
16.	60 CB 403	Software Design withUML	PC	3	3	0	0	3	Object Oriented Programming basics
17.	60 CB 404	MERN Stack	PC	5	1	0	4	3	Web technology, Database Management Systems
18.	60 CB 501	Computer Networks	PC	3	3	0	0	3	C or Java Programming
19.	60 CB 502	C# and .NET Programming	PC	3	3	0	0	3	Basic knowledge ofC or C++ or any programming language or programming fundamentals
20.	60 CB 503	Artificial Intelligence	PC	3	3	0	0	3	Computer Science Fundamentals,Data Structure,Basic Mathematics and python programming
21.	60 IT 003	Design Thinking	PC	4	2	0	2	3	Basic Programming Skills
22.	60 CB 5P1	Computer Networks	PC	4	0	0	4	2	C or Java



		Laboratory							Programming
23.	60 CB 5P2	C# and .NET Programming Laboratory	PC	4	0	0	4	2	Basic knowledge ofC or C++ or any programming language or programming fundamentals
24.	60 CB 601	Machine Learning	PC	3	3	0	0	3	Data Mining, Basic Statistics
25.	60 CB 602	Usability Design of Software Applications	PC	3	3	0	0	3	Knowledge ofHTML, CSS, JavaScript, design thinking
26.	60 CB 6P1	Machine Learning Laboratory	PC	4	0	0	4	2	Basic Mathematics andProgramming Languages
27.	60 CB 6P2	Usability Design of Software Applications Laboratory	CGC	4	0	0	4	2	Knowledge ofHTML, CSS, JavaScript, design thinking
28.	60 CB 701	Cloud Application Development	PC	3	3	0	0	3	Basic understanding of Java, Spring, and Spring Cloud Framework.
29.	60 CB 7P1	Data Analytics Laboratory	PC	4	0	0	4	2	Machine Learning, Statistics, Programming, Database
30.	60 CB 703	Software Testing and Automation	PC	3	3	0	0	3	Programming languages, Database concepts, Software Engineering

PROFESSIONAL ELECTIVES (PE) SEMESTER V, ELECTIVE I

S.No.	Course Code	Course Title	Category	Contact Periods	L	т	Ρ	С	Prerequisite
1.	60 CB E11	Python Full Stack	PE	5	1	0	4	3	Basic knowledgeof HTML, CSS, JavaScript, Java and Object oriented programming.
2.	60 CB E12	MEAN Stack	PE	5	1	0	4	3	HTML, CSS and JavaScript programming languages.
3.	60 CB E13	Android Application Development	PE	5	1	0	4	3	Basic Knowledgeof Programming, Java and Concepts of OOPs
4.	60 CB E14	Swift Coding and AppDevelopment	PE	5	1	0	4	3	MachineLearning
5.	60 CB E15	Robotics Process	PE	5	1	0	4	3	Java, C, C++, OOPs,



		Automation							AI and Machine Learning, Command over HTML, JavaScript, and other scripting languages.
6.	60 CB E16	Game Development	PE	5	1	0	4	3	Al Technology and tools, Software Engineering, Programming Language C, C++ and Java.

SEMESTER VI, ELECTIVE II

Marketing

S.No.	Course Code	Course Title	Category	Contact Periods	L	т	Ρ	С	Prerequisite
1.	60 CB E21	Marketing Research & Marketing Management	PE	3	3	0	0	3	Business Fundamentals, Statistics, Economics
2.	60 CB E22	Financial Analytics	PE	3	3	0	0	3	Principles of Finance, Mathematics, Statistics, Economics
3.	60 CB E23	Digital Marketing	PE	3	3	0	0	3	Marketing Fundamentals, Business Fundamentals, Analytical Skills and Communication Skills
4.	60 CB E24	Risk Analytics	PE	3	3	0	0	3	Mathematics, Statistics, Finance, Computer Science, Data Analysis
5.	60 CB E25	Financing New Business Ventures	PE	3	3	0	0	3	Business Fundamentals, Finance, Economics
6.	60 CB E26	Creativity & Innovation in Entrepreneurship	PE	3	3	0	0	3	Business Fundamentals, Marketing, Economics

SEMESTER VII, ELECTIVE III Integrated Course

S.No.	Course Code	Course Title	Category	Contact Periods	L	Т	Р	С	Prerequisite
1.	60 CB E31	Natural Language Processing	PE	4	2	0	2	3	Probability, linear algebra, and calculus.
2.	60 CB E32	Conversational Systems	PE	4	2	0	2	3	MachineLearning, Natural Language



									Processing
3.	60 CB E33	Virtual and Augmented Reality	PE	4	2	0	2	3	Computer Programming , Multimedia and Animation
4.	60 CB E34	Cyber Security	PE	4	2	0	2	3	Cryptographyand Network Security
5.	60 CB E35	Cryptocurrency and Blockchain Technologies	PE	4	2	0	2	3	Object-oriented programming, distributed systems, networking, cryptography, and data structures
6.	60 CB E36	Cognitive Science	PE	4	2	0	2	3	Concepts of Mathematics, Statistics sequence, Fundamentals of Programming Course Calculus.

SEMESTER VII, ELECTIVE IV Management

S.No.	Course Code	Course Title	Category	Cont act Periods	L	т	Ρ	С	Prerequisite
1.	60 CB E41	Behavioral Economics	PE	3	3	0	0	3	Economics, Statistics, Psychology, Mathematics, Data Analysis Tools
2.	60 CB E42	Customer Relation Management	PE	3	3	0	0	3	Marketing Management, Business Fundamentals
3.	60 CB E43	Financial Management	PE	3	3	0	0	3	Finance, Accounting, Mathematics, Economics
4.	60 CB E44	Fintech Personal Finance and Payments	PE	3	3	0	0	3	Understanding of basic financial concepts, Digital Payments Knowled ge, Digital Banking and Payments
5.	60 CB E45	Fundamentals of Investment	PE	3	3	0	0	3	Basic knowledge of Higher Secondary Mathematics, Binary Operations & Mathematical Logic
6.	60 CB E46	Introduction to Fintech	PE	3	3	0	0	3	Finance, Basic Technology Literacy, Economics, Digital



				Payments
				Knowledge, Data
				Analytics, Analytical
				Skills and
				Communication Skills

S.No.	Course Code	Course Title	Category	Cont act Periods	L	т	Р	С	Prerequisite
1.	60 CB E51	Exploratory Data Analysis	PE	4	2	0	2	3	Basic R programming skills, Statistics and Data visualization.
2.	60 CB E52	Recommender Systems	PE	4	2	0	2	3	Machine Learning, Linear Algebra.
3.	60 CB E53	Neural Networks and Deep Learning	PE	4	2	0	2	3	Programming, Statictics, Calculus,Linear Algebra,Data Science
4.	60 CB E54	Social, Text and Media Analytics	PE	4	2	0	2	3	Data Science, Natural Language Processing, Network Analysis, Information Visualization.
5.	60 CB E55	Computer Vision	PE	4	2	0	2	3	Maths, Image Processing, Programming, Machine Learning, Deep Learning.
6.	60 CB E56	Business Analytics	PE	4	2	0	2	3	Linear Algebra, Programming skills of Python language.

SEMESTER VIII, ELECTIVE V Integrated Course

SEMESTER VII

AUDIT COURSES (AC)

S.No.	Cour se Code	Course Title	Category	Contact Periods	L	т	Ρ	С	Prerequisite
1.	60 AC 001	Research Methodology	AC	1	1	0	0	0	Critical Thinking, Academic Writing, Research Methods



S.No.	Course Code	Course Title	Category	Cont act Periods	L	т	Ρ	С	Prerequisite
1.	60 MY 001	Environmental Studies andClimate Change	MC	2	2	0	0	0	Basic Science Courses, Environmental Monitoring Techniques
2.	60 MY 002	Universal Human Values	MC	3	3	0	0	3*	Open-Mindedness, Empathy, Ethical Awareness, Curiosity
3.	60 MY 003	Startups and Entrepreneurship	MC	2	2	0	0	0	Business Fundamentals, Entrepreneurship Basics, Economics, Creativity and Innovation

MANDATORY COURSES (MC)

OPEN ELECTIVES I / II / III / IV (OE)

S.No.	Course Code	Course Title	Category	Contact Periods	L	Т	Ρ	С	Prerequisite
1.	60 CB L01	C# and .NET Programming	OE	3	3	0	0	3	Basic knowledge ofC or C++ or any programming language or programming fundamentals
2.	60 CB L02	Automation Testing Tools	OE	3	3	0	0	3	Basic knowledge of programming languages
3.	60 CB L03	Usability Design of Software Applications	OE	3	3	0	0	3	Knowledge of HTML, CSS, JavaScript, design thinking

CAREER GUIDENENCE COURSES (CGC)

S.No.	Course Code	Course Title	Category	Contact Periods	L	т	Ρ	С	Prerequisite
1.	60 CG 0P1	Career Skill Development I	CGC	2	0	0	2	1*	Communication Skills, Critical Thinking, Basic Computer Literacy
		Career Skill							Career Skill
2.	60 CG 0P2	Development II	CGC	2	0	0	2	1*	Development I
		Career Skill							Career Skill
3.	60 CG 0P3	Development III	CGC	2	0	0	2	1*	Development II

4.	60 CG 0P4	Career Skill Development IV	CGC	2	0	0	2	1*	Career Skill Development III
5.	60 CG 0P5	Comprehension Test	CGC	2	0	0	2	1*	Career Skill Development I.II,III ,IV
6.	60 CB 7P2	Project Work Phase-I	CGC	4	0	0	4	2	Core Subject Knowledge, Research Methods
7.	60 CB 8P1	Project Work Phase-II	CGC	16	0	0	16	8	Project Work Phase-I
8.	60 CG 0P6	Internship	CGC	0	0	0	0	1/2/ 3*	Industry Knowledge, Communication Skills, Time Management, Relevant Coursework

GENERAL ELECTIVE COURSES (GE)

S.No.	Course Code	Course Title	Category	Contact Periods	L	т	Ρ	С	Prerequisite
1.	61 GE 001	Heritage of Tamils	GE	1	1	0	0	1*	NIL
				•	•	Ŭ	Ŭ	· ·	
		Tamils and							
2.	60 GE 002	Technology	GE	1	1	0	0	1*	NIL



K.S.RANGASAMY COLLEGE OF TECHNOLOGY, TIRUCHENGODE -637215 (An Autonomous Institution affiliated to Anna University)

COURSES OF STUDY B.Tech - Computer Science and Business Systems

(For the candidates admitted from 2024-2025 onwards)

SEMESTER I

S. No.	Course Code	Course Title	Category	Contact Periods	L	т	Р	С		
		Induction Programme	-	-	-	-	-	0		
	THEORY									
1.	60 EN 003	Business Communication and Value Science I	HS	2	2	0	0	2		
2.	60 MA 002	Statistics and probability	BS	5	3	1	0	4		
3.	61 PH 008	Fundamentals of Physics	BS	3	3	0	0	3		
4.	61 CB 101	Computer Programming	PC	3	3	0	0	3		
5.	60 EE 003	Principles of Electrical Engineering and Lab	ES	5	3	0	2	4		
6.	60 MY 001	Environmental Studies and Climate Change	MC	2	2	0	0	0		
7.	61 GE 001	Heritage of Tamils / தமிழர் மரபு	GE	1	1	0	0	1*		
		PRACTICALS								
8.	60 CB 1P1	Computer Programming Lab	PC	4	0	0	4	2		
9.	60 PH 0P3	Fundamentals of Physics Lab	BS	4	0	0	4	2		
			Total	29	17	1	10	20		

* Internship 3 additional credits not accounted for CGPA is offered based on the Internship duration

Heritage of Tamils/ தமிழர் மரபு additional 1 credit is offered and not account for CGPA.

SEMESTER II

S. No.	Course Code	Course Title	Category	Contact Periods	L	Т	Р	С
		THEORY	•					
1.	60 EN 004	Business Communication and Value Science II	HS	2	2	0	0	2
2.	60 HS 001	Fundamentals of Economics	s of Economics HS 3					
3.	60 MA 005	Statistical Modeling	eling BS 7					5
4.	60 CB 201	Computer Organization and Architecture	ization and Architecture PC				0	3
5.	61 CB 202	Object Oriented Programming	ed Programming PC					3
6.	60 GE 002	Tamils and Technology/ தமிழரும்	05	4			0	4*
		தததொழில் நுட்பமும்	GE	1	1	0	0	1.
		PRACTICALS						
7.	60 ME 0P1	Fabrication and Reverse Engineering Laboratory	ES	4	0	0	4	2
8.	61 CB 2P1	Object Oriented Programming Lab	PC	4	0	0	4	2
9.	60 CG 0P1	Career Skill Development – I	CGC	2	0	0	2	1*
10.	60 CG 0P6	Internship *	CGC	0	0	0	0	1/2/ 3*
			Total	29	15	1	12	20

Career Skill Development (CSD) - additional credit is offered not accounted for CGPA.

Internship 3 additional credits not accounted for CGPA is offered based on the Internship duration

* Tamils and Technology/ தமிழரும் தததொழில் நட்பமும் *extra credit is offered



S.No.	Course Code	Course Title	Category	Contact Periods	L	т	Ρ	С
		THEORY	I	L				
1	60 HS 004	Introduction to Innovation, IP	ЦС	3	3	0	0	3
1.		Management andEntrepreneurship	115	5	5	0	0	5
2.	60 MA 013	Computational Statistics	BS	5	3	0	2	4
3.	61 CB 301	Automata and Compiler Design	PC	5	3	1	0	4
4.	60 CB 302	Database Management Systems	PC	3	3	0	0	3
5.	60 CB 303	Data Structures	PC	3	3	0	0	3
6.	60 CB 304	Software Engineering	PC	3	3	0	0	3
		PRACTICAL	S					
7.	60 CB 3P1	Database Management Systems Lab	PC	4	0	0	4	2
8.	60 CB 3P2	Data Structures Lab	PC	4	0	0	4	2
9.	60 CG 0P2	Career Skill Development II	CGC	2	0	0	2	1*
10.	60 CG 0P6	Internship *	CGC	0	0	0	0	1/2/3*
			Total	32	18	1	12	24

SEMESTER III

* Career Skill Development (CSD) - additional credit is offered not accounted for CGPA.
 * Internship 3 additional credits not accouted for CGPA is offered based on the Internship duration.

		SEMES	FER IV					
S.No.	Course	Course Title	Category	Contact	L	Т	Ρ	С
	Code			Periods				
		THEORY						
1.	60 MA 018	Optimization Techniques	BS	5	3	1	0	4
2.	60 CB 401	Operating Systems	PC	3	3	0	0	3
3.	60 CB 402	Design and Analysis of Algorithms	PC	3	3	0	0	3
4.	60 CB 403	Software Design with UML	PC	3	3	0	0	3
5.	60 CB 404	MERN Stack	PC	5	1	0	4	3
6.	60 OE L*	Open elective-I	OE	3	3	0	0	3
7.	60 MY 002	Universal Human Values*	MC	3	3	0	0	3*
		PRACTICALS	6					
8.	60 CB 4P1	Operating Systems Lab	PC	4	0	0	4	2
9.	60 CB 4P2	Design and Analysis of Algorithms Lab	PC	4	0	0	4	2
10.	60 CG 0P3	Career Skill Development III	CGC	2	0	0	2	1*
11	60 CG 0P6	Internship *	CGC	0	0	0	0	1/2/
			000	U	0	0	0	3*
			Total	35	19	1	14	23

* Career Skill Development (CSD) - additional credit is offered not accounted for CGPA.
 * Internship 3 additional credits not accouted for CGPA is offered based on the Internship duration

* UHV[#] additional 3 credit is offered and not accouted for CGPA



S.No	Course Code	Course Title	Category	Contact Periods	L	Т	Ρ	С
		THEORY			1			
1.	60 CB 501	Computer Networks	PC	3	3	0	0	3
2.	60 CB 502	C# and .NET Programming	PC	3	3	0	0	3
3.	60 CB 503	Artificial Intelligence	PC	3	3	0	0	3
4.	60 IT 003	Design Thinking	PC	4	2	0	2	3
5.	60 CB E1*	Professional Elective I	PE	5	1	0	4	3
6.	60 OE L*	Open elective-II	OE	3	3	0	0	3
7.	60 MY 003	Startups and Entrepreneurship	MC	2	2	0	0	0
	•	PRACTICA	LS					
8.	60 CB 5P1	Computer Networks Laboratory	PC	4	0	0	4	2
q	60 CB 5P2	C# and .NET Programming	PC	4	0	0	4	2
0.	00 00 01 2	Laboratory	10	-	Ŭ	Ŭ	-	2
10.	60 CG 0P4	Career Skill Development IV	CGC	2	0	0	2	1*
11.	60 CG 0P6	Internship *	CGC	0	0	0	0	1/2/3*
			Total	33	17	0	16	22

SEMESTER V

* Career Skill Development (CSD) - additional credit is offered not accounted for CGPA.

* Internship 3 additional credits not accouted for CGPA is offered based on the Internship duration.

SEMESTER VI

S.No.	Course Code	Course Title	Category	Contact Periods	L	Т	Ρ	С
		THEORY						
1.	60 HS 005	Business Strategy	HS	3	3	0	0	3
2.	60 HS 006	Financial and Cost Accounting	HS	3	3	0	0	3
3.	60 CB 601	Machine Learning	PC	3	3	0	0	3
4.	60 CB 602	Usability Design of Software Applications	PC	3	3	0	0	3
5.	60 CB E2*	Professional Elective II	PE	3	3	0	0	3
6.	60 OE L*	Open elective-III	OE	3	3	0	0	3
		PRACTICA	LS					
7.	60 CB 6P1	Machine Learning Laboratory	PC	4	0	0	4	2
8.	60 CB 6P2	Usability Design of Software Applications Laboratory	CGC	4	0	0	4	2
9.	60 CB 6P3	Mini Project	PC	2	0	0	2	1*
10.	60 CG 0P5	Comprehension Test	CGC	2	0	0	2	1*
11.	60 CG 0P6	Internship *	CGC	0	0	0	0	1/2/ 3*
			Total	30	18	0	12	22

* Mini-project& - 1 additional credit is offered and not accounted for CGPA calculation.

* Career Skill Development (CSD) - additional credit is offered not accounted for CGPA.

* Internship 3 additional credits not accouted for CGPA is offered based on the Internship duration.

* Comprehension Test* -one additional credit is offered and not accounted for CGPA calculation.



S.No.	Course	Course Title	Category	Contact Periods	L	Т	Ρ	С
	Code	THEORY	<u> </u>	T enous				
1.	60 HS 007	Human Resource Management	HS	3	3	0	0	3
2.	60 CB 701	Cloud Application Development	PC	3	3	0	0	3
3.	60 CB 702	Data Analytics	PC	3	3	0	0	3
4.	60 CB 703	Software Testing and Automation	PC	3	3	0	0	3
5.	60 CB E3*	Professional Elective III	PE	4	2	0	2	3
6.	60 CB E4*	Professional Elective IV	PE	3	3	0	0	3
7.	60 AB 00*	NCC/NSS/NSO/YRC/RRC/Fine Arts*	HS	4	2	0	2	3*
8.	60 AC 001	Research Methodology	AC	1	1	0	0	0
		PRACTICA	LS					
9.	60 CB 7P1	Data Analytics Laboratory	PC	4	0	0	4	2
10.	60 CB 7P2	Project Work Phase-I	CGC	4	0	0	4	2
11.	60 CG 0P6	Internship *	CGC	0	0	0	0	1/2/3 *
			Total	28	18	0	10	22

SEMESTER VII

* NCC% - Course can be waived with 3 credits in VII semester or offered as extra credits

* NSS/NSO/YRC/RRC/Fine Arts% 3 credits is not accounted for CGPA

* Career Skill Development (CSD) - additional credit is offered not accounted for CGPA.

* Internship 3 additional credits not accouted for CGPA is offered based on the Internship duration

SEMESTER VIII

S.No.	Course Code	Course Title	Category	Contact Periods	L	т	Р	С			
		THEODY	e alle ger j					_			
		THEUR									
1.	60 CB E5*	Professional Elective V	PE	4	2	0	2	3			
	PRACTICALS										
2.	60 CB 8P1	Project Work Phase-II	CGC	16	0	0	16	8			
3.	60 CG 0P6	Internship *	CGC	0	0	0	0	1/2/3 *			
			Total	20	2	0	18	11			

* Internship 3 additional credits not accouted for CGPA is offered based on the Internship duration TOTAL NUMBER OF CREDITS TO BE EARNED FOR AWARD OF THE DEGREE = 164

HS- Humanities and Social Sciences including Management Courses,

BS- Basic Science Courses,

ES-Engineering Science Courses,

PE-Professional Core Courses,

PE-Professional Elective Courses,

GE- General Elective Courses,

OE- Open Elective Courses,

CG - Career Enhancement Course,

MC- Mandatory Courses

Note:

1 Hour Lecture is equivalent to 1 credit

2 Hour Tutorial is equivalent to 1 credit

2 Hour Practical is equivalent to 1 credit



K.S.RANGASAMY COLLEGE OF TECHNOLOGY, TIRUCHENGODE - 637215 (An Autonomous Institution affiliated to Anna University)

B.E. / B.Tech. Degree Programme

SCHEME OF EXAMINATIONS

(For the candidates admitted from 2023-2024 onwards)

FIRST SEMESTER

S.No	Course Code	Name of the	Duration of Internal	Weightage of Marks for Pass tion of Seme ernal Exa		Weightage of Marks for Pas Sen E:		
•		Course	Exam	Continuous Assessment *	End Semester Exam **	Max. Marks	End Semester Exam	Total
	·		TH	EORY				
1	60 EN 003	Business Communication and Value Science I	2	40	60	100	45	100
2	60 MA 002	Statistics and probability	2	40	60	100	45	100
3	61 PH 008	Fundamentals of Physics	2	40	60	100	45	100
4	61 CB 101	Computer Programming	2	40	60	100	45	100
5	60 EE 003	Principles of Electrical Engineering and Lab	2	50	50	100	45	100
6	60 MY 001	Environmental Studies and Climate Change	2	100	-	100	-	-
7	61 GE 001	Heritage of Tamils	2	-	100	100	100	100
	1	1	PRAG	CTICAL	1			1
8	60 CB 1P1	Computer Programming Lab	3	60	40	100	45	100
9	60 PH 0P3	Fundamentals of Physics Lab	3	60	40	100	45	100

* CA evaluation pattern will differ from course to course and for different tests. This will have to be declared in advance to students. The department will put a process in place to ensure that the actual test paper follow the declared pattern.

** End Semester Examination will be conducted for maximum marks of 100 and subsequently be reduced to 60 marks for the award of terminal examination marks

BoS Chairman

60 EN 003	Business Communication and Value	Category	L	Т	Ρ	Credit
	Science I	HS	2	0	0	2

Objectives

- To embellish students' overall communication and interpersonal skills by engaging the min group activities and helping them to emerge as thorough professionals.
- To focus on the development of basic English language skills with appropriate usage of vocabulary both in general and technical specific terms pertaining to their domain.
- To sensitize the learners with the importance of communication and listening skill by overcoming the barriers for effectiveness.
- To equip the students with the ability of setting personal and career goals so as to self- appraise them on value and belief systems for better understanding cultural sensitivities at the workplace.
- To reinforce team dynamics in order to maximize personal effectiveness for the healthier understanding of both personal and corporate values.

Pre-requisites

• Basic knowledge of reading and writing in English

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Illustrate meaningful sentences by using suitable tenses, voices and academic lexical words with phonological proficiency	Understand
CO2	Classify different types of letters of correspondence and reports in the academic and professional contexts.	Understand
CO3	Recall and relate the importance of communication skills in general and listening skills in particular	Remember
CO4	Infer self-awareness by values and beliefs for better goal setting and understand the cultural sensitivities that is prevalent at the workplace	Understand
CO5	Demonstrate the team effectives and group dynamics in making better decisions by the effective managerial exposition of human values	Understand

Mapping with Programme Outcomes

<u> </u>	POs												PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	-	-	-	-	-	-	-	-	-	3	2	3	2	1	-
CO2	-	-	-	-	-	-	-	-	-	3	2	3	2	1	-
CO3	-	-	-	-	-	-	-	-	-	3	1	3	2	1	-
CO4	-	-	-	-	-	-	-	-	-	3	3	3	2	1	-
CO5	-	-	-	-	-	-	-	-	-	3	3	3	2	1	-
3 - St	3 - Strong: 2 - Medium: 1 - Some														

Assessment Pattern

Bloom's	Continuous A (M	ssessment Tests arks)	End Sem Examination (Marks)							
Calegory	1	2								
Remember	10	10	20							
Understand	50	50	80							
Apply	-	-	-							
Analyse	-	-	-							
Evaluate	-	-	-							
Create	-	-	-							
Total	60	60	100							

Syllabus										
K.S.Rangasamy College of Technology – Autonomous R2022										
B.Tech Computer Science and Business Systems										
			60 EN 003 -	Business	Communic	ation and	Value Scie	nce l		
Seme	ster		Hours/Week	<u> </u>	Total	Credit		Maximum Marks	ks	
		L	Т	P	Hours	C	CA	ES	Total	
I		2	0	0	30	2	40	60	100	
Esser	ntial G	irammar –	· I*			.				
Parts of speech through context - Direct and Reported Speech Structures and Voices -										
Vocab	olarv	Enrichmer	nt: Exposure f	to words fro	om General	Service List	(GSL) by V	Vest - Academic		
word list (AWL) technical specific terms related to the field of technology - Phrases - Idioms -								[6]		
signific	cant a	bbreviatio	ns formal bu	siness voo	abulary - F	honetic: Pr	onunciatior	n - Reduction of		
MTI ir	n spol	ken Englis	h - Question	formation	with empl	nasis on co	mmon erro	ors made during		
conve	rsatio	n.								
Writte	en Co	mmunicat	ion – I*	11.0			Desert	de la companya	[0]	
Letter	Writin	ig - Formal	l and Informa	al letter writ on letter	ing - Applic	ation letters	- Report w	riting: Academic	[6]	
Comn	nunic	ation Skill	s*							
Import	tance	of effectiv	e communic	ation - Typ	bes of com	munication	- Verbal a	nd Non-verbal -	[0]	
Barrie	rs to	communi	cation - Eff	ective con	nmunicatior	n - Listenir	ng Skills:	Law of nature-	[6]	
Import	tance	of listening	g skills - Diffe	rence betw	veen listenii	ng and hear	ing - Types	of listening.		
Self –	Awa	eness*								
Self-A	ssess	ment - Se	lf-Appraisal -	- SWOT -	Self-esteen	n - Self- aw	areness - I	Perceptions and		
attitud	es - P	ositive atti	tude - Values	and belief	systems -	Personal go	al setting -	Career planning		
- Pers	onal s	uccess fac	ctors - Handli	ing failures	- Depressi	on and habi	t - Relating	SWOT analysis	[6]	
& goa	l settir	ng and pric	pritization - S	ocio-cultura	al and cross	s-cultural se	nsitivities a	t the workplace:		
What	is Incl	usion? - W	omen's cont	ributions in	Industry -	Work issues	s faced by	women - what is		
sexua	i nara	ssment? -	what is appr	opriate bei	navior for ev	veryone at v	Vork?			
Interp	ersor	nal Skills*								
Team	work	- Team eff	fectiveness -	Group dise	cussion - D	ecision mak	ing - Team	communication		
team:	Conf	lict Resolu	ution - Tear	n goal se	tting - Tea	am motivati	on - Unde	erstanding team		
develo	pmer	nt – Team j	problem solvi	ing - Buildiı	ng the team	dynamics -	- Multi-cultu	ural team activity		
Time I	Manag	gement: Th	ne Time man	agement m	atrix - Appl	ication of Pa	areto Princi	ple (80/20 Rule)	[6]	
to time	e man	agement is	ssues, to prio	oritize using	decision m	hatrices, to b	eat the mo	ost common time		
Waste	rs - Ho	ow to plan i	? - How to ha	nale interru	iptions ? - to	o maximize y	our persor	hai effectiveness		
behav	ior P	ersonal / H	luman Values	s - Pride ar	nd grace in	Nationalist		State values and		
bonar								Tetal Hauman		
Taxt F	Rook(e).						Total Hours:	30	
1	Dr S	aroi Hirem:	ath 'Rusines	s Commun	ication' Nir	ali Prakash	an Mumba	i 2017		
2	Ravm	ond Murph	nv 'Essential	Fnalish G	rammar' 2 ⁿ	d Edition Ca	ambridae U	Iniversity Press 2	015	
Refer	ence(s):	ij, 2000iiia		, <u>,</u>				<u></u>	
	Alan	McCarthy	and Felicity	O'Dell,'En	glish Voca	bulary in U	se', Prelim	inary and Advan	ced, 4 th	
1.	1. Edition, Cambridge University Press, 2017									
2.	Charl	es Marsh,	David W. Gu	th, Bonnie	Poovey Sh	ort, 'Strategi	c Writing N	Iultimedia Writing	for Public	
<u> </u>	Relat	ons, Adve	rtising, and N	/lore',4thEc	lition, 2017		Dull 1 CC	0.4		
3.	Unris	opner Boo	Word De	ven Basic		msbury, Nev	w Deihi, 20	U4		
	4. Norman Lewis, Word Power Made Easy - The Complete Handbook for Building a Superior									

*SDG 4:- Quality Education



S No	Jontents and Lecture Schedule	No. of
3. NO.	Topics	hours
1.0	Essential Grammar – I	
1.1	Tenses: Basic forms and use	1
1.2	Sentence formation (general & Technical) - Common errors	1
1.3	Parts of speech through context - Direct and reported speech structures and voices	1
1.4	Vocabulary Enrichment: Exposure to words from General Service List (GSL) by West	1
1.5	Academic word list (AWL) technical specific terms related to the field of technology	1
1.6	Phrases – Idioms - Significant abbreviations formal business vocabulary	1
1.7	Phonetic: Pronunciation - Reduction of MTI in spoken English	1
1.8	Question formation with emphasis on common errors made during conversation.	1
2.0	Written Communication – I	
2.1	Letter Writing - Formal and Informal letter writing	2
2.2	Application letters	2
2.3	Report writing: Academic report	1
2.4	Report writing: Business report - Job application letter	1
3.0	Communication Skills	
3.1	Importance of effective communication	1
3.2	Types of communication - Verbal and Non-verbal - Barriers to communication - Effective communication	1
3.3	Listening Skills: Law of nature- Importance of listening skills	1
3.4	Difference between listening and hearing - Types of listening.	2
4.0	Self – Awareness	
4.1	Self-Assessment - Self-Appraisal - SWOT - Self-esteem - Self- awareness	1
4.2	Perceptions and attitudes - Positive attitude - Values and belief systems	1
4.3	Personal goal setting - Career planning - Personal success factors	1
4.4	Handling failures - Depression and habit - Relating SWOT analysis & goal setting and prioritization	1
4.5	Socio-cultural and cross-cultural sensitivities at the workplace	1
4.6	What is Inclusion? - Women's contributions in Industry - Work issues faced by women - What is sexual harassment? - What is appropriate behavior for everyone at work?	1
5.0	Interpersonal Skills	
5.1	Team work - Team effectiveness - Group discussion - Decision making	1
5.2	Team communication team: Conflict Resolution - Team goal setting – Team motivation - Understanding team development - Team problem solving	1
5.3	Building the team dynamics – Multi-cultural team activity - Time Management: The Time management matrix	1
5.4	Application of Pareto Principle (80/20 Rule) to time management issues, to prioritize using decision matrices, to beat the most common time wasters	1
5.5	How to plan? - How to handle interruptions? - to maximize your personal effectiveness - How to say no to time wasters	1



5.6	Values of a good manager: Understanding corporate values and behavior: Personal / Human Values	1
5.7	Pride and grace in Nationalist	1

Course Designer(s)

1. Dr.A.Palaniappan - palaniappan@ksrct.ac.in



60 MA 002	Statistics and Probability	Category	L	Т	Ρ	Credit
00 WA 002	Statistics and Probability	BS	3	1	0	4

Objectives

- To understand the basic concepts of statistics.
- To understand and have a well founded knowledge of Descriptive Statistics.
- To acquire skills in the concept of probability.
- To familiarize discrete and continuous distributions.
- To learn the concepts of various testing techniques and its properties.

Pre-requisites

• Basic knowledge of Higher Secondary Mathematics: Probability Distributions.

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Apply the knowledge of different types of data.	Apply
CO2	Apply the concepts of descriptive method and frequency distributions.	Apply
CO3	Realize the concept of probability.	Apply
CO4	Apply the Knowledge of discrete and continuous distributions.	Apply
CO5	Interpret the various concepts of hypothesis testing.	Apply

Mapping with Programme Outcomes

	POs												PSOs		
COs	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
CO2	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
CO3	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
CO4	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
CO5	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
3 - St	3 - Strong: 2 - Medium: 1 - Some														

Assessment Pattern	

Bloom's	Continuous Ass (Ma	sessment Tests rks)	End Sem Examination (Marks)
Calegory	1	2	
Remember	10	10	10
Understand	10	10	30
Apply	40	40	60
Analyse	-	-	-
Evaluate	-	-	-
Create	-	-	-
Total	60	60	100



Syllabus									
K.S. Rangasamy College of Technology – Autonomous R2022									
B.Tech -Computer Science And Business Systems									
		60	MA 002 -St	atistics and	d Probabili	ty			
0	tan H	lours/Weel	(Total	Credit	Ma	aximum Ma	rks	
Semes	L	Т	Р	Hours	С	CA	ES	Total	
	3	1	0	60	4	40	60	100	
Introdu	uction to Statis	tics							
Definiti	on of Statistics -	- Basic obie	ctives – Ap	plications in	various bra	nches of so	cience with		
exampl	les – Collection	of Data: Inte	ernal and e	xternal data	– Primary a	and second	arv Data –		
Popula	tion and sample	-Represer	tative sam	ple.	,		,	[9]	
Hands	s - on:	·							
Compu	iting Summary	Statistics	/plotting a	nd visualizi	ng data u	sing Tabul	lation and		
Graphic	cal Representat	ions.	. 0		C	0			
Descri	ptive Statistics								
Classifi	ication and tabu	ulation of ur	nivariate da	ata – Graph	ical represe	entation -	Frequency		
curves	- Descriptive r	measures -	Central te	endency an	d Dispersio	n – Bivaria	ate data –		
Summa	arization – Marg	ginal and co	onditional f	requency d	istribution.	Expected v	alues and	[0]	
momer	nts: Mathematica	al expectatio	on and its pi	roperties – N	Noments (in	cluding var	iance) and	[9]	
their pr	operties – Interp	pretation.							
Hands	s - on:								
Calcula	ate the measure	s of central	tendency						
Probab	oility								
Concep	ot of experiment	s – sample	space – Ev	ents – Defir	nition of Cor	nbinatorial	Probability		
– Cond	litional Probabili	ty – Baye's	Theorem.					[9]	
Hands	s - on:								
Calcula	ate the probabilit	ty using Bay	es Theorer	n.					
Probab	oility Distribution	ons							
Momer	nt Generating Fu	nction – Dis	crete & Coi	ntinuous dis	tributions: B	inomial –P	oisson and		
Geome	etric distributions	s, Uniform –	Exponentia	al and Norm	al distributi	ons.		[9]	
Hands	s - on:								
Fitting t	the following pro	bability dist	ributions: E	Binomial dist	ribution, Po	isson distri	bution.		
Testing	g of Hypothesis	S							
Proced	ure for testing c	of hypothesis	s - Test of	significance	of small sa	mples– Stu	udent's 't' -		
test-Si	ngle Mean- Di	fference of	means. V	ariance - 'l	=' - Test -	Chi-Squa	re Test of	[9]	
goodne	ess of Fit-Chi-So	quare Test f	or Indepen	dence of att	ributes.			[0]	
Hands	s - on:								
Applyin	ig Chi-square te	st for goodr	less of fit te	est and Con	tingency tes	t to real da	taset.		
			1	otal Hours	: Total Hou	ırs: 45 + 1	o(Tutorial)	60	
Text B	ook(s):		<u> </u>				B 1 " "		
1. 5	5. M. Ross," Intr	oduction of	Probability	Models", Ac	cademic Pre	ess, Springe	er Publicatio	n, 2000.	
2. 8	S.P. Gupta, "Sta	tistical Meth	ods", Sulta	nChand & S	Sons, 2012.				
Refere	nce(s):								
1. A	A. Goon, M. Gupta and B. Dasgupta, "Fundamentals of Statistics", Vol. I, 2013 & Vol. II, 201							l. II, 2016,	
Paper Back Edition, World Press.									
2. I. R. Miller, J. E. Freund and R. Johnson, "Probability and Statistics for E								ngineers".	
FourthEdition, PHI,2011.									
3. A	A.M. Mood, F. A.	. Graybill an	d D. C. Boe	es, "Introduc	ction to the	Theory of S	tatistics", Mo	cGraw Hill	
E	Education, 2010								
4. h	http://nptel.ac.in/	courses/11	1104079/,	Probability	Theory and	d Applicatio	ons, IIT Kar	pur, Prof.	
F	Prabha Sharma.								
*SDG 9	9 – Industrv Inno	ovation and	Infrastructu	ire					

*SDG 4:- Quality Education



Course C		No. of					
S. No.	Topics	hours					
1.0	Introduction to Statistics	1					
1 1	Definition of Statistics, Basic objectives, Applications in various branches of	1					
1.1	science with examples	'					
1.2	Collection of Data: Internal and external data						
1.3	Primary and secondary Data	1					
1.4	Population and sample	1					
1.5	Representative sample	1					
1.6	Classification and tabulation of univariate data	1					
1./	Frequency curves.	1					
1.8	Population and sample	2					
1.9		2					
1.10	Hands on Departmenting Statistics	1					
2.0		4					
2.1	Descriptive measures	1					
2.2	Central tendency and Dispersion	1					
2.3	Marginal and conditional frequency distribution	2					
2.4	Expected values and moments: Mathematical expectation and its	1					
2.5	properties	2					
2.6	Interpretation	2					
27	Tutorial	2					
2.8	Hands on						
3.0	Probability	•					
31	Concept of experiments	1					
3.2	Sample space and Events	2					
3.3	Definition of Combinatorial Probability	2					
3.4	Conditional Probability	2					
3.5	Baves Theorem	2					
3.6	Tutorial	2					
3.7	Hands on	1					
4.0	Probability Distributions						
4.1	Moment Generating Function – Discrete: Binomial distribution.	2					
4.2	Moment Generating Function – Discrete: Poisson distributions	2					
4.3	Moment Generating Function – Discrete: Geometric distributions	1					
4.4	Moment Generating Function – Continuous: Uniform distributions	1					
4.5	Moment Generating Function – Continuous: Exponential distributions.	1					
4.6	Moment Generating Function – Continuous: Normal distributions.	2					
4.7	Tutorial	2					
4.8	Hands on	1					
5.0	Testing of Hypothesis	•					
5.1	Procedure for testing of hypothesis.	1					
5.2	Test of significance of small samples –Student's 't' – test– Single mean	2					
5.3	Student's 't' – test– difference of Means.	2					
5.4	Fisher's 'F'- Test	1					
5.5	Chi-Square Test of goodness of Fit	1					
5.6	Chi-Square Test for Independence of attributes.	2					
5.7	Tutorial	2					
5.8	Hands on	1					
Course D	uesigner(s)						

1. Dr.K.Prabakaran – prabakaran@ksrct.ac.in



Fundamentals of Physics	Category	L	Т	Р	Credit
	BS	3	0	0	3

Objectives

- Understand the characteristics of simple and damped harmonic motion and illustrate the • interference, diffraction, polarization and basic ideas of electromagnetism.
- Exemplify the dual nature of matter and apply the Schrodinger wave equation to determine the • wave function of particle in one dimensional box
- To enhance students' knowledge of theoretical and modern technological aspects in • semiconductor Physics and to assess the crystallographic parameters of seven crystal systems.
- Compare the different types of lasers based on pumping method, active medium and energy • levels
- Analyze the laws of thermodynamics and different thermodynamic processes. •

Pre-requisites

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Recognize the different types of harmonic oscillations and compare electrical oscillator withmechanical oscillator.	Understand
CO2	Acquire the interference, diffraction and polarization of light in Newtons rings, diffractiongrating and double refraction respectively.	Understand
CO3	Apply the concepts of quantum mechanics to solve the Schrodinger time dependent and time independent wave equations	Apply
CO4	Infer the crystallographic parameters of seven crystal systems and compare the unit cellcharacteristics of SC, BCC, FCC and HCP crystal structures and classification of solids	Understand
CO5	Realize the different types of lasers and compare the different types of optical fibers based on mode and refractive index profile for data communication system, laws of thermodynamics and different thermodynamic process.	Understand

Mapping with Programme Outcomes

<u> </u>		POs											PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	
CO3	3	-	-	-	-	-	-	-	-	-	-	-	2	-	
CO4	3	-	-	-	-	-	-	-	-	2	-	-	2	-	
CO5	3	-	-	-	-	-	-	-	-	2	-	-	2	-	
3 - St	- Strong: 2 - Medium: 1 - Low														

Accorement Bettern

Assessment rattern								
Bloom's	Continuous As (Ma	sessment Tests arks)	End Sem Examination (Marks)					
Calegory	1	2						
Remember	20	20	40					
Understand	40	40	60					
Apply	-	-	-					
Analyse	-	-	-					
Evaluate	-	-	-					
Create	-	-	-					
Total	60	60	100					



K.S.Rangasamy College of Technology – Autonomous R2022 B.Tech – Computer Science and Business Systems 61 PH 008- Fundamentals of Physics Semester L Total Credit Maximum Marks Semester L T Photors Credit Maximum Marks Semester L T L T Photors Credit Maximum Marks Consciption: Total Credit Maximum Marks Obsciption: Credit Maximum Marks Consciption: Total Total T Administration of colspansition: Consciption: (9) Total T Total Credit Maximum Marks: Critical and lipit damping, energy decay in a damped harmonic oscillator,	Syllabus									
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Text Book(s): Total Hours: 45 1. Ajoy Ghatak, Optics, Tata McGraw Hill, 5th Edition., 2012 2. 2. Rajagopal, K., Engineering Physics, PHI Learning., 2010 Reference(s): 1. Basics of laser physics: for students of science and engineeringhttp://www.springer.com/978-3-319-50650-0 2. Arthur Beiser, Shobhit Mahajan and S Rai Choudhury, Concepts of Modern Physics, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 6th Edition, 2014 3. B. K. Pandey and S. Chaturvedi, Engineering Physics, Cengage Learning India Pvt Ltd., New Delhi, 1st edition, 2017. 4. Halliday and Resnick, Fundamentals of Physics, John Wiley and Sons, Inc,11 th edition, 2018	entropy	. change in ent	ropy in reve	rsible and i	rreversible	processes.	na oonoopt	or Engine,		
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1. Ajoy Ghatak, Optics, Tata McGraw Hill, 5th Edition., 2012 2. Rajagopal, K., Engineering Physics, PHI Learning., 2010 Reference(s): 1. Basics of laser physics: for students of science and engineeringhttp://www.springer.com/978-3- 319- 50650-0 2. Arthur Beiser, Shobhit Mahajan and S Rai Choudhury, Concepts of Modern Physics, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 6th Edition, 2014 3. B. K. Pandey and S. Chaturvedi, Engineering Physics, Cengage Learning India Pvt Ltd., New Delhi, 1st edition, 2017. 4. Halliday and Resnick, Fundamentals of Physics, John Wiley and Sons, Inc,11 th edition, 2018 * SDG:4- Quality Education	Text Bo	ook(s):								
 2. Rajagopal, K., Engineering Physics, PHI Learning., 2010 Reference(s): Basics of laser physics: for students of science and engineeringhttp://www.springer.com/978-3-319-50650-0 2. Arthur Beiser, Shobhit Mahajan and S Rai Choudhury, Concepts of Modern Physics, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 6th Edition, 2014 3. B. K. Pandey and S. Chaturvedi, Engineering Physics, Cengage Learning India Pvt Ltd., New Delhi, 1st edition, 2017. 4. Halliday and Resnick, Fundamentals of Physics, John Wiley and Sons, Inc,11th edition, 2018 	1. A	joy Ghatak, Op	otics, Tata M	lcGraw Hill,	5th Edition	., 2012				
Reference(s): 1. Basics of laser physics: for students of science and engineeringhttp://www.springer.com/978-3- 319-50650-0 2. Arthur Beiser, Shobhit Mahajan and S Rai Choudhury, Concepts of Modern Physics, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 6th Edition, 2014 3. B. K. Pandey and S. Chaturvedi, Engineering Physics, Cengage Learning India Pvt Ltd., New Delhi, 1st edition, 2017. 4. Halliday and Resnick, Fundamentals of Physics, John Wiley and Sons, Inc,11 th edition, 2018 * SDG:4- Quality Education	2. Rajagopal, K., Engineering Physics, PHI Learning., 2010									
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 Arthur Beiser, Shobhit Mahajan and S Rai Choudhury, Concepts of Modern Physics, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 6th Edition, 2014 B. K. Pandey and S. Chaturvedi, Engineering Physics, Cengage Learning India Pvt Ltd., New Delhi, 1st edition, 2017. Halliday and Resnick, Fundamentals of Physics, John Wiley and Sons, Inc,11th edition, 2018 * SDG:4- Quality Education 	1. Basics of laser physics: for students of science and engineeringhttp://www.springer.com/978-3- 319- 50650-0									
 B. K. Pandey and S. Chaturvedi, Engineering Physics, Cengage Learning India Pvt Ltd., New Delhi, 1st edition, 2017. Halliday and Resnick, Fundamentals of Physics, John Wiley and Sons, Inc,11th edition, 2018 * SDG:4- Quality Education 	2. A	2. Arthur Beiser, Shobhit Mahajan and S Rai Choudhury, Concepts of Modern Physics, Tata								
Leini, 1st edition, 2017. 4. Halliday and Resnick, Fundamentals of Physics, John Wiley and Sons, Inc,11 th edition, 2018 * SDG:4- Quality Education	3. B	. K. Pandey ar	nd S. Chatu	rvedi, Engir	neering Phy	sics, Cenga	age Learnin	g India Pvt	Ltd., New	
* SDG:4- Quality Education		elhi, 1st edition	1, 2017. Spick Eurod	amontale of	Dhysics 4	hn Wilov o	nd Sona In	c 11th aditia	n 2019	
	<u> </u>	aniuay anu Ke: I- Quality Fdu	cation		1 11y5105, J0	Juli vviley a	10 3015, 11		11, 2010	



Course Contents and Lecture Schedule						
S. No.	Topics	No. of hours				
1.0	Oscillation:					
1.1	Periodic motion-simple harmonic motion	1				
1.2	Characteristics of simple harmonic motion-vibration of simple spring mass system	2				
1.3	Resonance-definition, damped harmonic oscillator	1				
1.4	Heavy critical and light damping	1				
1.5	Energy decay in a damped harmonic oscillator	1				
1.6	Quality factor, forced mechanical and electrical oscillators	1				
1.7	Flash Evaporation	1				
2.0	Interference-principle of superposition-young's experiment					
2.1	Theory of interference fringes-types of interference	1				
2.2	Fresnel's prism	1				
2.3	Newton's rings	1				
2.4	Diffraction-Two kinds of diffraction	1				
2.5	Difference between interference and diffraction	1				
2.6	Emission Norms in India – Bharat Stage VI	1				
2.7	Fraunhofer diffraction at single slit-plane diffraction grating.	1				
2.8	Temporal and Spatial Coherence.	1				
2.9	Polarization of light: Polarization - Concept of production of polarized beam of light from two SHM acting at rightangle	1				
2.10	plane, elliptical and circularly polarized light Brewster's law, double refraction	1				
3.0	Basic Idea of Electromagnetisms					
3.1	Continuity equation for current densities	1				
3.2	Maxwell's equation in vacuum and non-conducting medium.	1				
3.3	Quantum Mechanics: Introduction	1				
3.4	Planck's quantum theory- Matter waves	1				
3.5	De-Broglie wavelength	1				
3.6	Heisenberg's Uncertainty principle	1				
3.7	Time independent and time dependent Schrödinger's wave equation	1				
3.8	Physical significance of wave function	1				
3.9	Particle in a one dimensional potential box	1				
3.10	Heisenberg Picture	1				
4.0	Crystallography	•				
4.1	Basic terms-types of crystal systems	1				
4.2	Bravais lattices	1				
4.3	Miller indices, d-spacing,	2				
4.4	Atomic packing factor for SC, BCC, FCC and HCP structures	1				
4.5	Semiconductor Physics: Conductor	1				
4.6	Semiconductor and Insulator	1				
4.7	Basic concept of Band theory	1				
5.0	Laser and Fiber Optics					

BoS Chairman

5.1	Einstein's theory of matter radiation interaction and A and B coefficients	1
5.2	Amplification of light by population inversion	1
5.3	Different types of lasers: Ruby Laser, CO2 and Neodymium lasers	1
5.4	Properties oflaser beams: mono-chromaticity, coherence, directionality and brightness	2
5.5	Laser speckles, applications of lasers in engineering	1
5.6	Fiber optics and Applications, Types of optical fibers	2
5.7	Thermodynamics: Zeroth law of thermodynamics,	1
5.8	First law of thermodynamics, brief discussion on application of1st law, second law of thermodynamics	
5.9	Concept of Engine, entropy, changes in entropy in reversible and irreversible processes.	

Course Designer(s)

- 1. Dr. V. Vasudevan vasudevanv@ksrct.ac.in
- 2. Mr. S. Vanchinathan vanchinathan@ksrct.ac.in
- 3. Dr. P. Suthanthira Kumar suthanthirakumar@ksrct.ac.in

61 CB 101	Computer Brogramming	Category	L	Т	Ρ	Credit
81 CB 101	Computer Programming	PC	3	0	0	3

Objectives

- To learn most fundamental element of the C language and to examine the execution of branching, looping statements
- To examine the concepts of arrays, its characteristics and types and strings.
- To understand the concept of functions, pointers and the techniques of putting them to use.
- To apply the knowledge of structures and unions to solve basic problems in C language.
- To enhance the knowledge in file handling functions for storage and retrieval of data.

Pre-requisites

• Basic Computer Knowledge, Mathematics.

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Explain the fundamental building blocks of structured Programming in C	Understand
CO2	Implement the different operations on arrays and strings	Apply
CO3	Develop simple real world applications utilizing functions, recursion and pointers.	Apply
CO4	Demonstrate the concepts of structures, unions ,user defined data types And Pre-processor	Apply
CO5	Interpret the file concepts using proper standard library functions for a given application	Apply

Mapp	Mapping with Programme Outcomes														
<u> </u>		POs										PSOs			
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2	-	-	3	-	-	-	-	-	-	2	3	-	-
CO2	3	2	2	-	3	-	-	-	2	-	2	2	3	-	-
CO3	3	2	2	-	3	-	-	-	2	-	2	2	3	-	-
CO4	3	2	2	-	3	-	-	-	2	-	2	2	3	-	-
CO5	3	2	2	-	3	-	-	-	2	-	2	2	3	-	-
2 04			ا مورينا	Carro	•										

3 - Strong; 2 - Medium; 1 - Some

Assessment Patte	rn		
Bloom's	Continuous A (N	ssessment Tests Iarks)	End Sem Examination (Marks)
Calegory	1	2	
Remember	-	-	-
Understand	20	20	40
Apply	40	40	60
Analyse	-	-	-
Evaluate	-	-	-
Create	-	-	-
Total	60	60	100



Syllabus											
K.S.Rangasamy College of Technology – Autonomous R2022											
B.Tech – Computer Science and Business Systems											
61 CB 101 – Computer Programming											
Seme	ster l	Hours/Week		Total	Credit	Ma	rks				
ocine	L	Т	Р	Hours	С	CA ES		Total			
	3	0	0	45	3	40	60	100			
Basics of C, I/O, Branching and Loops*											
Structure of a C Program – Data types – Keywords - Variables – Type Qualifiers - Constants											
- Operators - Expressions and Precedence - Console I/O - Unformatted and Formatted											
Conso	ole I/O - Conditio	nal Branch	ing and Loc	ops - Writing	g and Eval	uation of Co	onditionals				
and C	onsequent Brand	ching.									
Array	s and Strings*		- D.								
Arrays	s: One Dimensio	onal Arrays	- Iwo Di	mensional	Arrays – I	Matrix Man	ipulation -	[9]			
Chara	acter arrays – S	strings - S	tring wanip	bulation wit	n and with	nout String	Handling				
Funct	ions.	***									
Funct	ions and Pointe	Function		ctions and I	loor dofino	d functions	Function				
Protot	iuns. Scope of a	Function –	LIDIALY FULL	cuons anu i	on Cotogor	ization Arc					
main	function - Pocure	ine and Ca		Decing Arr	on Calegor	tions Sto		[0]			
Specif	fiers - Introduction	n to Pointer	Variables -	The Pointe	r Operators	- Pointer Ex	naye class	[9]			
- Poin	ters and Arrays -	Generating	a Pointer to	an Array -	Indexing P	ninters – Fu	nction and				
Pointe	Pointers - Dynamic Memory Allocation										
Struc	tures. Unions. E	numeratio	ns. Typede	f and Prep	rocessors	*					
Struct	ures - Introductio	on to Struct	ures and Ini	tialization -	Arrays of S	Structures: A	Arrays and	[0]			
Struct	ures, Nested Str	ructures - I	Passing Str	uctures to	Functions	- Structure	Pointers -	[9]			
Union	s - Bit Fields - Er	umerations	- typedef -	- The Prepr	ocessor an	d Commano	ds.				
File H	landling*										
File: \$	Streams – Read	ing and W	riting Chara	acters - Rea	ading and	Writing Stri	ngs - File	[0]			
Syster	m functions – F	ile Manipu	ulation-Sequ	uential Acc	ess - Ran	dom Acces	s Files –	[9]			
Comn	nand Line Argum	ents.									
						To	tal Hours:	45			
lext L	Book(s):	<u>"</u> =! 0					=				
1.	Herbert Schildt,	"The Comp	lete Refere		irth Edition,	I ata McGr	aw Hill Editi	on, 2010			
2.	Byron Gottfried,	"Programm	ning with C"	, Third Editi	on, McGrav	v Hill Educa	tion, 2014.				
Reference(s):											
1.	1. E.Balagurusamy, "Programming in ANSI C", Seventh Edition, Tata McGraw Hill Edition, New Delhi, 2016.										
2.	Brian W. Kernigh	nan and De	nnis M. Rito	hie, "C Pro	gramming L	.anguage", l	Prentice-Ha	ll.			
3.	ReemaThareja,	"Computer	Fundamen	tals and P	rogramming	g in C", Se	cond Editic	on, Oxford			
4	K N King "C Prov	n, 2010. Arammina: A	Modern A	nnroach" S	econd Editi		rton New V	ork 2008			
4.	4. This king, C Programming: A wodern Approach, Second Edition, W.W.Norton, New York, 2008.										

*SDG: 4-Quality Education.



Course Contents and Lecture Schedule								
S. No.	Topics							
1.0	Basics of C, I/O, Branching and Loops	-						
1.1	Structure of a C Program, Keywords	1						
1.2	Data types, Type Qualifiers	1						
1.3	Operators-expressions and precedence	1						
1.4	Console I/O – Unformatted and Formatted Console I/O	1						
1.6	Conditional Branching	2						
1.7	Iteration and loops	1						
1.8	Writing and Evaluation of Conditionals and Consequent Branching	1						
2.0	Arrays and Strings							
2.1	One Dimensional Array	1						
2.2	Two-Dimensional Array and Matrix Manipulation	2						
2.3	Character arrays and Strings Basics	2						
2.4	String Manipulation without String Handling Functions	2						
2.5	String Manipulation with String Handling Functions	2						
3.0	Functions and Pointers							
3.1	Scope of a Function – Library Functions, User defined functions and Function Prototypes	1						
3.2	Function Call by value and Function Call by reference, Function Categorization	1						
3.3	Arguments to main function	1						
3.4	Recursion and application	1						
3.5	Passing Arrays to Functions	1						
3.6	Storage class Specifiers	1						
3.7	Introduction to Pointer Variables - The Pointer Operators - Pointer Expressions	1						
3.8	Pointers and Arrays - Generating a Pointer to an Array - IndexingPointers	1						
3.9	Function and pointers - Dynamic memory allocation	1						
4.0	Structures, Unions, Enumerations, Typedef and Preprocessors							
4.1	Introduction to Structures and Initialization	1						
4.2	Arrays and Structures, Arrays of Structures	2						
4.3	Structures within Structures, Passing Structures to Functions	2						
4.4	Structure Pointers	1						
4.5	Unions and Bit Fields.	1						
4.6	Enumerations - typedef	1						
4.7	Preprocessor commands	1						
5.0	File Handling							
5.1	File Streams – Reading and Writing Characters - Reading and Writing Strings	2						
5.2	File System functions and File Manipulation	2						
5.3	Sequential access	2						
5.4	Random Access Files	2						
5.5	Command Line arguments and files	1						
L								

Course Designer(s)

1. Mr.K.Karthikeyan - karthikeyank@ksrct.ac.in



60 EE 003	Principles of Electrical	Category	L	Т	Ρ	Credit
00 EE 003	Engineering and Lab	ES	3	0	2	4

Objectives

- To familiarize the basic concept on electrical quantities
- To use the network theorems to analyze the DC circuit parameters
- To gain knowledge on AC circuits and impacts on various circuit parameters
- To provide exposure on the Electrostatic and Electromagnetic fields
- To familiarize the use of various measuring instruments

Pre-requisites

• Fundamentals of Physics

Course Outcomes

On the successful completion of the course, students will be able to						
CO1	Apply the basic concepts and terminology of electrical quantities.	Understand				
CO2	Compute the DC circuit using various network theorems.	Apply				
CO3	Analyze the electrical parameters of AC circuits with R-L-C elements.	Analyze				
CO4	Illustrate the Static and dynamic characteristics of Electro-static and electromagnetic fields.	Understand				
CO5	Apply the concept of sensors in measurement of various electrical quantities.	Apply				

Mapping with Programme Outcomes

COs	Pos												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	-	-	2	2	-	-	-	-	3	3	1	1	-
CO2	3	3	-	-	2	2	-	-	-	-	3	3	3	2	-
CO3	3	3	-	-	2	2	-	-	-	-	3	3	3	2	-
CO4	3	3	-	-	2	-	2	-	-	-	3	3	1	1	-
CO5	3	3	-	-	2	-	2	-	-	-	3	3	2	1	-
3 - St	3 - Strong; 2 - Medium; 1 – Some														

Assessment Pattern

Bloom's	Conti	nuous As: (Ma	sessment rks)	Tests	Model Examination	End Sem Examination (Marks)		
Category	Tes	st 1	Tes	st 2	(Marks)			
	Theory	Lab	Theory	Lab	Lab	Theory	Lab	
Remember	20	-	20	-	-	20	-	
Understand	40	-	40	-	-	80	-	
Apply	-	50	-	50	50	-	50	
Analyse	-	50	-	50	50	-	50	
Evaluate	-	-	-	-	-	-	-	
Create	-	-	-	-	-	-	-	
Total	60	100	60	100	100	100	100	


K.S.Rangasamy College of Technology – Autonomous R2022 B.Tech - Computer Science and Business Systems							
B.Tech - Computer Science and Business Systems							
60 EE 003 - Principles of Electrical Engineering and Lab							
00 EE 003 - Frinciples of Electrical Engineering and Lab							
Semaster Hours / Week Total Credit Maximum Marks							
Semester L T P Hours C CA ES To	otal						
I 3 0 2 75 4 50 50 1	00						
Introduction *							
Concept of Potential difference*, voltage*, current*, Fundamental linear passive and active							
elements to their functional current-voltage relation, Terminology and symbols in order to	01						
describe electric networks, voltage source and current sources, ideal and practical sources, concept	9]						
of dependent and independent sources, Kirchhoff-s laws and applications to network solutions using							
mesh and nodal analysis, Concept of work*, power, energy*, and conversion of energy.							
DC Circuits*							
Current-voltage relations of the electric network by mathematical equations to analyze the network	01						
(Thevenin's theorem, Norton's Theorem, Maximum Power Transfer theorem) Simplifications of	9]						
networks using series-parallel, Star/Delta transformation. Super position theorem.							
AC Circuits *							
AC waveform definitions, form factor, peak factor, study of R-L, R-C, RLC series circuit, R-L-C							
parallel circuit, phasor representation in polar and rectangular form, concept of impedance, [9]						
admittance, active, reactive, apparent and complex power, powerfactor,3phase Balanced AC							
Circuits Star to Delta & Delta to Delta).							
Electrostatics and Electro-Mechanics *							
Electrostatic field, electric field strength, concept of permittivity in dielectrics, capacitor							
composite, dielectric capacitors, capacitors in series and parallel, energy stored in capacitors,	01						
charging and discharging of capacitors, Electricity and Magnetism, magnetic field and Faraday's law,	9]						
of operation EME equation voltage ratio current ratio KVA rating efficiency and regulation							
Electromechanical energy conversion							
Measurements and Sensors *							
Introduction to measuring devices/sensors and transducers (Piezoelectric and thermo-couple)							
related to electrical signals. Elementary methods for the measurement of electrical quantities in							
DC and AC systems (Current & Single-phase power). Electrical Wiring and Illumination system:							
Basic layout of the distribution system. Types of Wiring System & Wiring Accessories. Necessity	9]						
of earthing, Types of earthing, Safety devices & system. For Further Reading - Principle of							
batteries, types, construction and application, Magnetic material and B-H Curve, Basic concept							
of indicating and integrating instruments.							
Practical:							
1. Familiarization of electrical Elements, sources, measuring devices and transducers related							
to electrical circuits							
2. Determination of resistance temperature coefficient							
3. Verification of Network Theorem (Superposition, Thevenin, Norton, Maximum Power							
Transfer theorem)	30]						
 Simulation of R-L-C series circuits for XL>XC, XL< XC 							
5. Simulation of Time response of RC circuit							
b. verification of relation in between voltage and current in three phase balanced star and							
delta connected loads							
7. Demonstration of measurement of electrical quantities in DC and AC systems							
I Otal Hours: (Lecture - 45; Practical - 30)	5						
I EXT DOOK(S): SmariithChash Eurodamentals of Electrical and Electronics Engineering Prophics Hell (India) D	/†						
1. Ltd. 2 nd Edition,2010.	/1.						
2. McGraw Hill, 5 Edition, 2017.							



1.	T. K. Nagsarkar and M.S.Sukhija, Basic of Electrical Engineering, Oxford University Press, 3 rd Edition, 2017.
2	Muthusubramanian&Salivahanan, Basic Electrical and Electronics Engineering and Communication
Ζ.	Engineering,Tata MC Graw Hill Education Private Limited, 7 th Edition, 2011.
3.	William H. Hayt, Jr. John A. Buck, Engineering Electromagnetics, McGraw Hill Higher
	Education, 8 th revisedEdition, 2011
Δ	K. A. Gangadhar, P.M. Ramanathan, Electromagnetic Field Theory, Khanna Publishers, 16 th Edition,
4.	2011

*SDG 9: Industry Innovation and Infrastructure

S. No.	Topics	No. of Hours
1	Introduction	
1.1	Basic Concepts - Potential Difference, Voltage and Current	1
1.2	Basic Circuit Elements - Active Elements – Resistance, Inductance and Capacitance, Passive Elements – Voltage and Current Sources	1
1.3	Electrical Networks: Terminology - Symbols	1
1.4	Basic Concepts: Dependent Sources, Independent Sources	2
1.5	Kirchhoff's laws :Current law and Voltage law - Statement and Explanation - Simple Problems	2
1.6	Basic Concepts : Work - Power - Energy - Conversion of Energy	1
2	DC Circuits	
2.1	Relation of Electric Networks: Current – Voltage	1
2.2	Thevenin's Theorem: Statement – Derivation - Simple Problems	1
2.3	Norton's Theorem: Statement – Derivation - Simple Problems	1
2.4	Superposition Theorem: Statement – Derivation - Simple Problems	1
2.5	Maximum Power Transfer Theorem: Statement – Derivation - Simple Problems	2
2.6	Serial and Parallel Circuits: Equivalent Resistance - Voltage & Current Division Rule ,Simple Problems	2
2.7	Star/Delta Transformation: Statement – Derivation	1
3	AC Circuits	
3.1	Representation of sinusoidal waveforms: Amplitude, Cycle, Frequency, Time period, Phase, Instantaneous, Average, RMS, Peak value, Form factor and Peak factor of Sine waveform	2
3.2	Power Triangle: Real power - Reactive power - Apparent power - Power factor	1
3.3	Analysis of AC Circuits: Pure Resistive Circuit - Pure Inductive Circuit - Pure Capacitive Circuit - Phasor Diagrams	2
3.4	Analysis of RL Series Circuits: Circuit Diagram & Phasor Diagram - Equations of Impedance, Current, Power, Power Factor - Simple Problems	1
3.5	Analysis of RC Series Circuits: Circuit Diagram & Phasor Diagram - Equations of Impedance, Current, Power, Power Factor - Simple Problems	1
3.6	Analysis of RLC Series Circuits: Circuit Diagram & Phasor Diagram Equations of Impedance, Current, Power, Power Factor - Simple Problems	1
4	Electrostatics and Electro-Mechanics	
4.1	Statement: Electrostatic Field - Electric Field Strength	1
4.2	Basic Concepts: Permittivity in Dielectrics - Capacitor Composite - Dielectric	1

Course Contents and Lecture Schedule

	Capacitors	
4.3	Capacitors in Series and Parallel: Illustration - Comparison	1
4.4	Energy Stored in Capacitors: Illustration Charging and Discharging of Capacitors	1
4.5	Comparison: Electricity and Magnetism, Magnetic and Electric Circuits	1
4.6	Laws of Electromagnetic Induction: Faraday's Law - Fleming's Rule	1
4.7	Self and Mutual Induction: Statement – Illustrations	1
4.8	Transformers: Construction - Main Parts - Principle of Operation, Material used - Core type and Shell type – Comparison, Applications	1
4.9	EMF Equation: Expression of EMF Equation - Voltage Transformation Ratio	2
5	Measurements and Sensors	
5.1	Introduction to Transducers: Characteristics - Classification of Transducers	1
5.2	Piezo-electric Transducers: Properties - Equivalent circuit - Modes of operation - Measurement of Temperature: Thermocouples	1
5.3	Measurement of Current and Single-Phase Power: Construction & Working -Applications	1
5.4	Basic House wiring tools and components: Wiring materials – Accessories - Simple Wiring Layout	1
5.5	Domestic Wiring: Service main - Meter board - Distribution board - Energy meter	1
5.6	Different types of wiring: Staircase wiring - Florescent lamp wiring - Ceiling fan wiring	1
5.7	Earthing: Objectives – Necessity - Types Electrical Safety: Safety Measures and Precautions at Home & Industry	1
5.8	Batteries: Types of Batteries - Important Characteristics of Battery	1
5.9	Indicating and Integrating Instruments: Block Diagram - Principle of Operation	1
	Total	45
Practical		
1.	Familiarization of electrical Elements, sources, measuring devices and transducers related to electrical circuits	2
2.	Determination of resistance temperature coefficient	4
3.	Verification of Network Theorem (Superposition, Thevenin, Norton, Maximum Power Transfer theorem)	4
4.	Simulation of R-L-C series circuits for XL>XC, XL< XC	2
5.	Simulation of Time response of RC circuit	2
6.	Verification of relation in between voltage and current in three phase balanced star and delta connected loads.	4
7.	Demonstration of measurement of electrical quantities in DC and AC systems.	4

1. M.Dhanapal -<u>dhanapalm@ksrct.ac.in</u>



60 MY 001	Environmental Studies and Climate	Category	L	Т	Ρ	Credit
	Change	MC	2	0	0	0

- To understand the impact climate changes in ecosystem and biodiversity.
- To analyze the impacts of pollution, control and legislation.
- To explain the importance of sustainable development practices.
- To explore the significance of organic farming.
- To identify the Geo-spatial tools for resource management.

Pre-requisites

• Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Interpret the impacts of pollution on climate change	Understand
CO2	Categorize the wastes and its management.	Analyze
CO3	Identify the different types of sustainable practices	Apply
CO4	Classify the organic farming techniques	Apply
CO5	Categorize the Geo-spatial tools for resource management	Analyze

Mapping with Programme Outcomes

<u> </u>	POs												PSO		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	-	-	-	-	3	-	-	-	-	2	-	-	-
CO2	3	2	-	-	-	3	3	2	-	-	-	2	-	-	-
CO3	3	2	-	-	-	3	3	2	-	-	-	2	-	-	-
CO4	3	2	-	-	-	2	3	-	-	-	-	2	-	-	-
CO5	3	2	-	-	3	-	2	-	-	-	-	2	-	-	-
3 - St	rona. (2 - Mo	dium	· 1 - Some	<u> </u>										

3 - Strong; 2 - Medium; 1 - Some

Assessment Pattern

Bloom's	Continuous Ass (Mar	essment Tests ks)	Qu (20 m	iz arks)	Seminar presentation
Oalegoly	Case Study	Activity Report	Quiz1	Quiz2	(50 marks)
Remember	10	10	5	5	10
Understand	30	20	10	10	15
Apply	-	30	-	5	15
Analyse	20	-	5	-	10
Evaluate	-	-	-	-	-
Create	-	-	-	-	-
Total	60	60	20	20	50



Syllabu	IS							
	K.S.I	Rangasamy	/ College o	of Technolo	gy – Autor	nomous R2	2022	
60 MY 001 – Environmental Studies and Climate Change								
			Commo	on to all bra	Inches			
Semes	ter I	Hours/wee	K	I otal Hours	Credit			r KS
1/11	L	0	 О	20		100	E3	100
Pollutio	\sim	act on Clim	ate Chang	e*	0	100		100
Pollutio	n: Sources and	d Impacts o	f Air Polluti	- ion – Greer	house Effe	ect- Global	Warming-	
Climate	Change - Ozo	ne Laver De	epletion - Ad	cid Rain. Ca	rbon Footp	rint - Climat	e Change	[4]
on Vari	ous Sectors –	Aariculture.	Forestrv ar	nd Ecosvste	m – Clima	te Change	Mitigation	
and Ac	laptation. Actio	on Plan on	Climate C	Change, IP	CC, UNFC	CC, Kyoto	Protocol,	
Montrea	al Protocol on C	Climatic Cha	nges.	0	,		,	
Integra	ted Waste Mai	nagement**						
Waste	- Types and	Classificatio	n. Principle	es of Wast	e Manager	nent (5R A	Approach)	
- Swac	hh Bharat Abh	iyan – Con	nmercial W	aste, Plast	ic Waste,	Domestic \	Naste, E-	[4]
Waste ·	Biomedical	Waste - Ris	skManagen	nent: Collec	tion, Segre	gation, Trea	atment	
and Dis	posal Methods	. waste wa		ent- Activate	Sludge Pro	ocess.		
Sustain	able Develop	nent Coole	(Sdac) - G	roon Comr	uting Carl	oon Tradiny	Groop	[4]
Building		ly Plastic	(Suys) – C Altornato El	oray: Hydr	ngen Bio-	Sunt Hauling	ar Energy	[.]
– Wind	– Hydroelectri	c Power W	ater Scarci	tv- Watersh	od Manade	ment Grou	ind Water	
Rechar	ne and Rainwa	ter Harvesti	na	ty watersh	cu manage			
Enviro	ment and Ag	riculture****	.9.					
Organic	: Farming – Bi	io-Pesticide	s- Compos	tina. Bio Co	ompostina.	Vermi- Co	mpostina.	[4]
Roof G	ardening and I	rrigation. W	aste Land	Reclamatio	n. Climate	Resilient A	ariculture.	
Green	Auditing						9	
Geo-So	ience in Natu	ral Resourc	e Manager	nent				
Data Ba	ase Software in	Environme	nt Informati	on- Digital I	mage Proce	essing Appl	ications in	
Forecas	sting. GPS - Re	mote Sensi	ng and Geo	graphical Ir	formation S	System (GIS	6) - World	F 41
Wide W	/eb (Www) - Er	vironmenta	l Informatio	n System (E	ENVIS).		,	[4]
						То	tal Hours:	20
Text Be	ook(s):							
Anu	bha Kaushik , (C P Kaushik	. Perspecti	ves in Envir	onmental S	tudies, Nev	v Age Intern	ational
publishers;6 th Edition 2018.								
Reference(s):								
1. G.Tyler Miller Environmental Science 14 th Edition Cengage Publications, Delhi, 2013								
Gilbert M.Masters and Wendell P. Ela,"Environmental Engineering And Science", PHI						Learning		
² PrivateLimited, 3 rd Edition, 2015								
3 Era	ich Bharucha.	Textbook o	f Environm	ental Studie	es for Unde	ergraduate	Courses, U	niversities
Pre	ess, 2000							
*SDG:	13 – Climate Ad	ction	otion					
***SDG:	4 - Clean Wat	er and Sahli	allon					
SDG:	SDG: 6 - Affordable and Clean Energy							

****SDG: 3 – Good Health and Well-being



S.No Topic No. c hour 1.0 Pollution and its impact on climate change 10 1.1 Pollution: Sources and impacts of air pollution – greenhouse effect- Global warming- climate change - ozone layer depletion - acid rain 2 1.2 Climate change on various sectors: Agriculture, forestry and ecosystem. – climate change mitigation and adaptation 1 1.3 Action plan on climate change - IPCC, UNFCCC, Kyoto Protocol, Montreal Protocol on Climatic Changes 1
hour 1.0 Pollution and its impact on climate change 10 1.1 Pollution: Sources and impacts of air pollution – greenhouse effect- Global varming- climate change - ozone layer depletion - acid rain 2 1.2 Climate change on various sectors: Agriculture, forestry and ecosystem. – 1 1.3 Action plan on climate change - IPCC, UNFCCC, Kyoto Protocol, Montreal 1 Protocol on Climatic Changes 1
1.0 Pollution and its impact on climate change 1.1 Pollution: Sources and impacts of air pollution – greenhouse effect- Global varming- climate change - ozone layer depletion - acid rain 2 1.2 Climate change on various sectors: Agriculture, forestry and ecosystem. – 1 1.3 Action plan on climate change - IPCC, UNFCCC, Kyoto Protocol, Montreal 1 Protocol on Climatic Changes 1
1.1 Pollution: Sources and impacts of air pollution – greenhouse effect- Global warming- climate change - ozone layer depletion - acid rain 2 1.2 Climate change on various sectors: Agriculture, forestry and ecosystem. – 1 1 1.3 Action plan on climate change - IPCC, UNFCCC, Kyoto Protocol, Montreal Protocol on Climatic Changes 1
1.2 Climate change on various sectors: Agriculture, forestry and ecosystem. – 1 climate change mitigation and adaptation 1.3 Action plan on climate change - IPCC, UNFCCC, Kyoto Protocol, Montreal 1 Protocol on Climatic Changes 1
1.3 Action plan on climate change - IPCC, UNFCCC, Kyoto Protocol, Montreal 1 Protocol on Climatic Changes 1
2.0 Integrated Waste Management
2.1 Waste - Types and classification. Principles of waste management (5R 1 approach) - Swachh Bharat Abhiyan
2.2 Commercial waste, plastic waste, domestic waste, e-waste and biomedical 1 waste
2.3 Risk management: Collection, segregation, treatment and disposal methods.
3.0 Sustainable development practices
3.1 Sustainable development goals (SDGs) – Green computing- Carbon trading - 1 Green building – Eco- friendly plastic
3.2 Alternate energy: Hydrogen – Bio-fuels – Solar energy – Wind – Hydroelectric 2 power
3.3 Water scarcity- Watershed management, ground water recharge and 1 rainwater harvesting
4.0 Environment and Agriculture
4.1 Organic farming – bio-pesticides 1
4.2 Composting, bio composting, vermi-composting 1
4.3 Roof gardening and irrigation 1
4.4 Waste land reclamation. Climate resilient agriculture, Green auditing 1
5.0 Geo-science in natural resource management
5.1 Data base software in environment information, Digital image processing 2 applications in forecasting
5.2 GPS, Remote Sensing and Geographical Information System (GIS) 1
5.3 World wide web (www), Environmental information system (ENVIS) 1
Total 20

- 1. Dr.T.A.Sukantha sukantha@ksrct.ac.in
- 2. Dr.B.Srividhya srividhya@ksrct.ac.in
- 3. Dr.S.Meenachi meenachi@ksrct.ac.in
- 4. Ms.D.Kirthiga kiruthiga@ksrct.ac.in



61 CE 001	Haritage of Tamile	Category	L	Т	Ρ	Credit
81 GE 001	Heritage of Tamils	GE	1	0	0	1

- To learn the extensive literature of classical Tamil
- To review the fine arts heritage of Tamil culture
- To realize the contribution of Tamils in Indian freedom struggle

Pre-requisites

NIL

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Recognize the extensive literature of Tamil and its classical nature.	Understand
CO2	Apprehend the heritage of sculpture, painting and musical instruments of ancient people.	Understand
CO3	Review on folk and martial arts of Tamil people.	Understand
CO4	Insight thinai concepts, trade and victory of Chozha dynasty.	Understand
CO5	Realize the contribution of Tamil in Indian freedom struggle, self- esteem movement and siddha medicine.	Understand

Mapping with Programme Outcomes

	<u> </u>		<u> </u>												
COs					PSOs										
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO2	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO3	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO4	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO5	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
3 - St	3 - Strong: 2 - Medium: 1 - Some														

Syllabus

K.S.Rangasamy College of Technology – Autonomous R2022											
Common to all Branches											
61 GE 001 – Heritage of Tamils											
Somostor	Н	lours/Wee	k	Total	Credit		Maximum Marks				
Semester	L	Т	Р	Hours	С	CA	ES	Total			
I	1	0	0	15	1*	-	100	100			
Language,	Literature	, Life Skill	s & Ethics	S *							
Language F	amilies in	India - Dra	avidian La	nguages - ⁻	Tamil as a	Classical L	anguage - Classical				
Literature i	n Tamil -	Secular N	ature of S	Sangam Lit	erature - I	Distributive	Justice in Sangam				
Literature -	Manageme	ent Principl	es in Thiru	kural - Tarr	nil Epics and	d Impact of	Buddhism & Jainism	3			
in Tamil Lar	nd - Bakthi	Literature /	Azhwars a	nd Nayanm	ars - Form	s of minor P	oetry - Development	5			
of Modern	literature	in Tam	il - Cont	ribution of	Bharathi	yar and E	Bharathidhasan-Life,				
Responsibi	lity, Self-e	xploration,	Attitude,	Self-confic	lence, Goa	als, Relatio	nships, Leadership,				
Gender equ	uality.										
Heritage -	Rock Art F	Paintings t	to Modern	Art – Scu	Ipture*						
Hero stone	to moderr	n sculpture	- Bronze i	cons - Tribe	es and their	[,] handicraft	s - Art of temple car				
making -Ma	assive Terr	acotta scu	lptures, Vil	lage deities	s, Thiruvallu	var Statue	at Kanyakumari,	2			
Making of r	musical ins	truments -	Mridhang	am, Parai, İ	Veenai, Ya	zh and Nao	dhaswaram - Role	3			
of Temples	s in Social	and Econo	mic Life of	Tamils.							
1								1			



Folk Ther Silar	t and Martial Arts* ukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leatherpuppetry, nbattam, Valari, Tiger dance - Sports and Games of Tamils.	3
Thir Flora Litera and Chola	hai Concept of Tamils* a and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam ature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of as.	3
Cont Cont parts Medi	tribution of Tamils to Indian National Movement and Indian Culture* ribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other of India – Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of cine – Inscriptions & Manuscripts – Print History of Tamil Books.	3
	Total Hours	15
Text	Book(s):	
1.	முனைவர் கே. கே. பிள்ளை, தமிழக வரலாறு - மக்களும் பண்பாடும், தமிழ் பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம், 18 th Ed ,2022.	நாடு
2.	முனைவர் இல. சுந்தரம், கணினித்தமிழ்,விகடன் பிரசுரம், 2 nd Ed 2021	
3.	முனைவர் இரா.சிவானந்தம், மு.சேரன், கீழடி - வைகை நதிக்கன சங்ககால நகர நாகரிகம், தொல்லியல் துறை வெளியீடு, 6 th Ed ,2020.	ரயில்
4.	முனைவர் இரா.சிவானந்தம் , முனைவர் ஜெ.பாஸ்கர், பொருநை - ஆற்றங் நாகரிகம், தொல்லியல் துறை வெளியீடு,1st Ed ,2022	கரை
5.	ஈரோடு கதிர், உயர்தல் உரிமை, சிக்ஸ் ப்ளஸ் ஒன் ட்ரெயினிங் அகாடமி, 2024	1 st Ed,
6.	Dr.K.K.Pillay, Social Life of Tamils, TNTB & ESC and RMRL - (In print).	
7.	Dr.S.Singaravel, Social Life of the Tamils - The Classical Period, International Institute of Tamil Studies, 1 st , 2001.	
8.	Dr.S.V.Subaramanian, Dr.K.D. Thirunavukkarasu, Historical Heritage of the Tamils, Interna Institute of Tamil Studies, 2 nd , 2010	ational
9.	Dr.M.Valarmathi, The Contributions of the Tamils to Indian Culture, International Institute of Tamil Studies,	:
10.	Dr.R.Sivanantham, Keeladi - Sangam City Civilization on the banks of river Vaigai, Departr of Archaeology & Tamil Nadu Text Book and Educational Services Corporation,	ment
11.	Dr.K.K.Pillay, Studies in the History of India with Special Reference to Tamil Nadu, K.K. Published by the Author.	Pillay(
12.	Dr.R.Sivanantham, Dr.J.Baskar, Porunai Civilization, Department of Archaeology & Tamil Text Book and Educational Services Corporation.	Nadu
13.	R.Balakrishnan, Journey of Civilization Indus to Vaigai, Roja Muthiah Research Library, 2022	3 rd Ed,
*SDC	G 4 – Quality Education	

61 CE 001	T ALO T LO T L	Category	L	Т	Ρ	Credit
OT GE UUT	தமழர் மர்பு	GE	1	0	0	1

பாடத்தின் நோக்கங்கள்

- தமிழ் மொழியின் இலக்கணச் செறிவைக் கற்றுணர்தல்
- தமிழர் பண்பாட்டின் நுண்கலைகள் பற்றிய ஒரு மீள்பார்வை
- இந்திய சுதந்திரப் போராட்டத்தில் தமிழர்களின் பங்களிப்பை உணருதல்



முன்கூட்டிய துறைசார் அறிவு:

தேவை இல்லை

பாடம் கற்றதின் விளைவுகள்.

பாடத்தை வெற்றிகரமாக கற்று முடித்த பின்பு, மாணவர்களால் முடியும் விளைவுகள்

CO1	தமிழ் மொழியின் செந்தண்மை மற்றும் இலக்கியம் குறித்த தெரிதல்	புரிதல்
CO2	தமிழர்களின் சிற்பக்கலை, ஓவியக்கலை மற்றும் இசைக்கருவிகள் குறித்த தெளிவு.	புரிதல்
CO3	தமிழர்களின் நாட்டுப்புறக்கலைகள் மற்றும் வீரவிளையாட்டுகள் குறித்த தெளிவு	புரிதல்
CO4	தமிழர்களின் திணைக் கோட்பாடுகள், சங்ககால வணிகம் மற்றும் சோழர்களின் வெற்றிகள் குறித்த தகவல்கள்.	புரிதல்
CO5	இந்திய தேசிய இயக்கம், சுயமரியாதையை இயக்கம் மற்றும் சித்த மருத்துவம் பற்றிய புரிதல்.	புரிதல்

Mapping with Programme Outcomes

COs				PSOs											
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	-	-	-	-	-	-	3	3	-	2		3	-	-	-
CO2	-	-	-	-	-	-	3	3	-	2		3	-	-	-
CO3	-	-	-	-	-	-	3	3	-	2		3	-	-	-
CO4	-	-	-	-	-	-	3	3	-	2		3	-	-	-
CO5	-	-	-	-	-	-	3	3	-	2		3	-	-	-
3 - St	3 - Strong: 2 - Medium: 1 - Some														

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Syllabus										
K.S.Rangasamy College of Technology – Autonomous R2022										
	அனைத்து துறைகளுக்கும் பொதுவானது									
61 GE 001 – தமிழர் மரபு										
Somostor	ŀ	lours/Wee	k	Total	Credit	aximum Ma	um Marks			
Semester	L	Т	Р	Hours	С	CA	ES	Total		
I	1	0	0	15	1*	-	100	100		
மொழி, இ இந்திய பெ செவ்விலச் இலக்கியத் காப்பியங் இலக்கியப் நவீன இல பாரதிதாச ஆய்வு, தலைமை	லக்கியம், வாழிக் குடு கியங்கள் த்தில் பகிர்த கள் - தட கள் - தட க்கியத்தில் க்கியத்தில் ககியத்தில் ககியத்தில் பனோட பபண்பு,	வாழ்க்கை ம்பங்கள் - - சங்க (தல் அறம் - மிழகத்தில் எகள் மற்ற எ வளர்ச்சி யாரின் ப பாவம், பாலின ச	த் திறன்கஎ திராவிட ஹே திருக்குற ற சமண வே ம நாயன்ப - தமிழ் இ ங்களிப்பு. தன்னம்பி மநிலை.	ள் மற்றும் மொழிகள் - தின் சமய ளில் மேலா பௌத்த ச மார்கள் - 9 லக்கிய வ வாழ்விய வாழ்விய பிக்கை,	நெறிமுன தமிழ் ஒரு என்மைக் ச மயங்களிச சிற்றிலக்க ளர்ச்சியில் பல், பொ இலக்கு	றைகள்:* செம்மொ ற தன்பை கருத்துக்கம கருத்துக்கம் கருத்துக்கம் வாத்துக்கம் பாரதியா றுப்புணர கள், உ	ழி - தமிழ் - சங்க ள் - தமிழ் - பக்தி தமிழில் ர் மற்றும் ர்வு, சுய _றவுகள்,	3		
மரபு - பா நடுகல் மு	ாறை ஓவிய தல் நவீன	ப ங்கள் மு சிற்பங்க	தல் நவீன ள் வரை -	ஓவியங்க ஐம்பொன்	ள் வரை- 6 ர சிலைகள	சிற்பக்கல ள் - பழங்	லை. * குடியினர்	3		



மற்ற செய் கிரு	றம் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் - தேர் பயும் கலை - சுடுமண் சிற்பங்கள் - நாட்டுப்புறத் தெய்வங்கள் - குமரிமுனையில் வள்ளூவர் சிலை - இசைக் கருவிகள் - மிருகங்கம், பறை, வீணை, யாம்,	
நாத	ஸ்வரம் - தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு.	
நாட் தெரு வின	.டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுள்: * நக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஒயிலாட்டம், ல்பாவைக் கூத்து சிலம்பாட்டம், வளரி, புளியாட்டம், தமிழர்களின் எயாட்டுகள் .	3
தமி	ழர்களின் திணைக் கோட்பாடுகள்: *	
தமிழ இல அற நகர கடல்	தகத்தின் தாவரங்களும், விலங்குகளும் - தொல்காப்பியம் மற்றும் சங்க க்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் - தமிழர்கள் போற்றிய க்கோட்பாடு - சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும் - சங்ககால ங்களும் துறை முகங்களும் - சங்க காலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி - லகடந்த நாடுகளில் சோழர்களின் வெற்றி .	3
இந்9 பங்க பிறப் மருத - தமி	திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் களிப்பு: * இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு - இந்தியாவின் ப்பகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் - சுயமரியாதை இயக்கம் - இந்திய த்துவத்தில், சித்த மருத்துவத்தின் பங்கு - கல்வெட்டுகள், கையெழுத்துப்படிகள் பிழ் புத்தகங்களின் அச்சு வரலாறு.	3
Tarré	Total Hours	15
Text		
1.	பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம், 18th Ed ,2022.	தயழநாடு
2.	முனைவர் இல. சுந்தரம், கணினித்தமிழ்,விகடன் பிரசுரம், 2 nd Ed,2021	
3.	முனைவர் இரா.சிவானந்தம், மு.சேரன், கீழடி - வைகை நதிக்கரையி சங்ககால நகர நாகரிகம், தொல்லியல் துறை வெளியீடு, 6 th Ed,2020.	ຎ
4.	முனைவர் இரா.சிவானந்தம் , முனைவர் ஜெ.பாஸ்கர், பொருநை - ஆ நாகரிகம், தொல்லியல் துறை வெளியீடு,1st Ed ,2022	ற்றங்கரை
5.	ஈரோடு கதிர், உயர்தல் உரிமை, சிக்ஸ் ப்ளஸ் ஒன் ட்ரெயினிங் அகாடமி),1 st Ed,2024
6.	Dr.K.K.Pillay, Social Life of Tamils, TNTB & ESC and RMRL – (In print).	
7.	Dr.S.Singaravel, Social Life of the Tamils - The Classical Period, International Institute Tamil Studies, 1 st , 2001.	e of
8.	Dr.S.V.Subaramanian, Dr.K.D. Thirunavukkarasu, Historical Heritage of the Tamils, In Institute of Tamil Studies, 2 nd , 2010	ternational
9.	Dr. M. Valarmathi, The Contributions of the Tamils to Indian Culture, International Instit	uto of
	Tamil Studies,	
10.	Tamil Studies, Dr.R.Sivanantham, Keeladi - Sangam City Civilization on the banks of river Vaigai, De Archaeology & Tamil Nadu Text Book and Educational Services Corporation,	epartment of
10. 11.	Tamil Studies, Dr.R.Sivanantham, Keeladi - Sangam City Civilization on the banks of river Vaigai, De Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Dr.K.K.Pillay, Studies in the History of India with Special Reference to Tamil Nadu, Published by the Author.	epartment of K.K. Pillay(
10. 11. 12.	Tamil Studies, Tamil Studies, Dr.R.Sivanantham, Keeladi - Sangam City Civilization on the banks of river Vaigai, De Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Dr.K.K.Pillay, Studies in the History of India with Special Reference to Tamil Nadu, Published by the Author. Dr.R.Sivanantham, Dr.J.Baskar, Porunai Civilization, Department of Archaeology & Text Book and Educational Services Corporation.	epartment of K.K. Pillay(Tamil Nadu
10. 11. 12. 13.	Tamil Studies, Tamil Studies, Dr.R.Sivanantham, Keeladi - Sangam City Civilization on the banks of river Vaigai, De Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Dr.K.K.Pillay, Studies in the History of India with Special Reference to Tamil Nadu, Published by the Author. Dr.R.Sivanantham, Dr.J.Baskar, Porunai Civilization, Department of Archaeology & Text Book and Educational Services Corporation. R.Balakrishnan, Journey of Civilization Indus to Vaigai, Roja Muthiah Research Li ,2022	epartment of K.K. Pillay(Tamil Nadu brary,3 rd Ed

SDG 4 – Quality Education



60 CB 1B1	Computer Programming	Category	L	Т	Ρ	Credit
OUCB IFI	Lab	PC	0	0	4	2

- To enable the students to apply the concepts of C to solve simple problems
- To use selection and iterative statements in C programs
- To apply the knowledge of library functions in C programming
- To implement the concepts of arrays, functions, structures and pointers in C
- To Implement The Handling Operations Through C

Pre-requisites

• Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Read, display basic information and use selection and iterative Statements.	Apply
CO2	Demonstrate C program to manage collection of related data.	Apply
CO3	Design and Implement different ways of passing arguments to functions, Recursion and implement pointers concepts.	Apply
CO4	Develop a C program to manage collection of different data using structures, Union, user-defined data types and preprocessor directives.	Apply
CO5	Demonstrate C program to store and retrieve data using file concepts.	Apply

Mappir	Mapping with Programme Outcomes														
CO2		POs													
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	-	3	-	-	-	2	2	-	2	3	3	-
CO2	3	3	3	-	3	-	-	-	2	2	-	2	3	3	-
CO3	3	3	3	-	3	-	-	-	2	2	-	2	3	3	-
CO4	3	3	3	-	3	-	-	-	2	2	-	2	3	3	-
CO5	3	3	3	-	3	-	-	-	2	2	-	2	3	3	-
3 - Stro	3 - Strong: 2 - Medium: 1 - Some														

Assessment Pattern

Bloom's Category	Lab Experimer (Ma	nts Assessment arks)	Model Examination (Marks)	End Sem Examination (Marks)			
Remember		-		-	_		
Remember	_		-	_	-		
Understand	-	-	-	-	-		
Apply	50	25	100	-	100		
Analyse	-	-	-		-		
Evaluate	-	-	-	-	-		
Create	-	-	-	-	-		
Total	50	25	100	-	100		



	K.S.Rangasamy College of Technology – Autonomous R2022 B.Tech – Computer Science and Business Systems												
	B.Tech – Computer Science and Business Systems 60 CB 1P1 – Computer Programming Lab												
•	ŀ	lours/Wee	<u>/b ii i = 0(</u> k	Total	Credit		laximum Ma	arks					
Semester	L	T	P	Hrs	C	CA	ES	Total					
	I 0 0 4 60 2 60 40 100 List of Experiments:												
List of Exp	eriments:												
1. Imp	lementatio	n of Simple	computatio	nal problen	ns using var	ious formu	las*.						
2. Imp	lementatio	n of Probler	ns involving	Selection	statements*								
3. Imp	lementatio	n of Iterativ	e problems	e.g., sum o	f series*.								
4. Imp	lementatio	n of 1D and	2D Array m	nanipulatior	۱*.								
5. Imp	lementatio	n of String o	operations*.										
6. Imp	lementatio	n of Simple	functions a	nd different	ways of pa	ssing argui	ments to fun	ctions and					
Ree	cursive Fun	ctions*.											
7. Imp	lementatio	n of Pointer	S*.										
8. Imp	lementatio	n of structu	res and Unio	on*.									
9. Imp	lementatio	n of Bit Fiel	ds, Typedef	and Enum	eration*.								
10. Imp	lementatio	n of File op	erations*.										
Lab Manua	l												
1. "Comp KSRC	outer Progra T.	amming Lal	o Manual", E	Department	of Compute	er Science	and Busines	s Systems,					
*SDG 4: Qu	ality Educa	ition											

1. Mr.K.Karthikeyan - karthikeyank@ksrct.ac.in



	Fundamentals of Physics Lab	Category	L	Т	Ρ	Credit
00 FH 0F3	Fundamentals of Physics Lab	BS	0	0	4	2

- To infer the practical knowledge by applying the experimental methods to correlate with the Physics theory.
- To demonstrate an ability to make physical measurements and understand the limits of precision in measurements
- To introduce different experiments to test basic understanding of physics concepts applied in optics and electronics
- To make ability to develop and fabricate engineering and technical equipments
- To analyze the behavior and characteristics of various materials for its optimum utilization

Pre-requisites

• Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Recognize the behaviour of electrical & magnetic properties by experimental verification	Apply
CO2	Interpret the knowledge of Hall coefficient and carrier concentration of a semiconductor for its potential applications	Apply
CO3	Realize the interference, diffraction and wave nature of light by experimentally.	Apply
CO4	Analyze the wavelength of laser by diffraction phenomenon and the propagation of light through an optical fibre	Apply
CO5	Demonstrate the wave and particle behavior of the light by experimentally	Analyze

Mapping with Programme Outcomes (BT)

CO2	POs												PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	-	-	-	-	-	-	-	2	-	-	-	2	-	-
CO2	3	-	-	-	-	-	-	-	2	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	2	-	-	-	-	-	-
CO4	3	-	-	-	-	-	-	-	2	-	-	-	2	-	-
CO5	3	-	-	-	-	-	-	-	2	-	-	-	2	-	-
3 - Stro	3 - Strong; 2 - Medium; 1 – Some														

Assessment Pattern

Bloom'sCategory	Lab Experimen (Ma	ts Assessment rks)	Model Examination	End Exami	Sem ination		
	Lab	Activity	(IVIALKS)	(warks)			
Remember	10	-	10	-	10		
Understand	30	30	30	-	30		
Apply	40	40	40	-	40		
Analyse	20	30	20	-	20		
Evaluate	-	-	-	-	-		
Create	-	-	-	-	-		



Total	Total 100 100 100 - 100												
K.S.Rangasamy College of Technology – Autonomous R2022													
B.Tech – Computer Science and Business Systems													
60 PH 0P3- Fundamentals of Physics Lab													
Semester	ŀ	lours/Wee	K	Total	Credit	Ma	Maximum Mark						
	L	Т	P	Hrs	С	CA	ES	Total					
	0 0 4 45 2 60 40 100												
List of Experiments:													
1.	1. Magnetic field along the axis of current carrying coil–Stewart and Gee.												
2.	Determinati	ion of Hall c	oefficient to	a semi-cor	nductor.								
3.	Determinat	tion of Planl	constant.										
4.	Determinati	ion of wavel	ength of lig	ht by Laser	diffractio	n method.							
5.	Determinati	ion of wavel	ength of lig	ht by Newto	on's Ring	method.							
6.	Determinati	ion of laser	and optical	fiber param	eters.								
7.	Determinati	ion of Stefa	n's Constan	ıt.									
8. Characteristics of Zener diode.													
Lab Manu	al												
1. "Engineering Physics Lab Manual", Department of Physics, KSRCT.													
* SDG: 4-	Quality Edu	Ication											

Course Designer(s) – Physics

- 1. Dr. V. Vasudevan vasudevanv@ksrct.ac.in
- 2. Mr. S. Vanchinathan vanchinathan@ksrct.ac.in
- 3. Dr. P. Suthanthira Kumar suthanthirakumar@ksrct.ac.in

SECOND SEMESTER

S. Course No Code		Name of the Course	Duration of Internal	Weightag		Minimum Marks for Pass in End SemesterExam		
NO.			Exam	Continuous Assessment *	End Semester Exam **	Max. Marks	End Semester Exam	Total
			TH	EORY				
1	60 EN 004	Business Communication and Value Science II	2	40	60	100	45	100
2	60 HS 001	Fundamentals of Economics	2	40	60	100	45	100
3	60 MA 005	Statistical Modeling	2	50	50	100	45	100
4	60 CB 201	Computer Organization and Architecture	2	40	60	100	45	100
5	61 CB 202	Object Oriented Programming	2	40	60	100	45	100
6	60 GE 002	Tamils and Technology/ தமிழரும்தததொழில் நுட்பமும்	2	-	100	100	100	100
			PRAG	CTICAL				
7	60 ME 0P1	Fabrication and Reverse Engineering Laboratory	2	60	40	100	45	100
8	61 CB 2P1	Object Oriented Programming Lab	2	60	40	100	45	100
9	60 CG 0P1	Career Skill Development -I	1	100	-	100	-	100
10	60 CG 0P6	Internship	-	100	-	100	-	100

* CA evaluation pattern will differ from course to course and for different tests. This will have to be declared in advance to students. The department will put a process in place to ensure that the actual test paper follow the declared pattern.

** End Semester Examination will be conducted for maximum marks of 100 and subsequently be reduced to 60 marks for the award of terminal examination marks

60 EN 004 Business Communication and Value Category L	Т	Ρ	Credit			
60 EN 004	Science II	PC	2	0	0	2

• To equip the learners with lexical and syntactical proficiency in the professional and business scenario for better formal communication

• To facilitate the learners with the drafting skill of different types of letters for effective correspondence at the academic and workplace

• To re-orient the learners to infer the fundamentals of effective communication in deciphering the managerial qualities for better presentation at the workplace

• To groom the learners with corporate etiquette and implement them ethically in the corporate / business setting.

• To make them aware about the socio-cultural and cross-cultural diversities for the appropriate use of value science at the workplace.

Pre-requisites

Must have completed Business Communication and Value Science I

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Demonstrate formal communication with appropriate syntactical statements and lexical proficiency in the given business contexts and situations	Understand
CO2	Compare and contrast different types of letters of correspondence, emails and writing compositions	Understand
CO3	Infer and demonstrate the presentation skills and leadership qualities in making key decisions and provide effective feedback for efficient problem solving	Understand
CO4	Recall the professional etiquette and ethics in the corporate scenario for effective self-grooming at the workplace.	Remember
CO5	Outline and relate the cultural diversity at the workplace arena and understand the value science in business scenario	Understand

Mapping with Programme Outcomes

000		POs											PSOs		
CUS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	-	-	-	-	-	-	-	-	-	3	2	3	2	1	-
CO2	-	-	-	-	-	-	-	-	-	3	2	3	2	1	-
CO3	-	-	-	-	-	-	-	-	-	3	1	3	2	1	-
CO4	-	-	-	-	-	-	-	-	-	3	3	3	2	1	-
CO5	-	-	-	-	-	-	-	-	-	3	3	3	2	1	-

3 - Strong; 2 - Medium; 1 - Some

Assessment Falle	n in the second s		
Bloom's	Continuous As (Ma	sessment Tests Irks)	End Sem Examination (Marks)
Calegory	1	2	
Remember	10	10	20
Understand	50	50	80
Apply	-	-	-
Analyse	-	-	-
Evaluate	-	-	-
Create	-	-	-

Total 60 60 100												
Syllabus	Syllabus											
	K	S.Rangasa	my Collea	e of Techn	ology – Au	tonomous	R2022					
-		B.Tech.	- Compute	er Science a	and Busine	ess System	S					
-		60 EN 004 -	Business	Communic	ation and	Value Scier	nce II					
•		Hours/Weel	K	Total	Credit		Maximum Marks					
Semester	L	Т	Р	Hours	С	CA	ES	Total				
	2	0	0	30	2	40	60	100				
Essential Grammar – II* Application of tenses – auxiliaries - correct usage and importance in formal communication - business vocabulary - vocabulary exercises through web-based applications – vocabulary exercises through web-based applications, usage and application through mock meetings - situational conversation: application of grammar and correct spoken English according to context/ situation and application in business scenario.												
Written Co Email writin complaint l paragraph v	mmunicat ng- formal a etters - rou writing.	ion – II* and Informal utine busine	- email wi	riting structu - sales lette	ure - Inquiry ers - techn	y letters - Ir ical writing	struction letters - - essay writing -	[6]				
Public spea speech, and PowerPoint language - leadership insight into determining how to move empowering solving skill	Fundamentals of Effective Communication Public speaking: fundamentals of effective public speaking – types: extempore speech, manuscript speech, and ways to enhance public speaking skills – storytelling - oral review presentation skills: PowerPoint presentations - effective ways to structure the presentation - importance of body language - leadership skills - leader's role, responsibilities and skill required understanding good leadership behaviors - learning the difference between leadership and management - gaining insight into your patterns, beliefs and rules - defining qualities and strengths of leadership - determining how well you perceive what's going on around you- learning about commitment and how to move things forward - making key decisions - handling your and other people's stress, empowering, motivating and inspiring others, leading by example – effective feedback - problem											
Corporate Corporate importance workplace - -Importanc ethical reas	/ Business grooming a of profess - presentin e of first in oning, righ	s Etiquettes and dressin ional behavi g oneself wi npression, g ts and respo	* or at the w th finesse a prooming, w nsibilities.	ttes in soci ork place - and making wardrobe-In	al and offi understand others com troduction	ce setting I and Impler Ifortable in a to Ethics in	- understand the ment etiquettes in a business setting engineering and	[6]				
Diversity a Socio-cultu learning dis identities of a good mar	nd Inclusi ral and cros abilities at f Indian en race, relig nager - ethi	on* ss-cultural so the workplac nployees an ion, nationho cs in busines	ensitivities e - caste, c d employe bod - appro ss - embod	at the workp class, regior ers and how opriate socia lying organia	blace: PwD halism, relig / to include al media us zational prio	and LGBT a ion and pov e everyone e values sci de with grac	at the workplace - erty - the different - global diversity iences - values of e.	[6]				
							Total Hours:	30				
Text Book(s):												
Reference(s):												
	ART: Sneal	Well 1 (Fn	alish Lanov	age and Co	mmunicati	on)						
2. APAART: Speak Well 2 (Soft Skills).												
3. Charl	 Charles Marsh, David W. Guth, Bonnie Poovey Short, 'Strategic Writing Multimedia Writing for Public Relations, Advertising, and More', 4th Edition, 2017. 											
4. Alan Caml	McCarthy a bridge Univ	and Felicity C ersity Press)'Dell, 4th E , 2017.	Edition, Engl	ish Vocabu	lary in Use',	Preliminary and Ad	vanced,				



*SDG 9 – Industry Innovation and Infrastructure

S. No.	Topics	No. of hours
1	Essential Grammar – II	
1.1	Application of tenses – auxiliaries	1
1.2	Correct usage and importance in formal communication	1
1.3	Business vocabulary - vocabulary exercises through web-based applications	1
1.4	Vocabulary exercises through web-based applications, usage and application through mock meetings	1
1.5	situational conversation: application of grammar	1
1.6	Correct spoken English according to context/ situation and application in business scenario	1
2.0	Written Communication – II	
2.1	Email writing- formal and Informal - email writing structure	1
2.2	Inquiry letters - Instruction letters	1
2.3	Complaint letters - routine business letters - Sales letters - technical writing	1
2.4	Essay writing - Paragraph writing	1
3.0	Fundamentals of Effective Communication	
3.1	Public speaking: fundamentals of effective public speaking	1
3.2	Extempore speech, manuscript speech, and ways to enhance public speaking skills	1
3.3	Storytelling - oral review	1
3.4	Presentation skills: PowerPoint presentations - effective ways to structure the presentation - importance of body language	1
3.5	Leadership skills - leader's role, responsibilities and skill required - understanding good leadership behaviors - learning the difference between leadership and management	1
3.6	Determining how well you perceive what's going on around you- learning about commitment and how to move things forward - making key decisions	1
3.7	Handling your and other people's stress, empowering, motivating and inspiring others, leading by example	1
3.8	Effective feedback - problem solving skill - confidence building.	1
4.0	Corporate / Business Etiquettes	
4.1	Corporate grooming and dressing - etiquettes in social and office setting	2
4.2	Understand the importance of professional behavior at the workplace - understand and Implement etiquettes in workplace	1
4.3	Presenting oneself with finesse and making others comfortable in a business setting	1
4.4	Importance of first impression, grooming, wardrobe	1
4.5	Introduction to Ethics in engineering and ethical reasoning, rights and responsibilities	1
5.0	Diversity and Inclusion	
5.1	Socio-cultural and cross-cultural sensitivities at the workplace: PwD and LGBT at the workplace	1
5.2	Learning disabilities at the workplace - Caste, class, regionalism, religion and poverty	1
5.3	The different identities of Indian employees and employers and how to include everyone	1

Course Contents and Lecture Schedule



BoS Chairman

8

5.4	Global diversity identities of race, religion, nationhood	1
5.5	Appropriate social media use values sciences - Values of a good manager	1
5.6	Ethics in business - Embodying organizational pride with grace	1
	Total	30

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	Eundomontols of Economics	Category	L	Т	Ρ	Credit
00 13 001	Fundamentals of Economics	HS	3	0	0	3

- The objective of this course is to make the students to exemplify the demand curves of Households and supply curves of firms with the principles.
- To make them aware of production and cost analysis
- To enable them understand the different market structures
- To provide them knowledge on Macro Economics Concepts
- To make them to examine demand for money and supply of money.

Pre-requisites

• Nil.

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Identify the concepts of Micro Economics namely demand, supply, elasticity, consumer's surplus and derivation of demand curve and its applications	Understand
CO2	Analyse Production function, ISO Quant and Costs	Analyse
CO3	Interpret the equilibrium of a firm under perfect competition, monopoly and monopolistic competition.	Apply
CO4	Understand Macro Economic Concepts like National Income, Computation of National Income, Multiplier, Exports and Imports	Understand
CO5	Examine the Monetary economics concepts like demand for money, supply of money, Monetary Policy, Fiscal Policy, Voluntary and Involuntary Unemployment	Analyse

Mapping with Programme Outcomes

<u> </u>						PC)s							PSOs	j
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	-	-	-	-	-	-	-	2	2	3	3	3	-	3	-
CO2	-	-	-	-	-	-	-	3	2	2	3	3	-	3	-
CO3	-	-	-	-	-	-	-	3	3	2	2	3	-	3	-
CO4	-	-	-	-	-	-	-	3	2	2	3	3	-	3	-
CO5	-	-	-	-	-	-	-	2	3	2	3	3	-	3	-
3 - St	rong; 2	2 - Me	dium	; 1 - Some	Э										

Assossment Battern

Assessment Falle	111		
Bloom's	Continuous As (Ma	sessment Tests rks)	End Sem Examination (Marks)
Calegory	1	2	
Remember	20	20	20
Understand	-	-	-
Apply	10	10	40
Analyse	20	20	30
Evaluate	-	-	-
Create	10	10	10
Total	60	60	100



Sylia	ibus										
K.S.Rangasamy College of Technology – Autonomous R2022											
B.Tech- Computer Science and Business Systems											
			60 H	S 001- Fun	damentals	of Econom	nics				
Som	ostor	F	lours/Wee	k	Total	Credit	Ma	ximum Ma	'ks		
Sem	ester	L	Т	Р	Hours	С	CA	ES	Total		
I		3	0	0	45	3	40	60	100		
Concepts of Microeconomics											
Principles of Demand and Supply — Supply Curves of Firms — Elasticity of Supply;											
Dem	and Cu	urves of Ho	ouseholds -	 Elasticity 	of Deman	d; Equilibri	um and Co	omparative	101		
Statio	cs (Shif	t of a Curve	e and Move	ment along	the Curve);	Welfare Ar	nalysis — C	onsumers'	[9]		
and F	Produce	ers' Surplus	s — Price C	eilings and	Price Floors	s; Consume	er Behavior	— Axioms			
of Ch	noice —	 Budget Co 	onstraints a	nd Indiffere	nce Curves						
Prod	uction	and Cost	Analysis								
Theo	ory of F	Production	 Productio 	n Function	and Iso-qu	ants — Co	st Minimiza	ation; Cost	[9]		
Curv	es Tota	al, Average	and Margir	al Costs —	Long Run a	and Short F	Run Costs.				
Mark	tet Stru	icture &Pri	cing								
Equil	ibrium	of a Firm U	nder Perfec	ct Competiti	on; Monopo	ly and Mon	opolistic Co	ompetition,			
Cons	sumer's	Equilibriun	n — Effects	s of a Price	Change, In	come and S	Substitution	Effects —	[9]		
Deriv	vation	of a Dema	nd Curve;	Application	is — Tax	and Subsid	dies — Inte	ertemporal			
Cons	sumptio	n — Suppli	ers' Income	e Effect.							
Concepts of Macro economics											
Natio	nal Inc	ome and it	s Compone	ents — GNI	, NNP, GL	P, NDP; C	onsumption	Function;	[9]		
Inves	stment;	Simple K	eynesian i		ncome Dei	ermination	and the	Keynesian			
Multi	plier; G	overnment	Sector — E	External Sec	ctor — Expo	orts and imp	Dorts.				
Lond		of Monetary	/ Economi	CS Maray T	ropostion		ativa Dama				
	ey — D	Popk's Cr	emanu ior	Noney — I	Integrating	Monov on	alive Demai	ty Markata			
	леу —	- Darik S Cr		and Stabili	nitegrating	notory and	Liccol Policy		[9]		
Bank	, LIVI IVI	be Covern	mont: The		Paradiam		d Wage Pi	giditios			
Volu	tarv a	ne Govern	ary Linemol	Olassical r	arauigin –		u waye Ki	giullies —			
Volui	nary a		ary onempi	oyment.			То	tal Hours:	45		
Text	Book(c).					10	tar nours.	75		
1	Dornh	sj. Jusch Fiscl	her and Sta	rtz Macroe	conomics '	10th Edition	Tata McG	raw Hill 201	12		
1.	Mote	$\frac{1}{\sqrt{1}}$ and $\frac{1}{\sqrt{2}}$		Gunta G S	Conomics, Manadel	rial Econom	nice Conce	nts and Car	nz ses" Tata		
2.	McGr	aw Hill 201	5		, managei				565, 1818		
Refe	rence	s):	•								
1	Pindy	ck Robert	S and Dani	ell Rubinf	eld Microe	conomics	8 th Edition	2013			
	Paul	Anthony S	Samuelson	William D) Nordhau	s Econor	nics 19th	<u>Edition</u> M	Graw-Hill		
2.	Educa	ation 2010	Jamaoloon,				noo, rour	Eatton, m			
_	Hal F	R Varia I	ntermediate	Microeco	nomics: A	Modern A	oproach 8	th Edition	Affiliated		
3.	EastV	VestPress	2006		1011100. 71		pp.0001, 0		,		
4.	Gilber	rt Strang In	troduction	to linear alo	ebra, 5 th F	dition. ANF	Books, 20	16.			
				Lafas star satu	· · · · · · · · · · · ·						



Course Contents and Lecture Schedule										
S. No.	Topics	No. of hours								
1.0	Concepts of Micro economics									
1.1	Principles of Demand and Supply	2								
1.2	Supply Curves of Firms	1								
1.3	Elasticity of Supply; Demand Curves of Households	1								
1.4	Elasticity of Demand; Equilibrium and Comparative Statics (Shift of a Curve and Movement along the Curve); Welfare Analysis	2								
1.5	Consumers' and Producers' Surplus	1								
1.6	Price Ceilings and Price Floors; Consumer Behaviour	2								
1.7	Axioms of Choice	1								
1.8	Budget Constraints and Indifference Curves.	2								
2.0	Production and Cost Analysis									
2.1	Theory of Production	1								
2.2	Production Function and Iso-quants	2								
2.3	Cost Minimization; Cost Curves Total, Average and Marginal Costs	2								
2.4	Long Run and Short Run Costs.	1								
3.0	Market Structure & Pricing									
3.1	Equilibrium of a Firm Under Perfect Competition	1								
3.2	Monopoly and Monopolistic Competition	1								
3.3	Consumer's Equilibrium	1								
3.4	Effects of a Price Change	1								
3.5	Income and Substitution Effects	1								
3.6	Derivation of a Demand Curve & Applications	1								
3.7	Tax and Subsidies	1								
3.8	Inter temporal Consumption	1								
3.9	Suppliers' Income Effect	1								
4.0	Concepts of Macroeconomics									
4.1	National Income and its Components	1								
4.2	GNP, NNP, GDP, NDP	1								
4.3	Consumption Function; Investment; Simple Keynesian Model of Income Determination and the Keynesian Multiplier	3								
4.4	Government Sector	1								
4.5	External Sector	1								
4.6	Exports and Imports	1								
5.0	Concepts of Monetary Economics									
5.1	Money — Definitions; Demand for Money	1								
5.2	Transaction and Speculative Demand; Supply of Money	2								
5.3	Bank's Credit Creation Multiplier; Integrating Money and Commodity Markets	1								
5.4	IS, LM Model; Business Cycles and Stabilization	1								



5.5	Monetary and Fiscal Policy	1
5.6	Central Bank and the Government; The Classical Paradigm	1
5.7	Price and Wage Rigidities	1
5.8	Voluntary and Involuntary Unemployment	1

1. Mr.P.Sabareesh -sabareesh@ksrct.ac.in



60 MA 005	Statistical Modeling	Category	L	Т	Р	Credit
60 MA 005	Statistical Modeling	BS	3	1	2	5

- To get exposed to the fundamentals of linear statistical models and Analysis of Variance
- To familiarize the basic concepts of estimation methods
- To understand the basic concepts of testing of hypothesis
- To familiarize various non-parametric inference techniques
- To acquire skills in using ARIMA models to make forecasts

Pre-requisites

• Statistics and Probability

Course Outcomes

On the successful completion of the course, students will be able to							
CO1	Calculate correlation, regression and analyze the design of experiments.	Apply					
CO2	Determine the point estimates of the parameters of the distribution.	Apply					
CO3	Test the statistical hypothesis using non parametric testing models.	Apply					
CO4	Apply various non-parametric inferences techniques.	Apply					
CO5	Apply ARIMA models to make forecasts.	Apply					

Mapping with Programme Outcomes

000						P	Os							PSOs	
005	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
CO2	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
CO3	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
CO4	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
CO5	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-

3 - Strong; 2 - Medium; 1 - Some

Assessment Pattern

Bloom's	Continuous Assessment Tests (Marks)				Mo Exami	del nation	End Sem Examination		
Category	Test 1		Test 2		(Ma	rks)	(Marks)		
	Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab	
Remember	10	-	10	-	20	-	20	-	
Understand	10	30	10	30	20	30	20	30	
Apply	40	70	40	70	60	70	60	70	
Analyse	-	-	-	-	-	-	-	-	
Evaluate	-	-	-	-	-	-	-	-	
Create	-	-	-	-	-	-	-	-	
Total	60	100	60	100	100	100	100	100	



Syllabus								
	K.	.S.Rangasan	ny College	e of Techno	ology – Aut	onomous	R2022	
		B.Tech -	Compute	r Science a	and Busines	ss System	S	
	-		60 MA 00	05- Statisti	cal Modelin	g		
Semeste	r H	lours / Weel	(Total	Credit		Maximum Ma	rks
	· L	Т	Р	Hours	C	CA	ES	Total
<u> </u>	3		2	90	5	50	50	100
Linear S	atistical Mo	dels and An	alysis of v	ariance:		_		
Multiple	Correlations	- Coefficient	of Multiple	e correlatio	ns - Multipl	e Regress	ion Analysis.	[9]
Analysis Platatiati	of variance -	Completely r	andomized	i design an	d Randomiz	ea block a	esign.	
R Statisti		ing. introduc		-unclions -	Control now		5.	
Estimati Doint oct	imation Cri	toria for goo	d octimate	o (un bioc	odnoss con	victorov	Mothodo of	
estimatio	n including m	avimum likeli	bood estin	ation	euness, con	isistericy) ·		[0]
R statisti	al Programm	ning: Working	with Vect	nation. ors and Ma	trices - Rea	ding in Dat	ta - Writing	[9]
Data	an rogramm	ing. working				ang in Da	u vinang	
Non-par	ametric Test	ing of hypot	hesis:					
Concept	and formulati	on - Type I a	nd Type II	errors - Ne	vman Pears	on lemma	(without	
proof) - S	imple examp	les with Nevr	nan Pears	on lemma.	,		([9]
R statisti	al Programm	ning: Working	with Data	, Manipulat	ing Data, Gr	aphics in F	R.	
Non-par	ametric Infer	ence:						
Comparis	on with para	metric inferer	nce - Use d	of order stat	tistics. Sign-	test - Wilc	oxon signed	
rank test	- Mann-Whitr	ney test - Rur	n-test - Kol	mogorov-S	mirnov test ·	 Spearmar 	n's and	[9]
Kendall's	test-Toleran	ce region.						
R statisti	al Programm	ning: Sign tes	t, Wilcoxo	n signed tes	st and Mann	-Whitney to	est	
Basics o	f Time Serie	s Analysis 8	Forecast	ing:	. –	,	- · · · · ·	101
Stationar	y - ARIMA M	odels: Identifi	cation - Es	stimation ar	Id Forecastii	ng (simple	Problems).	[9]
R statisti	ai Programm	ling: Simulati	on, Linear	model - Da	ita Frame.			
1 Introdu	Inction to P E	unctions Cor	stral flow a	ndloons				
2 Worki	a with Vecto	rs and Matric	11101 110W a					
3 Readi	ng in Data W	riting Data V	Vorkina wit	h Data Ma	nipulating D	ata		
4 Simula	ition	ning Data, v	ronning mi	in Data, ma	inpulating D	ulu		
5. Linear	model							[30]
6. Data F	rame							
7. Graph	ics in R							
8. Buildir	g ARIMA mo	dels						
9. Fitting	the multiple i	regression						
				Total F	lours: 45 +1	5(Tutoria	l) + 30 (LAB)	90
Text Boo	ok(s):							
1 R.	Miller, J.E. Fr	eund and R.	Johnson, I	Probability a	and Statistic	s for Engin	eers, Fourth E	dition,
··· Pe	arson,2015.					<u></u>		
2. A.C	Soon. M.Gupt	a and B.Das	gupta, ⊢un	damentals	of Statistics	(Vol. I), Ir	e Word Press	, 1933.
Reference	e(s):							
1. Jai Pro	ed P. Lander ofessional, 20	r, R for Everyo 17.	one: Advar	iced Analyt	ics and Grap	ohics, Seco	ond Edition, Ad	disonWesley
2. D.0	C. Montgome	ry and E.Pec	k , Introdu	ction to Line	ear Regress	ion Analysi	s, Third Editio	n, Wiley,
3 6	IU.	Ind Hands o	n Program			lishars & [Distributors Pu	t 1 td 2018
	Gunta and	V K Kanoor	Tundaman	tals of math	ematical eta	tistice 12+	h Edition sult	r = ru, 2010.
4.	ns New Delhi	2020	unuamen	uis oi malli	511211021 310	1131103, 121		an chang ang
50								

9 BoS Chairman

5. Web Reference: https://archive.nptel.ac.in/courses/111/105/111105090/, Probability and Statistics, IITKharagpur, PROF. SOMESH KUMAR.

Course	Contents and Lecture Schedule	
S. No.	Topics	No. of Hours
1	Linear Statistical Models and Analysis of variance	1
1.1	Multiple Correlations	2
1.2	Coefficient of Multiple correlations	2
1.3	Multiple Regression Analysis	1
1.4	Tutorial	2
1.5	Analysis of variance - Completely randomized design	1
1.6	Randomized block design.	2
1.7	Tutorial	2
2	Estimation Theory	
2.1	Point estimation	2
2.2	Criteria for good estimates (un-biasedness, consistency)	2
2.3	Tutorial	2
2.4	Methods of estimation	2
2.5	Methods of estimation including maximum likelihood estimation	2
2.6	Tutorial	2
3	Non-parametric Testing of hypothesis	
3.1	Concept and formulation – Type I and Type II errors.	2
3.2	Neyman Pearson lemma (without proof)	3
3.3	Tutorial	2
3.4	Simple examples with Neyman Pearson lemma	3
3.5	Tutorial	2
4	Non-parametric Inference	
4.1	Comparison with parametric inference, Use of order statistics	2
4.2	Sign-test –Wilcoxon signed rank test	1
4.3	Mann-Whitney test – Run-test	1
4.4	Tutorial	2
4.5	Kolmogorov-Smirnov test	1
4.6	Spearman's and Kendall's test	2
4.7	Tolerance region.	1
4.8	Tutorial	2
5	Basics of Time Series Analysis & Forecasting	
5.1	Stationary	2
5.2	ARIMA Models: Identification	2
5.3	Tutorial	2
5.4	Estimation (simple Problems)	2
5.5	Forecasting (simple Problems)	2
5.6	Tutorial	2
Practica	l:	·



1.	Introduction to R, Functions, Control flow and Loops	4
2.	Working with Vectors and Matrices	3
3.	Reading in Data, Writing Data, Working with Data, Manipulating Data	3
4.	Simulation	4
5.	Linear model	3
6.	Data Frame	3
7.	Graphics in R	3
8.	Building ARIMA models	4
9.	Fitting the multiple regression	3

1. Dr.K.PRABAKARAN - prabakaran@ksrct.ac.in



60 CB 201	60 CB 201 Computer Organization and Architecture	Category	L	Т	Ρ	Credit
60 CB 201	and Architecture	PC	3	0	0	3

• To recognize the basic structure of a digital computer and representation of nonnumeric data.

• To learn different arithmetic operations and organization of control unit.

• To understand the concept of pipelining and its impact in processor design.

• To understand the concept in memory system.

• To study memory organization different ways of communication with I/O devices and parallel processors.

Pre-requisites

Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Apply the functionalities of various blocks of a digital computer and express the data representation.	Apply
CO2	Apply the logic design of Arithmetic and control Unit.	Apply
CO3	Understand hazards in pipelining and outline its impact in the performance of the processors.	Understand
CO4	Analyze the concepts of memory system.	Analyze
CO5	Understand the concepts in memory organization, concurrence access in parallel processors and classify the approaches for I/O communication.	Understand

Mapp	ing wi	th Pro	gramn	ne Out	come	5									
<u> </u>						P	Os							PSOs	,
CUS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	2	3	-	-	-	-	2	2	2	2	1	-
CO2	3	3	2	2	3	-	-	-	-	2	2	2	3	1	-
CO3	3	3	3	2	2	-	-	-	-	2	2	2	-	1	-
CO4	3	3	2	2	3	-	-	-	-	2	2	2	-	1	-
CO5	3	3	2	3	3	-	-	-	-	2	2	3	3	1	-
3 - St	rong; 2	2 - Mec	dium; 1	- Som	e										

Assessment Pattern

Bloom's	Continuous Ass (Ma	sessment Tests rks)	End Sem Examination (Marks)
Calegory	1	2	
Remember	10	10	10
Understand	20	20	40
Apply	30	30	50
Analyse	10	10	10
Evaluate	-	-	-
Create	-	-	-
Total	60	60	100



K. S. Rangasamy College of Technology – Autonomous R2022 B.Tech – Computer Science and Business Systems B.Tech – Computer Organization and Architecture Semester Hours/Week Total Maximum Marks Semester L T Performance Architecture II 3 40 60 100 Basic Structure of Computers* Fortal Maximum Marks Functional units – Basic operational concepts – Bus structures – Performance and metrics – Instructions and instruction sequencing – Hardware – Software Interface – Instructions et architecture – Addressing modes – RISC – CISC. ALU design – Fixed point and floating point operations Computer arithmetic** Integer addition and subtraction, ripple carry adder, carry look-ahead adder, etc. multiplication – shift-andadd, Booth multiplier, carry save multiplier, etc. Division restoring and non-restoring techniques, floating point arithmetic, High performance arithmetic, Subword parallelism. [9] Pipelining** Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets – Data pasto concepts – Semiconductor RAM – ROM – Speed – Size and cost – Cache memories – Instructions and usotractions – Virtual memory – Memory management requirements – Associative memories – Secondary storage devices. [9]	Sylla	bus								
B.Tech - Computer Science and Business Systems 60 CB 201 - Computer Organization and Architecture Semester Hours/Week Total Credit Maximum Marks II 3 0 0 45 3 40 60 100 Basic Structure of Computers* Functional units – Basic operational concepts – Bus structures – Performance and metrics – Instructions and instruction sequencing – Hardware – Software Interface – Instruction set architecture – Addressing modes –RISC – CISC. ALU design – Fixed point and floating point operations [9] Computer arithmetic** Integer addition and subtraction, ripple carry adder, carry look-ahead adder, etc. multiplication – shift-andadd, Booth multiplier, carry save multiplier, etc. Division restoring and non-restoring techniques, floating point arithmetic, High performance arithmetic, Subword parallelism. [9] Memory system* Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets – Data path and control considerations – Performance considerations – Exception handling. [9] Memory system* Basic concepts – Semiconductor RAM – ROM – Speed – Size and cost – Cache memories – Improving cache performance – Virtual memory – Memory management requirements – Associative memories – Secondary storage devices. [9] // O Organization** Accessing I/O devices – Programmed Input/output -Interrupts – Direct Memory Access – Buses – Interface circuits			K. S. I	Rangasam	y College o	of Technolo	ogy – Auto	nomous R	2022	
60 CB 201 - Computer Organization and Architecture Semester Total Credit Maximum Marks Semester L Total II 3 0 0 45 3 40 60 100 Basic Structure of Computers* Functional units – Basic operational concepts – Bus structures – Performance and metrics – Instructions and instruction sequencing – Hardware – Software Interface – Instruction set operational concepts – Bus structures – Performance and metrics [9] oright operations Computer arithmetic** Interface – Instruction set operational concepts – CISC. ALU design – Fixed point and floating point operations [9] Oon on -restoring techniques, floating point arithmetic, High performance arithmetic, Subword parallelism. [9] Pipelining** Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets – Data path and control considerations – Performance considerations – Exception handling. [9] Memory system* Basic concepts – Semiconductor RAM – ROM – Speed – Size and cost – Cache memories – Improving cache performance – Virtual memory – Memory management requirements – Associative memories – Secondary storage devices. [9] IVO Organization** Accessing I/O devices – Programmed Input/output -Inter				B.Tech – C	computer S	science and	Business	Systems		
Semester Hours/Week Total Credit Maximum Marks II 3 0 0 45 3 40 60 100 Basic Structure of Computers* Functional units – Basic operational concepts – Bus structures – Performance and metrics – Instructions and instruction sequencing – Hardware – Software Interface – Instruction set architecture – Addressing modes – RISC – CISC. ALU design – Fixed point and floating point operations [9] Computer arithmetic** Integer addition and subtraction, ripple carry adder, carry look-ahead adder, etc. multiplication – shift- andadd, Booth multiplier, carry save multiplier, etc. Division restoring and non-restoring techniques, floating point arithmetic, High performance arithmetic, Subword parallelism. [9] Pipelining** Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets – Data path and control considerations – Performance considerations – Exception handling. [9] Memory system* Basic concepts – Semiconductor RAM – ROM – Speed – Size and cost – Cache memories – Improving cache performance – Virtual memory – Memory management requirements – Associative memories – Secondary storage devices. [9] I/O Organization** Accessing I/O devices – Programmed Input/output -Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB), I/O devices and processors. [9] 1. Carl Hamacher, Zvonko Vranesic and Safwat Zak	60 CB 201 - Computer Organization and Architecture									
L T P Hours C CA ES Total II 3 0 0 45 3 40 60 100 Basic Structure of Computers* Functional units – Basic operational concepts – Bus structures – Performance and metrics – Instructions and instruction sequencing – Hardware – Software Interface – Instruction set architecture – Addressing modes –RISC – CISC. ALU design – Fixed point and floating point operations [9] Computer arithmetic** Integer addition and subtraction, ripple carry adder, carry look-ahead adder, etc. multiplication – shift- andad, Booth multiplier, carry save multiplier, etc. Division restoring and non-restoring techniques, floating point arithmetic, High performance arithmetic, Subword parallelism. [9] Pipelining** Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets – Data path and control considerations – Performance considerations – Exception handling. [9] Memory system* Basic concepts – Semiconductor RAM – ROM – Speed – Size and cost – Cache memories – Improving cache performance – Virtual memory – Memory management requirements – Associative memories – Standard I/O Interfaces (PCI, SCSI, USB), I/O devices and processors. [9] I/O Organization** Accessing I/O devices – Programmed Input/output -Interrupts – Direct Memory Access – Buses –Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB), I/O devices and processors. [9]	Seme	ester	F	lours/Wee	k	Total	Credit	Ma	ximum Ma	rks
II 3 0 0 45 3 40 60 100 Basic Structure of Computers* Functional units – Basic operational concepts – Bus structures – Performance and metrics – Instructions and instruction sequencing – Hardware – Software Interface – Instruction set architecture – Addressing modes –RISC – CISC. ALU design – Fixed point and floating point operations [9] Computer arithmetic** Integer addition and subtraction, ripple carry adder, carry look-ahead adder, etc. multiplication – shift-andadd, Booth multiplier, carry save multiplier, etc. Division restoring and non-restoring techniques, floating point arithmetic, High performance arithmetic, Subword parallelism. [9] Pipelining** Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets – Data path and control considerations – Performance considerations – Exception handling. [9] Memory system* Basic concepts – Semiconductor RAM – ROM – Speed – Size and cost – Cache memories – Improving cache performance – Virtual memory – Memory management requirements – Associative memories – Secondary storage devices. [9] I/O Organization** Accessing I/O devices – Programmed Input/output -Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB), I/O devices and processors. [9] 1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, "Computer Organization", Fifth Edition, Tata McGraw Hill, 2002. 45 2. Atul P. Godse and Deepali A. Godse, "Computer Architecture	ocint	.3(0)	L	Т	P	Hours	С	CA	ES	Total
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Edition, Pearson Education, 2003.	Ζ.	Editio	n, Pearson	Education,	2003.					
John P. Hayes, "Computer Architecture and Organization", Third Edition, Tata McGraw Hill,	3	John	P. Hayes,	"Computer	Architectur	re and Orga	anization",	Third Editio	n, Tata Mc	Graw Hill,
³ 1998.	5.	1998.								
4. V.P. Heuring, H.F. Jordan, "Computer Systems Design and Architecture", Second Edition,	4.	V.P.	Heuring, H	.F. Jordan,	"Compute	r Systems	Design and	d Architectu	ure", Secon	d Edition,
Pearson Education, 2004.		Pears	son Educati	on, 2004.						
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*SDG:4- Quality Education **SDG: 9- Industry innovation and infrastructure.



Course C	ontents and Lecture Schedule	
S. No.	Topics	No. of hours
1.0	Basic Structure of Computers	4
1.1	Functional units – Basic operational concepts	1
1.2	Bus structures – Performance and metrics	1
1.3	Hardware – Software Interface	1
1.4	Instructions and instruction sequencing	1
1.5	Instruction set architecture	1
1.6	Addressing modes	1
1.7	RISC – CISC	1
1.8	ALU design	1
1.9	Fixed point and floating point operations.	1
2.0	Computer arithmetic	1
2.1	Integer addition and subtraction	1
2.2	ripple carry adder, carry look-ahead adder	1
2.3	multiplication – shift-and-add	1
2.4	Booth multiplier	1
2.5	carry save multiplier	1
2.6	Division restoring and non-restoring techniques	1
2.7	floating point arithmetic	1
2.8	High performance arithmetic	1
2.9	Subword parallelism	1
3.0	Pipelining	
3.1	Basic concepts	1
3.2	Data hazards	1
3.3	Instruction hazards	1
3.4	Influence on instruction sets	2
3.5	Data path and control considerations	1
3.6	Performance considerations	1
3.7	Exception handling	2
4.0	Memory system	
4.1	Basic concepts	1
4.2	Semiconductor RAM	1
4.3	ROM – Speed	1
4.4	Size and cost	1
4.5	Cache memories	1
4.6	Improving cache performance	1
4.7	Virtual memory	1
4.8	Memory management requirements	1
4.9	Associative memories – Secondary storage devices	1



5.0	I/O Organization	
5.1	Accessing I/O devices	1
5.2	Programmed Input/output	1
5.3	Interrupts	1
5.4	Direct Memory Access	1
5.5	Buses – Interface circuits	1
5.6	Standard I/O Interfaces (PCI, SCSI, USB)	2
5.7	I/O devices and processors	2

1. Mrs.R.Loga priya - logapriyar@ksrct.ac.in



61 CB 202	Object Oriented	Category	L	Т	Ρ	Credit
61 CB 202	Programming	PC	3	0	0	3

• To explore object-oriented programming concepts, and apply them in solving problems.

- To learn the concepts of Arrays, String handling and Interfaces.
- To create applications to store the data with the aid of files classes.
- To develop programs using Collection APIs and multithreading.
- To understand the try catch finally statement and Regular expression.

Pre-requisites

• Basic knowledge of C Programming Language

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Apply the concept of classes, objects and exhibit reusability through inheritance along with string and array.	Apply
CO2	Extrapolate different operations through Arrays, interfaces and string handling.	Apply
CO3	Explore the importance of Packages and Streams.	Apply
CO4	Implement problems using java collection framework and multi- threading.	Apply
CO5	Understand the uses of Regular expression and Exception handling.	Understand

Mapping with Programme Outcomes

			<u> </u>												
CO 2		POs											PSOs		
005	1	2	3	4	5	6	7	8	9	10	11	12	1	PSOs 2	3
CO1	3	3	3	-	-	-	-	-	2	2	-	2	-	-	2
CO2	3	3	3	-	-	-	-	-	2	2	-	2	-	-	2
CO3	3	3	3	-	-	-	-	-	2	2	-	2	-	-	2
CO4	3	3	3	-	-	-	-	-	2	2	-	2	-	-	2
CO5	3	3	3	-	-	-	-	-	2	2	-	2	-	-	2
3 - St	rong; 2	2 - Mec	dium; 1	– Son	ne										

Assessment Pattern											
Bloom's	Continuous A (M	ssessment Tests arks)	End Sem Examination (Marks)								
Calegory	1	2									
Remember	-	-	-								
Understand	10	10	20								
Apply	50	50	80								
Analyse	-	-	-								
Evaluate	-	-	-								
Create	-	-	-								
Total	60	60	100								

Syllabus											
	K.S.F	Rangasamy	/ College o	f Technolo	ogy – Autor	nomous R2	022				
		61 CE	8 202- Obje	ct Oriented	d Programr	ning					
				СВ							
Somostor	F	lours/Wee	k	Total	Credit	Ma	ximum Ma	rks			
Semester	L	Т	Р	Hours	С	CA	ES	Total			
II	3	0	0	45	3	40	60	100			
Introduction*											
Object-Oriented Concepts-Naming Convention, Object and Class, Method, Constructors,											
Use of Super, Final, Static and this keyword, Inheritance, Polymorphism, Abstraction,											
Encapsula	tion, Method	Overloadir	ng, Method	Overriding.							
Java Basi	CS*										
Introductio	n- Data Typ	es, Variabl	es, Operato	ors, Control	Statement	s, Arrays, S	String and	[9]			
String buff	er, Interfaces	s, Exceptior	n Handling,	Reading Co	onsole Inpu	t and Writin	g Console	[0]			
Output, Th	e Console cl	ass									
Packages	and Stream	IS*				0					
Defining a	Package, Im	porting pac	kages, Acce	ess protection	on, I/O: The	Stream cla	sses, Byte	[9]			
Streams a	na Characte	r Streams,	File Class,	Reading ar	na vvriting F	lies, Rando	m Access				
	Eremewer	zation and		luon							
Collection		ArrovLiet L	inkodlict (hSot Itorat	or Voctor				
Multithread	ed Program	ming_The I	ava Thread	Model The	Main Three	ad Creating	a Thread	[9]			
Creating M	Iultiple Three	ads Thread	Priority Sv	nchronizati	on	au, oreating	a micau,				
Regular E	xpressions	and Excep	tion handli	na	on						
Regular E	xpression:	Matcher C	lass. Patte	ern class.	Regex Cha	aracter Cla	sses and	101			
Quantifiers	, Meta cha	racters. E	xception h	andling Éu	ndamentals	, Types, N	lested try	[9]			
statements	, Built-in-Exe	ceptions	•	Ū							
						То	tal Hours:	45			
Text Book	x(s):										
1 Hert	pert Schildt,	"Java: Th	e complete	e Referenc	e", Compre	ehensive co	overage of	the Java			
'' Lang	guage, Oracl	e press, 10	th Edition, 7	Fata McGra	w-Hill, 2017	7					
2 Y.Da	aniel Liang,	"Introductio	on to Java	Programmi	ng", Compi	rehensive \	/ersion, 10t	h Edition,			
Pea	rson Educati	on,2015									
Reference	e(s):										
1. Java	7 Program	ning Black	Book, Koge	nt Learning	Solutions I	nc, DreamT	ech Press,	2013			
2. Bert	Bates and K	athy Sierra	, "Head Fire	st Java", 2n	d Edition, P	ublisher: O	Reilly's, 200	<u>)9.</u>			
3. Jeffr	ey E. F. Frie	dl, "Masteri	ng Regular	Expression	s", 3rd Edit	ion, O'Reilly	/ Media, Inc	.,2006			
4. Onlii	ne Reso	urces :	https://	www.tutoria	ispoint.com	, https:/	/www.javat	point.com,			
https	s://www.jourr	haldev.com	, https://beg	innersbook	.com, https:	://www.w3s	chools.com				
*SD	4:- Quality ف	/ Educatio	n								



Course C	Contents and Lecture Schedule	1
S. No.	Topics	No. of hours
1.0	Introduction	
1.1	Object-Oriented Concepts-Naming Convention	1
1.2	Object and class	1
1.3	Method	1
1.4	Constructors	1
1.5	Use of super, final, static and this keyword	1
1.6	Inheritance, Polymorphism	1
1.7	Abstraction, Encapsulation	1
1.8	Method Overloading	1
1.9	Method Overriding	1
2.0	Java Basics	
2.1	Introduction	1
2.2	Data Types, Variables	1
2.3	Operators	1
2.4	Control Statements, Arrays	1
2.5	String and String buffer	1
2.6	Interfaces	1
2.7	Exception handling	1
2.8	Reading console Input and Writing Console Output	1
2.9	The Console class	1
3.0	Packages and Stream	
3.1	Defining a Package	1
3.2	Importing packages	1
3.3	Access protection	1
3.4	I/O: The Stream classes	1
3.5	Byte streams and Character streams	1
3.6	File class	1
3.7	Reading and writing Files	1
3.8	Random access file operations	1
3.9	Serialization and De-serialization	1
4.0	Collection Framework and Threads	
4.1	Collections overview	1
4.2	Arrays List, LinkedList,Queue	1
4.3	HashMap, HashSe	1
4.4	Iterator, Vector	1
4.5	Multithreaded programming	1
4.6	The Java Thread Model, The Main Thread	1



4.7	Creating a Thread, Creating multiple Threads	1
4.8	Thread priority	1
4.9	Synchronization	1
5.0	Regular Expressions and Exception handling	
5.1	Regular Expression: Matcher Class	1
5.2	Pattern class	2
5.3	Regex Character Classes	1
5.4	Quantifiers, Metacharacters	1
5.5	Exception handling Fundamentals	1
5.6	Types	1
5.7	Nested try statements	1
5.8	Built-in-Exceptions	1
	Total	45

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60 CE 002	Tamile and Tachnology	Category	L	Т	Ρ	Credit
00 GE 002	Tamils and Technology	GE	1	0	0	1

• To learn weaving, ceramic and construction technology of Tamils

- To understand the agriculture, irrigation and manufacturing technology of Tamils
- To realize the development of scientific Tamil and Tamil computing

Pre-requisites

NIL

Course Outcomes

On the su	On the successful completion of the course, students will be able to							
CO1	Understand the weaving and ceramic technology of ancient Tamil	Understand						
001	people nature.							
CO^{2}	Comprehend the construction technology, building materials in	Understand						
002	sangam period and case studies.							
CO3	Infer the metal process, coin and beads manufacturing with	Understand						
003	relevant archeological evidence.							
CO4	Realize the agriculture methods, irrigation technology and pearl	Understand						
CO4	diving.							
CO5	Apply the knowledge of scientific Tamil and Tamil computing.	Apply						

Mapping with Programme Outcomes

<u> </u>						P	Os							PSOs	S
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO2	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO3	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO4	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO5	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
3 - St	rona: 2	2 - Me	dium:	1 - So	me										

Syllabus

K.S.Rangasamy College of Technology – Autonomous R2022											
Common to all Branches											
60 GE 002 – Tamils and Technology											
Somostor	H	ours/Wee	k	Total	Credit		Maximum Marks				
Semester	L	Т	Р	Hours	С	CA	ES	Total			
	1	0	0	15	1	-	100	100			
Weaving a	Ind Ceram	nic Techno	ology								
Weaving Ir	dustry Du	ring Sanga	am Age –	Ceramic T	echnology	 Black an 	d Red Ware Potteries	3			
(Brw) – Gra	affiti On Po	otteries.									
Design an	d Constru	ction Tec	hnology								
Designing a	and Structu	iral Constr	uction Ho	use & Desi	igns in Hou	isehold Ma	terials During Sangam	3			
Age – Build	ling Materi	als and H	ero Stone	s of Sanga	am Age – I	Details of S	Stage Constructions in	5			
Silappathika	aram – Sc	ulptures a	ind Templ	es of Mam	allapuram	 Great T 	emples of Cholas and				
other Worship Places – Temples of Nayaka Period - Type Study (Madurai Meenakshi Temple)- Thirumalai Nayakar Mahal – Chetti Nadu Houses, Indo – Saracenic Architecture at Madras During British Period.											
--	--	---------	--	--	--	--	--	--	--	--	--
Mar	ufacturing Technology										
Art of Ship Building – Metallurgical Studies – Iron Industry – Iron Smelting ,Steel -Copper and Gold Coins as Source of History – Minting of Coins – Beads Making – Industries Stone Beads – Glass Beads – Terracotta Beads – Shell Beads/Bone Beats – Archeological Evidences -Gem Stone Types Described in Silappathikaram.											
Aari	culture and Irrigation Technology										
Dam, Tank,Ponds,Sluice,Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry – Wells Designed for Cattle Use – Agriculture and Agro Processing – Knowledge of Sea- Fisheries – Pearl – Conche Diving -Ancient Knowledge of Ocean – Knowledge Specific Society.											
Scie	ntific Tamil & Tamil Computing										
Development of Scientific Tamil – Tamil Computing – Digitalization of Tamil Books – Development of Tamil Software – Tamil Virtual Academy- Tamil Digital Library – Online Tamil Dictionaries – Sorkuvai Project.											
	, Total Hours	15									
Text	Book(s):										
1.	தமிழக வரலாறு - மக்களும் பண்பாடும் கே. கே . பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் ம கல்வியியல் பணிகள் கழகம்).	வற்றும்									
2.	கணினித்தமிழ் – முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).										
3.	கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரீகம் (தொல்லியல் துறை வெளியீடு).										
4.	பொருநை - ஆற்றங்கரை நாகரீகம் (தொல்லியல் துறை வெளியீடு).										
5.	Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in prin	t).									
6.	 6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies. 										
7.	Historical Heritage of the Tamils (Dr.S.V.Subaramanian, Dr.K.D. Thirunavukkarasu) (Pub by: International Institute of Tamil Studies).	lished									
8.	The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: Interna Institute of Tamil Studies.)	ational									
9.	 Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu) 										
10.	10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author).										
11.	 Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu). 										
Refe	Reference(s):										
1.	Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) - Reference	Book.									
*SD0	G 4 – Quality Education										
**SD	G 15 – Life on Land										
***SI	DG 16 – Peace, Justice and Strong Institutions										
Cou	rse Designer(s)										
	தமிடிரும் தொமில் நட்பமும் Category L T P Credi	it									

60 GE 002 (அனைத்து துறைகளுக்கும் பொதுவானது) GE 1 0 0 1		கமிமரும் கொமில்நட்பமும்	Category	L	Т	Р	Credit
	60 GE 002	(அனைத்து துறைகளுக்கும் பொதுவானது)	GE	1	0	0	1

பாடத்தின் நோக்கங்கள்:

- தமிழர்களின் சங்ககால நெசவு, பனை வனைதல் மற்றும் கட்டிட தொழில் நுட்பம் குறித்து அறிதல்.
- தமிழர்களின் சங்ககால வேளாண்மை, நீர்ப்பாசனம் மற்றும் உற்பத்தி முறைகள் குறித்த கற்றல்.
- நவீன அறிவியல் தமிழ் மற்றும் கணித்தமிழ் குறித்த புரிதல்.



முன்கூட்டிய துறைசார் அறிவு:

தேவை இல்லை

பாடம் கற்றதின் விளைவுகள்:

பாடத்தை	பாடத்தை வெற்றிகரமாக கற்று முடித்த பின்பு, மாணவர்களால் முடியும் விளைவுகள்								
CO1	சங்ககாலத் தமிழர்களின் நெசவு மற்றும் பானை வனைதல்	புரிதல்							
001	தொழில்நுட்பம் குறித்த கற்றுணர்தல்								
	சங்ககாலத் தமிழர்களின் கட்டிட தொழில்நுட்பம்	புரிதல்							
CO2	கட்டுமானப் பொருட்கள் மற்றும் அவற்றை விளக்கும்								
	தளங்கள் குறித்த அறிவு.								
	சங்ககாலத் தமிழர்களின் உலோகத் தொழில், நாணயங்கள்	புரிதல்							
CO3	மற்றும் மணிகள் சார்ந்த தொல்லியல் சான்றுகள் பற்றிய								
	அறிவு.								
CO4	சங்ககாலத் தமிழர்களின் வேளாண்மை, நீர்ப்பாசன	புரிதல்							
004	முறைகள் மற்றும் முத்து குளித்தல் குறித்த தெளிவு.								
CO5	நவீன அறிவியல் தமிழ் மற்றும் கணித்தமிழ் குறித்த	பகுப்பாய்வு							
003	புரிந்துகொள்ளலும் மற்றும் பயன்படுத்துதலும்.								

Mappi	Mapping with Programme Outcomes																
<u> </u>	POs													PSOs			
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
CO1	-	-	-	-	-	-	3	3	-	2		3	-	-	-		
CO2	-	-	-	-	-	-	3	3	-	2		3	-	-	-		
CO3	-	-	-	-	-	-	3	3	-	2		3	-	-	-		
CO4	-	-	-	-	-	-	3	3	-	2		3	-	-	-		
CO5	-	-	-	-	-	-	3	3	-	2		3	-	-	-		
2 C+-		Mad		1 Como													

3 - Strong; 2 - Medium; 1 - Some

Syllabus

K.S.Rangasamy College of Technology – Autonomous R2022												
அனைத்து துறைகளுக்கும் பொதுவானது												
60 GE 002 – தமிழரும் தொழில்நுட்பமும்												
Somostor	Н	ours/Wee	k	Total	Credit	Maxir	num M	arks				
Semester	L	Т	Р	Hours	С	CA	ES	Total				
III	1	0	0	15	1	-	100	100				
நெசவு மற்றும் பானைத் தொழில்நுட்பம்:												
சங்க காலத்தில் நெசவுத் தொழில் - பானைத் தொழில்நுட்பம் - கருப்பு சிவப்பு												
பாண்டங்கள் - பாண்டங்களில் கீறல் குறியீடுகள்.												
வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்:												
சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப்												
பொருட்களில் வடிவமைப்பு - சங்க காலத்தில் கட்டுமானப் பொருட்களும்												
நடுகல்லும் - சி	லப்பதிகா	ரத்தில் பே	படை அன	மப்பு பற்றிu	ப விவரங்கள்	ா – மாமல்	லபுரச்					
சிற்பங்களும், (கோவில்க	ளும் - சே	ாழர் கால	்த்துப் பெரு	நங்கோயில்க	கள் மற்றுப	் பிற	3				
வழிபாட்டுத் த	லங்கல் -	நாயக்கர்	காலக்	கோயில்கள்	ா – மாதிரி	கட்டமைப்	புகள்					
பற்றி அறிதல்,	மதுரை	மீனாட்சி	அம்மன்	ஆலயம் ம	ற்றும் திருப	லை நாய	_க்கர்					
மஹால் - செப்	ட்டிநாட்டு	வீடுகள்	- பிரிட்டிஎ	டி காலத்தில	ல் சென்னை	ாயில் இந்	தோ -					
சாரோசெனிக்	கட்டிடக்	கலை.										
உற்பத்தித் தெ	தாழில் நு	ட்பம்:										
கப்பல் கட்டும்	മ ക്കെ –	உலோக	வியல் - (இரும்பு த் ெ	தாழிற்சால	லை - இருட	பலை	c				
உருக்குதல், எஃ	ஃகு - வரல	ரற்றுச் ச	ான்றுகள	ாக செம்பு	மற்றும் தங்	க நாணய	ங்கள்	3				
- நாணயங்கள்	அச்சடித்த	தல் - மணி	ி உருவாக்	கும் தொழி	ற் சாலைகள்	் - கல்மண	ிகள் ,					



கண்ன	ராடி மணிகள் - சுடுமண் மணிகள் - சங்கு மணிகள் - எலும்புத் துண்டுகள் -						
தொல்	லியல் சான்றுகள் – சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.						
வேள	ாண்மை மற்றும் நீர்பாசனத் தொழில் நுட்பம்:						
എത്തെ	ா, ஏரி, குளங்கள், மதகு - சோழர்காலக் குமு ழி த் தாம்பின் முக்கியத்துவம் -						
கால்நக	டை பராமரிப்பு - கால்நடைகளுக்கான வடிவமைக்கப்பட்ட கிணறுகள் –	Э					
வேளா	ண்மை மற்றும் வேளாண்மை சார்ந்த செயல்பாடுகள் - கடல்சார் அறிவு -	5					
மீன்வல	ாம் - முத்து மற்றும் முத்துக்குளித்தல் - பெருங்கடல் குறித்த பண்டைய அறிவு						
- அறிவ	புசார் சமூகம்.						
அறிவ	ியல் தமிழ் மற்றும் கணித்தமிழ்						
அறிவியல் தமிழின் வளர்ச்சி - கணித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின்பதிப்பு							
செய்தல் - தமிழ் மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக்கழகம் -							
தமிழ் ப	பின் நூலகம் - இணையத்தில் தமிழ் அகராதிகள் - சொற்குவைத் திட்டம்.						
	Total Hours	15					
Text Bo	ok(s):						
1	தமிழக வரலாறு - மக்களும் பண்பாடும் கே. கே . பிள்ளை (வெளியீடு: தப	பிழ்நாடு					
١.	பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).						
2.	கணினித்தமிழ் – முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).						
2	கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரீகம் (தொல்லியல் துறை						
3.	வெளியீடு).						
4.	பொருநை - ஆற்றங்கரை நாகரீகம் (தொல்லியல் துறை வெளியீடு).						
5.	Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL -	(in print).					
0	Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Publis	hed by:					
6.	International Institute of Tamil Studies.						
7	Historical Heritage of the Tamils (Dr.S.V.Subaramanian, Dr.K.D. Thirunavul	kkarasu)					
7.	(Published by: International Institute of Tamil Studies).	,					
0	The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by:						
0.	International Institute of Tamil Studies.)						
	Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published I	ру:					
9.	Department of Archaeology & Tamil Nadu Text Book and Educational Services						
	Corporation, Tamil Nadu)						
10	Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay)						
10.	(Published by: The Author).						
11	Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Na	adu Text					
	Book and Educational Services Corporation, Tamil Nadu).						
Refere	nce(s):						
1.	R.Balakrishnan , "Journey of Civilization Indus to Vaigai", Published by: RMRL						
*SDG 4							

*SDG 4 – Quality Education **SDG 15 – Life on Land

***SDG 16 – Peace, Justice and Strong Institutions



	Fabrication and Reverse Engineering	Category	L	Т	Ρ	Credit
60 ME 0P1	Laboratory (Common to All branches)	ES	0	0	4	2

- To acquire skills in operating hand tools and instruments.
- To provide hands-on training on Carpentry, Sheet metal, Fitting and Welding.
- To provide hands-on training on household wiring and electronic circuits.
- To offer real time activity on plumbing connections in domestic applications.
- To provide hands-on activities on dismantling, and assembling the Home Appliance, Center lathe operations, computer's internal components and peripherals.

Pre-requisites

NIL

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Perform power tools operations.	Apply
CO2	Make a wooden model using carpentry Process.	Apply
CO3	Make a model using sheet metal, filing and joining a MS Plate.	Apply
CO4	Repair and Maintenances of water lines for home applications.	Apply
CO5	Trouble shoots the electrical and electronic circuits, Electrical Machines and realizes the reputation of house wiring, home Appliance, computer internal components and peripherals.	Apply

Mapp	Mapping with Programme Outcomes																
<u> </u>	POs														PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
CO1	3	2	3	-	-	2	2	-	3	-	-	3	3	3	-		
CO2	3	2	3	-	-	2	2	-	3	-	-	3	3	3	-		
CO3	3	2	3	-	-	2	2	-	3	-	-	3	3	3	-		
CO4	3	2	3	-	-	2	2	-	3	-	-	3	3	3	-		
CO5	3	2	3	-	-	2	2	-	3	-	-	3	3	3	-		
3 St	rona: (2 - Mo	dium	· 1 - Som	0												

3 - Strong; 2 - Medium; 1 - Some

Assessment Pattern												
Bloom's Category	Lab Experiments As	sessment (Marks)	Model Examination (Marks)	End Sem Examination (Marks)								
	Lab	Activity	(IVIALKS)									
Remember	-	-	-	-	-							
Understand	25	12	50	-	50							
Apply	25	13	50	-	50							
Analyse	-	-	-	-	-							
Evaluate	-	-	-	-	-							
Create	-	-	-	-	-							
Total	50	25	100	-	100							





		K.S.F	Rangasamy	College o	f Technolo	ogy – Autor	nomous R2	2022					
		CO N		Commo				- 43 <i>f</i>					
		00 IV	le up 1 – Fac	orication al	Total	Credit	Ig Laborat	ory Dximum Ma	rks				
Semest	er —	L	T	P	Hrs	C	CA	ES	Total				
		0	0	4	6	2	60	40	100				
List of E	Experi	iments:											
2.	Fitting	g of Wall	lmounting	Parts usin	g Power To	ools*							
	a.	Drilling	in different	Walls and	Materials	uar Tawal b	anger and l	Dino with C	lamne				
	D.	i nung			i, onin nang		anger and i		lamps				
3.	Makir	ng of Wo	oden mode	el using the	e Carpentry	Process*							
	a.	T / Cro	oss Joint										
 b. Mortise and Tenon Joint / different joints Determination of viscosity of lubricating oil by Reduced and Southalt viscometer 													
		by Red	dwood and S	Saybolt viso	cometer								
4.	Makir	ng of Me	tal Model*										
	 a. Making of Components using Sheet Metal Process b. Mating of Components using the Filling Process Heat Balance Test on 4-Stroke 												
	 Mating of Components using the Filling Process Heat Balance Test on 4-Stroke Diesel Engine** 												
5.	Fabri	cation of	Welded m	odel*									
6.	Repai	ir and Ma	aintenance	of Pipe Fit	ting for Ho	me Applica	ations*						
	a. b.	Assem Cutting	bly of GI pip g of Threads	bes/PVC ar in GI pipe:	nd Pipe Fitti s by thread	ng Cutting Dies	s Measuren	nent of eng	ine				
		emissi	on and smo	ke using ex	khaust gas a	analyser an	d smoke m	eter					
7.	Assei	mbling a	nd dismant	ling of*									
	a.	Iron bo	ЭХ										
	b.	Inducti	ion stove										
	c.	Water	heater										
	d.	Mixer											
	e.	Table	fan										
	f	. Ceiling	g fan										
8.	S`Des	sign and	Execution	of Resider	ntial house	wiring*							
	a. b.	1 BHK 2 BHK	Performanc	ce test on v	apour com	pression ref	rigeration te	est rig					
9	Desig	in and F	xecution of	Residenti	al house w	irina with I	JPS.*						
	20019												



- a. 1 BHK
- **b.** 2 BHK

10. Design and Execution of Residential house wiring with UPS.*

- a. 1 BHK
- **b.** 2 BHK

11. Assembling of Audio Amplifier*

- a. Connecting USB/Bluetooth MP3 player board
- b. Connecting Volume controllers
- c. Connecting bass & treble filter boards
- d. Connecting Surround and sub-woofer filter board

Study Exercises:

- 1. Demonstration of Centre Lathe and its operations like Facing, Turning, and drilling.
- 2. Dismantle and Assemble of Vacuum Cleaner / Refrigerator.
- 3. Study of components of computer. Dismantle and assemble of desktop computer systems.

Lab Manual

1. **"Fabrication and Reverse Engineering Laboratory**", Department of Mechanical Engineering, KSRCT.

*SDG 9 – Industry Innovation and Infrastructure

Course Designer(s)

- 1. Mr.S Sakthivel sakthivel_s@ksrct.ac.in
- 2. Dr. D Sri Vidya srividhya@ksrct.ac.in
- 3. Mr. K. Raguvaran raguvaran@ksrct.ac.in



61 CB 2B1	Object Oriented	Category	L	Т	Ρ	Credit
OI CB ZF I	Programming Lab	PC	0	0	4	2

- To develop programs using basic concepts of Java
- To create applications using java concepts
- To provide the permanent storage for programs using files
- To design and develop the programs using collection APIs and threads To understand the try catch finally statement.

Pre-requisites

• Basic Knowledge of C Programming

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Implement programs using object-oriented concepts.	Apply
CO2	Develop programs with the concept of interfaces, exception handling.	Apply
CO3	Implement programs using packages and the file operations using IO classes.	Apply
CO4	Develop programs using Collections and multi-threading.	Apply
CO5	Understand the try catch finally statement.	Understand

Mapping with Programme Outcomes

<u> </u>	POs PSOs														
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	3	2	1	-	-	1	2	-	-	1	3	-	-
CO2	3	2	3	2	2	-	-	1	2	-	-	1	3	-	-
CO3	3	2	3	2	2	-	-	1	2	-	-	1	3	-	-
CO4	4 3 2 3 2 2 1 2 1 3														
CO5	3	2	3	2	3	-	-	1	2	-	-	1	3	-	-
3 - St	3 - Strong; 2 - Medium; 1 – Some														

Assessment Patte	ern		-			
Bloom's Category	Lab Experimer (Ma	nts Assessment arks)	Model Examination	End Sem Examination (Marks)		
	Lab Activity		(warks)	(IVI a	irks)	
Remember	-	-	-	-	-	
Understand	25	13	50	-	50	
Apply	25	12	50	-	50	
Analyse	-	-	-	-	-	
Evaluate	-	-	-	-	-	
Create	-	-	-	-	-	
Total	50	25	100	-	100	



K.S.Rangasamy College of Technology – Autonomous R2022									
	61 CB 2P1 - Object Oriented Programming Lab								
Somostor	ŀ	lours/Wee	k	Total	Credit	Ма	ximum Ma	rks	
Jemester	L	Т	Р	Hrs	C	CA	ES	Total	
	0	0	4	60	2	60	40	100	
List of Expe	iments:								
1.	Classes and	Objects *							
2.	Interfaces *								
3.	Packages *								
4.	Data storage	using files '	ŧ						
5.	Collections *								
6. Multi-threading *									
7. Regular Expressions *									
8. Exception handling *									
Mini project: Develop a mini project for any application using Java.									
Lab Manual									
1. "Object Oriented Programming Lab", Department of Computer Science and Business Systems, KSRCT.									
*SDG 4:- Qu	ality Educati	on							

1. Ms.R.Loga priya –logapriyar@ksrct.ac.in



60 CC 0P1	Career Skill Development I	Category	L	Т	Ρ	Credit
	Career Skill Development I	CGC	0	0	2	1

- To help learners improve their vocabulary and to enable them to use words appropriately in different academic and professional contexts
- To help learners develop strategies that could be adopted while reading texts
- To help learners acquire the ability to speak effectively in English in real life and career related situations
- To equip students with effective speaking and listening skills in English
- To facilitate learners to enhance their writing skills with coherence and appropriate format effectively

Pre-requisites

Basic knowledge of reading and writing in English

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Listen and comprehend complex academic texts.	Understand
CO2	Read and infer the denotative and connotative meanings of technical texts.	Analyze
CO3	Write definitions, descriptions, narrations, and essays on various topics.	Apply
CO4	Speak fluently and accurately in formal and informal communicative contexts.	Apply
CO5	Appraise the verbal ability skills in the career development and professional contexts.	Analyze

Марр	Mapping with Programme Outcomes														
<u> </u>	POs PSOs														
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	-	-	-	-	-	-	-	2	3	3	2	3	-	-	-
CO2	-	-	-	-	-	-	-	2	3	3	2	3	2	-	-
CO3	-	-	-	-	-	-	-	2	3	3	2	3	2	2	-
CO4	-	-	-	-	-	-	-	2	3	3	2	3	-	-	-
CO5	-	-	-	-	-	-	-	2	3	3	2	3	2	2	-
3 - St	3 - Strong; 2 - Medium; 1 - Some														

Bloom's	Lab Experiment (Mar	ts Assessment ks)	Model Examination	End Sem Examination
Calegory	1	2	(Marks)	(Marks)
Remember	-	-	-	-
Understand	-	-	40	-
Apply	-	-	20	-
Analyse	-	-	40	-
Evaluate	-	-	-	-
Create	-	-	-	-
Total	-	-	100	-



Syllab	ous									
		K.S.F	Rangasamy	College o	f Technolo	gy – Autor	nomous R2	2022		
			B.Tech – C	omputer S	cience And	d Business	Systems			
			60 C	G 0P1 - Ca	reer Skill D	Developme	nt l			
Seme	ster	ŀ	lours/Wee	ĸ	Total	Credit	Ма	aximum Ma	rks	
Ocilie	5101	L	Т	P	Hours	С	CA	ES	Total	
		0	0	2	30	1	100	00	100	
Lister	ning									
Listen	ing fo	r general in	formation-s	pecific deta	ils - audio /	video (form	al & inform	al) - Listen		
to pod	casts	/ TED talks/	anecdotes	/stories/ev	ent narratio	on / docume	ntaries and	interviews	[6]	
with c	elebri	ities - Liste	en to a pro	duct and p	process des	scriptions, a	advertiseme	ents about		
produc	cts or	services.								
Speak	Speaking									
Self-In	Self-Introduction; Introducing a friend; conversation - politeness strategies - Narrating									
persor	documentaries / podcasts/ interviews - Picture description: giving instruction to use the [6]									
aocun	product: presenting a product - Small Talk: Mini presentations - Group discussions									
dobate	product; presenting a product - Small Talk; Mini presentations - Group discussions, debates & role plays									
Poadi	debates & role plays.									
	Reading									
(techn	(technical context), social media messages relevant to technical contexts and emails -									
Biographies, travelogues, newspaper reports and travel & technical contexts and emails - [6]										
dadde	adget reviews and user manuals - Newspaper articles and Journal reports - Editorials: and									
opinio	opinion blogs									
Writin	a	50.								
Writing	a lette	ers – inform	nal and form	nal – basics	and forma	t orientation	n - paragra	ph texting,		
short	report	t on an eve	ent (field trij	o etc.) - De	finitions; in	structions;	and produc	t /process	[6]	
descri	ption	- Note-mak	king / Note-	taking; recc	ommendatio	ns; transfe	rring inform	ation from		
non-ve	erbal ((charts, gra	phs to verb	al mode) - E	Essay textin	g.	-			
Verba	l Abil	lity I								
Readi	ng Co	mprehensi	on (MCQs)	– Cloze Tes	st - Sequen	cing of sent	ences – Su	mmarizing	[6]	
and pa	araph	rase – Erro	rDetection -	 Spelling T 	est – Sente	nce Improv	ement – Pr	eposition.		
							То	tal Hours:	30	
Text E	Book(s):								
1.										
2.		· •								
Refere	ence(s):							<u> </u>	
1.	'Engli	ish for Engi	ineers & le	chnologists	Orient Bla	ckswan Pri	vate Ltd. D	epartment c	of English,	
	Anna	University,	2020.						<u> </u>	
2.	Norm	an Lewis,	vvord Pow	er Made Ea	asy - The C	complete H	andbook to	or Building a	Superior	
	voca	bulary Book	C, Penguin	Random Ho	buse India, 2	2020.		1.1		
3.		aei MicCart	ny and Fe	N Verte 20	eii, `English	vocabular	y in Use:	upper inte	rmediate',	
\vdash		onage Univ	ersity Press	, IN. YOFK, 20	JIZ. Teeksissi	En alia - 2 O - 2	teah Dubli	ationa (last)		
4.	Laksi	inii waraya	nan, A Cou	ISE BOOK OF	rrecrinical	English Sci		auons (India	i) PVI. LTO.	
*000	<u>2020.</u>	Jolity Educe	tion							
SDG	4: QU	anty Equca								

*SDG 8: Decent work and Economic growth ***SDG 9 – Industry, innovation and Infrastructure



S. No.	Topics	No. of
1	Listening	nours
1.1	Listening for general information and Specific details	1
1.2	Listening to podcasts, documentaries and interviews with celebrities	1
1.3	Narrating personal experiences	1
1.4	Reading relevant to technical contexts and emails	2
1.5	Listen to a product and process descriptions	1
2	speaking	•
2.1	Self-introduction	1
2.2	Summarizing of documentaries& Picture Narration	1
2.3	Small Talk; Mini presentations	1
2.4	Group discussions, debates & role plays	2
2.5	Group discussions	1
3	Reading	·
3.1	Loud reading vs Silent reading, Skimming & Scanning of passages	1
3.2	Reading social media messages relevant to technical contexts	1
3.3	Reading newspaper reports and travel & technical blogs	1
3.4	Reading advertisements, gadget reviews and user manuals	2
3.5	Reading newspaper articles and journal reports	1
4	Writing	
4.1	Writing letters – informal and formal	1
4.2	Paragraph Texting	1
4.3	Definitions and instructions	1
4.4	Note-making / Note-taking	2
4.5	Essay texting	1
5	Verbal Ability	
5.1	Reading Comprehension (MCQs) and Cloze Test	1
5.2	Sequencing of sentences	1
5.3	Paraphrasing and Summarizing	1
5.4	Error Detection and Spelling Test	2
5.5	Prepositions	1
	TOTAL	30

1. Dr.A.Palaniappan- palaniappan@ksrct.ac.in



S.No.	Course Code	Name of the Course	Duration of Internal	Weightag	je of Marks	S	Mir M for I End S E	himum larks Pass in Semester Exam
			Exam	Continuous Assessment *	End Semes ter Exam **	Max. Marks	End Semes ter Exam	Total
			THEOR	Y	L			
1	60 HS 004	Introduction to Innovation, IP Management and Entrepreneurship	2	40	60	100	45	100
2	60 MA 013	Computational Statistics	2	40	60	100	45	100
3	61 CB 301	Automata and Compiler Design	2	40	60	100	45	100
4	60 CB 302	Database Management Systems	2	40	60	100	45	100
5	60 CB 303	Data Structures	2	40	60	100	45	100
6	60 CB 304	Software Engineering	2	40	60	100	45	100
	1	1	PRACTICA	LS				
7	60 CB 3P1	Database Management Systems Lab	2	60	40	100	45	100
8	60 CB 3P2	Data Structures Lab	2	60	40	100	45	100
9	60 CG 0P1	Career Skill Development -I	1	100	-	100	-	100
10	60 CG 0P6	Internship	-	100	-	100	-	100

THIRD SEMESTER

* CA evaluation pattern will differ from course to course and for different tests. This will have to be declared in advance to students. The department will put a process in place to ensure that the actual test paper follow the declared pattern.

** End Semester Examination will be conducted for maximum marks of 100 and subsequently be reduced to 60 marks for the award of terminal examination marks



	Introduction to Innovation IP	Category	L	т	Р	Credit
60 HS 004	Management and Entrepreneurship	HS	3	0	0	3

- To identify and discover market needs.
- To manage an innovation program.
- To create, protect, assertive and commercialize intellectual property, opportunities and challenges for entrepreneurs.

Pre-requisites

• Basic Knowledge on Management, entrepreneurship, technology and innovation.

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Summarize the life cycle and types of innovation	Understand
CO2	Interpret the needs, benefits and procedure of filing an IPR	Apply
CO3	Examine a business plan to ensure success of a start-up	Analyse
CO4	Devise an innovative idea, protect it through IPR	Apply
CO5	Explore the scope of converting it to a startup	Evaluate

Mapping with Programme Outcomes

<u> </u>		POs												PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	1	2	2	2	2	2	2	2	3	1	2	1	-	3	-	
CO2	2	2	2	3	1	2	1	3	3	2	3	2	-	3	-	
CO3	2	1	1	3	1	1	3	3	1	2	2	1	-	3	-	
CO4	2	3	2	3	2	2	1	2	2	1	3	2	-	3	-	
CO5	2	1	2	3	3	2	2	3	2	1	3	2	-	3	-	
0.01				4												

3 - Strong; 2 - Medium; 1 - Some

Bloom's	Continuous As (Ma	sessment Tests rks)	End Sem Examination (Marks)
Calegory	1	2	
Remember	-	-	-
Understand	20	20	20
Apply	20	20	40
Analyse	10	10	20
Evaluate	10	10	20
Create	-	-	-
Total	60	60	100



K.S.Rangasamy College of Technology – Autonomous R2022 B.TECH – Computer Science and Business Systems Image: Source and Susiness Systems Semester Hours/Week Total Credit Maximum Marks Semester Hours/Week Total Credit Maximum Marks Image: State	Syllab	us								
B.TECH – Computer Science and Business Systems Semester Hours/Week Total Credit Maximum Marks Semester L T P Hours C CA ES Total III 3 0 0 45 3 40 60 100 Introduction to Innovation * Adoption of Innovations, Exploring Innovations, Idea generation, Developing innovative culture, Executing innovations, Innovation and intellectual property rights, Innovation protoino rate, Measuring and evaluation of innovation and intellectual property rights, Innovation portfolio. Immovation and intellectual Property - Patents, Copyrights, Geographical Indications, IRP in India and Abroad – Genesis and Development – the way from WTO to WIPO – TRIPS, Nature of Intellectual Property, Industrial Property, technological Research, Inventions and Innovations – Important examples of IPR. [9] Registration of IPRS * Meaning and practical aspects of registration of Copy Rights, Trademarks, Patents, Geographical Indications, Trade Secrets and Industrial Design registration India and Abroad, Agreements and Legislations. [9] Entrepreneurship * Entrepreneurship [9] Entrepreneurship and practical aspects of registration of Copy Rights, Trademarks, Patents, Geographical Indications, Trade Secrets and Industrial Design registration India and Abroad, Agreements and Legislations. [9]	K.S.Rangasamy College of Technology – Autonomous R2022									
60 HS 004 - Introduction to Innovation, IP Management and Entrepreneurship Semester L T P Hours C CA ES Total III 3 0 0 45 3 40 60 100 Introduction to Innovation * Adoption of Innovations, Exploiting Innovations attributes and their adoption rate, Measuring and evaluation of innovation, Exploiting and renewing innovations, Managing innovations in organizations, Innovation and intellectual property rights, Innovation portfolio. [9] Introduction to IPR * Basic concepts and need for Intellectual Property - Patents, Copyrights, Geographical Indications, IPR in India and Abroad – Genesis and Development – the way from WTO to WIPO – TRIPS, Nature of Intellectual Property, Industrial Property, technological Research, Inventions and Innovations – Important examples of IPR. [9] Registration of IPRS * Meaning and practical aspects of registration of Copy Rights, Trademarks, Patents, Geographical Indications, Trade Secrets and Industrial Design registration in India and Abroad, Agreements and Legislations. [9] Entrepreneur - Types of Entrepreneurs - Difference between Entrepreneur and Intrapreneur, Major Motives Influencing an Entrepreneur – Achievement Motivation Training, Self Rating, Business Games, Thematic Apperception Test – Stress Management. [9] Business and Financing * Intelectual Property, Rights, Ess Ess Publications, New Delhi,	B.TECH – Computer Science and Business Systems									
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 S.V. Satarkar, Intellectual Property Rights and Copy Rights, Ess Ess Publications, New Delhi, 2002 Reference(s): Intellectual Property and Open Source: A Practical Guide to Protecting Code, http://shop.oreilly.com/product/9780596517960.doc Edison in the Boardroom: How Leading Companies Realize Value from Their Intellectual Assets, https://www.wiley.com/enus/Edison+in+the+Boardroom%3A+How+Leading+Companies+Realize +Val ue+from+Their+Intellectual+Assets-p-9780471217350 Donald F Kuratko, "Entreprenuership – Theory, Process and Practice", 9 th Edition, Cengage Learning, 2014. Khanka. S.S., "Entrepreneurial Development" S.Chand & Co. Ltd., Ram Nagar, New Delhi, 2013. 	1. '	V. Sco	ole Vinod, I	Managing I	ntellectual	Property, Pre	entice Hall of	India pvt L	td, 2012	
Reference(s):1.Intellectual Property and Open Source: A Practical Guide to Protecting Code, http://shop.oreilly.com/product/9780596517960.doc2.Edison in the Boardroom: How Leading Companies Realize Value from Their Intellectual Assets, https://www.wiley.com/enus/Edison+in+the+Boardroom%3A+How+Leading+Companies+Realize +Val ue+from+Their+Intellectual+Assets-p-97804712173503 Donald F Kuratko, "Entreprenuership – Theory, Process and Practice", 9 th Edition, Cengage Learning, 2014.4.Khanka. S.S., "Entrepreneurial Development" S.Chand & Co. Ltd., Ram Nagar, New Delhi, 2013.	2.	2. S.V. Satarkar, Intellectual Property Rights and Copy Rights, Ess Ess Publications, New Delhi, 2002								
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	4.	Khanka	a. <mark>S.S., "En</mark>	trepreneur	ial Develop	oment" S.Cha	nd & Co. Ltd	., Ram Nag	ga <mark>r, New D</mark> e	elhi, 2013.

*SDG 9: Quality Education



Course Contents and Lecture Schedule									
S. No.	Topics	No. of hours							
1.0	Introduction to Innovation								
1.1	Adoption of Innovations	1							
1.2	Exploring Innovations - Idea generation	1							
1.3	Developing innovative culture - Executing innovations	1							
1.4	Innovation attributes and their adoption rate	1							
1.5	Measuring and evaluation of innovation	1							
1.6	Exploiting and renewing innovations	1							
1.7	Managing innovations in organizations	1							
1.8	Innovation and intellectual property rights	1							
1.9	Innovation portfolio	1							
2.0	Introduction to IPR								
2.1	Basic concepts and need for Intellectual Property	1							
2.2	Patents, Copyrights, Geographical Indications	1							
2.3	IPR in India and Abroad	1							
2.4	Genesis and Development	1							
2.5	The way from WTO to WIPO	1							
2.6	TRIPS, Nature of Intellectual Property, Industrial Property	1							
2.7	Technological Research, Inventions and Innovations	1							
2.8	Important examples of IPR.	2							
3.0	Registration of IPRs								
3.1	Meaning and practical aspects of registration of Copy Rights	1							
3.2	Trademarks	2							
3.3	Patents	2							
3.4	Geographical Indications	2							
3.5	Trade Secrets and Industrial Design registration in India and Abroad	1							
3.6	Agreements and Legislations	1							
4.0	Entrepreneurship								
4.1	Entrepreneur – Types of Entrepreneurs	1							
4.2	Difference between Entrepreneur and Intrapreneur	1							
4.3	Major Motives Influencing an entrepreneur	1							
4.4	Achievement Motivation Training	1							
4.5	Self Rating	1							
4.6	Business Games	1							
4.7	Thematic Apperception Test	2							
4.8	Stress Management	1							
5.0	Business and Financing								
5.1	Small Enterprises - Characteristics	1							
5.2	Ownership Structures – Steps involved in setting up a Business	1							
5.3	Identifying, selecting a Good Business opportunity, Market Survey and Research	1							

5.4	Techno Economic Feasibility Assessment	1
5.5	Preparation of Preliminary Project Reports	1
5.6	Project Appraisal –Sources of Finance, Management of working Capital, Costing	2
5.7	Break Even Analysis, Taxation – Income Tax	1
5.8	Excise Duty – Sales Tax	1

1. Mr.R.Murugaganesh - murugaganesh@ksrct.ac.in



60 MA 013	Computational Statistics	Category	L	Т	Ρ	Credit
00 WA 013	Computational Statistics	BS	3	0	2	4

- To get exposed to the concepts of multivariate normal distribution and multivariate regression
- To familiarize the basic concepts of discriminant analysis and principal component analysis
- To acquire basic knowledge of factor analysis and Python
- To get exposed to clustering, segmentation analysis and data wrangling
- To get knowledge on visualization of data and data aggregation

Pre-requisites

• Statistics and Probability

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Calculate the concepts of multivariate normal distribution and multivariate regression.	Apply
CO2	Interpret the results of Discriminant Analysis and Principal component analysis.	Apply
CO3	Develop programs using Factor analysis and Python concepts.	Apply
CO4	Apply the concepts of clustering, segmentation analysis and data wrangling	Apply
CO5	Interpret the data and visualize the graphs using Python	Apply

Mapping with Programme Outcomes

<u> </u>						PC)s						PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	-	-	2	-	-	-	I	-	-	-	2	•	-
CO2	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
CO3	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
CO4	3	2	-	-	2	-	-	-	I	-	-	-	2	•	-
CO5	3	2	-	-	2	-	-	-	I	-	-	-	2	•	-
3 - St	3 - Strong; 2 - Medium; 1 – Some														

Bloom's	Conti	nuous Ass (Mar	essment ˈ ˈks)	Tests	Mo Exami	del nation	End Sem Examination		
Category		1		2	(Ma	rks)	(Marks)		
	Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab	
Remember	10	-	10	-	20	-	20	-	
Understand	10	30	10	30	20	30	20	30	
Apply	40	70	40	70	60	70	60	70	
Analyse	-	-	-	-	-	-	-	-	
Evaluate	-	-	-	-	-	-	-	-	
Create	-	-	-	-	-	-	-	-	
Total	60	100	60	100	100	100	100	100	



Syllabus									
K.S.Rangasamy College of Technology – Autonomous R2022									
60 MA 013 & Computational Statistics									
		B.Tech –	Computer	[·] Science a	nd Busines	ss Systems			
Somostor	ŀ	lours/Week		Total	Credit	M	aximum M	arks	
Semester	L	Т	Р	Hours	С	CA	ES	Total	
	3	0	2	75	4	50	50	100	
Multivaria	te Normal	Distributio	on*: Multi	variate No	ormal Distr	ibution Fur	nctions –		
Conditiona	al distribution	and its relat	ion to regr	ession mod	el.			[0]	
Multivaria	ite Regressi	on: Assump	otions of N	/lultivariate	Regression	Models - F	Parameter	[0]	
estimation	- Multivariate	e Analysis of	variance	and covaria	nce.				
Discrimin	ant Analysis	s*: Statistica	l backgrou	und - Linea	r discrimina	int function	analysis -		
Estimating linear discriminant functions and their properties.									
Principal	Componen	it Analysis'	*: Principa	al compone	ents - Algo	rithm for c	onducting	[9]	
principal c	omponent ar	nalysis - Dec	iaing on n	ow many pi	incipal com	ponents to r	etain - H-		
plot.	!··-!-*- -					a at a ma	4 a		
Factor Al	nalysis": Fa	ctor analysis	s model -	Extracting	common t	actors - De	etermining		
Puthon C	Taciors Tran	Sionnation o			ons - Facio	rogram Ev	ocution	[0]	
Statement	= Evoressi	ons - Flow C	ontrole - F	Supetions -	Numeric Tv	rogram Lx	ecution -	[9]	
Class Defi	$rac{1}{2}$	structors -Te	vt and Rin	arv Files - F	Peading and	Writing	ances and		
Clustering	and Segme	entation Ana	alvsis*• Int	troduction -	Types of cli	istering - Co	rrelations		
and distances - Clustering by partitioning methods - Hierarchical clustering - Overlapping									
clustering - K-Means Clustering - Profiling and Interpreting Clusters									
Data Wrangling*: Combining and Merging Datasets - Reshaping and Pivoting - Data									
Transformation - String Manipulation - Regular Expressions.									
Visualization in Python*: Matplotlib package - Plotting Graphs - Controlling Graph -									
Adding Te	xt - More Gra	aph Types - (Getting an	d setting va	lues - Patch	nes.	-		
Data Age	gregation, G	Group Oper	ations, Ti	ime series	*: Group b	y Mechanic	s - Data	[9]	
Aggregatio	on- Group w	vise Operation	ons and T	Fransforma	tions - Pivo	ot Tables a	nd Cross		
Tabulation	is - Time Ser	ies Basics -	Data Rang	ges - Freque	encies and s	shifting			
Practical:									
1. Basic P	ython Progra	ms On enertiene							
2. Program	n using String	J Operations							
3. Flogran	n on python i n with data in	Data Structur	es a nondoc					[20]	
5 Perform	y with uata in	python using	y pariuas. Se and ene	cial function	ne			[30]	
6 Draw st	atistical grap	hics using se	ahorn		15.				
7. Implem	ent k-means.	logistic and	time serie	s algorithm	using Scikit	-learn			
8. Visualiz	ation in pythe	on using mat	plotlib.	e algertann	doining Contain	loan			
			1			Tot	al Hours:	75	
Text Bool	k(s):							-	
1. T.W	Anderson, "	An Introducti	ion to Mult	ivariate Sta	tistical Anal	ysis", Wiley,	3rd Edition	, 2009 .	
2. J.D.	Jobson, "Ap	plied Multiva	riate Data	Analysis", '	Vol I & II, Sp	oringer, 2012	2.		
3. Mag	3. Magnus Lie Hetland, "Beginning Python: From Novice to Professional", Apress, 2nd Edition, 2009.								
Reference(s):									
1. Stanley A Mulaik, "Foundations of Factor Analysis", CRC Press, 2nd Edition, 2009.									
2 Dou	iglas C. Mont	ogomery, Eli	zabeth A.	Peck, G. G	eoffrey Vinir	ng, "Introduc	tion to Linea	ar Regression	
∠. Ana	lysis", Wiley,	5th Edition,2	2012.						
3. Wes	3. Wes Mc Kinney, "Python for Data Analysis", O'Reilly, 2018.								
4. Mar	4. Mark Lutz, "Programming Python", Shroff Publishers, 3rdEdition, 2006								
5. Tim	Hall and J-P	Stacey, "Py	thon 3 for	Absolute B	eginners", A	press, 20 <u>09</u>			

*SDG 4 – Quality Education



Course Contents and Lecture Schedule									
S. No.	Topics	No. of hours							
1.0	Multivariate Normal Distribution								
1.1	Multivariate Normal Distribution Functions and Conditional Distribution and its relation	1							
1.2	Conditional Distribution and regression model	1							
1.3	Regression model problems	1							
1.4	Multivariate Regression: Assumptions of Multivariate Regression Models	1							
1.5	Parameter estimation	1							
1.6	Multivariate Analysis of variance and covariance	1							
1.7	Multivariate Analysis of variance problems	1							
1.8	Covariance problems	1							
1.9	Multivariate normal distribution problems	1							
2.0	Discriminant Analysis								
2.1	Statistical background and Linear discriminant function analysis	2							
2.2	Estimating linear discriminant functions and their properties.	1							
2.3	Discriminant function problems	2							
2.4	Principal Component Analysis: Principal components Algorithm	1							
2.5	Principal component analysis problems	1							
2.6	Principal components to retain, H-plot.	2							
3.0	Factor Analysis								
3.1	Factor analysis model	1							
3.2	Extracting common factors	1							
3.3	Determining number of factors	2							
3.4	Transformation of factor analysis solutions and Factor scores.	1							
3.5	Python Concepts, Data Structures, Classes: Interpreter, Program Execution, Statements	2							
3.6	Expressions, Flow Controls, Functions, Numeric Types.	1							
3.7	Sequences and Class Definition, Constructors, Text & Binary Files - Reading and Writing	1							
4.0	Clustering and Segmentation Analysis								
4.1	Introduction, Types of clustering	1							
4.2	Correlations and distances, clustering by partitioning methods	2							
4.3	Hierarchical clustering, overlapping clustering, K-Means Clustering	2							
4.4	Profiling and Interpreting Clusters.	2							
4.5	Data Wrangling: Combining and Merging Datasets	1							
4.6	Reshaping and Pivoting, Data Transformation, String Manipulation, Regular Expressions.	1							
5.0	Visualization in Python								
5.1	Visualization in Python	1							
5.2	Adding Text, More Graph Types, Getting and setting values, Patches	1							
5.3	Data Aggregation, Group Operations, Time series: Group By Mechanics, Data Aggregation	2							
5.4	Group wise Operations and Transformations, Pivot Tables and Cross	2							



	Tabulations	
5.5	Time Series Basics	1
5.6	Data Ranges	1
5.7	Frequencies and Shifting.	1
Practica	l:	
1.	Basic Python Programs	4
2.	Program using String Operations	4
3.	Program on python Data structures	4
4.	Working with data in python using pandas	4
5.	Perform various numpy operations and special functions	4
6.	Draw statistical graphics using seaborn	4
7.	Implement k-means, logistic and time series algorithm using Scikit-learn	3
8.	Visualization in python using matplotlib	3

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61 CB 201	Automata and Compiler	Category	L	Т	Р	Credit
61 CB 301	Design	PC	3	1	0	4

- To understand the types of finite automata and the relationship between finite automata.
- To understand regular expressions, push down automata and context free grammar.
- To understand the properties of context free language.
- To learn the programming techniques of Turing machine and undecidable problems.
- To learn the concepts of Undecidability and interactable Problems.

Pre-requisites

Basic knowledge of Higher Secondary Mathematics, Binary Operations & Mathematical Logic.

Course Outcomes

On the successful completion of the course students will be able to

On the Su										
CO1	Comprehend the formal proofs, Inductive proofs and Finite Automata	Understand								
CO2	Understand regular expressions and the properties of regular languages	Understand								
CO3	Construction of context-free grammar and Push-down automata Understand	Understand								
CO4	Interpret the uses of Turing machine and properties of Context-Free Languages	Apply								
CO5	Recognize the Undecidability, and Interactable problems	Apply								

Mapping with Programme Outcomes

			<u> </u>			PC)s						PSOs			
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	2	-	-	-	-	-	1	-	-	2	-	1	-	-	
CO2	-	3	-	2	-	-	-	-	-	-	-	-	1	-	-	
CO3	-	3	-	-	2	-	-	2	-	-	2	2	1	-	-	
CO4	-	3	-	-	2	-	-	2	-	1	2	-	1	-	-	
CO5	-	3	-	-	-	-	-	-	-	2	-	2	1	-	-	
3 - St	rong; 2	2 - Me	dium; ′	I - Son	ne											

Bloom's	Continuous Ass (Ma	sessment Tests rks)	End Sem Examination (Marks)
Calegory	1	2	
Remember	-	-	-
Understand	30	30	60
Apply	30	30	40
Analyse	-	-	-
Evaluate	-	-	-
Create	-	-	-
Total	60	60	100



Syllabus											
	K.S.Rangasamy College of Technology – Autonomous R2022										
			B.Tech-Co	omputer So	cience And	Business	Systems				
			61 CB	301 - Auto	mata and C	compiler D	esign				
Some	actor	ŀ	lours/Wee	k	Total	Credit	Ма	iximum Ma	arks		
Seme	ester	L	Т	Р	Hours	С	CA	ES	Total		
		3	1	0	60	4	40	60	100		
Introduction to Finite Automata: * Alphabet, languages and grammars, Finite Automata ,Chomsky hierarchy of languages, Deterministic finite automata (DFA), nondeterministic finite automata (NFA) and equivalence with DFA, minimization of finite automata ,Finite Automata with Epsilon Transitions.											
Regu Regu expre langu	Ilar Ex Ilar ex essions Iages,	pression a pressions s, regular gr pumping le	and Langua and langu rammars an mma for reg	ages:* ages, finite id equivaler gular langua	e automata nce with finit ages.	and equive automata	valence wi , properties	th regular of regular	[9]		
Cont Conte forms trees pushe	Context-free Languages and Pushdown Automata: * Context-free grammars (CFG) and languages (CFL), Chomsky and Greibach normal forms, nondeterministic pushdown automata (PDA) and equivalence with CFG, parse trees, ambiguity in CFG, pumping lemma for context-free languages, deterministic pushdown automata, closure properties of CFLs.										
Linear bounded automata and Turing Machines:* Context-sensitive grammars (CSG) and languages, linear bounded automata and equivalence with CSG. The basic model for Turing machines (TM), Turing recognizable (recursively enumerable) and Turing-decidable (recursive) languages and their closure properties, variants of Turing machines, Nondeterministic TMs and equivalence with deterministic TMs									[9]		
Unde Unive langu Theo	ecidab ersal Tu lages ry: Bas	ility: * uring machi and Rice's sic Introduct	ine, the univ theorem, tion to Com	versal and d undecidab plexity, The	iagonalization le problems Class P and	on language s about lai d NP, NP- c	es, reductio nguages, (completenes	n between Complexity ss.	[9]		
						Total Hou	rs: 45 + 15	(Tutorial)	60		
Text	Book(s):									
1.	John Langi	E. Hopcro uages and (oft, Rajeev Computatio	Motwani, 、 n", Third Ec	Jeffrey D. l lition, Pears	Jllman, "In on Educatio	troduction on, 2009.	to Automat	a Theory,		
2.	Peter Pub,	Linz, "An I 2016.	ntroduction	to formal L	anguages a	and Automa	ata", 6th Ed	ition, Jones	& Bartlett		
Refe	rence(s):									
1.	Kama Comp	ala Krithivas outation", Po	san and Ra earson Edu	ima. R, "Int cation, 200	roduction to 9.	Formal La	anguages, <i>I</i>	Automata T	heory and		
2.	Lewis Pears	s, H. and F son Educati	Papadimitrio	ou, C.H "E)3.	lements of	the Theory	y of Comp	utation", 2n	d Edition,		
3.	Micha 2013	ael Sipser,	"Introductio	n to the Th	neory of Col	mputation",	3rd Editior	n, Cengage	Learning,		
4.	John McGr	C.Martin, " aw Hill Edu	Introduction	n to Langua 0.	ages and th	ne Theory	of Compute	ation", Fourt	th Edition,		

*SDG 9 – Industry Innovation and Infrastructure



S. No.	Topics	No. of hours						
1.0	Introduction to Finite Automata	neuro						
1.1	Alphabet, languages and grammars	1						
1.2	Finite Automata	1						
1.3	Chomsky hierarchy of languages	1						
1.4	Deterministic finite automata (DFA)							
1.5	Nondeterministic finite automata (NFA)	1						
1.6	Equivalence with DFA	2						
1.7	Minimization of finite automata	1						
1.8	Finite Automata with Epsilon Transitions.	1						
2.0	Regular Expression and Languages							
2.1	Regular expressions and languages	2						
2.2	Finite automata and equivalence with regular expressions	2						
2.3	Regular grammars and equivalence with finite automata	1						
2.4	Properties of regular languages	2						
2.6	Pumping lemma for regular languages	2						
3.0	Context-free Languages and Pushdown Automat							
3.1	Context-free grammar (CFG) and languages (CFL)	1						
3.2	Chomsky and Greibach normal forms	1						
3.3	Nondeterministicpushdown automata (PDA)	1						
3.4	Equivalence with CFG, parse trees, ambiguity in CFG	2						
3.5	Pumping lemma forcontext-free languages	1						
3.6	Deterministic pushdown automata	1						
3.7	Closure properties of CFLs.	1						
4.0	Linear bounded automata and Turing Machines							
4.1	Context-sensitive grammar (CSG) and languages	1						
4.2	Linear bounded automata and equivalence with CSG	1						
4.3	The basic model for Turing machines (TM)	1						
4.4	Turing recognizable (recursively enumerable) and Turing-decidable (recursive) languages and their closure properties	1						
4.5	Variants of Turing machines	1						
4.6	Nondeterministic TMs and equivalence with deterministic TMs.	1						
5.0	Undecidability							
5.1	Universal Turing machine, the universal and diagonalization languages	1						
5.2	Reduction between languages and Rice s theorem	1						
5.3	Undecidable problems about languages	1						
5.4	Complexity Theory	2						
5.5	Basic Introduction toComplexity	2						
5.7	The class P and NP, NP- completeness	2						

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60 CB 302	Database Management Systems	Category	L	Т	Ρ	Credit
00 CB 302	Database Management Systems	PC	3	0	0	3

Objectives

- To discuss the fundamentals of data models to conceptualize and depict a database system using ER diagram.
- To illustrate the relational database implementation using SQL with effective relational database design concepts.
- To demonstrate Query evaluation and optimization techniques.
- To explain the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure.
- To introduce the concepts of Database Security, Object Oriented, Data Warehousing and Data Mining

Pre-requisites

Basic knowledge of Relational Algebra, Data Structure, Java Programming

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Distinguish database systems from file systems and describe data models and DBMS architecture.	Understand
CO2	Demonstrate with understanding of SQL Programming language and normalization theory.	Remember
CO3	Practice the query evaluation techniques, query optimization and familiarwith basic database storage structures and access techniques.	Understand
CO4	Identify the basic issues of transaction processing and concurrency control.	Apply
CO5	Analyze and derive an information model expressed in the form of an entity relation diagram and transform into a relational database schema.	Apply

Марр	Mapping with Programme Outcomes															
<u> </u>	POs													PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	3	3	-	-	-	2	2	-	2	-	1	3	1	-	
CO2	3	2	3	-	-	-	2	2	-	2	-	1	3	1	-	
CO3	3	2	2	-	-	-	2	1	-	2	-	1	2	1	-	
CO4	3	2	2	-	-	-	2	1	-	2	-	1	3	1	-	
CO5	3	2	2	-	-	-	2	1	-	2	-	1	3	1	-	
2 04																

3 - Strong; 2 - Medium; 1 - Some

ASSESSMENT atte	Assessment ratem											
Bloom's	Continuous Ass (Ma	sessment Tests rks)	End Sem Examination (Marks)									
Calegory	1	2										
Remember	10	10	20									
Understand	40	40	60									
Apply	10	10	20									
Analyse	-	-	-									



Eva	luate		-		-				-		
Crea	ate		-		-				-		
Tota	al		60		60				100		
Sylla	bus						•				
	K.S.Rangasamy College of Technology – Autonomous R2022										
	B.Tech-Computer Science And Business Systems										
	60 CB 302- Database Management Systems										
			Hours/Weel	k	Total	ĬC	redit	M	aximum Ma	rks	
Seme	ester	L	Т	Р	Hours		С	CA	ES	Total	
11	1	3	0	0	45		3	40	60	100	
Introduction to Databases: *											
Purpose of Database System – Views of data – Data Models – Database System Architecture – Introduction to relational databases – Relational Model -Keys – Entity										[9]	
Relat	ionship S Lang	model – I	E-R Diagram	ns – En	hanced-ER M	odel -	- ER-to	-Relational	Mapping –		
Polat	S Larry	uaye- Ope				J.					
Relat		laebra Tu	juayes. nle and dom	ain rola	tional calculu	s SO	l hasic	command	s loin and		
Neste		ries Proce	edures Fun	ctions	Cursors Tria	19,00	Relatio	nal Dataha	s, Juir anu Ise Design:	[0]	
Doma	ain anc	l data der	pendency A	rmstroi	nd's axioms	Functi	ional D	ependenci	es Normal	[0]	
forms	forms. Dependency preservation Lossless design										
Quer	Query processing and optimization: *										
Evaluation of relational algebra expressions - Query Processing and Optimization -											
Heuri	istics a	nd Cost Es	stimates in C	Querv O	ptimization -	, Querv	equiva	lence. Join	strategies.	[9]	
Stora	ige stra	tegies: Inc	dexing and B	3+ tree.	Hashing – AC	CID Pr	opertie	S.	J J J J J J J J J J		
Transaction Processing:*											
Transaction Concepts - Transaction Model - Desirable Properties of Transaction Schedule										[0]	
and F	Recove	rability- Se	erializability	- Cond	currency Cont	rol - L	_ock-Ba	sed Proto	cols - Two-	[9]	
Phase	e Locki	ng Protoco	ol - Timestar	mp-Bas	ed Protocols	– Rec	overy S	System.			
Data	base S	ecurity: *									
Authe	enticatio	on, Author	ization and a	access	control, DAC,	MAC	and RE	BAC model	s, Intrusion		
detec	ction, So	QL injectio	n. Advanced	d topics	: Object orient	ed an	d objec	t relational	databases,	[9]	
Logic	al data	abases, W	eb databas	es, Dis	tributed data	bases	, Unstr	uctured Da	atabases		
Maria	aDB, Mo	ongoDBDa	atabase crea	ation-Cl	RUD operation	าร.					
								Тс	tal Hours:	45	
Text	Book(s	s):									
1.	Abrah Editio	am Silber n, TataMc	schatz, Her Graw Hill, M	nry F. I arch 20	Korth, S. Suo 19.	lharsh	nan, "D	atabase S	ystem Cond	epts", 7th	
2.	Gupta Delhi.	G K, "Data 2011.	abase Mana	gemen	t Systems", Ta	ata Mo	Graw ⊦	lill Educatio	on Private Lir	nited,New	
Refe	rence(s	s):									
1.	Rame	z Elmasri a on Educat	and Shamka	ant B. N	avathe, "Fund	lamer	tals of l	Database S	Systems", Fif	th Edition,	
2.	Peter th Edit	rob, Carlo	s Coronel, "	Databa	se Systems -	- Desi	gn, Imp	lementatio	n and Mana	gement",9	
3.	J. D.	Ullman, "	Principles o	f Datak k 1009	base and Kno	owledg	ge – B	ase Syster	ms", Vol 1,	Computer	
4.	Serge	Abitebo	ul, Richard	Hull,	Victor Vian	u, "F	oundat	ions of [Databases",	Addison-	
	vvesle		ig Company	, 1990.							

SDG 4 – Quality Education



S No		No. of
0. NO.		hours
1.0	Introduction to Databases	<u> </u>
1.1	Purpose of Database System	1
1.2	Views of data – Data Models	1
1.3	Database System Architecture	1
1.4	Introduction to relational databases	1
1.5	Relational Model -Keys	1
1.6	Entity Relationship model – E-R Diagrams	1
1.7	Enhanced-ER Model- ER-to-Relational Mapping	1
1.8	DBMS Language	1
1.9	Open source and Commercial DBMS	1
2.0	Relational query languages	Г
2.1	Relational algebra	1
2.2	Tuple and domain relational calculus	1
2.3	SQL basic commands	1
2.4	Join and Nested Queries	1
2.5	Procedures, Functions, Cursors, Triggers	1
2.6	Relational Database Design	1
2.7	Domain and data dependency, Armstrong's axioms, Functional Dependencies	1
2.8	Normal forms	1
2.9	Dependency preservation, Lossless design.	1
3.0	Query processing and optimization	
3.1	Evaluation of relational algebra expressions	1
3.2	Query Processing and Optimization	1
3.3	Heuristics and Cost Estimates in Query Optimization	1
3.4	Query equivalence	1
3.5	Join strategies	1
3.6	Storage strategies: Indexing	1
3.7	B+ tree	1
3.8	Hashing	1
3.9	ACID Properties	1
4.0	Transaction Processing	
4.1	Transaction Concepts	1
4.2	Transaction Model	1
4.3	Desirable Properties of Transaction Schedule and Recoverability	1
4.4	Serializability	1
4.5	Concurrency Control	1
4.6	Lock-Based Protocols	1
4.7	Two-Phase Locking Protocol	1



4.8	Timestamp-Based Protocols	1
4.9	Recovery System	1
5.0	Database Security	
5.1	Authentication, Authorization and access control	1
5.2	DAC, MAC and RBAC models	1
5.3	Intrusion detection, SQL injection	1
5.4	Advanced topics: Object oriented and object relational databases	1
5.5	Logical databases, Web databases	1
5.6	Distributed databases, Unstructured Databases	1
5.7	MariaDB	1
5.8	MongoDB	1
5.9	Database creation-CRUD operations	1
	Total	45

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60 CB 202	Data Structuras	Category	L	Т	Ρ	Credit
60 CB 303	Data Structures	PC	3	0	0	3

- •To understand the concepts of ADTs
- •To understand linear data structures lists, stacks, and queues
- •To understand non-linear data structures trees and graphs.
- •To understand sorting, searching and hashing algorithms
- •To apply Tree and Graph structures

Pre-requisites

• Basic knowledge of C Programming Language C

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Apply linear and non-linear data structures.	Apply
CO2	Apply linear and non–linear data structure operations.	Apply
CO3	Evaluate appropriate linear/non–linear data structure operations for solving a given problem	Evaluate
CO4	Analyze appropriate graph algorithms for graph applications.	Analyze
CO5	Apply the various searching and sorting algorithms.	Understand

Mapping with Programme Outcomes

	<u> </u>		-												
<u> </u>						P	Os							PSOs	
003	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	2	1	-	-	-	2	-	-	-	3	1	-
CO2	3	3	3	2	1	-	-	-	2	-	-	-	3	1	-
CO3	3	3	3	2	1	-	-	-	2	-	-	-	3	1	-
CO4	3	3	3	2	1	-	-	-	2	-	-	-	3	1	-
CO5	3	3	3	2	1	-	-	-	2	-	-	-	3	1	-
2 04	ropau			Con											

3 - Strong; 2 - Medium; 1 – Some

Assessment Patte	rn		
Bloom's	Continuous A (M	ssessment Tests arks)	End Sem Examination (Marks)
Calegory	1	2	
Remember	-	-	-
Understand	10	10	20
Apply	30	30	40
Analyse	10	10	20
Evaluate	10	10	20
Create	-	-	-
Total	60	60	100

Syllabu	IS										
	K.S.F	Rangasamy	/ College o	of Technolo	ogy – Autor	nomous R2	2022				
		B.Tech – C	computer S	Science and	d Business	Systems					
			60 CB 30	3- Data Str	uctures						
Semes	ter h	lours/Wee	k	Total	Credit	Ma	ximum Ma	rks			
Ocifics	L	Т	P	Hours	С	CA	ES	Total			
	3	0	0	45	3	40	60	100			
Lists* Abstract Data Types (ADTs) – List ADT – Array-based implementation – Linked list implementation – Singly linked lists – Circularly linked lists – Doubly-linked lists – Applications of lists – Polynomial ADT – Radix Sort – Multi lists. [9]											
Stacks Stack A express Circular	And Queues* ADT – Operations Infix to Poperations Infix to Poperation (Contemporation)	ons – Appl ostfix conve ueue – App	ications – l ersion – Fu plications of	Balancing S Inction Call Queues	Symbols – s – Queue	Evaluating ADT – Op	arithmetic erations –	[9]			
Trees* Tree Al ADT – /	DT – Tree Travo AVL Trees – Pri	ersals - Bin iority Queue	ary Tree A[e (Heaps) –	DT – Expres Binary Hea	ssion trees	– Binary Se	earch Tree	[9]			
Multi w B-Tree Breadth Topolog Kruskal	ay Search Tree – B+ Tree – C I-first traversal gical Sort – Dijl 's algorithm	es And Gra Graph Defir – Depth- kstra's algo	iphs iition – Rep first travers rithm – Mir	oresentatior sal — Bi- nimum Spa	n of Graphs connectivity nning Tree	s – Types o v – Euler – Prim's a	of Graph - circuits – Igorithm –	[9]			
Search Searchi Insertio – Open	ing, Sorting A ng – Linear Se n sort – Shell se Addressing – F	n d Hashing earch – Bir ort –. Merge Rehashing -	J Techniqu hary Search Sort – Has - Extendible	es* n. Sorting – shing – Has e Hashing	- Bubble so h Functions	ort – Select s – Separate	ion sort – e Chaining	[9]			
						То	tal Hours:	45			
Text Bo	ook(s):										
1. K	lark Allen Wei	ss, "Data	Structures	and Algorit	thm Analys	is in C", 2	2nd Edition	Pearson			
2. K	amthane, "Intro	duction to I	Data Structu	ures in C", 1	st Edition, I	Pearson Ed	ucation, 200)7.			
Refere	nce(s):										
1. L P	angsam, Auge earson Educati	nstein and on, 2015	Tanenbau	m, "Data S	tructures L	Jsing C an	d C++", 2n	d Edition,			
2. T	homas H. Cori Igorithms", Fou	men, Charl rth Edition,	es E. Leise Mcgraw Hil	erson, Rona II/ MIT Press	ald L.Rives s, 2022.	t, Clifford S	Stein, "Intro	duction to			
3. A	lfred V. Aho, Je earson, 2002.	ffrey D. Ullr	nan,John E	. Hopcroft ,'	'Data Struct	tures and A	gorithms", 1	st edition,			
4. C	online Reso ttps://www.jourr	urces : naldev.com	https://v https://beg	www.tutoria jinnersbook	Ispoint.com .com, https:	, https://www.w3s	//www.javatj chools.com	point.com,			
*SDG 4	- Quality Educ	ation	. 0		•						



Course C	Contents and Lecture Schedule	
S. No.	Topics	No. of hours
1.0	Lists	
1.1	Abstract Data Types (ADTs)	1
1.2	List ADT	1
1.3	Array-based implementation	1
1.4	Linked list implementation	1
1.5	Singly linked lists	1
1.6	Circularly linked lists	1
1.7	Doubly linked lists	1
1.8	Applications of lists	1
1.9	Applications of lists – Polynomial ADT – Radix Sort – Multi lists.	
2.0	Stacks And Queues	
2.1	Stack ADT	1
2.2	Operations - Applications	1
2.3	Balancing Systems	1
2.4	Evaluating arithmetic expressions	1
2.5	Infix to Postfix conversion	1
2.6	Function Calls	1
2.7	Queue ADT	1
2.8	Operations – Circular Queue	1
2.9	De Queue – Applications of Queues	1
3.0	Trees	
3.1	Tree ADT	1
3.2	Tree Traversals	1
3.3	Binary Tree ADT	1
3.4	Expression trees	1
3.5	Binary Search Tree ADT	2
3.6	AVL Trees	1
3.7	Priority Queue (Heaps)	1
3.8	Binary Heap	1
4.0	Multi way Search Trees and Graphs	
4.1	B-Tree- B+ Tree	1
4.2	Graph Definition – Representation of Graphs- Types of Graphs	1
4.3	Breadth-first traversal- Depth-first traversal	1
4.4	Bi connectivity	1
4.5	Euler circuits – Topological Sort	1
4.6	Dijkstra's algorithm	1
4.7	Minimum Spanning Tree	1
4.8	Prim's algorithm	1
4.9	Kruskal's algorithm	1



5.0	Searching, Sorting And Hashing Techniques	
5.1	Searching	1
5.2	Linear Search – Binary Search	1
5.3	Sorting – Bubble sort	1
5.4	Selection sort – Insertion sort	2
5.5	Shell sort –. Merge Sort	1
5.6	Hashing – Hash Functions	1
5.7	Separate Chaining – Open Addressing	1
5.8	Rehashing – Extendible Hashing	1
	Total	45

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60 CB 204	Software Engineering	Category	L	Т	Ρ	Credit
60 CB 304	Software Engineering	PC	3	0	0	Credit 3

- To understand the phases in a software project
- To understand fundamental concepts of requirements engineering and Analysis Modeling.
- To understand the various software design methodologies
- To learn various testing and maintenance measures
- To learn various project cost models and risk management

Pre-requisites

• UML Concepts

Course Outcomes

On the successful completion of the course, students will be able to

CO1	To learn various project cost models and risk management	Undersatnd
CO2	Concepts of requirements engineering and Analysis Modeling.	Remember
CO3	Apply systematic procedure for software design and deployment.	Apply
CO4	Compare and contrast the various testing and maintenance	Analyse
CO5	Manage project schedule, estimate project cost and effort required.	Apply

Mapping with Programme Outcomes

<u> </u>						P	Os							PSOs	
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	2	-	-	-	-	-	-	-	-	2	3	-	-
CO2	3	3	3	-	3	-	-	2	2	2	2	2	-	3	-
CO3	3	3	3	-	3	-	-	2	-	-	3	2	3	-	-
CO4	3	3	3	2	3	-	2	2	-	2	3	2	3	-	-
CO5	3	3	3	3	3	-	2	2	-	2	3	2	3	-	-
3 - St	rong; 2	2 - Mec	lium; 1	– Son	ne										

Bloom's	Continuous As: (Ma	sessment Tests rks)	End Sem Examination (Marks)
Calegory	1	2	
Remember	10	10	20
Understand	10	10	20
Apply	30	30	40
Analyse	10	10	20
Evaluate	-	-	-
Create	-	-	-
Total	60	60	100



Syllab	ous									
	K.S.Rangasamy College of Technology – Autonomous R2022									
			B.Tech – C	computer S	Science and	l Business	Systems			
60 CB 304- Software Engineering										
Somo	stor	H	lours/Wee	k	Total	Credit	Ма	iximum Ma	rks	
Seme	L		Т	Р	Hours	С	CA	ES	Total	
	3		0	0	45	3	40	60	100	
Softw	Software Process and Agile Development *									
Introd	uction to Sof	twa	re Enginee	ering, Softw	are Proces	s, Perspec	tive and S	specialized	[0]	
Proce	ss Models- Ir	ntroc	duction to A	gility-Agile	Process-Ex	treme progi	ramming-XI	P Process.	[9]	
Case	Studies.						_		L	
Requi	irements Ana	alys	is and Spe	cification '	ł					
Softwa	are Requiren	nent	s: Functio	nal and No	on-Function	al, User re	equirement	s, System		
require	ements, Soft	ware	e Requirer	nents Docu	iment –Red	quirement E	Engineering	Process:	[0]	
Feasib	bility Studies	, R	equiremen	ts elicitatio	n and ana	alysis, requ	uirements	validation,	[9]	
require	ements mana	gem	nent-Classi	cal analysis	: Structured	system Ana	alysis, Petri	Nets-Data		
Diction	nary. Case St	udie	es							
Softw	are Design *									
Desigi	n process–De	esigi	n Concepts	s-Design Mo	odel–Desigr	n Heuristic-	Architectur	al Design-		
Archite	ectural styles	, Ar	rchitectural	Design, A	rchitectural	Mapping u	sing Data	Flow-User	[9]	
Interfa	ace Design: In	terfa	ace analysi	s, Interface	Design –Co	mponent le	vel Design:	Designing		
Class	based compo	oner	nts, traditior	nal Compon	ents. Case	Studies				
Testir	ng and Maint	ena	nce							
Softwa	are testing fu	nda	mentals-Int	ernal and e	external vie	ws of Testi	ng-white b	ox testing-		
basis	path testing-	CO	ntrol struct	ure testing-	-black box	testing-Reg	ression Te	esting–Unit		
Testin	g–Integratior	n Te	sting–Valid	ation Testin	g– System	Testing and	Debugging	–Software	[9]	
Impler	mentation T	ech	niques: (Coding pr	actices- F	Refactoring	Maintena	ince and		
Reeng	gineering-BPF	R r	model-Ree	ngineering	process	model-Rev	erse and	Forward		
Engine	eering. Case	Stud	dies							
Proje	ct Manageme	ent '	k							
Softwa	are Project	Mar	nagement:	Estimation	LOC, FP	Based E	stimation,	Make/Buy		
Decisi	ion COCOMC) &	II Model-	Project Sch	eduling-Sc	heduling, E	arned Valu	e Analysis	[9]	
Planni	ing–Project	Plar	n, Plannin	g Process	s, RFP R	isk Manag	gement–Ide	entification,		
Projec	ction-Risk Ma	nage	ement-Risk	Identificatio	on -RMMM	Plan-CASE	E Tools. Ca	se Studies	1	
							То	tal Hours:	45	
Text E	Book(s):									
1	Roger S. Pr	essi	man, Softv	vare Engin	eering – A	Practitione	er's Approa	ich, Sevent	h Edition,	
1.	McGraw Hill	Inte	rnational E	dition, 2010	•					
2. Ian Sommerville, Software Engineering, 9th Edition, Pearson Education Asia, 2011.										
Refer	Reference(s):									
1.	Pankaj Jalote	e, So	oftware Eng	gineering, A	Precise Ap	proach, Wil	ey India, 20	010.		
2.	Rajib Mall, Fu 2009.	unda	amentals of	Software E	Engineering,	Third Edition	on, PHI Lea	arning Privat	e Limited,	
3.	Kelkar S.A.,	Soft	ware Engin	eering, Pre	ntice Hall of	India Pvt L	td, 2007.			
4.	Stephen R.S	chao	ch, Softwar	e Engineerii	ng, Tata Mc	Graw-Hill P	ublishing C	ompany Lim	ited, 2007	
5.	https://nptel.a	ac.in	/courses/1	06105182	<u>,</u>				,	
<u> </u>										

*SDG 4 – Quality Education



Course Contents and Lecture Schedule							
S. No.	Topics	No. of hours					
1.0	Software Process and Agile Development						
1.1	Introduction to Software Engineering	1					
1.2	Software Process	1					
1.3	Perspective and Specialized	1					
1.4	Process Models	1					
1.5	Introduction to Agility	1					
1.6	Agile process	1					
1.7	Extreme programming	1					
1.8	XP Process	1					
2.0	Requirements Analysis and Specification	-					
2.1	Software Requirements	1					
2.2	Functional and Non-Functional	1					
2.3	User requirements	1					
2.4	System requirements	1					
2.5	Software Requirements Document	1					
2.6	Requirement Engineering Process	1					
2.7	Feasibility Studies, Requirements elicitation and analysis	1					
2.8	requirements validation, requirements management	1					
2.9	Classical analysis: Structured system Analysis	1					
2.10	Petri Nets-Data Dictionary	1					
3.0	Software Design						
3.1	Design process, Design Concepts	1					
3.2	Design Model, Design Heuristic	1					
3.3	Architectural Design	1					
3.4	Architectural styles, Architectural Design, Architectural Mapping using Data Flow-User Interface Design	1					
3.5	Interface analysis, Interface Design	1					
3.6	Component level Design	1					
3.7	Designing Class based components	1					
3.8	Traditional Components	1					
4.0	Testing and Maintenance						
4.1	Software testing fundamentals	1					
4.2	Internal and external views of Testing	1					
4.3	white box testing	1					
4.4	basis path testing	1					
4.5	control structure testing	1					
4.6	black box testing-Regression Testing ,Unit Testing ,Integration Testing	1					
4.7	Validation Testing– System Testing And Debugging	1					
4.8	Software Implementation Techniques - Coding practices- Refactoring Maintenance and Reengineering	1					



4.9	BPR model Reengineering process model - Reverse and Forward Engineering	1
5.0	Project Management	
5.1	Software Project Management	1
5.2	Estimation–LOC, FP Based Estimation, Make/Buy Decision COCOMO I & IIModel, Project Scheduling	1
5.3	Scheduling, Earned Value Analysis Planning	1
5.4	Project Plan, Planning Process	1
5.5	RFP Risk Management	1
5.6	Identification	1
5.7	Projection-Risk Management	1
5.8	Risk Identification	1
5.9	RMMM Plan-CASE Tools	1

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60 CB 3P1	Database Management	Category	L	Т	Ρ	Credit
	Systems Lab	PC	0	0	4	2

•To understand data definitions and data manipulation commands.

•To learn the use of nested and join queries.

- •To understand functions, procedures and procedural extensions of databases.
- •To be familiar with the use of a front end tool.
- •To design and implementation of typical database applications.

Pre-requisites

NIL

Course Outcomes

On the successful completion of the course, students will be able to

	Implement the Data Definition Language commands, Data Manipulation	
CO1	Language, Data Control Language Commands and Transaction Control	Apply
	Language in RDBMS	
CO2	Construct Sub queries, views and joins to retrieve data from multiple	Δηρίνερ
002	tables	Analyse
CO3	Implement the database programming with Cursors, Triggers,	Apply
	Procedures and Functions in PL/SQL.	Арріу
CO4	Design and implement applications using Front end tools.	Apply
CO5	Create and manipulate data using Mongo database.	Create

Mapp	Mapping with Programme Outcomes														
<u> </u>	POs											PSOs			
CUS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1	3	1	-	1	-	-	-	2	1	-	2	3	-	-
CO2	1	3	1	-	1	-	-	-	2	1	-	2	3	-	-
CO3	1	3	2	-	3	-	-	-	-	1	-	-	2	-	-
CO4	1	3	2	-	2	-	-	-	-	1	-	-	3	-	-
CO5	1	3	2	-	1	-	-	-	2	1	-	-	3	-	-
3 - St	rong; 2	2 - Med	dium	; 1 - Low											

Bloom's Category	Lab Experiment (Mar	ts Assessment 'ks)	Model Examination	End Sem Examination (Marks)		
	Lab	Activity	(warks)			
Remember	-	-	-	-	-	
Understand	-	-	-	-	-	
Apply	25	12	50		50	
Analyse	25	13	50		50	
Evaluate	-	-	-	-	-	
Create	-	-	-	-	-	
Total	50	25	100	-	100	


	K.S.Rangasamy College of Technology – Autonomous R2022									
		B.Tech-C	omputer So	cience And	Business S	Systems				
	1	60 CB 3	P1- Databas	se Manager	nent Syste	ms Lab				
Semester	F	lours/Weel	ĸ	Total	Credit	Ma	ximum Mar	′ks		
Ochicater	L	Т	Р	Hrs	С	CA	ES	Total		
III	0	0	4	60	2	60	40	100		
List of Exp	eriments:				ж.					
1. Conceptual Database design using E-R DIAGRAM.*										
2 Imr	lementation	of SQL con	mands DD		l and TCL *					
2				L, DML, DO						
3. Qu	eries to dem	onstrate imp	lementatior	n of Integrity	Constraints	S.*				
4. Pra	ctice of Inbu	ilt functions.	*							
5. Imp	ementation	of Join and	Nested Que	eries AND S	set operators	S.*				
	lamontation	of virtual to		/:						
6. Imp	ementation	of virtual ta	bies using v	lews."						
7. Pra	ctice of Proc	edural exte	nsions usinę	g Procedure	and Function	on.*				
8. Dat	abase Progr	amming: Im	plicit and E	xplicit Curso	ors.*					
9. Hig	h level langu	lage extens	ion with Trig	gers.*						
	U	0								
Design Fxr	periments:									
10. Im	plementation	and perfor	mance com	parison of Ir	ndexing and	Hashing Te	chniques.			
		•		•	0	U	•			
11. Mini Project (Application Development using MongoDB).										
Lab Manua										
1. "Data	base Manag	gement Sys	tems Lab",	Departmen	t of Comput	er Science a	and Busines	S		
Systems, KSRCT.										
*SDG	4 – Quality E	ducation								
Course De	signer(s)									

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60 CB 2B2	Data Structures Lab	Category	L	Т	Ρ	Credit
00 CB 3F2	Data Structures Lab	PC	0	0	4	2

- •To understand the concepts of ADTs
- •To understand linear data structures lists, stacks, and queues
- •To understand non-linear data structures trees and graphs.
- •To understand sorting, searching and hashing algorithms
- •To apply Tree and Graph structures

Pre-requisites

NIL

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Apply linear and non-linear data structures.	Apply
CO2	Apply linear and non-linear data structure operations.	Apply
CO3	Evaluate appropriate linear/non–linear data structure operations for solving a given problem	Evaluate
CO4	Analyse appropriate graph algorithms for graph applications	Analyse
CO5	Apply the various searching and sorting algorithms.	Apply

Mapping with Programme Outcomes

000						P	Os							PSOs	
005	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	2	3	-	-	-	2	-	-	-	3	-	-
CO2	3	3	3	2	3	-	-	-	2	-	-	-	3	-	-
CO3	3	3	3	2	3	-	-	-	2	-	-	-	3	-	-
CO4	3	3	3	2	3	-	-	-	2	-	-	-	3	-	-
CO5	3	3	3	2	3	-	-	-	2	-	-	-	3	-	-
3 - St	rong; 2	2 - Mec	lium; 1	- Low											

Bloom's Category	Lab Experimen (Ma	ts Assessment rks)	Model Examination (Marks)	End Sem Examination (Marks)		
	Lab Activity		(indi no)	(indi Ko)		
Remember	-	-	-	-	-	
Understand	-	-	-	-	-	
Apply	25	12	50		50	
Analyse	25	13	50		50	
Evaluate	-	-	-	-	-	
Create	-	-	-	-	-	
Total	50	25	100	-	100	



	K.S.Rangasamy College of Technology – Autonomous R2022									
		B.Tech – C	Computer S	cience and	Business	Systems				
		6	0 CB 3P2 -	- Data Stru	ctures Lab		_	-		
Semester	F	lours/Wee	k	Total	Credit	Ma	ximum Ma	rks		
	L	Т	P	Hrs	C	CA	ES	Total		
	0	0	4	60	2	60	40	100		
List of Exp	List of Experiments:									
1. Arr	ay impleme	ntation of S	tack, Queue	e and Circul	ar Queue A	DTs *				
2. Imp	plementation	n of Singly I	_inked List							
3. Lin	ked list impl	ementation	of Stack ar	nd Linear Qu	ueue ADTs					
4. Imp	blementation	n of Polynor	mial Manipu	lation using	Linked list					
5. Imp	lementatior	n of Evaluat	ing Postfix	Expressions	s, Infix to Po	stfix conve	rsion *			
6. Imr	lementatior	n of Binarv	Search Tree	es						
7. Imr	lementatior	n of AVL Tr	ees							
8 Imr	lementation	of Heaps	usina Priorit	tv Queues						
		1 of 1 loupo	doing r norm	y Quouoo						
1. Imp	periments: plementatior	n of Dijkstra	's Algorithm	ı						
2. Imp	2. Implementation of Prim's Algorithm									
Lab Manua	al									
1. "Data Structures Lab Manual", Department of Computer Science and Business Systems, KSRCT.										
*SDG 4 – C	Quality Educ	ation								

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	Caroor Skill Dovelonment II	Category	L	Т	Ρ	Credit
00 CG 0F2	Career Skill Development II	CS	0	0	2	1

• To help learners improve their vocabulary and to enable them to use words appropriately in different academic and professional contexts

• To help learners develop strategies that could be adopted while reading texts

- To help learners acquire the ability to speak effectively in English in real life and career related situations
- · Improve listening, observational skills, and problem-solving capabilities
- Develop message generating and delivery skills

Pre-requisites

• Basic knowledge of reading and writing in English

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Compare and contrast products and ideas in technical texts.	Analyze
CO2	Identify cause and effects in events, industrial processes through technical texts	Analyze
CO3	Analyze problems in order to arrive at feasible solutions and communicate them orally and in the written format	Analyze
CO4	Report events and the processes of technical and industrial nature.	Apply
CO5	Articulate their opinions in a planned and logical manner, and draft effective résumés in context of job search.	Apply

Mapping with Programme Outcomes

<u> </u>		POs												PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	-	-	-	-	-	-	-	2	3	3	2	3	-	-	-	
CO2	-	-	-	-	-	-	-	2	3	3	2	3	-	2	-	
CO3	-	-	-	-	-	-	-	2	3	3	2	3	2	-	-	
CO4	-	-	-	-	-	-	-	2	3	3	2	3	2	-	-	
CO5	-	-	-	-	-	-	-	2	3	3	2	3	-	2	-	
3 - St	rong; 2	2 - Me	dium	; 1 - Some	Э											

Bloom's	Continuous Ass (Ma	sessment Tests rks)	Model Examination	End Sem Examination
Calegory	1	2	(Marks)	(Marks)
Remember	-	-	-	-
Understand	-	-	40	-
Apply	-	-	20	-
Analyse	-	-	40	-
Evaluate	-	-	-	-
Create	-	-	-	-
Total	-	-	100	-



Syllab	Syllabus									
		K.S.F	Rangasamy	/ College o	f Technolo	gy – Autor	nomous R2	2022		
			B.Tech – C	omputer S	cience And	d Business	s Systems			
			60 C	G 0P2 - Ca	reer Skill D	evelopme	nt ll			
Somo	stor	ŀ	lours/Weel	k	Total	Credit	Ma	ximum Ma	rks	
Seme	SICI	L	Т	Р	Hours	С	CA	ES	Total	
		0	0	2	30	1	100	00	100	
Listen Evalua organi: talks a – Liste depicti	ing ative L zer (c and co ening ng a	Listening: A choosing a ompleting– to proces technical pr	dvertisemer product or gap filling e s/event des oblem and	nts, Product service by xercises. L scriptions to suggesting	Descriptior comparisor istening tec o identify o solutions -	ns, - Audio / n) - Listenir hnical infor cause & ef Listening to	video; filling ng to longe mation from fects, docu o TED Talks	g a graphic r technical n podcasts imentaries	[6]	
Speak Marke reasor case s particip	ting a ting a ns of a tudies pating	product, po accidents o s), presenti g in role pla	ersuasive s r disasters t ng oral repo ys, virtual ir	beech techr based on ne orts, Mini pro terviews	niques - Des ews reports esentations	scribing and , Group Dis on select to	d discussing cussion (ba opics with v) the sed on isual aids,	[6]	
Readin Readin effect of news r	ng ad essay eport	vertisemen /s, and lette /s etc Cor	ts, user mai ers / emails o npany profil	nuals and b of complain les, Statem	rochures - I t - Case Stu ent of Purpo	onger techr idies, excer ose (SoPs)	nical texts– pts from lite	cause and erary texts,	[6]	
Writin Profes compla Cover	g siona aints letter	Il emails, El Precis writ & Résumé	mail etiquet ing, Summ	te - compar arizing and	re and contr Plagiarism	rast essay - i- Job / Int	· Writing res ernship app	sponses to olication –	[6]	
Verba Readir Theme	I Abil ng Co Dete	ity I omprehens ction – Cha	ion (Inferer ange of Voic	ntial fillups) æ – Change	 Spotting of Speech 	g Errors – – One wor	Verbal Ar	nalogies – on	[6]	
							To	tal Hours:	30	
Text B	Book(s):								
1.										
2.										
Refere	ence(s):								
1.	1. English for Engineers & Technologists' Orient Blackswan Private Ltd. Department of English, Anna University, 2020									
2. Norman Lewis, 'Word Power Made Easy - The Complete Handbook for Building a Superior Vocabulary Book', Penguin Random House India, 2020										
3 Raman. Meenakshi, Sharma. Sangeeta, 'Professional English'. Oxford University Press. New Delhi. 2019										
4	Arthu Intern	r Brookes a nediate Lea	and Peter (arners', Can	Grundy,' Be nbridge Univ	eginning to versity Pres	Write: Writi s, New Yor	ng Activitie k, 2003	s for Eleme	entary and	
*SDG	4: Qu	ality Educa	tion		i					
*SDG	8 [.] De	cent work a	and Econom	nic arowth						

***SDG 9 – Industry, innovation and Infrastructure



Course	Contents and Lecture Schedule	
S. NO.	Topics	No. of hours
1		
1.1	Evaluative Listening: Advertisements, Product Descriptions	1
1.2	Listening to longer technical talks and completing– gap Filling exercises.	1
1.3	Listening technical information from podcasts	1
1.4	Listening to process/event descriptions to identify cause & effects and documentaries depicting a technical problem and suggesting solutions	1
1.5	Listening to TED Talks	1
2	Speaking	
2.1	Marketing a product, persuasive speech techniques	1
2.2	Describing and discussing the reasons of accidents or disasters based on news reports,	1
2.3	Group Discussion (based on case studies)	1
2.4	Presenting oral reports, Mini presentations on select topics with visual aids	1
2.5	Participating in role plays and virtual interviews	1
3	Reading	
3.1	Reading advertisements, user manuals and brochures	1
3.2	Reading - longer technical texts- cause and effect essays, and letters / emails of complaint	1
3.3	Case Studies, excerpts from literary texts, news reports etc.	1
3.4	Company profiles	1
3.5	Statement of Purpose (SoPs)	1
4	Writing	
4.1	Professional emails, Email etiquette	1
4.2	Compare and contrast essay	1
4.3	Writing responses to complaints	1
4.4	Precis writing, Summarizing and Plagiarism	1
4.5	Job / Internship application – Cover letter & Résumé	1
5	Verbal Ability	
5.1	Reading Comprehension (Inferential fillups) and Theme Detection	1
5.2	Spotting Errors	1
5.3	Verbal Analogies	1
5.4	Change of Voice and Change of Speech	1
5.5	One word substitution	1
	TOTAL	30
L	1	1

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FOURTH SEMESTER

S.No.	Course Code	Course Du Code Name of the Course I		Weightag	je of Marks	5	Minimum Marks for Pass in End Semester Exam					
			Exam	Continuous Assessment *	End Semes ter Exam **	Max. Marks	End Semes ter Exam	Total				
THEORY												
1	60 MA 018	Optimization Techniques	2	40	60	100	45	100				
2	60 CB 401	Operating Systems	2	40	60	100	45	100				
3	60 CB 402	Design and Analysis of Algorithms	2	40	60	100	45	100				
4	60 CB 403	Software Design with UML	2	40	60	100	45	100				
5	60 CB 404	MERN Stack	2	50	50	100	45	100				
6	60 OE L*	Open elective-I	2	40	60	100	45	100				
7	60 MY 002	Universal Human Values	2	100	-	100	-	-				
	r		PRACTICA	LS	[1	1					
8	60 CB 4P1	Operating Systems Lab	2	60	40	100	45	100				
9	60 CB 4P2	Design and Analysis of Algorithms Lab	2	60	40	100	45	100				
10	60 CG 0P1	Career Skill Development -I	1	100	-	100	-	100				
11	60 CG 0P6	Internship	-	100	-	100	-	100				

* CA evaluation pattern will differ from course to course and for different tests. This will have to be declared in advance to students. The department will put a process in place to ensure that the actual test paper follow the declared pattern.

** End Semester Examination will be conducted for maximum marks of 100 and subsequently be reduced to 60 marks for the award of terminal examination marks



60 M A 019	Optimization Techniques	Category	L	Т	Ρ	Credit
60 MA 018		BS	3	1	0	4

- To familiarize the basic concepts of linear programming problems.
- To get exposed to transportation and assignment problems.
- To acquire skills in handling situations involving network models.
- To familiarize various queuing models.
- To learn basics of inventory models.

Pre-requisites

• Statistics and Probability

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Formulate the linear programming problems and solve by simplex	Apply
	Angli autopia method to predict the entire up colution for	Annha
CO2	Apply suitable method to predict the optimum solution for	Арріу
002	transportation and assignment problems.	
CO3	Apply CPM and PERT techniques to control project activities and cost.	Apply
CO4	Apply various queuing models to find the optimum service rate.	Apply
COF	Determine optimal order quantity for various deterministic Inventory	Apply
005	models.	

Mapp	apping with Programme Outcomes														
<u> </u>	POs												PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
CO2	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
CO3	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
CO4	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-
CO5	3	2	-	-	2	-	-	-	-	-	-	-	2	-	-

Assessment Pattern									
Bloom's	Continuous As (Ma	ssessment Tests arks)	End Sem Examination (Marks)						
Calegory	1	2							
Remember	10	10	10						
Understand	10	10	30						
Apply	40	40	60						
Analyse	-	-	-						
Evaluate	-	-	-						
Create	-	-	-						
Total	60	60	100						



Syllabus	Syllabus									
	K.S. Rangasamy College of Technology – Autonomous R2022									
B.Tech – Computer Science and Business Systems										
60 MA 018 - Optimization Techniques										
Somosto		Hours/Week	(Total	Credit		Maximum Marks			
Semeste	L	Т	Р	Hours	С	CA	ES	Total		
IV	3	1	0	60	4	40	60	100		
Linear P	ogramming	J Problems								
Origin of Mathema Big-M me Hands -	OR and its tical formula thod. on: olve linear n	definition - T tion of LPP	ypes of C - Solution	R problems of LPP by	s - Phases Graphical m	of OR pro nethod - Si s	blem approach - implex method –	[9]		
Transno	tation and	Assianment	Problem		chi method	5				
Mathematical formulation of transportation problem – Methods for finding Initial Basic Feasible Solution – Optimum solution – Degeneracy – Mathematical formulation of Assignment Models – Hungarian Algorithm – Transshipment Problems. Hands - on: Solve Assignment problem										
Network	Analysis									
Introduction - Network and Basic Components - Rules of Network Construction – Critical Path Method – Probability Considerations in PERT - Concept of Project Crashing / Time-Cost trade- off. Hands - on: Calculate Project scheduling with critical Paths, Estimation of Project time and its variance in PERT								[9]		
Queuein	Models									
Markovia - Pollacze Hands -	Markovian models – Single and Multiple server queuing models with finite and infinite capacity - Pollaczek-Khintchine formula (excluding proof) – Problem. Hands - on:									
Inventor	Control	Markoviann	100013							
Types of Quantity of buffer = Hands -	nventory mo EOQ) - Puro stock and re- on:	odels - Inven chase and Pr -order levels	tory cost - oduction r - EOQ wit	Determinis nodels with h price brea	tic Inventory and withou aks.	y models - t shortages	Economic Order s - Determination	[9]		
(enerate Inv	entory mode	els							
	. / .			Total Ho	urs: 45 + 5	Hands on) + 10 (Tutorial)	60		
Text Boo	K(S):			<u> </u>	0 1 "C			<u></u>		
1. Kar Sor	ti Swarup, F s, New Delh	² .K.Gupta, M ii, 20t h Editio	lanmohan, on, 2022	, Priyanshu	Gupta "Op	erations re	esearch", Sultan C	hand and		
2. H.A	Taha, "Ope	ration Resea	rch an intr	oduction", l	Pearson Ed	ucation, N	oida,10th Edition, 2	2019.		
Reference	e(s):									
1. F.S Dell	Hiller and G ni, 2010.	3.J. Lieberma	ın, "Introdu	iction to Op	erations Re	search", M	cGrawHill, 9 th Ed	ition, New		
2. J.K. 201	Sharma, "O 6.	peration Res	earch The	eory and A	oplications",	Trinity Pr	ess, Norcross, 6t	h Edition,		
3. V.K Edit	Kapoor, "Op ion, New De	peration Res Ihi, 2011.	earch: Coi	ncepts Prob	lems and S	olutions",	Sultan Chand and	Sons 5th		
4. P.R 200	ama Moorth 7.	y, "Operatior	Research	י", New Age	e Internatior	al Publica	tion, New Delhi, 2ı	d Edition,		



*SDG 4:Quality Education

4	O CP 404	Operating Systems	Category	L	Т	Ρ	Credit
C	DU CB 401	Operating Systems	PC	3	0	0	3



Course Contents and Lecture Schedule									
S. No.	Topics	No. of hours							
1.0	Linear Programming Models	1							
1.1	Origin of OR and its definition	1							
1.2	Types of OR problems - Phases of OR problem approach	1							
1.3	Mathematical formulation of LPP	1							
1.4	Solution of LPP by Graphical method	2							
1.5	Simplex method	2							
1.6	Big-M method	1							
1.7	Case study related problems	2							
1.8	Tutorial	1							
1.9	Hands on	1							
2.0	Transportation and Assignment Models								
2.1	Mathematical formulation of transportation problem	1							
2.2	Methods for finding Initial Basic Feasible Solution	1							
2.3	Optimum solution	1							
2.4	Degeneracy problems	1							
2.5	Mathematical formulation of Assignment Models	1							
2.6	Hungarian Algorithm	1							
2.8	Case study related problems	1							
2.9	Tutorial	1							
2.10	Hands on	2							
3.0	Network Analysis								
3.1	Introduction - Network and Basic Components	1							
3.2	Rules of Network Construction	2							
3.3	Critical Path Method	2							
3.4	Probability Considerations in PERT	2							
3.5	Concept of Project Crashing / Time-Cost trade-off	2							
3.6	Tutorial	2							
3.7	Hands on	1							
4.0	Queueing Models								
4.1	Markovian models	2							
4.2	Single server queuing models with finite and infinite capacity	3							
4.3	Single server queuing models with finite and infinite capacity	2							
4.4	Pollaczek-Knintchine formula (excluding proof) - Problem	2							
4.5		2							
4.6	Hands on	1							
5.0	Inventory Control	4							
5.2		1							
5.3	Deterministic Inventory models	1							
5.4	Economic Order Quantity (EOQ)	2							
5.5	Purchase and Production models with shortages	1							
5.6	Production models with and without shortages	1							
5.7	Determination of buffer stock and re-order levels	1							



5.8	EOQ with price breaks	1					
5.9	Tutorial	2					
5.10	Hands on	1					
A							

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Objectives

- To recognize the fundamentals of operating systems.
- To describe the mechanisms of OS to handle processes and threads and their communication.
- To discuss the principles of concurrency and Deadlocks.
- To identify the mechanisms involved in memory management and its schemes.
- To identify I/O management, File systems and security issues.

Pre-requisites

• Basic knowledge of Computer Fundamentals

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Identify the basic concepts and design issues of operating systems.	Remember
CO2	Apply Process management concepts including scheduling, Inter process communication, deadlocks and multithreading in real world problems	Apply
CO3	Apply concepts of memory management including Virtual Memory and Page Replacement to the issues that occur in Real time applications.	Apply
CO4	Identify issues related to IO hardware	Understand
CO5	Identify basic concepts of file system and disk management	Understand

Mapping with Programme Outcomes

	_		-													
<u> </u>		POs												PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	2	2	-	-	-	-	-	-	-	-	3	3	-	-	
CO2	3	3	3	3	-	-	2	-	-	2	-	2	3	-	-	
CO3	3	3	3	3	-	-	2	-	-	2	-	2	3	-	-	
CO4	3	2	3	-	-	-	-	-	-	-	-	2	3	-	-	
CO5	3	3	3	3	-	-	2	-	-	-	-	2	3	-	-	
3 - St	3 - Strong: 2 - Medium: 1 - Some															

3 - Strong; 2 - Medium; 1 - Som

Bloom's	Continuous As (Ma	sessment Tests Irks)	End Semester Examination (Marks)
Category	1	2	
Remember	10	10	20
Understand	10	10	20
Apply	40	40	60
Analyse	-	-	-
Evaluate	-	-	-
Create	-	-	-
Total	60	60	100



Syllabus		-						
	K.S.F	Rangasamy	/ College o	of Technolo	gy – Autor	nomous R2	2022	
		B.Tech – C	Computer S	Science and	Business	Systems		
			60 CB 401	- Operating	Systems	N		
Semester	r	Hours/wee	ĸ	lotal	Credit	IVIA		Tatal
D /	L	1	P 0	Hours	<u> </u>	CA	ES	lotal
IV	3	0	0	45	3	40	60	100
Introductio	on: ^	Diretorno (O						
Concept of	Operating and	Systems (U	5), General	cions of US,	Types of C	os, OS Serv	vices,	[9]
Virtual Mag	anuling anu	System Cal	is, basic al		oncepts of	an US, Cor	f an OS	
Processes	Thread ar	d Process	Schedulin				an 05.	
Definition	Process Re	lationshin [Different sta	i g. ates of a Pri	ocess Proc	ess State t	ransitions	
Process C	Control Bloc	k (PCB) (Context swi	itching Thr	ead: Defin	ition Vario	us states	
Benefits o	f threads. 7	vpes of th	reads. Cor	ncept of m	ultithreads.	Process S	chedulina:	[9]
Foundation	and Sche	dulina obied	ctives. Type	es of Sche	dulers. Sch	edulina crit	eria: CPU	
utilization,	Throughput	Turnaroun	d Time, Wa	iting Time,	and Respor	nse Time.		
Deadlocks	and Inter	process co	mmunicati	on: *				
Definition,	Necessary	and sufficie	ent conditio	ns for Dead	dlock, Dead	llock Preve	ntion, and	
Deadlock A	Avoidance: E	Banker's alg	orithm, Dea	adlock deteo	ction and R	ecovery-Inte	er-process	
Communic	ation: Cond	current pro	cesses, pr	ecedence	graphs, Ci	ritical Secti	ion, Race	[0]
Conditions	, Mutual E	Exclusion,	Hardware	Solution, S	Semaphore	s, Strict A	Iternation,	[9]
Peterson's	Solution,	The Produ	cer/ Consu	imer Proble	em, Event	Counters,	Monitors,	
Message	Passing, C	lassical IP	C Problem	ns: Reader	's & Write	er Problem	i, Dinning	
Philosophe	er Problem,E	Barber's sho	p problem.					
Memory N	lanagemen				M			
Basic con	cept, Logica	al and Phy	SICAL addre	ess maps,	Memory a	llocation: C	ontiguous	
Nemory al	location – F	ixed and va	riable partit	ion–interna	I and Exteri	nal tragmen	atructures	[0]
Locality	of reference	Dogo all	cs of virtua	rtitioning		and control	structures	[9]
- Locality	tion Deman	e, Faye all d naging P	ade Renlac	ement algo	rithms: Ont	imal First in	h First Out	
(FIFO) Se	cond Chanc	e (SC) Not	recently us	ed (NRU) a	nd Least R	ecently use	d (I RU)	
I/O Hardw	are. File an	d Disk Man	agement: *	*				
I/O devices	5. Device cor	ntrollers. Dir	ect Memory	Access. Pi	rinciples of I	/O. File Mar	nagement:	
Concept o	f File, Acce	ess method	s, File type	es, File op	eration, Dir	ectory stru	cture, File	
System s	structure, A	Allocation	methods	(contiguous	, linked,	indexed),F	ree-space	
manageme	ent (bit vect	or, linked li	st, grouping	g), directory	implement	tation(linear	list, hash	[9]
table), effic	ciency and p	performance	e. Disk Mar	nagement: I	Disk structu	ire, Disk so	heduling -	
FCFS, SS	ΓF, SCAN, C	C-SCAN, Di	sk reliability	, Disk forma	atting, Boot	-block, Bad	blocks.	
Case stud	iy: UNIX OS	5 file system	i, shell, filte	rs, shell pro	gramming,	programmir	ng with the	
standard I/	O, and UNIX	k system ca	lls.					
Taut Daal	(-)-					10	tal Hours:	45
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	Inam Silber	Schatz, Pet	er Baer G	aivin and C	sreg Gagn	e, Operatii	ng System	Concepts
2 \\/;IIi	am Stallinge	"Operating	Sveteme: I	nternale and	d Design Dr	inciples" O	ld Edition 20	113
Z. VVIIII	ani Staiiniys (c):	, operating	Oysiems. I	incinais alle	a Design Pl			710.
Cha	rles Patrick	Crowley	"Operating	System: A		iented Ann	roach" Mo	Graw Hill
	ration 2017	Crowley,	operating	Gystem. A	Design-0	ioniou App		
2 Gan	/.1 Nutt "On	erating Svs	tems: A Mo	dern Perso	ective" Pea	arson 1907		
3 Mau	rice J Bach	"Design of	the Unix Or	perating Svs	stems" 1 st F	dition Pear	son 1986	
4. Dani	el Pierre Ro	vet. Marco	Cesati "Un	derstanding	the Linux k	Kernel" O'R	eilly Media	2005
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S. No.	Topics	No. of hours
1.0	Introduction	
1.1	Concept of Operating Systems (OS),	1
1.2	Generations of OS, Types of OS	1
1.3	OS Services, Interrupt handling and System Calls	1
1.4	Basic architectural concepts of an OS	1
1.5	Concept of Virtual Machine, Resource Manager view	1
1.6	Process view and hierarchical view of an OS	1
2.0	Processes, Thread and Process Scheduling	•
2.1	Definition, Process Relationship, Different states of a Process	1
2.2	Process State transitions, Process Control Block (PCB)	1
2.3	Context switching Thread Definition	1
2.4	Various states, Benefits of threads	1
2.5	Types of threads, Concept of multithreads	1
2.6	Process Scheduling: Foundation and Scheduling objectives	1
2.7	Types of Schedulers Scheduling criteria: CPU utilization	1
2.8	Throughput, Turnaround Time, Waiting Time, Response Time	1
3.0	Scheduling algorithms and Inter process communication	
3.1	Inter-process Communication: Concurrent processes	1
3.2	SJF,RR, Multiprocessor scheduling: Real Time scheduling	1
3.3	RM and EDF. Inter-process Communication: Concurrent processes	1
3.4	precedence graphs, Critical Section, Race Conditions, Mutual Exclusion	1
3.5	Hardware Solution, Semaphores, Strict Alternation, Peterson's Solution	1
3.6	The Producer/ Consumer Problem, Event Counters	1
3.7	Monitors, Message Passing	1
3.8	Classical IPC Problems: Reader's & Writer Problem	1
3.9	Dinning Philosopher Problem, Barber's shop problem	1
4.0	Deadlocks, Concurrent Programming:	
4.1	Definition, Necessary and sufficient conditions for Deadlock	1
4.2	Deadlock Prevention, Deadlock Avoidance, Banker's algorithm	1
4.3	Deadlock detection and Recovery, Concurrent Programming: Critical region	1
4.4	conditional critical region, monitors, concurrent languages, communicating sequential process (CSP)	1
4.5	Deadlocks – prevention, avoidance, detection and recovery.	1
4.6	Remote Method Invocation (RMI)	1
4.7	Regular Expressions and Database Connectivity	1
5.0	Memory Management:	
5.1	Basic concept, Logical and Physical address maps, Memory allocation:	1

5.2	Fixed and variable partition–Internal and External fragmentation and Compaction. Virtual Memory: Basics of Virtual Memory	1
5.3	Hardware and control structures – Locality of reference, Page allocation	1
5.4	Partitioning, Paging, Page fault	1
5.5	Working Set, Segmentation, Demand paging	1
5.6	Page Replacement algorithms: Optimal, First in First Out (FIFO), Second Chance (SC),	
5.7	Not recently used (NRU) and Least Recently used (LRU)	1
6.0	I/O Hardware, File and Disk Management:	1
6.1	I/O devices, Device controllers, Direct Memory Access, Principles of I/O	1
6.2	File Management: Concept of File, Access methods, File types, File operation	1
6.3	Directory structure, File System structure, Allocation methods (contiguous, linked, indexed)	1
6.4	Free-space management (bit vector, linked list, grouping), directory implementation(linear list, hash table), efficiency	1
6.5	Performance. Disk Management: Disk structure, Disk scheduling - FCFS	1
6.6	SSTF, SCAN, C-SCAN, Disk reliability, Disk formatting, Boot-block, Bad blocks	1
7.0	Case study:	
7.1	UNIX OS file system, shell, filters, shell programming	1
	Programming with the standard I/O, UNIX system calls.	1
	Total	45

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60 CB 402	Design and Analysis of	Category	L T		Ρ	Credit	
00 CB 402	Algorithms	PC	3	0	0	3	

• To design algorithms in both the science and practice of computing.

• To choose the appropriate data structure and algorithm design method for a specified.

• To understand how the choice of data structures and algorithm design

Methods impacts the performance of programs.

• To solve problems using algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking and branch and bound

• To solve NP-hard and NP-complete problems.

Pre-requisites

• Basic knowledge of Data Structures

Course Outcomes

On the suc	On the successful completion of the course, students will be able to									
CO1	Classify the problem types and compare orders of growth to represent asymptotic notations.	Understand								
CO2	Apply 'Brute Force' and 'Divide and conquer' design techniques for sorting and searching problems.	Apply								
CO3	Illustrate Graph and Tree Algorithms	Analyze								
CO4	Identify Np-Complete and NP hard problems.	Analyze								
CO5	Apply Approximation, Randomized and Quantum Algorithms	Apply								

Mapping with Programme Outcomes

	U		U														
COs		POs													PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
CO1	3	2	-	3	-	-	-	-	-	-	-	-	3	-	-		
CO2	3	3	-	3	-	-	-	-	-	-	-	-	3	-	-		
CO3	3	3	3	2	3	-	-	-	-	-	-	-	3	-	-		
CO4	3	3	3	2	-	-	-	-	-	-	-	-	3	-	-		
CO5	3	3	3	2	-	-	-	-	-	-	-	-	3	-	-		
3 - St	rong. (2 - Me	dium	· 1 - Some	<u>ب</u>												

Bloom's	Continuous As (Ma	ssessment Tests arks)	End Sem Examination (Marks)				
Calegory	1	2					
Remember	-	-	-				
Understand	20	20	30				
Apply	20	20	40				
Analyse	20	20	30				
Evaluate	-	-	-				
Create	-	-	-				
Total	60	60	100				



Sylla	bus											
		K.S.R	angasamy	College o	f Technolo	gy – Autor	nomous R2	2022				
	B.Tech – Computer Science and Business Systems											
			60 CB 4	02- Design	and Analy	sis of Algo	rithms					
Sem	ester	ŀ	lours/Wee	k	Total	Credit	Ma	ximum Ma	rks			
		L	T	P	Hours	С	CA	ES	Total			
<u> </u>	V	3	0	0	45	3	40	60	100			
Introduction:*												
Chara	acterist	tics of Algo	prithm, Ana	lysis of Alg	porithm: Asy	ymptotic an	alysis of C	omplexity				
Boun	ds – I	Best, Avera	age and v	Vorst-Case	behavior;	Performanc	e Measure	ements of	[9]			
Algor	ithm,	Time and	Space Ira	ade-Offs, A	Analysis of	Recursive	Algorithm	s through				
Recu	rrence	Relations	Substitut	ion ivietnoo	a, Recursic	on Tree M	ethod and	Masters				
Fund	lomont	la Maaritk	imia Strat	ogioo*								
Brute			Greedy	Dynamic	Programm	ning Brand	b and B	ound and				
Back	trackin	a Methodo	onios Illus	trations of	these tech	ning, brand	Problem Sc	lying Bin	[9]			
Packing Knapsack Travelling Salesman Problem												
Granh and Tree Algorithms*												
Traversal algorithms: Depth First Search (DES) and Breadth First Search (BES): Shortest												
path	algorith	nms. Trans	itive closure	e. Minimum	Spanning 7	Free, Topol	ogical sorti	na	[•]			
Trac	table a	nd Intracta	able Proble	ems*			- J	3				
Com	outabili	ty of Algori	thms, Com	putability c	lasses – P,	NP, NP-co	mplete and	I NP-hard.	[9]			
Cook	's theo	rem, Stand	lard NP-cor	nplete prob	lems and R	eduction te	chniques.					
Adva	inced ⁻	Topics*										
Appro	oximati	ion algorith	ms, Rando	mized algo	orithms, Cla	ss of probl	ems beyon	id NP – P	[9]			
SPAC	CE, Inti	roduction to	o Quantum	Algorithms								
							Tot	al Hours:	45			
Text	book(s	s):										
1	Chris	Bates, "We	eb Program	ming: Build	ling Internet	t Application	ns", Wiley [Dream Tech	i, 3 rd			
	Editio	n,2010										
2.	Steve	en Holzner,	"The Comp	lete referer	nce PHP",Ta	ataMcGraw	-Hill,3rd Ed	ition,2013				
Refe	rence(s):										
1.	Herbe	ert Schildt,	"Java, The	Complete I	Reference",	Hill - Osbo	rne, 12th E	dition, 2021				
2.	W Ha	ins Bergste	n, "Java Se	erver Pages	s", O"Reilly,	3rdEdition,	2003					
3.	D. Fla	anagan, "Ja	ava Script",	O"Reilly, 6	th Edition, 2	011.						
1	l leffre	ev C K Jack	son Web T	Technologie	es". Pearsor	n Education	. 3rd Editio	n. 2011.				

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Course Contents and Lecture Schedule											
S. No.	Topics	No. of hours									
1.0	Introduction:										
1.1	Characteristics of Algorithms	1									
1.2	Analysis of Algorithm	1									
1.3	Asymptotic analysis of Complexity Bounds	1									
1.4	Best, Average and Worst-Case behavior	1									
1.5											
1.6	Time and Space Trade-Oils										
1.7	Analysis of Recursive Algorithms through Recurrence Relations	1									
1.8	Substitution Method	1									
1.9	Recursion Tree Method and Masters' Theorem	1									
2.0	Fundamental Algorithimic Strategies:										
2.1	Brute-Force	1									
2.2	Heuristics,	1									
2.3	Greedy	1									
2.4	Dynamic Programming	1									
2.5	Branch and Bound and Backtracking Methodologies	1									
2.6	Illustrations of these techniques for Problem Solving	1									
2.7	Bin Packing	1									
2.8	Knapsack	1									
2.9	Travelling Salesman Problem	1									
3.0	Graph and Tree Algorithms:										
3.1	Traversal algorithms:	1									
3.2	Depth First Search (DFS)	1									
3.3	Breadth First Search	1									
3.4	Shortest path algorithms	2									
3.5	Minimum Spanning Tree	1									
3.7	Topological sorting	1									
4.0	Tractable and Intractable Problems:	i									
4.1	Computability of Algorithms	1									
4.2	Computability classes – P	2									
4.3	NP, NP-complete	1									
4.4	NP-hard.	1									
4.5	Cook's theorem	1									
4.6	Standard NP	1									
4.7	Complete problems and Reduction techniques.	2									
5.0	Advanced Topics										
5.1	Approximation algorithms	2									
5.2	Randomized algorithms	1									
5.3	Class of problems beyond NP	2									
5.4	P SPACE	2									
5.5	Introduction to Quantum Algorithms	2									



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60 CB 402	Software Design with	Category	L	Т	Ρ	Credit	
00 CB 403	UML	PC	3	0	0	3	

Objectives

- To know the importance of modeling in the software development life cycle.
- To understand the object-oriented approach to analyzing and designing systems and software solutions.
- To employ the UML notation and symbols to create effective and efficient system designs.
- To learn various testing and maintenance measures.
- To learn various project cost models and risk management.

Pre-requisites

Basic knowledge of Software requirements

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Analyze and understand Software Engineering Lifecycle Models	Understand
CO2	Exemplify the concept of software requirements analysis	Remember
CO3	Design concepts using UML and System Analysis	Understand
CO4	Understand software testing and maintenance approaches	Apply
CO5	Develop project management scheduling using DevOps	Apply

Mapping with Programme Outcomes

<u> </u>		POs													PSOs		
005	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
CO1	2	2	1	2	2	-	-	-	-	1	1	2	3	-	-		
CO2	2	3	2	3	2	-	-	-	2	2	3	2	3	-	-		
CO3	2	3	2	1	1	-	-	-	2	2	3	2	3	-	-		
CO4	2	3	3	2	3	-	-	-	2	2	3	2	3	-	-		
CO5	2	3	1	2	2	-	-	-	-	-	-	1	3	-	-		
3 - St	rong; 2	2 - Me	dium;	1 - So	me												

Assessment Pattern									
Bloom's	Continuous Ass (Ma	sessment Tests rks)	End Sem Examination (Marks)						
Category	1	2							
Remember	10	10	20						
Understand	20	10	30						
Apply	20	20	40						
Analyse	-	-	-						
Evaluate	-	-	-						
Create	10	10	10						
Total	60	60	100						



Sylla	bus								
	K.S	.Rangasa	amy Colle	ege of Te	chnology -	- Autonom	nous R20	22	
		B.Tech	– Compu	uter Scien	ce and Bu	isiness Sy	stems		
60 CB 403-Software Design with UML									
	Semester Hours/Week Total Credit Maximum Ma							arks	
C	beiniestei	L	Т	Р	Hours	С	CA	ES	Total
	IV	3	0	0	45	3	40	60	100
Intro	duction to on (Object Or	iented Te	echnologi	es and the	UML Met	hod*		
Softw	are developme	nt proces	s: The Wa	aterfall Mo	del vs. The	e Spiral Mo	delThe	Software	
Crisis	, description of	f the real	world usi	ng the Ob	ojects Mod	elClasse	s, inherita	ance and	[9]
multip	ole configuration	ons- Qua	lity softw	are chara	cteristics.	-Description	on of the	Object-	
Orien	ted Analysis pro	ocess vs.	the Struc	ture Analy	sis Model				
Intro	duction to the	UML Lan	guage *					_	101
Analy	rsis of system	requirem	ents -Acto	or Definition	ons- Writin	ig a case	goal U	se Case	[9]
Diagr	am -Use Case	Relations	hips-Requ		Analysis U	sing Case I	Modeling.		
Irans	ster from Analy	ysis to De	esign in t	he Chara	cterization	Stage [*]	• •••••		
Intera	iction Diagram	s-Descrip	tion of (joal Defir	ning Uivil	Wethod,	Operation	, Object	[0]
niena	ace, Class Seq	hierte Dia	agrani -Fi	naing obje	arom Door	now of Eve	nis-Desci	bing the	[9]
proce	ts using a Colla	boration I	ng a Seq Diagram		igram-Desi	choing the	process (Ji innung	
		osian Sta	Jiagrain no *						
The	Static Structure	re Diagra	ams-The	Class Di	aaram Mo	ndel-Attribu	ites desc	rintions -	
Opera	ations descripti	ons - Co	onnection	s descript	ions in the	e Static Mo	ndel -Ass	sociation	[9]
Gene	ralization. Agar	egation. D	Dependen	cv. Interfa	cina. Multir	olicity.			
Pack	age Diagram N	lodel *		<i>ey,e.</i>	<u></u> ,				
Desci	ription of the	model-W	hite box,	black bo	ox-Connect	tions betw	een pack	agers	
Interfa	aces Create	Package	Diagram	Drill Do	own. Dyna	mic Model	: State D	iagram /	
Activi	ty Diagram Des	scription of	of the Sta	te Diagrar	nEvents	Handling.	-Descripti	on of the	[0]
Activi	ty Diagram	Exercise	in State	Machines.	Compone	ent Diagran	n Model-	Physical	[9]
Aspe	ctLogical Asp	ectConr	nections a	ind Depen	denciesL	Jser face	Initial DB	design in	
a UM	L environment.	. Deploym	nent Mode	el Process	ors-Conne	ctions -Cor	mponents	-Tasks	
Threa	adsSignals an	d Events.	i.						
							Tota	al Hours:	45
Textb	ook(s):								
	Bernd Bruego	ge and Alle	en H. Dute	oit, "Objec	t-Oriented	Software E	ngineerin	g: Using L	IML,
1.	Patterns and	Java", Thi	ird Edition	, Pearson	Education	, 2009.			
	Craig Larman	i, "Applyin	g UML an	d Patterns	s: An Introd	luction to O	bject-Orie	ented Anal	ysis and
2.	Design and It	erative De	evelopmer	nt", Pearso	on Educatio	on, 3rd Edit	ion, 2005		
Refer	ence(s):								
Grady Booch, Robert A. Maksimchuk, Michael W. Engle, Bobbi J. Young, Ph.D., Jim Cor								Conallen	
1. Kelli A. Houston, "Object Oriented Analysis and Design with Applications", Addision-V								i-Wesely,	
3rd Edition, 2007									
2. Erich Gamma, Richard Heim, Raiph Johnson, John M. Vissides, "Design Patterns: Eleme								ementsof	
Reusable Object-Oriented Software", Pearson, 2012									
3.	Roger. S. Pre	ssman an	a Bruce R	. iviaxim, " 015	Sonware E	ingineering	– A Pract	moner's A	pproach",
4			aw Fill, Z	UID.	Eirot Doci	nn Dottorra	" 1ot Ed:4		W 2004
4.		J & RODSC	n, ⊏iisabe	eui, nead	riist Desi	yn Palleins	ISI EUIT	on, O Rell	iy, 2004
SDG	i 4 – Quality Ed	ucation							



Course Contents and Lecture Schedule						
S. No.	Topics	No. of hours				
1.0	Introduction to on Object Oriented Technologies and the UML Method					
1.1	Software development process: The Waterfall Model vs. The Spiral Model	1				
1.2	The Software Crisis, description of the real world using the Objects Model	1				
1.3		1				
1.4	Inneritance and multiple configurations	1				
1.5	Quality software characteristics	2				
1.6	Description of the Object	1				
1./	Oriented Analysis process vs. the Structure Analysis Model	2				
2.0	Introduction to the UML Language					
2.1	Analysis of system requirements	1				
2.2	Actor Definitions	1				
2.3	Writing a case goal	1				
2.4	Use Case Diagram	2				
2.5	Use Case Relationships	2				
2.6	Requirements Analysis Using Case Modeling	2				
3.0	Transfer from Analysis to Design in the Characterization Stage					
3.1	Interaction Diagrams	1				
3.2	Description of goal Defining UML Method	1				
3.3	Operation, Object Interface, Class	1				
3.4	Sequence Diagram	1				
3.5	Finding objects from Flow of Events	2				
3.6	Describing the process of finding objects using a Sequence Diagram	1				
3.7	Describing the process of finding objects using a Collaboration Diagram	2				
4.0	The Logical View Design Stage					
4.1	The Static Structure Diagrams	1				
4.2	The Class Diagram Model	2				
4.3	Attributes descriptions	2				
4.4	Operations descriptions	1				
4.5	Connections descriptions in the Static Model	1				
4.6	Association, Generalization, Aggregation, Dependency, Interfacing, Multiplicity.	2				
5.0	Package Diagram Model					
5.1	Description of the model-White box, black box	1				
5.2	Connections between packagers InterfacesCreate Package Diagram	2				
5.3	Drill Down. Dynamic Model: State Diagram / Activity Diagram	2				
5.4	Description of the State DiagramEvents Handling	1				
5.5	Description of the Activity Diagram Exercise in State Machines. Component Diagram Model	1				
5.6	Physical AspectLogical AspectConnections and DependenciesUser face Initial DB design in a UML environment	1				
5.7	Deployment Model-Processors-Connections -Components-TasksThreads Signals and Events	1				



1. Mr.K.Karthikeyan - karthikeyank@ksrct.ac.in

60 CB 404	MEDN Stock	Category	L	Т	Ρ	Credit
60 CB 404	MERN Stack	PC	1	0	4	3

Objectives

- To understand the various components of full stack development and front end basics
- To design the web page using JavaScript
- To develop simple web applications with React
- To learn Node.js and Express.js features and applications
- To develop applications with MongoDB

Pre-requisites

• Basic knowledge of HTML, Java script, CSS, Database Management Systems

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Understand the various stacks available for web application development.	Apply
CO2	Develop practical, real-world web applications using JavaScript.	Apply
CO3	Build and deploy React applications.	Apply
CO4	Use Node.js and Express.js for application development.	Apply
CO5	Develop applications with Mongo DB.	Apply

Mapping with Programme Outcomes

			5			-									
<u> </u>		POs										PSOs			
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	2	2	-	-	-	2	2	2	2	3	-	-
CO2	3	3	3	3	2	-	-	-	2	2	2	2	3	-	-
CO3	3	3	3	3	2	-	-	-	2	2	2	2	3	-	-
CO4	3	3	3	3	2	-	-	-	2	2	2	2	3	-	-
CO5	3	3	3	3	2	-	-	-	2	2	2	2	3	-	-
3 - St	3 - Strong: 2 - Medium: 1 – Some														

Bloom's	Continuous As (M	ssessment Tests arks)	Model Examination	End Sem Examination
Calegory	1	2	(Marks)	(Marks)
Remember (Re)	-	-	-	-
Understand(Un)	-	-	-	-
Apply(Ap)	60	60	100	100
Analyse(An)	-	-	-	-
Evaluate(Ev)	-	-	-	-
Create(Cr)	-	-	-	-
Total	60	60	100	100



Sylla	Syllabus								
	K.S.Rangasamy College of Technology – Autonomous R2022								
	B.Tech - Computer Science and Business Systems								
				60 CB 4	<u>04 – MERN</u>	Stack			
Sem	actor	ŀ	lours/Wee	k	Total	Fotal Credit Maximum Marks			rks
ocini	53101	L	Т	P	Hours	С	CA	ES	Total
ľ	V	1	0	4	75	3	50	50	100
Basi	cs of F	Full Stack*							
Introd	ductior	n To Web	Developme	ent Framew	vork -Single	e Page Ap	plication-Me	odel-View-	
Cont	roller (l	MVC)-Struc	ture Of We	b Page-HTN	ML: Basic Ta	ags, Links,	Lists, Table	s, Images,	[3+12]
Video	os, Auc	lios, Forms	- CSS: Inte	rnal And Ex	ternal Stylin	ig, Bootstra	p: Containe	rs, Tables,	
Imag	es, Co	lors, Alerts,	Buttons, C	ards, Pagin	ation, Drop	Down, Car	ousel		
Java	Scrip	t*							
Intro	duction	I I o Javas	cript - Dat	atypes - V	ariables -	Arrays - S	trings-Oper	ators And	[3+12]
Expre	ession:	s - Looping	- Function	s - Dialog I	BOX – EVEN	it Handling-	working w	ith DOM -	
Baaa		Inclions Pro	omises-Ano	w Function:	S-Felch API				
Intro	a Austion			1 Croata An		Croate Re	act App P	opet ISV	
Read	t l ifor		ke -Prope-9	States-Even	t Handling		act-App - IN	Eurotional	[3+12]
Com		s- React R	ns -riops-c	ling Forms	l Ising Reac	t Routes-Co	nditional R	endering -	[3+12]
Fetch		ev In Reac	t To Popula	ate Data	Using Read			endering	
Node	JS a	nd Express	JS*						
Intro	duction	To Node.	ls-Installatio	on Of Node	Js-Node Pa	ackage Mai	nager - Noc	le.Js Core	
Modu	iles - F	Routina In N	ode.JsCr	eate Simple	API In Noc	de.Js-Introd	uction To E	xpress.Js-	[3+12]
Rout	ng In I	Express.Js	Create A Si	mple API U	sing Expres	ss.Js		1	
Mon	go DB	*		•	0				
Unde	erstand	ling Nosql A	And Mongo	db – Manag	ging Collect	ionsCRU	O Operation	s: Create,	[0.40]
Read	l, Upo	date And	Delete -	Restful A	Apis – Co	onnecting	To Mongo	db From	[3+12]
Node	.Js/Ex	press.Js–S	imple Appli	cations	-	_	_		
							То	tal Hours:	75
Text	Book	(s):							
1	Vasa	n Subramaı	nian,"Pro M	ERN Stack,	Full Stack \	Neb App De	evelopment	with Mongo	, Express,
	Read	t, and Node	e", Second I	Edition, Apr	ess, 2020.				
2.	2. Shama Hoque,"Full-Stack React Projects", Second Edition, Packt Publishing Ltd, 2020.								
Refe	rence	(s):							
1.	Shan	na Hoque,"F	Full-Stack R	leact Projec	sts", Second	l Edition, Pa	ackt Publish	ing Ltd, 202	20
2	Kirup	a Chinnath	ambi, "Lear	ning React:	A Hands-C	On Guide to	Building W	eb Applicat	ions using
	Read	t and Redu	x", Addison	-Wesley Pro	otessional,	Second Edi	tion, 2018.		
3.	https	://www.ude	my.com/co	urse/master	r-full-stack-	web-develo	pment-novid	ce-to-expert	:/
4.	4. https://www.udemy.com/course/fullstack-web-development-course-projects-base/								

*SDG 4:-Quality Education



Course Contents and Lecture Schedule							
S. No.	Topics	No. of hours					
1	Basics of Full Stack						
1.1	Introduction To Web Development Framework	1					
1.2	Single Page Application	1					
1.3	Model View Controller (Mvc)	1					
1.4	Structure Of Web Page-HTML: Basic Tags, Lists, Images	1					
1.5	Videos, Iframe Forms, Tables, Links, Div Tags	1					
1.6	CSS: Internal Vs External Styling	1					
1.7	Box Model, Flex Box And Responsive Design	1					
1.8	Bootstrap: Bootstrap Containers, Tables, Images, Colors, Alerts	1					
1.9	Buttons, Cards, Pagination, Drop Down, Carousel	1					
2	Java Script						
2.1	Introduction To Javascript	1					
2.2	Advantages Of Java Script - Syntax	1					
2.3	Datatypes, Variables, Arrays	1					
2.4	Strings-Operators And Expressions	1					
2.5	Looping - Functions - Dialog Box – Events	1					
2.6	Understanding And Working With DOM-AJAX	1					
2.7	Callback Functions-Promises-Arrow Functions	1					
2.8	Fetch API-Jquery	1					
3	React						
3.1	Introduction To React Virtual DOM	1					
3.2	Create An App Using Create-React-App-React JSX-React Lifecycle	1					
3.3	Props-States-Event Handling	1					
3.4	React Router-Class Components	1					
3.5	Functional Components-Building Forms Using React-Routes	1					
3.6	Conditional Rendering-Server-Side Rendering	1					
3.7	Fetch API Key In React To Populate Data-React Hooks	1					
4	Node JS and Express JS						
4.1	Introduction To Node.Js	1					
4.2	Installation Of Node.Js-Node Package Manager-Node.Js REPL Commands Node.Js Core Modules	1					
4.3	Routing In Node.Js-JSON In Node.Js-Create Simple API In Node.Js	1					
4.4	Introduction To Express.Js-Routing In Express.Js-Sending HTML & JSON Data Using Express.Js	1					
4.5	Serving Static Website Using Express.Js	1					
4.6	Express.Js And API	1					
5	Mongo DB						
5.1	Understanding Nosql And Mongo DB	1					
5.2	Building Mongo DB Environment -User Accounts – Access Control	1					
5.3	Administering Databases – Managing Collections	1					



5.4	CRUD Operations:Connecting And Inserting Data, Updating And Deleting Data	1
5.5	Restful Apis	1
5.6	Connecting To Mongodb From Node.Js	1
5.7	Simple Applications	1
6	Project	
6.1	Problem Identification	5
6.2	Solution For Problem	10
6.3	Implementation	10
6.4	Presentation	5
6.5	Report	5
6.6	Demo	5

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60 MV 002	Universal Human Values	Category	L	Т	Ρ	Credit
	Universal Human values	MC	3	0	0	3

- To identify the essential complementarily between 'values' and 'skills'
- To ensure core aspirations of all human beings
- To acquire ethical human conduct, trustful and mutually fulfilling human behaviour
- To enrich interaction with Nature
- To achieve holistic perspective towards life and profession

Pre-requisites

• Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Understand the significance of value inputs in formal education and start applying them in their life and profession.	Understand
CO2	Evaluate coexistence of the "I" with the body.	Analyse
CO3	Identify and evaluate the role of harmony in family, society and universal order.	Remember
CO4	Classify and associate the holistic perception of harmony at all levels of existence and Nature.	Analyse
CO5	Develop appropriate human conduct and management patterns to create harmony in professional and personal lives.	Apply

Mapping with Programme Outcomes

						-										
<u> </u>	POs												PSOs			
005	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	-	-	-	-	-	-	-	3	2	-	2	3	-	-	-	
CO2	-	-	-	-	-	3	-	3	3	-	-	3	-	-	-	
CO3	-	-	-	-	-	3	3	3	3	-	-	3	-	-	-	
CO4	-	-	-	-	-	3	3	3	3	-	-	3	-	2	-	
CO5	-	-	-	-	-	3	3	3	3	3	-	3	-	2	-	
3 - St	3 - Strong: 2 - Medium: 1 - Some															

3 - Strong; 2 - Medium; 1 - Sor

Bloom's	Continuous As (Ma	sessment Tests Irks)	End Sem Examination (Marks)
Calegoly	1	2	
Remember	10	10	
Understand	10	10	
Apply	20	20	
Analyse	20	20	No End Semester Examination
Evaluate	-	-	
Create	-	-	
Total	60	60	



Syllabus										
	K.S.F	Rangasamy	/ College o	f Technolo	ogy – Autor	nomous R2	2022			
		60	MY 002 - U	niversal Hu	uman Valu	es				
			Commo	on to all Bra	nches					
Somostor	ŀ	lours/Wee	k	Total	Credit	Ma	ximum Ma	rks		
Semester	L	Т	Р	Hours	С	CA	ES	Total		
IV	3	0	0	45	3	100	0	100		
Introductio	on to value	Education	*				•			
Understand	ding Value I	Education-S	Self Explora	tion as The	e Process	For Value E	Education-			
Continuous	Happiness	and Prospe	erity-The Ba	sic Human J	Aspirations-	-Right Unde	rstanding-	[9]		
Relationshi	p and Physi	cal Facility -	 Happines: 	s and Prosp	erity - Curre	ent Scenaric	o – Method			
to Fulfill the	Basic Hum	an Aspirati	ons**.							
Harmony i	n the Huma	an Being *								
Understand	ding Humai	n Being a	s The Co	-Existence	of The S	Self and T	he Body-			
Distinguish	ing Betweer	n The Need	s of The Se	elf and The I	Body-The E	Body as an I	nstrument	[9]		
of The Self	-Understand	ding Harmo	ony in the S	elf-Harmon	y of The Se	elf With The	e Body **-			
Programme	e to Ensure	Self-Regula	ation and He	ealth.						
Harmony i	n the Famil	y and Soci	iety *							
Harmony I	n The Fami	ily –The Ba	asic Unit of	Human In	teraction-Va	alues In Hu	iman- to -			
Human Relationship – 'Trust' The Foundation Value In Relationship – 'Respect'- As The [9]										
Right Evaluation-Understanding Harmony in the Society –Vision For the Universal Human										
Order.	Order.									
Harmony i	n the Natur	e/Existenc	e *	_						
Understand	ling Harmoi	ny in the N	lature-Interd	connectedne	ess, Self-R	egulation A	nd Mutual	[9]		
Fulfillment	Among the I	-our Orders	s of Nature	- Realizing	Existence A	As Co-Existe	ence at All	[-]		
Levels – I h	e Holistic Pe	erception O	f Harmony		9.					
Implication	ns of the Ho	Distic Und	erstanding	^ 						
Natural Ac	ceptance of	Human Va	alues- Defil		of Human C	Conduct- A	Basis For			
Humanistic	Education,	Humanistic			ersal Huma	n Order- Co	ompetence	[9]		
In Protess	ional Ethics			es, Produci	tion System	IS AND MA	nagement			
Drofoosion	Dical Case 3	studies – S	strategies F	or Transitio	n Towards	value Base	e Life and			
Profession.										
Text Book(s):										
A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P										
1. Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1										
Teachers' Manual for A Foundation Course in Human Values and Professional Ethics, R R Gaur,										
2. R As	sthana, G P	Bagaria, 2	nd Revised	Edition, Ex	cel Books,	New Delhi,	, 2019. ISBI	N 978-93-		
87034-53-2										
Reference(s):										
1. Jeevan Vidya: EkParichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.										
2. Hum	an Values, <i>i</i>	A.N. Tripath	ni, New Age	Internation	al. Publishe	ers, New De	lhi, 2004.			
*SDG:3 – 0	Good Health	and Well-E	Being							

**SDG:4 - Quality Education



Course C	Contents and Lecture Schedule	
S. No.	Topics	No. of hours
1.0	Introduction to Value Education	
1.1	Discussion On Present Education System And Skill Based Education	1
1.2	Understanding Value Education	1
1.3	Self-Exploration As The Process For Value Education	1
1.4	Basic Human Aspirations - Continuous Happiness And Prosperity	1
1.5	Basic Requirements To Fulfill Human Aspirations - Right Understanding, Relationship And Physical Facility	1
1.6	Transformation From Animal Consciousness To Human Consciousness	1
1.7	Sources Of Happiness And Prosperity – Harmony And Disharmony	1
1.8	Current Scenario And Role Of Education	1
1.9	Outcome Of Human Education And Method To Fulfill The Basic Human Aspirations	1
2.0	Harmony in the Human Being	
2.1	Understanding Human Being - As Co-Existence Of The Self And The Body - The Needs Of The Self And The Body	1
2.2	Understanding Human Being - As Co-Existence Of The Self And The Body – The Activities And Response Of The Self And The Body	2
2.3	The Body As An Instrument Of The Self	1
2.4	Understanding Harmony In The Self	1
2.5	Harmony Of The Self With The Body	2
2.6	Programme To Ensure Self-Regulation And Health	1
2.6	My Participation (Value) Regarding Self And My Body - Correct Appraisal Of Our Physical Needs	1
3.0	Harmony in the Family and Society	
3.1	Harmony In The Family - Understanding Values In Human Relationships	1
3.2	Family As The Basic Unit Of Human Interaction	1
3.3	Values In Human Relationships	1
3.4	Trust - The Foundation Value In Relationship	1
3.5	Respect As The Right Evaluation, The Basis For Respect, Assumed Basesfor Respect Today	1
3.6	Harmony From Family To World Family: Undivided Society	1
3.7	Extending Relationship From Family To Society, Identification Of The Comprehensive Human Goal	1
3.8	Programs Needed To Achieve The Comprehensive Human Goal: The Five Dimensions Of Human Endeavour	1
3.9	Harmony From Family Order To World Family Order – Universal Human Order	1
4.0	Harmony in the Nature / Existence	
4.1	The Four Orders In Nature	1
4.2	Participation Of Human Being In Entire Nature	1
4.3	Natural Characteristics - Tendency Of Human Living With Animal Consciousness / The Holistic Perception Of Harmony In Existence	1
4.4	Present Day Problems	1



4.5	Recyclability And Self-Regulation In Nature	1
4.6	Relationship Of Mutual Fulfillment	1
4.7	An Introduction To Space, Co-Existence Of Units In Space	1
4.8	Harmony In Existence – Understanding Existence As Co- Existence	1
4.9	Natural Characteristic Of Human Living With Human Consciousness	1
5.0	Implications of the Holistic Understanding	
5.1	Natural Acceptance Of Human Values	1
5.2	Definitiveness Of Ethical Human Conduct - Development Of Human Consciousness	1
5.3	Identification Of Comprehensive Human Goal	1
5.4	Basis For Humanistic Education And Humanistic Constitution	1
5.5	Ensuring Competence In Professional Ethics	1
5.6	Issues In Professional Ethics-The Current Scenario	1
5.7	Holistic Technologies And Production Systems And Management Models – Typical Case Studies	2
5.8	Strategies For Transition Towards Value Based Life And Profession	1

Course Designer(s) 1. Dr.G.Vennila - <u>vennila@ksrct.ac.in</u> 2. Dr.K.Raja - rajak@ksrct.ac.in

60 CP 4P1	Operating Systems Lab	Category	L	Т	Ρ	Credit
60 CB 4F1	Operating Systems Lab	PC	0	0	4	2

- To recognize the fundamentals of operating systems.
- To describe the mechanisms of OS to handle processes and threads and their communication.
- To discuss the principles of concurrency and Deadlocks.
- To identify the mechanisms involved in memory management and its schemes.
- To identify I/O management, File systems and security issues.

Pre-requisites

• Basic knowledge of Computer Fundamentals

Course Outcomes

On the successful completion of the course, students will be able to Identify the basic concepts and design issues of operating systems. CO1 Apply Apply Process management concepts including scheduling, Inter process communication, deadlocks and multithreading in real world CO₂ Apply problems. Apply concepts of memory management including Virtual Memory and CO3 Apply Page Replacement to the issues that occur in Real time applications. CO4 Identify issues related to IO hardware Analyse CO5 Identify basic concepts of file system and disk management Apply

Марр	ing wi	th Pro	gramn	ne Out	comes	5											
<u> </u>		POs												PSO			
005	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
CO1	3	2	2	-	-	-	-	-	-	-	-	3	3	-	-		
CO2	3	3	3	3	-	-	3	-	-	2	-	2	3	-	-		
CO3	3	3	3	3	-	-	3	-	-	2	-	2	3	-	-		
CO4	3	2	3	-	-	-	-	-	-	-	-	2	3	-	-		
CO5	3	3	3	3	-	-	3	-	-	-	-	2	3	-	-		
3 - St	rong; 2	2 - Med	dium; 1	- Som	e												

Assessment Patte	ern						
Bloom's Category	Lab Experimer (Ma	its Assessment irks)	Model Examination	End Sem Examination (Marks)			
	Lab	Activity	(iviarks)	(warks)			
Remember	-	-	-	-	-		
Understand	-	-	-	-	-		
Apply	25	12	50		50		
Analyse	25	13	50		50		
Evaluate	-	-	-	-	-		
Create	-	-	-	-	-		
Total	50	25	100	-	100		



	K.S.	Rangasam	y College o	f Technolo	gy – Autor	nomous R2	018				
		B.Tech – (Computer S	cience and	Business	Systems					
		60	<u>CB 4P1 – C</u>	Derating S	Systems La	lb Ma	wine we Me	-			
Semest	er i		P	Hrs	Credit			Total			
IV	0	0	4	60	2	60	40	100			
List of I	Experiments:	1	1	I		1	I	I			
1. Analysis And Synthesis Of Basic Linux Commands											
2.	Programs Usir	r ng Shell Pro	ogramming								
3.	Implementatio	n Of UNIX S	System Call	S							
4.	Installation Of	Linux Oper	ating Syster	n							
5. Implementation Of POSIX Thread Functions For Create, Join And Exit											
6. Simulation And Analysis Of Non Pre-Emptive And Pre-Emptive CPU Scheduling Algorithms											
7. Simulation Of Producer – Consumer Problem Using Semaphores And Implementation Of											
	Dining Philosopher's Problem To Demonstrate Process Synchronization										
8.	Simulation Of	Banker's Al	gorithm For	Deadlock A	voidance						
9.	Analysis And S	Simulation (Of Memory A	Allocation A	nd Manage	ment Techr	niques				
10.	Implementatio	n Of Page I	Replacemen	nt Technique	es						
11.	Simulation Of	Disk Sched	uling Algorit	hms							
Design	Experiments:										
12.	Implementatio	n Of File O	rganization 7	Fechniques							
13.	Design An Eff	cient Traffi	c Control Sy	/stem To Av	void Traffic	Congestior	n In Metro (Cities. Use			
	Process Synchronization, Scheduling, Deadlock And Memory Management Concepts To										
	Implement The	e System									
Lab Ma	nual :										
1. "(K	Dperating Syst SRCT.	ems Lab M	anual", Depa	artment of C	Computer S	cience and	Business S	ystems,			

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Algorithms Lab PC 0 0 4 2	60 CB 4B2	Design and Analysis of	Category	L	Т	Ρ	Credit
-	60 CB 4F2	Algorithms Lab	PC	0	0	4	2

• To design algorithms in both the science and practice of computing.

•To choose the appropriate data structure and algorithm design method for a specified Application.

•To understand how the choice of data structures and algorithm design methods impacts the performance of programs.

• To solve problems using algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking and branch and bound.

• To solve NP-hard and NP-complete problems.

Pre-requisites

Basic knowledge of Data Structures

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Develop programs for sorting a given set of elements and analyze its time complexity.	Analyze
CO2	Solve and analyze the problems using greedy methods.	Analyze
CO3	Solve and analyze the problems using dynamic programming.	Analyze
CO4	Apply backtracking method to solve various problems.	Apply
CO5	Apply branch and bound method to solve 0/1 knapsack problem	Apply

Mapp	ing wi	th Pro	gramn	ne Out	comes	5									
<u> </u>	POs													PSOs	j
005	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	-	3	-	-	-	-	-	-	-	-	3	-	-
CO2	3	3	-	3	-	-	-	-	-	-	-	-	3	-	-
CO3	3	3	3	2	3	-	-	-	-	-	-	-	3	-	-
CO4	3	3	3	2	-	-	-	-	-	-	-	-	3	-	-
CO5	3	3	3	2	3	-	-	-	-	-	-	-	3	-	-
3 - St	rong; 2	2 - Mec	lium; 1	- Low											

Bloom's	Lab Experimen (Ma	ts Assessment rks)	Model Examination	End Sem Examination		
Category	Lab	Activity	(Marks)	(Ma	rks)	
Remember	-	-	-	-	-	
Understand	-	-	-	-	-	
Apply	25	12	50		50	
Analyse	25	13	50		50	
Evaluate	-	-	-	-	-	
Create	-	-	-	-	-	
Total	50	25	100	-	100	



	K.S.Rangasamy College of Technology – Autonomous R2022									
B.Tech. Computer Science and Business Systems										
	60 CB 4P2-Design and Analysis of Algorithms Lab									
Seme	ester				l otal Hrs	Credit			Total	
	V	0	0	4	60	2	60	40	100	
List o	List of Experiments:									
1	1. Implement Minimum Cost Spanning Tree Of A Given Undirected Graph Using Kruskal's									
	Alo	orithm And	Prim's Alac	orithm.				Ū		
2	` Im	plement The	Sorting Al	norithm To	Sort A Give	n Set Of Ele	ments And	Determine	The Time	
_	Re	quired To S	ort The Ele	ment.						
3	. Im	plement 0/1	Knapsack	Problem Us	ing Dynami	c Programn	ning.			
4	. Im	plement Bra	nch And Bo	ound To Fin	d The Optin	nal Solution	For The Tr	avelling Sal	esperson	
	Pr	oblem.								
5	. Im	plement N C	Queen's Pro	blem Using	Backtracki	ng.				
6	. Di	splay All The	e Nodes Re	achable Fro	om A Given	Starting No	de In A Dig	raph Using	BFS	
	Me	ethod.								
7	. Im	plement DFS	S Method T	o Check WI	hether A Giv	ven Graph I	s Connecte	d Or Not.		
8	. De	monstrate D	Dijkstra's Alę	gorithm To F	Find Shortes	st Paths Fro	om A Given	Vertex In A		
	W	eighted Coni	nected Gra	oh To Other	· Vertices.					
Desig	gn Ex	periments:								
1	. Co	mpute The	Transitive C	losure Of A	Given Dire	cted Graph	By Implem	enting Wars	shall's	
	Alę	gorithm.								
2	. Im	plement The	e Topologica	al Ordering	Of Vertices	In A Given	Digraph.			
Lab M	Manu	al								
1.	"Des Busi	sign and Ana ness Systen	alysis of Alg ns, KSRCT	orithms Lab	o Manual", E	Department	of Compute	er Science a	Ind	
*SDG	*SDG 4:- Quality Education									

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	Career Skill	Category	L	Т	Ρ	Credit
80 CG 0F3	Development III	CGC	0	0	2	1

• To help learners improve their logical reasoning skills at different academic and professional contexts.

• To help learners relate basic quantitative problems and solve them.

• To help learners Infer critically the statements with optimal conclusions and assumptions.

• To Solve the quantitative problems pertaining to calculations of averages, ratio and proportions, and profit and loss effectively

• To compute quantitative problems related to time and work, speed and distance, and simple and compound interest

Pre-requisites

• Basic knowledge of Arithmetic and Logical Reasoning

Course Outcomes

On the suc	On the successful completion of the course, students will be able to						
CO1	Deduce the topics in logical reasoning at the preliminary and intermediate level.	Understand					
CO2	Relate basic quantitative problems and solve them effectively at the preliminary level	Apply					
CO3	Infer critically the statements with optimal conclusions and assumptions with the data and information given.	Analyze					
CO4	Solve the quantitative problems pertaining to calculations of averages, ratio and proportions, and profit and loss effectively at the pre- intermediate level.	Apply					
CO5	Compute quantitative problems related to time and work, speed and distance, and simple and compound interest at intermediate level.	Apply					

Mapping with Programme Outcomes

<u> </u>	POs									PSOs					
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2	2	2	-	3	-	-	-	2	3	3	2	3	-
CO2	3	3	3	3	-	2	-	-	-	2	3	3	2	3	-
CO3	2	2	2	2	-	3	-	-	-	2	3	3	2	3	-
CO4	3	3	3	3	-	2	-	-	-	2	3	3	2	3	-
CO5	3	3	3	3	-	2	-	-	-	2	3	3	2	3	-
3 - St	3 - Strong; 2 - Medium; 1 - Some														

Assessment Pattern							
Bloom's	Continuous As (Ma	sessment Tests arks)	Model Examination	End Sem Examination			
Calegory	1	2	(Marks)	(Marks)			
Remember	-	-	-	-			
Understand	-	-	40	-			
Apply	-	-	20	-			
Analyse	-	-	40	-			
Evaluate	-	-	-	-			



Create	-	-	-	-
Total	-	-	100	-

Syllabus

K.S.Rangasamy College of Technology – Autonomous R2022									
60 CG 0P3 - Career Skill Development III									
Common to All Branches									
Som	ostor	ŀ	lours/Wee	k	Total	Credit	Ма	ximum Ma	rks
Selli	Salei	L	Т	Р	Hours	С	CA	ES	Total
P	/	0	0	2	30	1	100	00	100
Logical Reasoning Analogies - Alpha And Numeric Series - Number Series - Coding And Decoding - Blood Relations - Coded Relations - Order And Ranking – Odd Man Out - Direction And Distance.									[6]
Quantitative Aptitude – Part 1 Number System - Squares & Cubes - Divisibility - Unit Digits - Remainder Theorem - HCF [6] & LCM - Geometric And Arithmetic Progression - Surds & Indices.								[6]	
Critical Reasoning Syllogism - Statements And Conclusions, Cause And Effect, Statements And Assumptions - Identifying Strong Arguments And Weak Arguments – Cause And Action -Data Sufficiency								[6]	
Quantitative Aptitude – Part 2 Average - Ratio And Proportion – Ages – Partnership– Percentage - Profit & Loss – Discount - Mixture And Allegation.								[6]	
Quantitative Aptitude – Part 3 Time & Work - Pipes And Cistern – Time, Speed & Distance - Trains - Boats And Streams – Simple And Compound Interest.							[6]		
							То	tal Hours:	30
Reference(s):									
1. Aggarwal, R.S. 'A Modern Approach to Verbal and Non-verbal Reasoning', Revised Edition 2008, Reprint 2009, S.Chand & Co Ltd., New Delhi.									
2.	Abhiji	t Guha, 'Qι	antitative A	vptitude', Mo	cGraw Hill E	Education, 6	th edition,2	016	
3.	Dines	sh Khattar, '	Quantitative	e Aptitude F	or Competi	tive Examin	ations', Pea	arson Educa	ation 2020
4.	Anne	Thomson,	Critical Rea	asoning: A I	Practical Int	roduction' L	exicon Boc	oks, 3rd edit	ion, 2022.

*SDG 4: Quality Education

Warzsaw

4.

**SDG 8: Decent work and Economic growth

***SDG 9: Industry, Innovation and Infrastructure



Course Contents and Lecture Schedule							
S. No.	Topics	No. of hours					
1	Logical Reasoning						
1.1	Analogies - Alpha And Numeric Series	1					
1.2	Number Series - Coding And Decoding	1					
1.3	Blood Relations - Coded Relations	1					
1.4	Order And Ranking – Odd Man Out	2					
1.5	Direction And Distance	1					
2.0	Quantitative Aptitude – Part 1						
2.1	Number System	1					
2.2	Squares & Cubes - Divisibility	1					
2.3	Unit Digits - Remainder Theorem	1					
2.4	HCF & LCM- Geometric And Arithmetic Progression	2					
2.5	Surds & Indices	1					
3.0	Critical Reasoning						
3.1	Syllogism	1					
3.2	Statements And Conclusions, Cause And Effect	1					
3.3	Statements And Assumptions	1					
3.4	Identifying Strong Arguments And Weak Arguments	2					
3.5	Cause And Action -Data Sufficiency	1					
4.0	Quantitative Aptitude – Part 2						
4.1	Average - Ratio And Proportion	1					
4.2	Ages – Partnership	1					
4.3	Percentage	1					
4.4	Profit & Loss	2					
4.5	Discount - Mixture And Allegation	1					
5.0	Quantitative Aptitude – Part 3						
5.1	Time & Work	1					
5.2	Pipes And Cistern	1					
5.3	Time, Speed & Distance - Trains	1					
5.4	Boats And Streams	2					
5.5	Simple Interest And Compound Interest	1					

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S.No.	Course Code	Name of the Course	Duration of Internal Exam	Weightag	5	Minimum Marks for Pass in End Semester Exam						
			Exam	Continuous Assessment *	End Semes ter Exam **	Max. Marks	End Semes ter Exam	Total				
THEORY												
1	60 CB 501	Computer Networks	2	40	60	100	45	100				
2	60 CB 502	C# and .NET Programming	2	40	60	100	45	100				
3	60 CB 503	Artificial Intelligence	2	40	60	100	45	100				
4	60 IT 003	Design Thinking	2	50	50	100	45	100				
5	60 CB E1*	Professional Elective I	2	50	50	100	45	100				
6	60 OE L*	Open elective-II	2	40	60	100	45	100				
7	60 MY 003	Startups and Entrepreneurship	2	100	-	100	-	-				
			PRACTICA	LS								
8	60 CB 5P1	Computer Networks Laboratory	2	60	40	100	45	100				
9	60 CB 5P2	C# and .NET Programming Laboratory	2	60	40	100	45	100				
10	60 CG 0P1	Career Skill Development -I	1	100	-	100	-	100				
11	60 CG 0P6	Internship	-	100	-	100	-	100				

FIFTH SEMESTER

* CA evaluation pattern will differ from course to course and for different tests. This will have to be declared in advance to students. The department will put a process in place to ensure that the actual test paper follow the declared pattern.

** End Semester Examination will be conducted for maximum marks of 100 and subsequently be reduced to



60 marks for the award of terminal examination marks

60 CB 501	Computer Networks	Category	L	Т	Ρ	Credit
60 CB 501		PC	3	0	0	3

Objectives

- To understand the computer networking basics and concepts of data communications, functions of different layers. IEEE
- To know the standards employed in computer networking
- To make the students to get familiarized with different protocols and network components
- To develop an understanding of different components of computer networks, various protocols, modern technologies and their applications
- To understand the application layer and its applications

Pre-requisites

• Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Know the concept of components, categories and ISO/OSI model of	Remember
	networks.	
CO2	Describe the Concept of various error detection techniques and Flow,	Understand
	Error control.	
CO3	Compare the concept of Circuit switching and Packet switching.	Apply
CO4	Gain the knowledge of Congestion control and QoS Techniques.	Remember
CO5	Identify the Purpose of Domain Name Space, Email and FTP.	Remember

Mapping with Programme Outcomes

<u> </u>						P	Os						PSOs		
003	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	3	-	-	-	-	-	-	-	-	-	2	2	-	-
CO2	2	3	-	-	-	-	-	-	-	-	-	2	2	-	-
CO3	2	3	-	-	-	-	-	-	-	-	-	3	2	-	-
CO4	-	3	-	-	2	-	-	-	-	-	-	3	2	-	-
CO5	-	3	-	-	2	-	-	-	-	-	-	3	2	-	-
3 - St	rong; 2	2 - Mec	lium; 1	- Som	e										

Assessment Pattern									
Bloom's	Continuous As (M	ssessment Tests arks)	End Sem Examination (Marks)						
Calegory	1	2							
Remember	10	10	20						
Understand	10	10	20						
Apply	40	40	60						
Analyse	-	-	-						
Evaluate	-	-	-						
Create	-	-	-						
Total	60	60	100						



Syllabus											
K.S.Rangasamy College of Technology – Autonomous R2022											
			B.Tech – C	computer S	science and	d Business	Systems				
				60 CB 501 -	Computer	Networks					
Some	octor	ŀ	lours/Wee	k	Total	Credit	Ma	ximum Ma	rks		
Sente	53101	L	Т	Р	Hours	С	CA	ES	Total		
V	/	3	0	0	45	3	40	60	100		
Data	Comn	nunication	s*								
Netw	orks –	Componen	ts And Cate	gories – Lin	e Configura	tion – Topo	logies –Pro	tocols And	[9]		
Stand	lards _,	– ISO / OS	Model –	Transmissio	on Media –	Coaxial Ca	able – Fibe	r Optics –	[0]		
Interf	aces (RS232 Star	ndard) And	Modems.							
Data	Link	_ayer*	•				a . —				
Error	– Det	ection And	Correction -	- Parity - L		– Hamming	Code – Flo	ow Control	[0]		
			op And wa		CK-N ARQ -	- Selective	Repeat AR	Q- Sliding	[9]		
Prida	ом — г ос	IDLC – LAI	N - Ethernei		5- Connect	ing Devices	s-Repeater				
Notw	es. ork La										
Intern		ayer ka Circui	t Switching	Packet	Switching		ssing Mothe	ode Sub			
Nettir	ting Super Netting Pouters, Pouting Algorithms Distance Vector Pouting Link [9]										
State Routing- ICMP/ Frame Format, Query Messages.											
Iransport Layer [*]											
Dulle		DD) Trop	ayer – Muli	.ipiexing – i potrol Proto		Congostio	els – User	Datagram	[9]		
Servi	0) 100 Ces (0	DF) – Halls DOS)-Techn				Congestion					
Appli			19400.								
Doma	ain Na	me Space			·P)-File Tra	nsfer Proto	COL (FTP)	_ НТТР _			
	2S-Wo	rld Wide Wi	eh Case St	udv: Structu	ral Health	Monitorina	Traffic Cont	rol Health	[9]		
Care.	Pipeli	ine Monitori	ng, Precisio	on Agricultu	re.	normoning,		ioi, rioaitii			
-	•		0.	0			Το	tal Hours:	45		
Text	Book((s):									
	Behro	ouz A. Foro	uzan, "Data	communica	ation and N	etworking U	Ipdate", Tat	a McGraw-H	lill, Third		
1.	Editic	on, 2006.				Ũ	•		,		
2.	Suda	kshina Kun	du, "Fundar	mentals of (Computer N	etworks", P	HI, Second	Edition.			
Refe	ence((s):									
1	Jame	es F. Kurose	e and Keith	W. Ross, "(Computer N	etworking:	A Top-Dow	n Approach	Featuring		
1.	the Ir	nternet", Pea	arson Educ	ation, 2003							
2	Larry	L.Petersor	and Peter	S. Davie,	"Computer	Networks",	Harcourt A	sia Pvt. Ltd	., Second		
۷.	Editic	on.									
3.	Andre	ew S. Tanei	nbaum, "Co	mputer Net	works", PH	I, Fourth Ed	lition, 2003.				
4.	Willia	m Stallings	, "Data and	Computer C	Communica	tion", Sixth	Edition, Pea	arson Educa	tion, 2000		
*SDG	i4 – Q	uality Educa	ation								



S. No.	o. Topics							
1.0	Data Communications	hours						
1.0	Networks	1						
1.1	Components And Categories	1						
1.2		1						
1.5								
1.4	Protocol And Standards	1						
1.5	ISO / OSI Model	1						
1.0	Transmission Media – Coaxial Cable	1						
1.7	Fiber Optics	1						
1.0	Interfaces(RS232 Standard) And	1						
20	Data Link Laver	I						
2.0	Error – Detection And Correction	1						
2.1	Parity – I RC	1						
2.2	CRC - Hamming Code	1						
2.5	Flow Control And Error Control- Stop And Wait	1						
2.4	Go Back-N ARQ	1						
2.5	Selective Repeat ARQ- Sliding Window	1						
2.0	Hdlc - I an	1						
2.7	Ethernet IEEE 802.3. Connecting Devices	1						
2.0	Repeaters-Hubs-Bridges	1						
3.0	Network Laver							
3.1	Internetworks – Circuit Switching	1						
3.1	Packet Switching	1						
3.3	IP Addressing Methods	1						
3.4	Sub Netting -Super Netting	1						
3.5	Routers- Routing Algorithms	1						
3.6	Distance Vector Routing	1						
37	Link State Routing	1						
3.8	ICMP / Frame Format.	1						
3.9	Query Messages	1						
4.0	Transport Layer							
4.1	Duties Of Transport Layer	1						
4.2	Multiplexing	1						
4.3	Demultiplexing	1						
4.4	Sockets	1						
4.5	User Datagram Protocol (Udp	1						
4.6	Transmission Control Protocol (Tcp)	1						
4.7	Congestion Control	1						



4.8	Quality Of Services (QOS)	1				
4.9	Quality of services (QOS Techniques)					
5.0	Application Layer					
5.1	Domain Name Space (Dns)	1				
5.2	Email (SMTP)-File Transfer Protocol (FTP)	1				
5.3	Http – Https	1				
5.4	World Wide Web	2				
5.5	Case Study: Structural Health Monitoring	1				
5.6	Traffic Control	1				
5.7	Test The Prototype	1				
5.8	Health Care	1				
5.9	Pipeline Monitoring, Precision Agriculture	1				

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60 CB 502	C# and.NET	Category	L	Т	Ρ	Credit
80 CB 302	Programming	PC	3	0	0	3

- To gain the fundamental skills in C# programming Language
- To understand object-oriented concepts in C#
- To develop cross-platform web-pages using ASP.NET Core platform
- To implement data access and manipulation using EF Core and Razor pages
- To develop cross-platform web-apps using MVC architecture in ASP.NET Core platform

Pre-requisites

• Basic knowledge of C or C++ or any programming language or programming fundamentals.

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Know the basic programming concepts of C#	Remember
CO2	Understand the Object-Oriented concepts in C#.	Understand
CO3	Develop cross-platform web pages using Razor pages in ASP.NET Core platform.	Apply
CO4	Implement the data manipulation concept using EF Core and Razor Pages.	Apply
CO5	Implement the MVC based web-apps using ASP.NET Core platform.	Apply

Mapping with Programme Outcomes

<u> </u>						P	Os						PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1	-	3	2	2	1	-	1	3	-	-	1	3	-	-
CO2	2	-	3	2	2	1	-	1	3	-	-	1	3	-	-
CO3	2	-	3	2	2	1	-	1	3	-	-	1	3	-	-
CO4	2	-	3	2	3	1	-	1	3	-	-	1	3	-	-
CO5	2	-	3	2	3	1	-	1	3	-	-	1	3	-	-
3 - St	rong; 2	2 - Mec	lium; 1	- Som	е										

Bloom's	Continuous As (Ma	sessment Tests arks)	End Sem Examination (Marks)
Calegory	1	2	
Remember	15	10	20
Understand	25	20	45
Apply	20	30	35
Analyse	-	-	-
Evaluate	-	-	-
Create	-	-	-
Total	60	60	100

Sylla	abus									
		K.S.F	Rangasamy	/ College o	f Technolo	gy – Autor	nomous R2	2022		
			B.Tech – C	computer S	Science and	d Business	Systems			
			60 (CB 502- C#	and.NET F	Programmi	ng			
Som	ostor	ŀ	lours/Weel	k	Total	Credit	Ma	ximum Ma	rks	
Sem	ester	L	Т	Р	Hours	С	CA	ES	Total	
\ \	V	3	0	0	45	3	40	60	100	
Intro	ductio	n to C# **								
Intro	ducing	C# - Overv	view Of C#	- Literals,	Variables A	and Data Ty	/pes - Ope	rators And	101	
Expr	essions	s - Branch	ing And Lo	oping - Me	ethods - Ar	rays - Strir	ngs - Struc	tures And	[9]	
Enur	neratio	ns.								
Obje	ect Orie	ented Aspe	cts of C# *	*						
Class	ses An	d Objects -	Inheritance	And Polym	orphism - I	nterfaces -	Operator O	verloading	[9]	
- Del	egates	And Event	s - Errors A	nd Exceptio	ons Collec	tions – Mar	naging Files	system.		
ASP	.NET C	ore Web A	pplication	using Raz	or Pages: *					
Intro	duction	To ASP.N	ET Core W	eb Applicat	ion – Enviro	onment Set	up – Projec	t Layout –	[9]	
Static And Default Files - Enabling And Defining Razor Pages – Shared Layouts – Using								[•]		
Code	Code-Behind Files.									
Usin	Using Entity Framework Core: **									
Setting Up EF Core: Defining And Building EF Core Models - Defining The Entity And									[0]	
Cont	ext Cla	isses - Ma	nipulating L	Jata With I	=F Core -	I ransaction	s. Manipula	ating Data	[9]	
	g Razo	r Pages: C	nget –Onp	ost – Onpo	staelete – (Onpostealt	- Onpostvi	ew. REST		
API-		Controlla		ASD NET	Corol *					
Intro	duction		Sotting II	ASP.NEI (n An ASP	NET Core I	MVC Webs		Pouting		
Cont	rollore	And Action	- Setting U	Views E	Parameters			Kouting –	[9]	
Valid	lation				arameters	rassing – v				
vanu							То	tal Hours:	45	
Text	Book(s).					10	tai nours.		
IOA	Mark	J. Price "C	#80 and 1	NET Core 3	<u> 0 – Moder</u>	n Cross-Pla	atform Deve	lopment" 4	th Edition	
1.	Packt	Publishing	Limited, 20	19.	model			sophione, i		
2.	Dino	Esposito, "I	Programmin	g ASP.NET	۲ Core", 1st	Edition, Pe	arson Educ	ation Inc., 2	018.	
Refe	rence(s):								
1.	E. Ba	lagurusam	y, "Program	ming in C#'	', 4th Editior	n, Tata McO	Graw-Hill, 20	017.		
2	Andre	w Troelse	n Phil Japi	kse, "Pro (C# 8 with	NET Core	3: Founda	itional Princ	iples and	
۷.	Pract	ices in Prog	gramming", .	Apress, 202	20.					
3.	Jon S	keet, "C# in	ו Depth",Fo	urth Edition	i, Manning F	Publications	Co. 2019.			
4.	Chris	tian Nagel,	"Profession	al C# 7 and	I.NET Core	e 2.0", 1st E	dition, Wile	y Publicatio	n, 2018.	
*SDC	39–Ir	dustry Inno	vation and	Infrastructu	ire					

**SDG 4 – Quality Education



Course C	Course Contents and Lecture Schedule							
S. No.	Topics	No. of hours						
1.0	Introduction to C#							
1.1	Introducing C# - Overview Of C# - Literals, Variables	1						
1.2	Data Types, Operators And Expressions	1						
1.3	Branching And Looping	3						
1.4	Methods - Arrays - Strings	3						
1.5	Structures And Enumerations	1						
2.0	Object Oriented Aspects of C#							
2.1	Classes And Objects	1						
2.2	Inheritance And Polymorphism	2						
2.3	Interfaces, Operator Overloading							
2.4	Delegates And Events Errors And Exceptions	2						
2.5	Collections, Managing File System	2						
3.0	ASP.NET Core Web Application using Razor Pages:							
3.1	Introduction To ASP.NET Core Web Application	1						
3.2	Environment Setup , Project Layout	1						
3.3	Static And Default Files	1						
3.4	Enabling And Defining Razor Pages	1						
3.5	Shared Layouts	2						
3.6	Using Code-Behind Files	3						
4.0	Using Entity Framework Core:							
4.1	Defining And Building EF Core Models	1						
4.2	Defining The Entity And Context Classes	2						
4.2	Manipulating Data With EF Core - Transactions	3						
4.3	Onget –Onpost – Onpostdelete – Onpostedit – Onpostview	1						
4.4	REST API – Model And Controller For REST API	3						
5.0	Model-View-Controller (MVC) in ASP.NET Core:							
5.1	Introduction To MVC	.5						
5.2	Setting Up An ASP.NET Core MVC Website	.5						
5.3	Mvc Routing	1						
5.4	Controllers And Actions	2						
5.5	Model – Views	1						
5.6	Parameters Passing	1.5						
5.7	View Helpers	1.5						
5.8	Model Validation	1						

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60 CB 502	Artificial Intelligence	Category	L	Т	Ρ	Credit
00 CB 303	Artificial Intelligence	PC	3	0	0	3

- To learn the basic AI approaches.
- To develop problem solving agents
- To implement game playing and CSP techniques
- To perform logical reasoning
- To develop systems with probabilistic reasoning

Pre-requisites

• Basic knowledge of Statistics and modeling and programming languages

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Understand the concepts of intelligent agents and problem solving aspects	Understand
CO2	Apply problem solving techniques	Apply
CO3	Apply game playing and CSP techniques	Apply
CO4	Perform logical reasoning	Remember
CO5	Perform probabilistic reasoning under uncertainty	Remember

Mapping with Programme Outcomes

CO2						F	os						PSOs		
005	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	-	-	-	2	2	-	2	-	1	2	I	-
CO2	3	2	3	-	-	-	2	2	-	2	-	1	2	2	-
CO3	3	2	2	-	-	-	2	1	-	2	-	1	2	-	-
CO4	3	2	2	-	-	-	2	1	-	2	-	1	2	-	-
CO5	3	2	2	-	-	-	2	1	-	2	-	1	2	2	-
3 - St	rong; 2	2 - Mec	dium; 1	- Som	ne										

Assessment ratte	111		
Bloom's	Continuous As (Ma	sessment Tests rks)	End Sem Examination (Marks)
Calegory	1	2	
Remember (Re)	10	10	20
Understand (Un)	20	20	30
Apply (Ap)	20	20	40
Analyse (An)	-	-	-
Evaluate (Ev)	-	-	-
Create (Cr)	10	10	10
Total	60	60	100



Syllabus									
	K.S.R	angasamy	College o	f Technolo	gy – Autor	nomous R2	2022		
		B.Tech – C	omputer S	cience and	l Business	Systems			
		6	0 CB 503-	Artificial Ir	ntelligence	•			
Somost	or H	lours/Wee	k	Total	Credit	Ma	ximum Ma	rks	
Semes	L	Т	Р	Hours	C	CA	ES	Total	
V	3	0	0	45	3	40	60	100	
Intellige	ent Agents *								
Introduc	tion to AI – A	gents and	Environme	ents – Con	cept of Ra	tionality –	Nature of		
Environ	ments – Struc	ture of Age	ents. Proble	em Solving	Agents –	Search Alg	orithms –	[9]	
Uninforr	ned Search St	rategies. L	ab Exercis	e: Impleme	nt Basic Se	earch Strate	egies – 8-		
Puzzle,	Puzzle, 8 - Queens Problem, Cryptarithmetic.								
Problem	n Solving *		–						
Heuristi	c Search Stra	itegies – I	Heuristic F	unctions. L	ocal Searc	ch and Op		[0]	
Problem	IS – LOCAI Seal	rcn in Cont	nuous Spa	ce – Searci		Determinis		[9]	
- Searc	n in Partially C	Joservable	Environme	ents – Onlin	e Search A	Agents and	Unknown		
Como F	nenis Lab Exe		ement A a	ind memory	Bounded P	A Algoninn	15		
Game T	hoory Optim	ol Docision	in Como		Rota Soarch	Monto (Carlo Troo		
Search	- Stochastic	Games -	Partially O	s – Alpha-L bservable	Games Co	nstraint S	atisfaction		
Problem	s – Constraint	Propagatio	n – Backtr	acking Sea	rch For CSI	P – Local S	earch For	[9]	
CSP – Structure of CSP Lab Exercise : Implement Minimax Algorithm For Game Plaving									
(Alpha-Beta Pruning)									
Logical	Reasoning *								
Knowled	dge-Based Age	ents – Pro	positional	Logic – Pr	opositional	Theorem	Proving –		
Proposi	tional Model Cl	necking – A	gents Base	ed on Propo	sitional Lo	gic. First-O	rder Logic	[0]	
 – Synta 	x And Semanti	cs – Know	ledge Repr	esentation	and Engine	ering – Infe	erences in	[9]	
First-Or	der Logic – Fo	rward Chai	ning – Bacl	kward Chair	ning – Resc	olution. Lab	Exercise:		
Impleme	ent Proposition	al Model Cl	hecking Alg	jorithms.					
Probab	ilistic Reason	ing *							
Acting l	Jnder_Uncerta	inty – Bay	esian Infer	ence – Nai	ive Bayes	Models. Pr	obabilistic	[9]	
Reason	ing – Bayesian	Networks	- Exact Infe	erence in Bl	V – Approxi	mate Infere	nce In BN	[0]	
– Causa	l Networks. La	b Exercise :	Implement	Bayesian N	letworks an	d Perform I	nferences		
T (1						Tot	al Hours:	45	
lextbo	ok(s):								
1. S	tuart Russell a	nd Peter No	orvig, "Artifi	cial Intellige	ence – A Mo	odern Appro	oach″, Four	th Edition,	
P	earson Educat	ion, 2021					0.4.0		
2. D	eepak Khemar	ni, "Artificial	Intelligenc	e", Tata Mc	Graw Hill E	ducation, 2	013.		
Referen			-4: 4 - 4 - 4						
	an vv. Pattersc	in, introdu		and ES, Pe	arson Educ				
2. K	evin Night, Ela	ine Kich, al	iu Nall B.,		eiligence",	IVICGRAW HI	11, 2008		
3. P	atrick H. WINSt	on, "Artificia /	ai inteiligen	ce', i nird E	altion, Peal	rson Equca	1100, 2006		
4. h	tp://nptel.ac.in/	/							

*SDG 4 – Quality Education



Course	Jontents and Lecture Schedule	
5. NO.	I OPICS	No. of hours
1.0	Intelligent Agents	
1.1	Introduction To Al	1
1.2	Agents And Environments	1
1.0	Nature Of Environments	1
1.5	Structure Of Agents	1
1.6	Problem Solving Agents – Search Algorithms	2
1.7	Uninformed Search Strategies	2
2.0	Problem Solving	
2.1	Heuristic Search Strategies	2
2.2	Heuristic Functions	1
2.3	Local Search And Optimization Problems	1
2.4	Local Search In Continuous Space	1
2.5	Search With Non-Deterministic Actions	1
2.6	Search In Partially Observable Environments	1
2.7	Online Search Agents And Unknown Environments	2
3.0	Game Playing and CSP	
3.1	Game Theory	1
3.2	Optimal Decisions In Games	2
3.3	Alpha-Beta Search - Monte- Carlo Tree Search	1
3.4	Stochastic Games - Partially Observable Games	1
3.5	Constraint Satisfaction Problems – Constraint Propagation	1
3.6	Backtracking Search For CSP	2
3.7	Local Search For CSP – Structure Of CSP	1
4.0	Logical Reasoning	I
4.1	Knowledge-Based Agents	1
4.2	Propositional Logic – Propositional Theorem Proving	1
4.3	Propositional Model Checking	1
4.4	Agents Based On Propositional Logic	1
4.5	First-Order Logic – Syntax And Semantics	1
4.6	Knowledge Representation And Engineering	1
4.7	Inferences In First-Order Logic	1
4.8	Forward Chaining – Backward Chaining	1
4.9	Resolution	1
5.0	Probabilistic Reasoning	
5.1	Acting Under Uncertainty	1
5.2	Bayesian Inference	1
5.3	Naïve Bayes Models	2
5.4	Probabilistic Reasoning	2
5.5	Bayesian Networks	1
5.6	Exact Inference In BN – Approximate Inference In BN	1
5.7	Causal Networks	1
Course	Designer(s)	

1. R.Loga priya – logapriyar@ksrct.ac.in



60 IT 002	Decian Thinking	Category	L	Т	Р	Credit
0011 003	Design minking	PC	2	0	2	3

- To learn design thinking concepts and principles.
- To design thinking methods in every stage of the problem.
- To learn the different phases of design thinking.
- To learn the application of design thinking for the IT industry
- To apply various methods in design thinking to different problems.

Pre-requisites

• Basic knowledge of mathematics and programming.

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Apply design thinking for product development	Understand
CO2	Use design thinking tools	Understand
CO3	Identify need for products and disruption	Apply
CO4	Design innovative products	Analyze
CO5	Apply design thinking to improve on existing products in IT	Apply

Mapping with Programme Outcomes

C0e						P	Os						PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	3	3	3	3	3	3	3	-	-	3	2	-
CO2	3	2	3	2	3	3	3	2	3	3	-	-	2	3	-
CO3	3	3	3	2	3	3	2	3	-	-	-	-	3	3	-
CO4	3	3	3	3	3	3	3	-	3	-	-	-	2	2	-
CO5	3	3	3	3	3	-	3	-	-	-	-	-	3	3	-
2 64	rona. (Sam											

3 - Strong; 2 - Medium; 1 – Some

Bloom's	Contii	nuous As: (Ma	sessment rks)	Tests	Mo Exami	del nation	End Sem Examination (Marks)		
Category	Tes	st 1	Tes	st 2	(Ma	rks)			
	Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab	
Remember	-	-	-	-	-	-	-	-	
Understand	40	-	40	-	60	-	60	-	
Apply	20	50	20	50	40	50	40	50	
Analyse	-	50	-	50	-	50	-	50	
Evaluate	-	-	-	-	-	-	-	-	
Create	-	-	-	-	-	-	-	-	
Total	60	100	60	100	100	100	100	100	



Syllabus									
K.S.Rangasamy College of Technology – Autonomous R2022									
60 IT 003 – Design Thinking									
Common to IT,AI&DS,CSBS Branch									
Semester	F	lours/Weel	<u>(</u>	Total	Credit	Ma	aximum Ma	rks	
	L	1		Hours		CA	ES	1 otal	
V 2 0 2 00 5 50 50									
Why Docide		uoctione Tr		Principlos Of	Docian Th	inking The	Drococc	[6]	
of Design T	hinking - H	ow To Plan	A Design T	Thinking Dro	Design III	inking - The	FIUCESS	[0]	
Understan	d Observe	and Dofin	A Design I		jeci.				
Soarch Ei	u, Observe	nation - Dr.	oblem Clar	ification - I	Inderetandi	ng of the	Problem		
Problem A	nalvsis - R	eformulatio	n of The F	Problem - (bservation	Phase - F	-moathetic	[6]	
Design - Ti	ps For Obse	erving - Met	hods For E	Empathetic I	Design - De	scription of	Customer	[-]	
Needs.		0		•	0				
Ideation ar	nd Prototyp	oing **							
Ideate Pha	ase - The C	reative Pro	cess and (Creative Pri	nciples - Ci	reativity Te	chniques -	[6]	
Evaluation	of Ideas - P	rototype Ph	ase – Learr	n Startup Me	ethod For Pi	rototype De	velopment	[0]	
- Visualizati	on and Pre	sentation Te	echniques.						
Testing an			T'			Destablish	T		
Test Phase	- TIPS For	Interviews -	Tips For S	Surveys - Ka	ano Model -	Desirabilit	y lesting -	[6]	
How to Con	duct vvorks	nops - Requ	Jirements to	or the Space	e - Material	Requireme	nts - Agility		
for Design	i ninking.								
Future			·:	N 0					
Design Thi	nking Meets	s the Corpo	ration – Th	ie New Soc	ial Contract	t – Design	Activism –	[6]	
Designing	omorrow.								
Practical:		-							
1. 2030 Sch	nools Challe	enge: Conce	pt: Design	thinking is a	often preser	nted withou	t teaching		
content. Th	is is very di	fferent. Lea	rners get 3	0 minutes t	o choose a	UN 2030 C	Soal (there		
are 17) that	is relevant	and meanir	igful to ther	n, then they	get into sm	all groups.	The group		
researches	the goal q	uickly, by a	nswering th	he question	s: What do	es the wor	ld need to		
know about	t this goal a	ind what ca	n we do ab	out it? The	group then	creates a	short PSA		
(Public Ser	vice Annoui	ncement) ar	nd shares if	t widely with	an authen	tic audience	e. It is fun,		
fast, and sh	lows the po	wer of desig	in sprints to	b teach cont	ent and skil	ls.			
2. THE GIF	T-GIVING	PROJECT	VIA STANF	FORD D-SC	HOOL Cor	cept: The	Gift-Giving		
Project is 9	0-minute (p	lus debrief)	fast-paced	project thro	ough a full d	esign cycle	e. Students		
pair up to ir	nterview ead	ch other, co	me to a po	int-of-view o	of how they	might desig	gn for their		
partner, ide	ate, and pr	ototype a n	ew solution	n to "redesi	gn the gift o	giving expe	rience" for	30	
their partne	r.								
3. THE WA	LLET PROJ	IECT VIA ST	ranford	D-SCHOOL	. Concept: \	/ery similar	to the Gift-		
Giving Proje	ect, the Wall	let Project is	90-minute	(plus Tenta	tive 48 debr	ief) fast-pa	ced project		
through a fu	ull design cy	/cle. Studen	its pair up,	show and te	ell each othe	er about the	eir wallets,		
ideate, and	make a nev	w solution th	າat is "usefເ	ul and mear	ingful" to th	eir partner.			
4. INVENT	A SPORT	(WITH JUS	T THESE I	ITEMS) Cor	ncept: We'v	e all played	d sports at		
some point	in our life.	Who came	up with the	e rules? Wh	o created th	ne game? N	Nho made		
the constra	ints? And v	who decide	d the objec	ts to play v	vith? Now,	with limited	d time and		
resources,	your group	will create a	nd invent a	new sport,	and a set o	f directions	for people		
to actually p	play the gan	ne.							
5. "BOOK I	N AN HOU	R" ACTIVIT	Y (VIA ALI	WHO WO	NDER) Cor	ncept: Give	a group a		
book (fiction	n or non-fict	ion). Then y	/ou break th	nem up into	smaller gro	ups (or indi	ividuals) to		





read different parts of the book. Each group (or person) has to read and then create an overview/trailer of their part of the book to share chronologically with the rest of the class. Here the design really starts with the creative process driving how you share the information, plot, characters etc. Perfect use for professional development when you want to introduce a topic in a fun, engaging way.

6. CHILDREN'S STORY DESIGN ACTIVITIES Concept: The University of Arkansas created a series of STEM Challenges that work as great design activities with groups old and young! For example after reading "The Three Billy Goat's Gruff" they set up a challenge like this: You decide to help the billy goats reach the opposite side of the creek so they can eat. You must create a model structure to help the billy goats get from one side to the other while using the design loop and only the materials provided. Your teacher will also provide you with model billy goats, with specific weights, that your bridge must be able to withstand. 7. New Product Development Activity: Student teams were given products ranging from toys to air fresheners. In 2 days, they had to create pitches on how to improve these products. The idea was to give them a clear sense of the scope of what they would do in a product development.

	Total Hours:(Theory – 30 + Practical – 30)	60
Text	Book(s):	
1.	Christian Mueller-Roterberg, Handbook of Design Thinking - Tips & Tools for how to o	design
	thinking. [Unit 1, 2, 3, 4]	
2	Designing for Growth: a design thinking tool kit for managers By Jeanne Liedtka and	Tim
۷.	Ogilvie. [Unit 1]	
2	Change by Design: How Design Thinking Transforms Organizations and Inspires Inne	ovation by
З.	Tim Brown. [Unit 5]	-
Refe	rence(s):	
1.	Johnny Schneider, "Understanding Design Thinking, Lean and Agile", O'Reilly Media,	, 2017.
2	Roger Martin, "The Design of Business: Why Design Thinking is the Next Competitive	3
Ζ.	Advantage", Harvard Business Press, 2009.	
2	Hasso Plattner, Christoph Meinel and Larry Leifer (eds), "Design Thinking: Understar	ıd –
з.	Improve – Apply", Springer, 2011.	
4.	Alistair Cockburn, "Agile Software Development", 2nd ed, Pearson Education, 2007.	
5.	http://ajjuliani.com/design-thinking-activities	
6.	https://venturewell.org/class-exercises	
* SD	G-4 – Quality Education	

* * SDG-8 – Employment and decent work for all

* * * SDG-9 - Industrialization and foster innovation

Course Contents and Lecture Schedule						
S. No.	Topics					
1.0	Introduction to Design Thinking					
1.1	Why Design? - Four Questions	1				
1.2	Ten Tools	1				
1.3	Principles Of Design Thinking	2				
1.4	The Process Of Design Thinking	1				
1.5	How To Plan A Design Thinking Project.	1				
2.0	Understand, Observe and Define The Problem					
2.1	Search Field Determination	1				

2.2	Problem Clarification - Understanding Of The Problem	1
2.3	Problem Analysis - Reformulation Of The Problem	1
2.4	Observation Phase - Empathetic Design	1
2.5	Tips For Observing, Methods For Empathetic Design	1
2.6	Description Of Customer Needs	1
3.0	Ideation and Prototyping	
3.1	Ideate Phase	1
3.2	The Creative Process And Creative Principles	1
3.3	Creativity Techniques	1
3.4	Evaluation Of Ideas, Prototype Phase	1
3.5	Learn Startup Method For Prototype Development	1
3.6	Visualization And Presentation Techniques.	1
4.0	Testing and Implementation	
4.1	Test Phase - Tips For Interviews	1
4.2	Tips For Surveys - Kano Model	1
4.3	Desirability Testing - How To Conduct Workshops	1
4.4	Requirements For The Space	1
4.5	Material Requirements	1
4.6	Aaility For Design Thinking	1
5.0	Future	
5.1	Design Thinking Meets The Corporation	2
5.2	The New Social Contract	2
5.3	Design Activism	1
5.4	Designing Tomorrow	1
Practical		
1	2030 Schools Challenge: Concept: Design thinking is often presented without teaching content. This is very different. Learners get 30 minutes to choose a UN 2030 Goal (there are 17) that is relevant and meaningful to them, then they get into small groups. The group researches the goal quickly, by answering the questions: What does the world need to know about this goal and what can we do about it? The group then creates a short PSA (Public Service Announcement) and shares it widely with an authentic audience. It is fun, fast, and shows the power of design sprints to teach content and skills.	4
2	THE GIFT-GIVING PROJECT VIA STANFORD D-SCHOOL Concept: The Gift- Giving Project is 90-minute (plus debrief) fast-paced project through a full design cycle. Students pair up to interview each other, come to a point-of-view of how they might design for their partner, ideate, and prototype a new solution to "redesign the gift giving experience" for their partner.	4
3	THE WALLET PROJECT VIA STANFORD D-SCHOOL Concept: Very similar to the Gift- Giving Project, the Wallet Project is 90-minute (plus Tentative 48 debrief) fast-paced project through a full design cycle. Students pair up, show and tell each other about their wallets, ideate, and make a new solution that is "useful and meaningful" to their partner.	4
4	INVENT A SPORT (WITH JUST THESE ITEMS) Concept: We've all played sports at some point in our life. Who came up with the rules? Who created the game? Who made the constraints? And who decided the objects to play with? Now, with limited time and resources, your group will create and invent a new	4



9

	sport, and a set of directions for people to actually play the game.	
5	"BOOK IN AN HOUR" ACTIVITY (VIA ALL WHO WONDER) Concept: Give a group a book (fiction or non-fiction). Then you break them up into smaller groups (or individuals) to read different parts of the book. Each group (or person) has to read and then create an overview/trailer of their part of the book to share chronologically with the rest of the class. Here the design really starts with the creative process driving how you share the information, plot, characters etc. Perfect use for professional development when you want to introduce a topic in a fun, engaging way.	4
6	CHILDREN'S STORY DESIGN ACTIVITIES Concept: The University of Arkansas created a series of STEM Challenges that work as great design activities with groups old and young! For example after reading "The Three Billy Goat's Gruff" they set up a challenge like this: You decide to help the billy goats reach the opposite side of the creek so they can eat. You must create a model structure to help the billy goats get from one side to the other while using the design loop and only the materials provided. Your teacher will also provide you with model billy goats, with specific weights, that your bridge must be able to withstand.	5
7	New Product Development Activity: Student teams were given products ranging from toys to air fresheners. In 2 days, they had to create pitches on how to improve these products. The idea was to give them a clear sense of the scope of what they would do in a product development.	5
	Total	60

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60MV002	Startups and	Category	L	Т	Ρ	Credit
801011003	Entrepreneurship	MY	2	0	0	2*

- To Learn basic concepts in entrepreneurship, develop mind-set and skills necessary to explore entrepreneurship
- To provide practical proven tools for transforming an idea into a product or service that creates value for others.
- To Comprehend the process of opportunity identification through design thinking, identify market potential and customers while developing a compelling value proposition solution and prototypes
- To create business plan, conduct financial analysis and feasibility analysis to assess the financial viability of a venture ideas & solutions built with domain expertise
- To Prepare and present an investible pitch deck of their practice venture to attract stakeholders

Pre-requisites

• Basic knowledge of reading and writing in English

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Develop an entrepreneurial mindset and appreciate the concepts of design thinking, entrepreneurship and innovation	Understand
CO2	Apply process of problem -opportunity identification and validation through human centred approach to design thinking in building solutions	Apply
CO3	Understand market types, conduct market estimation, identify customers, create customer persona, develop the skills to create a compelling value proposition and build a Minimum Viable Product	Apply
CO4	Create business plan, conduct financial analysis and feasibility analysis to assess the financial viability of a venture	Apply
CO5	Prepare and deliver an investible pitch deck of their practice venture to attract stakeholders	Create

Mapping with Programme Outcomes

<u> </u>	POs								PSOs						
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	3	1	3	1	2	1	-	2	2	3	3	-
CO2	2	3	3	2	2	-	2	2	2	-	2	2	2	3	-
CO3	3	2	3	1	2	-	-	-	1	3	1	3	3	2	-
CO4	3	3	3	3	3	2	2	1	-	1	3	3	3	3	-
CO5	3	2	3	3	3	-	-	2	-	-	3	2	3	2	-
3 - Strong; 2 - Medium; 1 - Some															

Bloom's	Continuous Asse	ssment Tests (Marks)	Pitch Deck final submission &
Category	Milestone 1 (25 Marks)	Milestone 2 & 3 (25 Marks)	Viva voce
Remember	10	-	
Understand	05	10	
Apply	10	15	50
Analyse	-	-	50
Evaluate	-	-	
Create	-	-	



Total		25		25						
Syllabus	·									
	K.S.F	Rangasamy	/ College d	of Technolo	gy – Autor	nomous R2	2022			
			Commo	n to ALL Br	anches					
		60 MY	003 - Star	tups and E	ntrepreneu	ırship				
Semester	ŀ	lours/Wee	k	Total	Credit	Ma	iximum Ma	arks		
Semester	L	Т	Р	Hours	С	CA	ES	Total		
V	2	0	0	30	2*	100	-	100		
Introductio	on to Entrep	reneurship	& Entrep	reneur			•			
Meaning ar	nd concept	of Entrepre	neurship, tl	he history of	f Entrepren	eurship dev	elopment,			
Myths of Entrepreneurship, role of Entrepreneurship in Economic Development, Agencies										
in Entrepre	eneurship M	lanagemen	t and Futu	ire of Entre	preneurshi	p. The Ent	repreneur:	[6]		
Meaning, th	ne skills req	uired to be	an entrepr	eneur, the e	entrepreneu	irial decisio	n process,			
Role model	ls, Mentors a	and Suppor	t system. In	novation an	d Creativity	, types of in	novations,			
Innovations	s in current s	scenario								
Problem-O	opportunity	Identifica	ation, Cu	stomers I	Discovery	and cor	npetitive			
advantage										
Understand	ding the Pr	oblem and	l opportun	ity, define	problem u	sing Desig	n thinking			
principles a	and validate	problem. E	Exploring m	arket types	and estimation	ating the m	arket size,	[6]		
knowing yo	our custome	er and cons	sumer, Cus	tomer segn	nentation a	nd creating	customer	[0]		
personas.	Importance	of Value	Propositio	n, Value F	roposition	Canvas, D	Developing			
Problem-sc	plution fit, C	ompetition	analysis, E	slue ocean s	strategy, Co	ompetitive p	positioning			
and unders	tanding unio	que selling	points.							
Business r	nodel and t	build your l	MVP							
Introduction	to Busines	ss model a	na types, L	ean approa	ich, 9 bioci	k lean canv	as model,	[0]		
riskiest ass			nodels. Pro	Diotyping, bu	mong a Mir		e product,	[0]		
	esting and	a wive vali		P neration-i	mponance	oi bulla - l	vieasure –			
Business I	Dach Dan Einan	cial foacibi	lity and M	anaging gr	wth					
Business	lanning: cor	mononte o	f Business	nlan- Salas	nlan Peo	nla nlan an	d financial			
nlan Prena	ring a husin	ass plan Fi	inancial Pla	plan- Sales	s plan, 1 eu	pie pian an prenaring th	e financial	[6]		
plan, r repa	financial te	emplate un	derstandin	a basics of	Unit econ	omics and	analyzing	[0]		
Growth and	the financia	al performa	nce	g 503105 01			anaryzing			
Go To Mar	ket Strateg	ies and Fu	ndina							
Introduction	to Go to m	arket strate	egies start	-up branding	and its el	ements Se	lecting the			
Right Chan	nel. creating	digital pre	sence. buil	dina custom	er acquisiti	on strategy.	Choosing	[6]		
a form of b	usiness ora	anization sp	ecific to vo	ur venture. i	dentifvina s	sources of fu	unds: Debt	[-]		
& Equity, M	ap the Start	-up Lifecycl	e to Fundin	g Options, E	Build an Inve	estor ready	oitch deck.			
	•					To	tal Hours:	30		
Text Book	(s):									
1 Step	hen Key, "O	ne Simple I	dea for Sta	rtups and E	ntrepreneu	rs: Live You	ır Dreams a	nd Create		
··· Your	Own Profita	able Compa	ny" 1st Edi	tion, Tata M	c Grawhill (Company, N	lew Delhi, 2	013.		
2 Char	les Bamfor	d and Garr	y Bruton,	"Entreprene	urship: The	e Art, Scier	nce, and Pr	ocess for		
Succ	ess", 2 nd Ed	lition, Tata I	Mc Grawhil	l Company,	New Delhi,	2016.				
Reference	(s):									
1. Philip Auerswald, "The Coming Prosperity: How Entrepreneurs Are Transforming the Glol Economy", Oxford University Press, 2012.								he Global		
2. Janet Kiholm Smith; Richard L. Smith Richard T. Bliss, "Entrepreneurial Finance: Valuation and Deal Structure, Stanford Economics and Finance" 2011								Strategy,		
3. Edwa	ard D. Hes	s, "Growing	g an Entre	preneurial	Business: (Concepts a	nd Cases",	Stanford		
4. Ignite	e program,	wadhwani	platform,	Entreprene	urship, NP	TEL online	course By	y Prof. C		
DHak	lavaisala R		auras							



S. No.	Topics	No. of hours
1.0	Introduction to Entrepreneurship & Entrepreneur	
1.1	Meaning and concept of Entrepreneurship and the history of Entrepreneurship development	1
1.2	The Entrepreneur: Meaning, the skills required to be an entrepreneur, the entrepreneurial decision process,	1
1.3	Myths of Entrepreneurship, How to Become a Successful Entrepreneur - Dr Romesh Wadhwani (Platform on boarding)	1
1.4	Role models, Mentors and Support system- Masterclass on My Story - Joshua Salins	1
1.5	Role of Entrepreneurship in Economic Development, Agencies in Entrepreneurship Management and Future of Entrepreneurship	1
1.6	Innovation and Creativity, types of innovations, Innovations in current scenario, Concepts of Entrepreneurial Thinking, General Enterprising tendency test	1
2.0	Problem-Opportunity Identification, Customers Discovery and competitive	
2.0	advantage	
2.1	Understanding the Problem and opportunity, define problem using Design thinking principles and validate problem. Case study and Fireside chat – Desi Hangover	1
2.2	Identifying a problem for practice venture and filling Problem statement canvas (Handout week 1 - class activity)	1
2.3	Customer and markets discovery, knowing your customer and consumer, Customer segmentation and Exploring market types and estimating the market size. Case study and Fireside chat – Verloop	1
2.4	Creating customer personas & Market estimation (Handout week 2 - class activity)	1
2.5	Importance of Value Proposition, Introduce Value Proposition Canvas, Developing Problem-solution fit. Case study and Fireside chat – Honey Twigs	1
2.6	Competition analysis, Blue ocean strategy, Competitive positioning and understanding unique selling points. Case study and Fireside chat on Inzpira Fill Value Proposition Canvas (Handout week 3 - class activity) and Competition analysis framework (Handout week 5 - class activity) Briefing on Assignment 1 - Milestone 1	1
3.0	Business model and Build your MVP	
3.1	Introduction to Business model and types. Case study and Fireside chat - NUOS	1
3.2	Lean approach, 9 block lean canvas model, riskiest assumptions to Business models	1
3.3	Class Activity- Fill Lean canvas for you idea and understand revenue model (Handout week 6)	1
3.4	Prototyping, Meaning of MLP, Difference between MLP and MVP, How to build an MLP? Different types MLP that you can build. Case study and Fireside chat – KNORISH	1
3.5	Hypothesis testing and MVP Validation, MVP Iteration-Importance of Build - Measure – Learn approach	1
3.6	Class Activity- Fill MVP framework (Handout week 7) and learn validation	1
4.0	Business Plan, Financial feasibility and Manging growth	
4.1	Business planning: components of Business plan- Sales plan, People plan and financial plan, Preparing a business plan. Case study and Fireside chat – Bodh Gems	1

Course Contents and Lecture Schedule





4.2	Financial Planning: Types of costs, preparing the financial plan using financial template (Handout week 9)	1
4.3	Class activity - starting up costs, COGS, Sales plan and people plan template.	1
4.4	Class activity - One year P&L projection, Breakeven Analysis, Five year projection	1
4.5	Understanding basics of Unit economics and analyzing Growth and the financial performance	1
4.6	Class activity - Financial template - Unit economics (Handout week 12)	1
5.0	Go To Market Strategies and Funding	
5.1	Introduction to Go to market strategies, start-up branding and its elements, Selecting the Right Channel	1
5.2	Creating digital presence, building customer acquisition strategy.	1
5.3	Class activity: Handout week 10 - create your GTM strategy	1
5.4	Choosing a form of business organization specific to your venture	1
5.5	Identifying sources of funds: Debt & Equity, Map the Start-up Lifecycle to Funding Options	1
5.6	Class activity - Visit relevant GOI websites, other sites to help students explore funding opportunities and briefing on final submission of the pitch deck Build an Investor ready pitch deck, What Should You Cover in Your Pitch Deck? Art of pitching and storytelling	1

1. Dr.N.Tiruvenkadam - tiruvenkadam@ksrct.ac.in

Course C	Contents and Lecture Schedule	
S. No.	Topics	No. of hours
1.0	Introduction to Entrepreneurship & Entrepreneur	
1.1	Meaning And Concept Of Entrepreneurship, The History Of Entrepreneurship Development,	1
1.2	Myths Of Entrepreneurship, Role Of Entrepreneurship In Economic Development,	1
1.3	Agencies In Entrepreneurship Management And Future Of Entrepreneurship.	1
1.4	The Entrepreneur: Meaning, The Skills Required To Be An Entrepreneur,	1
1.5	The Entrepreneurial Decision Process	1
1.6	Role Models	1
1.7	Mentors And Support System.	1
2.0	Business Opportunity Identification and Preparing a Business Plan	
2.1	Business Ideas, Methods Of Generating Ideas	1
2.2	Opportunity Recognition	1



2.3	Idea Generation Process	1
2.4	Feasibility Study	1
2.5	Preparing A Business Plan	1
2.6	Meaning And Significance Of A Business Plan	1
2.7	Components Of A Business Plan	1
3.0	Innovations	
3.1	Innovation And Creativity - Introduction, Innovation In Current. Environment	1
3.2	Types Of Innovation, School Of Innovation, Analyzing The Current Business Scenario	1
3.3	Challenges Of Innovation, Steps Of Innovation Management	1
3.4	Experimentation In Innovation Management, Participation For Innovation	1
3.5	Co-Creation For Innovation, Proto Typing To Incubation.	1
3.6	Blue Ocean Strategy-I, Blue Ocean Strategy-Ii.	1
3.7	Marketing Of Innovation, Technology Innovation Process	1
4.0	Financing and Launching the New Venture	
4.1	Importance Of New Venture Financing, Types Of Ownership,	1
4.2	Venture Capital, Types Of Debt Securities,	1
4.3	Determining Ideal Debt-Equity Mix, And Financial Institutions And Banks.	1
4.4	Launching The New Venture	1
4.5	Choosing The Legal Form Of New Venture,	1
4.6	Protection Of Intellectual Property	1
4.7	Formation Of The New Venture	1
5.0	Managing Growth and Rewards in New Venture	
5.1	Characteristics Of High Growth New Ventures	1
5.2	Strategies For Growth	1
5.3	Building The New Ventures	1
5.4	Managing Rewards	1
5.5	Exit Strategies For Entrepreneurs,	1
5.6	Mergers And Acquisition, Succession And Exit Strategy	1
5.7	Managing Failures- Bankruptcy.	1
	Total Hours	30

1. Dr.N.Tiruvenkadam - tiruvenkadam@ksrct.ac.in



60 CB 5D1	Computer Networks	Category	L	Т	Ρ	Credit
00 CB 5F1	Laboratory	PC	0	0	4	2
					•	

- To understand the computer networking basics and concepts of data communications functions of different layers
- To know the standards employed in computer networking
- To make the students to get familiarized with different protocols and network components
- To develop an understanding of different components of computer networks, various protocols, modern technologies and their applications
- To understand the application layer and its applications

Pre-requisites

Nil

Course Outcomes

On the suc	ccessful completion of the course, students will be able to	
CO1	Know the concept of components, categories and ISO/OSI model of	Apply
001	networks	
CO2	Describe the Concept of various error detection techniques and Flow,	Apply
002	Error control.	
CO3	Compare the concept of Circuit switching and Packet switching.	Apply
CO4	Gain the knowledge of Congestion control and QoS Techniques.	Analyze
CO5	Identify the Purpose of Domain Name Space, Email and FTP.	Apply
		1

Mapping with Programme Outcomes

<u> </u>						P	Os						PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	3	-	-	-	-	-	-	-	-	-	2	3	-	-
CO2	2	3	-	-	-	-	-	-	-	-	-	2	3	-	-
CO3	2	3	-	-	-	-	-	-	-	-	-	3	3	-	-
CO4	-	3	-	-	2	-	-	-	-	-	-	3	3	-	-
CO5	-	3	-	-	2	-	-	-	-	-	-	3	3	-	-
3 - St	rong; 2	2 - Mec	lium; 1	– Low	1										

Bloom's Category	Lab Experimen (Ma	ts Assessment rks)	Model Examination	End Sem Examination (Marks)		
	Lab	Activity	(iviai ks)			
Remember	-	-	-	-	-	
Understand	-	-	-	-	-	
Apply	25	12	50		50	
Analyse	25	13	50		50	
Evaluate	-	-	-	-	-	
Create	-	-	-	-	-	
Total	50	25	100	-	100	





	K.S.F	langasam	y College o	f Technolo	ogy – Auton	omous R2	022				
		60 CB	5P1– Com	puter Netw	orks Labor	atory					
Semest	er h	lours/Wee	<u>k</u>	Total	Credit	Ma	ximum Ma	rks			
V		<u> </u>	<u>Р</u>	Hrs 60	C 2	CA 60	ES 40	l otal			
List of E	xperiments:	0	4	00	2	00	40	100			
1.	Learn To Use	Commands	Like Tcp D	ump ,Netst	at, Ifconfig, I	Nslookup A	nd Trace R	oute			
	Capture Ping A	nd Trace F	Route PDU	Using A Ne	twork Protoc	col Analyze	Rand Exar	nine.*			
2.	Write A HTTP	Web Client	Program To	o Download	I A Webpage	e Using TC	P Sockets.	*			
3. Applications Using TCP Sockets Like:											
4.	4. Echo Client And Echo Server										
5.	Chat										
6.	File Transfer										
7.	Simulation of D	NS Using	UDP Socke	ts.							
8.	Write A Code S	Simulating <i>i</i>	ARP /RARP	Protocols.	*						
9.	Studv Of Netw	ork Simulat	or(NS)And	Simulation	Of Conaesti	on Control	Algorithms	Usina			
	NS2				J J		<u>J</u>	5			
10	Study Of TCP/	UDP Perfo	rmance Usir	na Simulatio	on Tool *						
11	Simulation Of I	Distance Ve	ector/Link S	tate Routing	n Algorithm						
Design	Exnerimente:				<i></i>						
Losign											
1.	Performance E	valuation c	T Routing P	rotocols Us	ing Simulati	on 1001.					
2.	Simulation of E	rror Correc	tion Code (Like CRC).	*						
Lab Mar	nual										
1 "C	omputer Netwo	orks Lab Ma	anual", Depa	artment of C	Computer So	cience and I	Business S	ystems,			

1. KSRCT.

*SDG 4 - Quality Education

Course Designer(s)

1. Dr.P.Manimaran manimaran@ksrct.ac.in



60 CB 5D2	C# and .NET Programming	Category	L	Т	Ρ	Credit
OU CD JFZ	Laboratory	PC	0	0	4	2

- To demonstrate the basic concepts of C#
- To demonstrate object oriented aspects of C#.
- · To illustrate the page-focused applications developed with ASP.NET Core Razor pages
- To demonstrate data access and data handling using EF Core
- To demonstrate foundational knowledge for building web-applications using MVC architecture

Pre-requisites

Basic knowledge of C or C++ or any programming language

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Know the basic programming constructs of C#.	Apply
CO2	Demonstrate the Object-Oriented concepts in C#	Apply
CO3	Build lightweight page-focussed applications developed with ASP.NET Core Razor pages	Apply
CO4	Handle data from traditional data bases using EF Core	Analyse
CO5	Create a simple ASP.NET Core MVC website	Apply

Mapping with Programme Outcomes

<u> </u>			•			PC)s						PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1	-	3	2	2	1	-	1	3	-	-	1	2	-	-
CO2	2	-	3	2	2	1	-	1	3	-	-	1	2	-	-
CO3	2	-	3	2	2	1	-	1	3	-	-	1	2	-	-
CO4	2	-	3	2	2	1	-	1	3	-	-	2	2	-	-
CO5	2	-	3	2	2	1	-	1	3	-	-	3	2	-	-
3 - St	rona: 2	2 - Mec	dium	: 1 - Som	е										

Bloom's Category	Lab Experimen (Mai	ts Assessment rks)	Model Examination	End Sem Examination (Marks)		
	Lab	Activity	(warks)	(warks)		
Remember	-	-	-	-	-	
Understand	-	-	-	-	-	
Apply	25	12	50		50	
Analyse	25	13	50		50	
Evaluate	-	-	-	-	-	
Create	-	-	-	-	-	
Total	50	25	100	-	100	



	K.S.Rangasamy College of Technology – Autonomous R2022										
			B.Tech – C	Computer S	Science and	d Business	Systems				
			60 CB 5P2	– C# and .	NET Progr	amming La	boratory Ma	vimum M	arke		
Semes	ster	I	T	P	Hrs	C		ES	Total		
V		0	0	4	60	2	60	40	100		
List of	Exp	eriments:									
1.	Wri	te a prograi	m in C# to i	dentify all 3	-digit numb	ers from an	array of alp	hanumeric	strings		
	and	I print the s	um of all the	e 3-digit nur	nbers as w	ords. *					
2.	Wri	te a C# app	lication to i	mplement C	OOPS conc	epts such as	Polymorpl	hism, Inhei	ritance (a)		
	Single Inheritance (b) Multilevel Inheritance (c) Multiple Inheritance (d) Hierarchical										
	inhe	eritance and	d Access M	odifiers.							
3.	Wri	te a C# pro	gram to der	nonstrate th	ne concepts	of Delegate	es, Events a	and Collec	tions such		
	as l	_ists, Dictio	naries and	Sets.							
4.	Wri	te a C# pro	gram to rea	d and write	to a flat file	, use except	tions to har	ndle negati	ve		
	sce	narios durir	ng file acces	s and to im	plement O	OPS concep	ts such as	Overloadir	ng,		
	Abstraction using Abstract Classes and Abstract Methods.										
5.	Cre	ate Razor p	bages with s	shared layo	ut. The sha	red layout sl	nould use F	RenderBod	у,		
	Rer	nderPage, F	RenderSect	ion and nes	ted layouts	to display c	ontent.				
6.	Cre	ate a razor	page form	to							
	a)	Pass para	meters to ha	andler meth	ods 'OnGe	ť, 'OnPosť.					
	b)	Pass para	meters to C	ustom hand	dler method	s OnPostDe	lete, OnPo	stEdit, OnF	PostView.		
	c)	Perform El	F Core CRU	JD operatio	n on databa	ase.					
7.	Use	REST AP	to access	details from	database a	and display t	hem on Ra	azor Page.			
8.	Use	e MVC, to re	oute to a co	ntroller 'Stu	dentContro	ller' and crea	ate actions	methods to	o display		
	stu	dent details	on the view	Ι.							
9.	Use	e MVC to de	emonstrate	passing pa	rameters via	a the URL, q	uery string	, request h	eader,		
	req	uest body a	and display f	he values i	n the view.	**					
10	. For	ASP.NET	Core, create	e a form, pe	erform Mode	el validation	and display	/ the errors	on the		
	pag	le.									
Desigr ₄		periments:			rootiv co						
1. 2.	Des Des RE	sign Razor sign ASP.N ST API and	pages using ET Core M\ displaying	/C applicati the resultin	rectives. ion for mode g data in the	el validation, e View. *	accessing	database	through		
Lab M	anua				-						
1.	C# a	and .NET F	Programmin ⊏	g Lab Man	iual", Depa	rtment of C	omputer S	cience and	d Business		

*SDG 4 – Quality Education **SDG 9 – Industry, Innovation and Infrastructure.



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60 CG 0P4	Caroor Skill Dovelonment IV	Category	L	Т	Р	Credit
	Career Skill Development IV	CS	0	0	2	1

Objectives

- To help learners improve their vocabulary and enable them to use words appropriately in different academic and professional contexts.
- To help learners develop strategies that could be adopted while reading texts.
- To help learners acquire the ability to speak and write effectively in English in real life and career related situations.
- Improve listening, observational skills, and problem-solving capabilities
- · Develop message generating and delivery skills

Pre-requisites

• Basic knowledge of Arithmetic and Logical Reasoning

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Compare and contrast products and ideas in technical texts.	Analyze
CO2	Identify cause and effects in events, industrial processes through technical texts	Analyze
CO3	Analyze problems in order to arrive at feasible solutions and communicate them orally and in the written format.	Analyze
CO4	Report events and the processes of technical and industrial nature.	Apply
CO5	Articulate their opinions in a planned and logical manner, and draft effective résumés in context of job search.	Apply

Mapping with Programme Outcomes

<u> </u>		POs												PSOs		
003	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	-	-	-	-	-	-	-	2	3	3	2	3	2	3	-	
CO2	-	-	-	-	-	-	-	2	3	3	2	3	2	3	-	
CO3	-	-	-	-	-	-	-	2	3	3	2	3	2	2	-	
CO4	-	-	-	-	-	-	-	2	3	3	2	3	2	3	-	
CO5	-	-	-	-	-	-	-	2	3	3	2	3	2	3	-	
3 - St	rong; 2	2 - Me	dium	; 1 - Some	9											

Assessment Pattern										
Bloom's Category	Continuous As (Ma	sessment Tests rks)	Model Examination	End Sem Examination						
Galegoly	1	2	(Marks)	(Marks)						
Remember	-	-	-	-						
Understand	-	-	40	-						
Apply	-	-	20	-						
Analyse	-	-	40	-						
Evaluate	-	-	-	-						
Create	-	-	-	-						
Total	-	-	100	-						



Syllabus										
K.S.Rangasamy College of Technology – Autonomous R2022										
60 CG 0P4 - Career Skill Development IV										
Common to All Branches										
Somos	tor h	lours/Wee	ĸ	Total	Credit	Ma	ximum Ma	rks		
Jennes	L	Т	Р	Hours	С	CA	ES	Total		
V	0	0	2	30	1	100	00	100		
Verbal & Analytical Reasoning Seating Arrangements – Analytical Reasoning (PUZZELS) – Machin Input And Output - [6] Coded Inequality – Eligibility Test										
Quanti Permut Calend	tative Aptitude ation And Com ar – Logarithmic	- Part – 4 bination - F c.	robability -	Quadratic	Equation -	Geometry	– Clock –	[6]		
Non-Verbal Reasoning Series Completion Of Figures – Classification – Courting Of Figure – Figure Matrix – Embedded Figure – Complete Figure – Paper Cutting And Folding – Mirror Images And Water Images										
Quanti Mensur Square Etc.	Water magged: Quantitative Aptitude - Part – 5 Mensuration Of Area, Volume And Surface Area In 2D And 3D Shapes – 2D Shapes – Square, Rectangle, Triangle, Circle, Etc 3D Shapes – Cube, Cuboid , Sphere , Cone , Etc.									
Data In Data In Bar Gra	terpretation ar	nd Analysis sed On Tex	t - Data Int	erpretation	Based On	Tabulation,	Pie Chart,	[6]		
Dai Ola		napri – ven	Dagram	- Data Sulli	ciency.	То	tal Hours:	30		
Toxt B	ook(s):					10	tarriours.			
1. C	Data Interpretation On Tabulation, P	on and Ana ie chart, Ba	lysis Data i r graph, An	nterpretatio d Line grap	n Based or h – Venn Di	n text - Data iagram - Da	a interpretati ata sufficience	ion Based cy.		
2. C	Crouse W. H., a Private Limited, I	nd Anglin D New Delhi, :	. L., "Autor 2017.	notive Mec	nanics", 10 ^t	^h Edition, N	lcGraw Hill	Éducation		
Refere	nce(s):									
1. K	/lartin W, Stock leart – Will Cox	el and Mar Company I	tin T Stock nc, USA, 20	tle, "Automo 012.	otive Mecha	anics Funda	amentals", ⁻	The Good		
2. A	Abhijit Guha, 'Qι	uantitative A	ptitude', Mo	cGraw Hill E	Education, 6	th edition, 2	2016			
3. ^[]	Dinesh Khattar, 2020)	'Quantitativ	e Aptitude	For Comp	etitive Exa	minations',	Pearson Ed	Jucation (
4. A	Anne Thomson, Varszaw	'Critical Rea	asoning: A	Practical Inf	roduction' L	exicon Boo	oks, 3rd edit	ion, 2022.		
*SDG 9 **SDG) – Industry Inno 3 – Good Healtl	ovation and h and Well I	Infrastructu Being	Ire						

***SDG 7 – Affordable and Clean Energy



S. No.	Topics	No. of
10	Verbal & Analytical Reasoning	nours
1.0	Seating Arrangements 1 1 2 Analytical Reasoning (Puzzels)	1
1.1	Machine Input And Output	1
1.2	Coded Inequality	1
1.0	Eligibility Test	1
1.5	Vehicle Aerodynamics	2
2.0	Quantitative Aptitude - Part – 4	_
2.1	Permutation And Combination	1
2.2	Probability	1
2.3	Quadratic Equation - Geometry	1
2.4	Clock – Calendar	1
2.5	Logarithmic	2
3.0	Non-Verbal Reasoning	
3.1	Series Completion Of Figures – Classification	1
3.2	Courting Of Figure – Figure Matrix	1
3.3	Embedded Figure – Complete Figure	1
3.4	Paper Cutting And Folding	1
3.5	Mirror Images And Water Images	2
4.0	Quantitative Aptitude - Part – 5	•
4.1	Mensuration Of Area, Volume	1
4.2	Mensuration Of Volume	1
4.3	Surface Area In 2D And 3D Shapes	1
4.4	2D Shapes – Square, Rectangle, Triangle, Circle, Etc.	1
4.5	3D Shapes – Cube, Cuboid , Sphere , Cone , Etc	2
5. 0	Data Interpretation and Analysis	
5.1	Data Interpretation Based On Text	1
5.2	Data Interpretation Based On Tabulation, Pie Chart	1
5.3	Bar Graph , And Line Graph	1
5.4	Venn Diagram	1
5.5	Data Sufficiency	2
	Total	30

1. R. Poovarasan - poovarasan@ksrct.ac.in



S.No.	Course Code	Name of the Course	Duration of Internal Exam	Weightag Continuous Assessment	s Max. Marks	Minimum Marks for Pass in End Semester Exam End Semes ter Exam						
	THEORY											
1	60 HS 005	Business Strategy	2	40	60	100	45	100				
2	60 HS 006	Financial and Cost Accounting	2	40	60	100	45	100				
3	60 CB 601	Machine Learning	2	40	60	100	45	100				
4	60 CB 602	Usability Design of Software Applications	2	40	60	100	45	100				
5	60 CB E2*	Professional Elective II	2	40	60	100	45	100				
6	60 OE L*	Open elective-III	2	40	60	100	45	100				
			PRACTICA	LS								
7	60 CB 6P1	Machine Learning Laboratory	2	60	40	100	45	100				
8	60 CB 6P2	Usability Design of Software Applications Laboratory	2	60	40	100	45	100				
9	60 CG 0P1	Career Skill Development -I	1	100	-	100	-	100				
10	60 CG 0P6	Internship	-	100	-	100	-	100				

SIXTH SEMESTER

* CA evaluation pattern will differ from course to course and for different tests. This will have to be declared in advance to students. The department will put a process in place to ensure that the actual test paper follow the declared pattern.

** End Semester Examination will be conducted for maximum marks of 100 and subsequently be reduced to 60 marks for the award of terminal examination marks



	Business Strategy	Category	L	Т	Ρ	Credit
00 HS 005	Busilless Strategy	HS	3	0	0	3

- Learn the process of strategic management
- Identify internal environment with the help of appropriate tools
- Identify external environment with the various strategies
- Understand the strategic decision making
- To enable the students to have an insight into strategic implementation and control

Pre-requisites

• NIL

Course Outcomes

On the su	On the successful completion of the course, students will be able to							
CO1	Understand the fundamental concepts of strategic management	Understand						
CO2	Apply holistic approach by integrating various perspectives to develop appropriate organizational policies and strategies	Remember						
CO3	Understand and make decisions in through various tools and techniques	Understand						
CO4	Identify the growth avenues against the back drop of the opportunities	Apply						
CO5	Develop the skills on implementation of strategy through organizational structure and control system	Apply						

Mapping with Programme Outcomes

<u> </u>		POs												PSOs		
003	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	-	3	3	3	-	2	2	2	3	3	3	3	2	3	-	
CO2	2	3	3	3	2	2	3	-	3	2	3	2	2	3	-	
CO3	2	2	3	3	3	2	-	-	3	3	3	3	-	3	-	
CO4	-	-	3	3	2	2	3	2	3	-	3	3	2	3	-	
CO5	-	3	3	3	3	-	2	2	2	2	3	2	-	3	-	
3 - St	rona		lium 1	- Som												

3 - Strong; 2 - Medium; 1 - Some

Assessment Pattern										
Bloom's	Continuous As (Ma	ssessment Tests arks)	End Sem Examination (Marks)							
Calegory	1	2								
Remember	20	20	30							
Understand	20	20	40							
Apply	20	20	30							
Analyse	-	-	-							
Evaluate	-	-	-							
Create	-	-	-							
Total	60	60	100							



Sylla	Syllabus										
	K.S.Rangasamy College of Technology – Autonomous R2022										
			B.Tech – C	computer S	Science and	d Business	Systems				
				60 HS 005	- Business	Strategy					
Som	octor	ŀ	lours/Wee	k	Total	Credit	Ма	iximum Ma	rks		
Sem	ester	L	Т	Р	Hours	С	CA	ES	Total		
V	/	3	0	0	45	3	40	60	100		
Intro	ductio	n to Strate	gic Manag	ement*							
Impo	Importance Of Strategic Management-Vision And Objectives-Schools Of Thought In										
Strate	egic N	Nanagemer	nt-Strategy	Content,	Process, A	And Practi	ce-Fit Con	cept And	[9]		
Confi	guratio	on Perspect	ive In Strate	egic Manag	ement.						
Inter	nal En	vironment	of Firm*								
Reco	gnizing	g A Firms I	ntellectual	Assets-Core	e Competer	nce As The	Root Of C	ompetitive	[9]		
Adva	ntage	Sources (Of Sustain	ed Compet	titive Advai	ntage-Busir	ness Proce	sses And	[0]		
Capa	bilities	-Based App	proach To S	Strategy.							
Exte	rnal Er	nvironmen	ts of Firm*				-				
Com	petitive	Strategy -	Five Forces	s Of Indust	ry Attractive	eness That	Shape Stra	ategy -The	[9]		
Conc	Concept Of Strategic Groups, And Industry Life Cycle-Generic Strategies-Generic										
Strate	Strategies And The Value Chain										
Corp	Corporate Strategy, and Growth Strategies*										
		For Divers	silication-Re	Nated And	Unrelated I		on-Busines	Vonturoo	[9]		
Analy	$\sqrt{515}$ E	$\frac{1}{2}$	tions	And Diversi	incation-Stra	alegic Allia	ices, Joint	ventures,			
Strat		s & Acquisi	ion*								
Struc	ture A	nd System	s - Designi	na Oraaniz	rational Stri	icture Mate	hing - Stru	icture And	[0]		
Cont		Strategy- Th	ne 7S Fram	ework -Stra	tegic Contr	ol And Corr	orate Gove	ernance	[5]		
00110		Strategy H						tal Hours:	45		
Text	Book(s):									
	Charl	es W.L.Hill.	Melissa A	Schilling &	Gareth R.J	ones. "Strat	egic Manad	ement: An	Integrated		
1.	Appro	oach", Cend	age Learni	ng, 12th Ed	ition, 2016	,	- 3	,			
_	John	Pearce,	Richard F	Robinson,	Amita Mita	al, "Strated	gic Manag	ement: Fo	mulation,		
2.	Imple	mentation a	and Control	", McGraw l	Hill, 12th Ec	lition, 2017.					
Refe	rence(s):		-		-					
1.	Robe	rt M. Grant,	Contempo	rary Strateg	gic Manager	nent, 7th E	dition Black	well, 2012			
2	Azha	r Kazmi an	d Adela Ka	zmi, "Strate	gic Manage	ement", Mc	Graw Hill E	ducation, 4	th Edition,		
Ζ.	2015.				0 0						
3.	R.Srii	nivasan, "Si	trategic Mai	nagement:	The Indian of	contest", PH	II Learning,	2014			
4	Richa	ard Rumelt,	Good Strat	egy Bad Str	ategy: The	Difference a	and Why It I	Matters, Pro	fileBooks,		
4.	2011.						-				
*SDC	69 – Ir	ndustry Inno	vation and	Infrastructu	ire						
**SD	G 3 – (Good Healtl	h and Well	Being							

***SDG 7 - Affordable and Clean Energy



		No. of
S. No.	Topics	hours
1.0	Introduction to Strategic Management	
1.1	Importance Of Strategic Management	1
1.2	Vision And Objectives	1
1.3	Schools Of Thought In Strategic Management	2
1.4	Strategy Content, Process, And Practice	2
1.5	Fit Concept	1
1.6	Configuration Perspective In Strategic Management	2
2.0	Internal Environment of Firm	
2.1	Recognizing A Firms Intellectual Assets	2
2.2	Core Competence As The Root Of Competitive Advantage	2
2.3	Sources Of Sustained Competitive Advantage	2
2.4	Business Processes	1
2.5	Capabilities-Based Approach To Strategy	2
3.0	External Environments of Firm	
3.1	Competitive Strategy	1
3.2	Five Forces Of Industry Attractiveness That Shape Strategy	2
3.3	The Concept Of Strategic Groups	2
3.4	Industry Life Cycle	1
3.5	Generic Strategies	1
3.6	Generic Strategies And The Value Chain	2
4.0	Corporate Strategy, and Growth Strategies	
4.1	The Motive For Diversification	1
4.2	Related And Unrelated Diversification	2
4.3	Business Portfolio Analysis	1
4.4	Expansion, Integration And Diversification-	2
4.5	Strategic Alliances, Joint Ventures,	2
4.6	Mergers & Acquisitions	1
5.0	Strategy Implementation	1
5.1	Structure And Systems	2
5.2	Designing Organizational Structure Matching	1
5.3	Structure And Control To Strategy	1
5.4	The 7s Framework	1
5.5	Strategic Control	2
5.6	Corporate Governance	2

Course Contents and Lecture Schedule

Course Designer(s)

1. Dr.M.Mohanraj - mohanrajm@ksrct.ac.in



	Einangial & Cost Accounting	Category	L	Т	Ρ	Credit
00 13 000	Financial & Cost Accounting	HS	3	0	0	3

- To understand the basic concepts of accounting.
- To understand the concepts of Financial Management and its application for managerial decision making
- To know about the preparation of financial statements
- To understand the basic concepts of cost accounting of a firm.
- To learn about the company accounts and audit report.

Pre-requisites

• NIL

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Understand the basic concepts in Accounting	Understand
CO2	Summarize the basic concepts and processes in determination of products and services cost	Understand
CO3	Apply the concepts of Financial Management	Apply
CO4	Apply the cost and classification of components in cost system	Apply
CO5	Understand the concepts of statutory requirements	Understand

Марр	Mapping with Programme Outcomes																
<u> </u>		POs													PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
CO1	3	2	-	3	2	2	-	-	-	-	3	2	2	3	-		
CO2	3	2	2	3	3	2	-	3	-	2	3	2	3	3	-		
CO3	3	3	2	3	2	2	-	2	-	2	2	-	-	3	-		
CO4	-	2	-	3	2	3	2	3	-	-	3	2	2	3	-		
CO5	2	3	3	3	-	-	-	3	2	3	3	3	2	3	-		
3 - St	rona. S	- Med	dium	· 1 - Some													

Bloom's	Continuous As (Ma	sessment Tests rks)	End Sem Examination (Marks)				
Calegory	1	2					
Remember	-	-	-				
Understand	50	50	60				
Apply	10	10	40				
Analyse	-	-	-				
Evaluate	-	-	-				
Create	-	-	-				
Total	60	60	100				



Syllabus											
		K.S.F	Rangasamy	/ College o	f Technolo	ogy – Autor	nomous R2	2022			
	B.Tech. – Computer Science and Business Systems										
			60 HS	006 – Fina	ncial and C	ost Accou	nting				
Seme	ester	ŀ	lours/Wee	k	Total	Credit Ma		aximum Mai	rks		
		L	Т	P	Hours	С	CA	ES	Total		
V	Ί	3	0	0	45	3	40	60	100		
Accounting Concept*											
Introc	Introduction- Accounting Cycle- Techniques and Conventions- Financial Statements- [9]										
Unde	rstand	ing Financi	al Statemer	nts.							
Acco	unting	g Process	*								
Book	Keepi	ng and Re	ecord Maint	enance - F	undamenta	al Principles	and Doub	ole Entry -	[9]		
Journ	ial, Leo	lger, Trial E	Balance, Bal	ance Sheet	, Final Acco	ounts - Cash	n Book and	Subsidiary	[0]		
Book	<u>s - Rec</u>	ctification of	Errors								
Finar	icial S	tatements	* <u>-</u>						101		
Form	and	Contents	of Financia	al Stateme	nts- Analys	sing and I	nterpreting	Financial	[9]		
State	ments,	Accountin	g Standards	6.							
Cost	ing Sy	stems "			aatian Unit	Cooting [ation lab			
Conti		r Cost, Co	st Allocatio		Cation, Unit	Drofit Ar		acto APC	[10]		
Apoly	riy, Abi	sorption CC	isting, iviary		, Cost volu	ine Fiont Ai	lalysis, buc	igels, ADC			
Com	nany /	Accounte a		Poporte *							
Audit	Renor	ts and Stat	utory Requi	rements-Di	rectors Ren	ort-Notes to	Accounts.	Pitfalls	[8]		
710011	Корог		atory requi					tal Hours:	45		
Text	Book(s):					10		-10		
	Robe	rt N Anth	ony David	Hawkins	Kenneth	Marchant	Accounting	n Texts an	d Cases		
1.	McGr	awHill.2017	7	i latitatio,		ina onan,			a 04000,		
2	Sarav	anvel P "N	lanagemen	t Accountin	a" Principle	s and Pract	ices				
Refer	rence(s):	genien		<u>g : :e.p.e</u>						
	Bhatta	acharva S.I	K, and Dear	den John.	"Accounting	for Manag	ement". Va	ni Education	al Books.		
1.	Mum	pai (Latest	Edition).	,		,					
2.	Prof.	K.S. Nadar	athi, "Mana	igement Ac	counting" R	. Chand and	d Co., New	Delhi			
	N. Ra	machandra	an and Ram	Kumar Ka	kani. "Finar	ncial Accour	nting for Ma	anagement".	Mc Graw		
3.	Highe	er Ed, 2017			,		U	ζ,			
4	S.P.Jain K.L. Narang, and Simmi Agrawal "Cost Accounting Principles and Practice". Kalaivani										
4.	Publis	shers, 2016).	÷		5	•				

*SDG 8:- Sustainable Economic Growth



S. No.	Topics	No. of hours					
1.0	Accounting Concept						
1.1	Introduction	2					
1.2	Accounting Cycle	1					
1.3	Techniques and Conventions	2					
1.4	Financial Statements	2					
1.5	Understanding Financial Statements	3					
2.0	Accounting Process						
2.1	Book Keeping and Record Maintenance						
2.2	Fundamental Principles and Double Entry	2					
2.3	Journal, Ledger, Trial Balance, Balance Sheet, Final Accounts	3					
2.4	Cash Book and Subsidiary Books	1					
2.5	Rectification of Errors	1					
3.0	Financial Statements						
3.1	Form and Contents of Financial Statements	3					
3.2	Analysing and Interpreting Financial Statements	3					
3.3	Accounting Standards	2					
4.0	Costing Systems						
4.1	Elements of Cost	1					
4.2	Cost Allocation	1					
4.3	OH Allocation, Unit Costing & Process Costing	2					
4.4	Job Costing, Absorption Costing & Marginal Costing	2					
4.5	Cost Volume Profit Analysis	2					
4.6	Budgets & ABC Analysis	2					
5.0	Company Accounts and Annual Reports						
5.1	Audit Reports and Statutory Requirements	2					
5.2	Directors Report	2					
5.3	Notes to Accounts	2					
5.4	Pitfalls	2					
	Total	45					

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60 CB 601	Machina Learning	Category	L	Т	Р	Credit
00 CB 001		PC	3	0	0	3

- •To understand the basic concepts of 445
- •To have a thorough understanding of the Tree learning learning and Neural Networks
- •To understand the principles of instance based learning and Cluster Analysis
- •To understand the concepts of Ensemble techniques
- •To have a thorough understanding of the Learning sets of rules

Pre-requisites

• Basic knowledge of Artificial intelligence

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Identify the perspectives of machine learning	Remember
CO2	Apply decision tree and Artificial neural networks for real world problems	Apply
CO3	Illustrate the principles of instance based learning and Cluster Analysis	Understand
CO4	Understanding of ensemble techniques and their practical applications	Understand
CO5	Describe the algorithms for rule and reinforcement learning	Understand

Mapping with Programme Outcomes

			-														
<u> </u>		POs													PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
CO1	3	3	-	-	-	-	-	-	-	-	-	3	-	3	-		
CO2	3	3	3	2	2	2	2	-	3	3	2	3	2	3	-		
CO3	3	3	3	2	2	-	-	-	3	3	2	3	2	3	-		
CO4	3	3	3	2	2	2	2	-	3	3	2	3	2	3	-		
CO5	3	3	-	-	-	-	-	-	-	-	-	3	-	3	-		
3 - St	rong: (2 - Mer	lium 1	- Som	D												

<u>3 - Strong; 2 - Medium; 1 - Some</u>

Assessment Pattern										
Bloom's	Continuous As (Ma	sessment Tests rks)	End Sem Examination (Marks)							
Calegory	1	2								
Remember	20	20	40							
Understand	40	40	60							
Apply	-	-	-							
Analyse	-	-	-							
Evaluate	-	-	-							
Create	-	-	-							
Total	60	60	100							


Syllabu	JS								
	K.S.F	Rangasamy	/ College o	f Technolo	gy – Autor	nomous R2	022		
		B.Tech – C	computer S	cience And	d Business	s Systems			
			60 CB 601	– Machine	Learning	•			
Somos	tor H	lours/Wee	k	Total	Credit	Ма	rks		
Jennes	L	Т	Р	Hours	C	CA	ES	Total	
VI	3	0	0	45	3	40	60	100	
Introduction: * Learning Problems - Designing a Learning System - Perspectives and Issues in Machine Learning – Concept Learning –Task – Search – Finding Maximally Specific Hypotheses – Version Spaces and Candidate Elimination Algorithm - Inductive Bias									
Decision Tree Learning and Artificial Neural Networks: * Decision Tree Representation – Problems – Basic Decision Tree Learning Algorithms – Hypotheses Search – Issues – Artificial Neural Networks: Introduction – Representations – Problems – Perceptrons – Multilayer Networks and Back Propagation Algorithm – Example									
Instance Based Learning and Cluster Analysis: * Introduction – k-Nearest Neighbour Learning – Locally Weighted Regression - Radial Basis Functions - Case-Based Reasoning. Cluster Analysis- Introduction – Types - A Categorization of Major Clustering Methods - Partitioning Methods - Hierarchical Methods - Density-Based Methods									
Ensem Combir Boostin with Bo	ble Techniques ning Multiple Lea g: AdaBoost – osting.	s: * arners: Moc Stumping -	lel Combina - Bagging:	ition Schem Subagging	ies, Voting, – Random	Ensemble I Forests: Co	_earning – omparison	[9]	
Learnin Learnin Sets-Fi Rough and its - Nonde Examp	ng Sets of Rules Ig Sets of Rules Ist Order Rules Set Theory: Cor Applications – R eterministic Rev les.	es: * = Introduct = FOIL – In acepts-of Ro einforcement vards and A	ion – Sequ nduction as ough Sets - ent Learning Action, Tem	ential Cove Inverted De Feature Sel – Introduct poral Differe	ring Algorit eduction – I ection and I ion – Learn ence Learn	hms – Leai Inverting Re Rule Inducti ing Task – C ing-Genera	rning Rule esolution – on-Theory Q Learning lizing from	[9]	
						Tot	tal Hours:	45	
Text B	ook(s):								
1. T	om M. Mitchell,	-Machine	Learning, I	ndian Editio	on, McGraw	-Hill Educat	tion (India),	2022.	
2. K	K. P. Murphy, "M	achine Lea	rning: A pro	babilistic p	erspective",	MIT Press,	2012.		
Refere	nce(s):								
1. S	Simon Rogeres a	and Mark G	irolami, —A	First Cours	se in Machi	ne Learning	II, CRC Pre	ss, 2016	
2. E	themAlpaydin,	-Introducti	on to Mach	ine Learnin	gll, 3rd Editi	ion, Prentice	e Hall India,	2015.	
3. J	iawei Han and I Iorgan Kaufmar	MichelineKa n Publicatio	amber, "Dat ns.	a Mining Co	oncepts and	d Technique	es", 3 rd Edi	tion, 2011	
4. C). Barber, "Baye	sian Reasc	ning and M	achine Lea	rning", Cam	bridge Univ	ersity Press	s,2012	
* SDG -	4: - Quality Edu	cation							



Course Contents and Lecture Schedule									
S. No.	Topics	No. of hours							
1.0	Introduction								
1.1	Learning Problems	1							
1.2	Designing a Learning System	1							
1.3	Perspectives and Issues in Machine Learning	1							
1.4	Concept Learning - Task	2							
1.5	Search - Finding Maximally Specific Hypotheses	2							
1.6	Version Spaces and Candidate Elimination Algorithm	1							
1.7	Inductive Bias	1							
2.0	Decision Tree Learning and Artificial Neural Networks								
2.1	Decision Tree Representation	1							
2.2	Problems	1							
2.3	Basic Decision Tree Learning Algorithms	1							
2.4	Hypotheses Search	1							
2.5	Issues	1							
2.6	Introduction – Representations	1							
2.7	Problems – Perceptrons	1							
2.8	Multilayer Networks and Back Propagation Algorithm – Example	2							
3.0	Instance Based Learning and Cluster Analysis								
3.1	Introduction	1							
3.2	k-Nearest Neighbour Learning	1							
3.3	Locally Weighted Regression	1							
3.4	Radial Basis Functions	1							
3.5	Case-Based Reasoning	1							
3.6	Cluster Analysis- Introduction	1							
3.7	Types - A Categorization of Major Clustering Methods	1							
3.8	Partitioning Methods - Hierarchical Methods	1							
3.9	Density-Based Methods	1							
4.0	Ensemble Techniques								
4.1	Model Combination Schemes	1							
4.2	Voting	1							
4.3	Ensemble Learning	2							
4.4	AdaBoost	1							
4.5	Stumping	1							
4.6	Subagging	1							
4.7	Comparison with Boosting	2							
5.0	Learning Sets of Rules								
5.1	Introduction – Sequential Covering Algorithms	1							
5.2	Learning Rule Sets	1							
5.3	First Order Rules – FOIL	1							
5.4	Induction as Inverted Deduction - Inverting Resolution	1							



5.5	Concepts-of Rough Sets - Feature Selection and Rule Induction	1
5.6	Theory and its Applications - Reinforcement Learning	1
5.7	Introduction – Learning task	1
5.8	Q learning-Nondeterministic Rewards and Action	1
5.9	Temporal Difference Learning-Generalizing from Examples	1

Course Designer(s)

1. R.Karthik - karthikr@ksrct.ac.in



60 CB 602	Usability Design of	Category	L	Т	Ρ	Credit
80 CB 802	Software Applications	PC	3	0	0	3

- To learn the fundamentals of User Centered Design, their relevance and contribution to businesses
- To study the principles of heuristic evaluation for interactive design
- To understand the appreciation of user research, solution conceptualization and validation as interwoven activities in the design and development lifecycle
- To familiarize the facets of User Experience (UX) Design, particularly as applied to the digital artefacts
- To utilize scenarios and persona technique to enhance understanding, usability, and user-centred design in various contexts

Pre-requisites

• Basic Knowledge of Software Development and User Experience (UX) Fundamentals

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Summarize the fundamentals and importance of User-Centred design.	Understand
CO2	Analyse the design evaluation by applying the heuristic principles.	Analyse
CO3	Illustrate an application focusing on the design aspects.	Apply
CO4	Remember the UX research techniques for analysing the application.	Remember
CO5	Analyse the personal technique for different projects.	Analyse

Mapping with Programme Outcomes

000			•			P	Ds						PSOs					
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3			
CO1	1	3	2	2	2	-	-	-	-	-	-	-	-	2	-			
CO2	3	2	2	1	1	-	-	-	-	-	-	-	-	3	-			
CO3	2	3	3	3	3	-	-	-	-	-	-	-	2	3	-			
CO4	2	1	2	3	2	-	-	-	-	-	-	-	1	2	-			
CO5	2	2	1	2	1	-	-	-	-	-	-	-	2	2	-			
3 - St	rong; 2	2 - Mec	lium; 1	- Som	е													

Bloom's	Continuous As (Ma	sessment Tests arks)	End Sem Examination (Marks)				
Calegoly	1	2					
Remember	-	20	06				
Understand	40	-	14				
Apply	-	40	40				
Analyse	20	-	40				
Evaluate	-	-	-				
Create	-	-	-				
Total	60	60	100				



Sylla	bus										
		K.S.F	Rangasamy	/ College o	f Technolo	ogy – Autor	nomous R2	022			
			B.Tech – C	computer S	Science and	d Business	Systems				
		6	60 CB 602 -	Usability [Design of S	oftware Ap	plications				
Some	ostar	ŀ	lours/Wee	k	Total	Credit	Ма	ximum Ma	rks		
Seine	53101	L	Т	Р	Hours	С	CA	ES	Total		
V	I	3	0	0	45	3	40	60	100		
Introd	ductio	n to User (Centred De	sign*							
Aspects of User Centred Design, Elements - Models and Approaches – User Centred											
Desig	ın Prin	ciples - UCI	D Process -	Analysis To	ols: Persor	nas, Scenari	os, and Ess	ential Use	[9]		
Cases	s with	Examples -	 Agile Aspe 	ects of User	Centred De	esign.					
Intera	active	Design Ev	aluation*								
Introd	luction	to Interact	ive Design	Process -	Interactive	Design in F	Practice – I	ntroducing	[9]		
Evalu	ation	 Evaluati 	on: Inspec	tion, Analy	sis and N	lodels – Ir	nspection -	Heuristic	[0]		
Evalu	ation:	10 Heuristi	c Principles	, Examples	 Case Stu 	ıdy.					
Deve	lopme	ent of Appli	ication*								
Case	Study	. Developm	ient of any	Application	like Mobile	or Web Ba	ised on Use	er Centred	[9]		
Desig	in –	Design Li	fecycle: E	stablishing	Requireme	ents, Desig	gn, Prototy	ping and	[-]		
Const	tructio	n.									
UXR	esear				4 af 11a a	-		Deeeeek	[0]		
Unde	rstand	ing Users:	I neir Goai	s - Contex	t of Use -	Environmer	IT OF USE -	Research	[9]		
Techr	niques	- Contextu	al Enquiry -		lews - Con	ipetitive Ana	alysis for U	Χ.			
Dreen	arios	and Person	na recnniq		et Decign	Thinking T	achaigue	Diagoveru			
Prese	Proine	n or Person	Concert D		ect - Design	i Thinking T	echnique -	Discovery	[0]		
Broto	biains	Toobaiquo	Concept D	evelopinen Iootropio - F	l - IdSK F	Toolo	ng ioi the	Project -	[9]		
Tools	usod.	Sketch/Eig	s - raper-c	iectionic - r	lototyping	10015.					
10013	useu.	Sketch/r ig	IIIa				То	tal Hours:	45		
Text	Book(s):					10	ai nouis.			
	Jenny	Preece H	elen Sharp	and Yvonne	Rogers "li	nteraction D	esian [.] Bevo	nd Human-	Computer		
1.	Intera	action" 5^{th}	Edition Job	n Wiley & 9	Sons Inc I	ISA 2019	ooigii. Doye		Computer		
	Jonny	v Schneider	"Understa	Inding Desi	an Thinking	Lean and	Aaile" 1 st	Edition Apr	ess USA		
2.	2020		, ondorote		gir rinning	, Louin, and	, igno , i	Landon, Apr	000, 00 <i>/</i> (,		
Refer	ence(s):									
	Thom	as Tullis a	and Bill Alb	ert. "Meası	urina the U	ser Experie	ence: Colle	cting. Analy	zing, and		
1.	Prese	enting Usab	ility Metrics	", 3rd Editic	n, Elsevier,	Netherland	ls, 2022.		,,		
•	Jesse	e James Ga	rrett,"The E	lements of	User Experi	ence User-	Centered D	esian for the	e Web and		
2.	Beyo	nd", 2 nd Ed	ition, New F	Riders, USA	, 2021. [.]			U			
3.	Alan	Cooper and	Robert Re	imann, "Ab	out Face", 4	th Edition, J	ohn Wiley,	USA, 2014.			
4	Elizat	oeth Goodr	man, Mike	Kuniavsky,	Andrea M	oed, "Obse	rving the L	Jser Experie	ence", 2 nd		
4.	Editio	on, Morgan	Kaufmann,	USA, 2012			-	•			

*SDG 4 – Quality Education



S. No.	Topics	No. of
1.0	Introduction To User Centred Design	nouis
1.1	Aspects of User Centred Design	1
1.2	Elements - Models and approaches	1
1.3	User Centred Design Principles	2
1.4	UCD Process	1
1.5	Analysis Tools: Personas, Scenarios	1
1.6	Essential Use Cases with Examples	2
1.7	Agile Aspects of User Centred Design	1
2.0	Interactive Design Evaluation	
2.1	Introduction to Interactive Design Process	1
2.2	Interactive Design in Practice	1
2.3	Introducing Evaluation	1
2.4	Evaluation: Inspection, Analysis and Models	2
2.5	Inspection - Heuristic Evaluation	1
2.6	10 Heuristic Principles	1
2.7	Examples – Case Study	2
3.0	Development of Application	
3.1	Case Study: Development of any Application like Mobile or Web Based on User Centred Design	3
3.2	Design Lifecyle	1
3.3	Lifecyle: Establishing Requirements	2
3.4	Lifecyle: Design	1
3.5	Prototyping and Construction	2
4.0	UX Research	
4.1	Understanding users – their goals	1
4.2	Context of use and environment of use	2
4.3	Research Techniques	2
4.4	Contextual Enquiry	2
4.5	User Interviews	1
4.6	Competitive Analysis for UX	1
5.0	Scenarios and Persona Technique	
5.1	Presentation of Personas for the group project	1
5.2	Design Thinking Technique	1
5.3	Discovery and Brainstorming	2
5.4	Concept Development	2
5.5	Task flow detailing for the Project	1
5.6	Prototyping Techniques	1
5.7	Paper-Electronic -Prototyping Tools	1

Course Contents and Lecture Schedule

Course Designer(s)

1. Mr. S. Vignesh - vigneshs@ksrct.ac.in



Machina Learning Laboratory	Category	Г	Т	Р	Credit
Machine Learning Laboratory	PC	0	0	4	2

- To understand the need for machine learning for solving problem
- To study the various supervised, semi-supervised and unsupervised learning algorithms in machine learning
- To understand the machine learning theory and implement linear and non-linear learning models
- To implement distance-based clustering techniques, build tree and rule based models
- To apply reinforcement learning techniques for solving real-time applications

Pre-requisites

NIL

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Apply suitable algorithms for selecting the appropriate features for analysis	Apply
CO2	Apply the Decision tree and back Propagation for any given problem	Apply
CO3	Suggest supervised, unsupervised or semi-supervised learning algorithms for assessing the distance-based analysis	Apply
CO4	Implement clustering techniques to solve real world problems	Apply
CO5	Design systems that use the appropriate tree and rule models of machine learning	Analyse

Mapp	Mapping with Programme Outcomes															
COs	POs												PSOs			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	3	-	-	-	-	-	-	-	-	-	3	-	3	-	
CO2	3	3	3	2	2	2	2	-	3	3	2	3	2	3	-	
CO3	3	3	3	2	2	-	-	-	3	3	2	3	2	3	-	
CO4	3	3	3	2	2	2	2	-	3	3	2	3	2	3	-	
CO5	3	3	-	-	-	-	-	-	-	-	-	3	-	3	-	
3 - St	trong; 2	2 - Mec	dium; 1	- Som	e											

Bloom's Category	Lab Experimen (Ma	ts Assessment rks)	Model Examination	End Sem Examination (Marks)		
	Lab	Activity	(Ivial KS)	(Ivial KS)		
Remember	-	-	-	-	-	
Understand			-	-	-	
Apply	25	12	50	-	50	
Analyse	25	13	50	-	50	
Evaluate	-	-	-	-	-	
Create	-	-	-	-	-	
Total	50	25	100	-	100	

	K.S.I	Rangasamy	/ College o	f Technolo	gy – Autor	omous R2	022			
		B.Tech – C	Computer S	Science and	l Business	Systems				
		60 CB	6P1 – Mac	nine Learr	Crodit	atory Mo	vinum Mo	rko		
Semes	ster		n P	Hrs	Credit		FS FS	Total		
VI	0	0	4	60	2	60	40	100		
List of	Experiments:		1	1	1		I			
1.	Implement and based on a set	l demonstra of training	ite the FIND data sample)-S algorithr es. Read th	n for finding e training da) the most s ata from a (pecific hypo CSV file.*	othesis		
 Implement and demonstrate the Candidate-Elimination algorithm to output a description of the set of all hypotheses consistent with the training example.* 										
3.	Implement and of training data	l demonstra samples. F	ite the Decis Read the tra	sion tree alo aining data f	gorithm for f rom a CSV	inding the r file.*	nost based	on a set		
4.	Implement the loss with respe biases during t	Backpropa ect to the we raining. *	gation algor eights and b	rithm Write t biases. Use	the code to these gradi	compute th ents to upd	e gradients ate the weig	of the ohts and		
5.	Implementing the probabilitie	he Naïve B s computed aracefullv.*	ayes Classi I in the prev	ifier Write th rious step. E	ne code to c Ensure that	lassify new your implen	documents nentation ha	using andles		
6.	Implementing algorithm. Ens	the k-NN Al	gorithm Wri ır implemer	te the code station allow	to classify r s for varying	new instanc g values of	es using the k and hand	e k-NN les ties if		
7.	Implementing t Regression. En handles the ac	he Weightensure that y	ed Regressi our implem weights du	on Algorithr entation allo ring the trai	n Write the ows for diffe ning proces	code to per rent weight s. *	form Weigh ing scheme	ited is and		
8.	Implement to c kernel and der	reate a bas nonstrate its	ic Support V	Vector Macl a sample da	hine (SVM) ataset. *	classifier us	sing the line	ar		
Desigr	n Experiments:									
1.	Design an exp clustering algo	eriment to s rithms on b	systematical oth syntheti	lly evaluate c and real-v	and compa	re the perfo ets. The exp	ormance of o	different ns to		
	understand how various factors such as dataset characteristics, algorithm parameters, and evaluation metrics influence the clustering results.									
2.	Designing an e controlled envi	experiment ronment to	to evaluate assess the	rule-based performanc	classificatio e of these r	n methods nethods on	involves cre different da	eating a atasets.		
Lab Ma	anual									
1. "	Machine Learni (SRCT.	ng Lab Ma	nual", Depa	artment of	Computer S	Science and	d Business	Systems,		

*SDG 4 – Quality Education

Course Designer(s)

1. R.Karthik - karthikr@ksrct.ac.in



60 CB 6P2	Usability Design of Software	Category	L	Т	Ρ	Credit
	Applications Laboratory	PC	0	0	4	2

- To develop the ability to critically evaluate existing websites or apps and identify opportunities for improvement
- To understand and apply the principles of the design life cycle, including research, analysis, design, implementation, and evaluation
- To create user personas and scenarios that represent the target audience and their needs effectively
- To generate creative design concepts and effectively map out task flows to improve user experience
- To learn the iterative design process, including prototyping and refinement, and justify design decisions based on user feedback and usability principles

Pre-requisites

• Basic Knowledge about the Principles and Theories of HCI

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Apply UX principles to redesign websites and app, improving its usability and user satisfaction.	Apply
CO2	Analyse user perceptions and preferences for improvement.	Analyse
CO3	Demonstrate the ability to empathize with users by understanding their motivations, goals, and challenges through the creation of detailed and realistic user personas.	Apply
CO4	Apply interactive prototypes and iterate based on user feedback to refine the design.	Apply
CO5	Apply usability principles to evaluate and refine designs, ensuring that the final product aligns with established usability standards.	Apply

Mapping with Programme Outcomes

	<u> </u>		U												
CO2						PO	s						PSOs		
005	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	2	3	-	-	-	3	-	-	-	2	-	-
CO2	3	3	3	2	3	-	-	-	3	-	-	-	2	-	-
CO3	3	3	3	2	3	-	-	-	3	-	1	-	2	-	-
CO4	3	3	3	2	3	-	-	-	3	-	2	-	2	-	-
CO5	3	3	3	2	3	-	-	-	3	-	2	-	2	-	-
3 - St	rong: 2 - Medium: 1 - Some														

Assessment Pattern

Lab Experiments Assessment End Sem Model Bloom's Examination (Marks) Examination Category (Marks) (Marks) Activity Lab Remember -----Understand -_ _ -30 15 50 50 Apply 20 10 50 50 Analyse Evaluate -----Create -----Total 50 25 100 -100



K.S.Rangasamy College of Technology – Autonomous R2022														
B.Tech – Computer Science and Business Systems														
60 CB 6P2 – Usability Design of Software Applications Laboratory														
Somostor	ŀ	lours/Weel	k	Total	Credit	Maximum Marks								
Semester	L	Т	Р	Hrs	С	CA	ES	Total						
VI	VI 0 0 4 60 2 60 40 100													

List of Experiments:

1. Identify a website or an App to redesign, with justification

You've been hired as a UX designer by a start-up company that provides a meal delivery service. The current website lacks user engagement and has a high bounce rate. Your task is to identify which areas of the website need redesigning and provide justification for your choices

2. Analysis of the App or the website through the design life cycle

You've joined an established e-commerce company as a UX analyst. The company is experiencing a decrease in sales and wants to understand why. Your role is to analyse the website's design and user experience throughout its life cycle, from conception to current state, to pinpoint potential issues

3. Identifying Personas and Scenarios for the App or the website

A travel agency is revamping its online booking platform. As a UX researcher, you're tasked with identifying the personas of potential customers (such as business travellers, families, solo adventurers) and scenarios they may encounter (booking a last-minute flight, searching for accommodations, planning a vacation itinerary)

4. Concept development for a specific feature or page of an App or the website

Scenario: You're part of a design team working on a social media platform. The team wants to introduce a new feature to enhance user engagement. Your role is to brainstorm and develop concepts for this feature, considering factors like user needs, technical feasibility, and alignment with the platform's overall goals

5. Map out task flows for a selected set of actions within a software application

A banking app wants to streamline its account opening process. As a UX designer, you're tasked with mapping out the task flow for users who want to open a new account. This involves identifying each step the user must take, from accessing the app to completing the account setup

6. Prototype development with Iterations and justification

A healthcare start-up is developing a mobile app to help users track their fitness goals. You're responsible for creating a prototype of the app's user interface and iterating based on feedback from stakeholders and usability testing sessions. Justify design decisions to ensure the prototype meets user needs effectively

7. Usability testing and demonstration

A software company has developed a productivity app for remote teams. As the UX lead, you

organize usability testing sessions with potential users to evaluate the app's effectiveness and identify areas for improvement. You then demonstrate the findings to the development team for implementation

8. Evaluate the accessibility of a website or app with users

A government agency is updating its website to comply with accessibility standards. You conduct usability tests with users of varying abilities (such as visual impairments or motor disabilities) to assess the website's accessibility features and provide recommendations for improvement

Design Experiments:

1. Cross-Platform Design Challenge

A streaming service wants to expand its platform to smart TVs and gaming consoles. As a UX designer, you're tasked with ensuring a seamless user experience across all devices. Develop design solutions that accommodate different screen sizes, input methods, and user behaviours

2. Usability Heuristic Evaluation

An educational app has been receiving complaints about its user interface being confusing. As a UX expert, you conduct a heuristic evaluation of the app, using recognized usability principles to identify and prioritize usability issues. Present your findings to the development team for action

Lab Manual

1. "Usability Design of Software Applications Lab Manual", Department of Computer Science and Business Systems, KSRCT.

* SDG 4:- Quality Education

Course Designer(s)

1. S.Vignesh – vigneshs@ksrct.ac.in



60 CB 6B2	Mini Project	Category	L	Т	Ρ	Credit
00 CB 0F3	Will Project	PC	0	0	2	1

- To develop their own innovative prototype of ideas
- To find solution by formulating proper methodology
- To inculcate innovative thinking and thereby preparing students for main project

Pre-requisites

• Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Analyze a problem in the domain of interest.	Analyse
CO2	Perform Literature survey and identify the existing issues.	Apply
CO3	Rank the possible solutions.	Apply
CO4	Implement the project by Identify tools and techniques.	Analyse
CO5	Prepare technical report.	Apply

Mapping with Programme Outcomes

<u> </u>						P	Os							PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	2	3	3	1	2	-	-	1	2	3	1	3	2	-	
CO2	1	3	1	2	3	2	-	-	1	2	3	3	3	2	-	
CO3	2	3	1	2	3	2	-	-	1	2	3	2	3	2	-	
CO4	2	3	2	2	3	2	-	-	1	2	3	3	3	2	-	
CO5	2	3	3	2	3	2	-	-	1	2	3	1	3	2	-	
3 - St	3 - Strong: 2 - Medium: 1 - Some															

Bloom's Category	Lab Experimen (Ma	ts Assessment rks)	Model Examination (Marks)	End Sem Examination (Marks)		
	Lab	Lab Activity		(
Remember	-	-	-	-	-	
Understand	-	-	-	-	-	
Apply	25	-	50	-	-	
Analyse	25	-	50	-	-	
Evaluate	-	-	-	-	-	
Create	-	-	-	-	-	
Total	50	25	100	-	-	



	K.S.Rangasamy College of Technology – Autonomous R2022															
B.Tech – Computer Science and Business Systems																
60 CB 6P3 – Mini Project																
Somosto	r	Hours/Week Total Credit Maximum Marks											Hours/Week			rks
Ocificate	' <u> </u>	Т	P	Hrs	С	CA	ES	Total								
VI	0	0	2	30	1	100	-	100								
List of Experiments:																
1. T	hree reviews	have to be	conducted	by the comr	nittee of mi	nimum of th	ree membe	rs one of								
v	hich should b	e guide*														
2. F	roblem shoul	d be Identif	ied and Sel	ected *												
3. S	tudents have	to collect a	bout 20 pap	pers related	to their wor	'к *										
4. A	pplication car	n be develo	ped *													
5. F	eports has to	be Prepare	ed by the St	tudents as p	per the form	at in Annex	ure-1 and s	uggested								
fo	for various conference Publication*															
6. Internal evaluation has to be done for 100 Marks																
*SDG 4 -	Quality Educ	ation														

Course Designer(s)

1. Dr.K.Sakthivel - sakthivelk@ksrct.ac.in



SEVENTH SEMESTER

S.No.	Course Code	Name of the Course	Duration of Internal	Weightag	je of Mark	S	Minimum Marks for Pass in End Semester Exam	
			Exam	Continuous Assessment *	End Semes ter Exam **	Max. Marks	End Semes ter Exam	Total
		-	THEOR	Y		1	1	
1	60 HS 007	Human Resource Management	2	40	60	100	45	100
2	60 CB 701	Cloud Application Development	2	40	60	100	45	100
3	60 CB 702	Data Analytics	2	40	60	100	45	100
4	60 CB 703	Software Testing and Automation	2	40	60	100	45	100
5	60 CB E3*	Professional Elective III	2	50	50	100	45	100
6	60 CB E4*	Professional Elective IV	2	40	60	100	45	100
7	60 AB 00*	NCC/NSS/NSO/YRC/RRC/ Fine Arts*	2	100	-	100	-	-
8	60 AC 001	Research Methodology	2	100	-	100	-	-
			PRACTICA	LS	1	1	1	
9	60 CB 7P1	Data Analytics Laboratory	2	60	40	100	45	100
10	60 CB 7P2	Project Work Phase-I	2	100	-	100	-	100
11	60 CG 0P1	Career Skill Development -I	1	100	-	100	-	100
12	60 CG 0P6	Internship	-	100	-	100	-	100

* CA evaluation pattern will differ from course to course and for different tests. This will have to be declared in advance to students. The department will put a process in place to ensure that the actual test paper follow the declared pattern.

** End Semester Examination will be conducted for maximum marks of 100 and subsequently be reduced to 60 marks for the award of terminal examination marks



60 US 007 Uuman Bacauraa Manag	Category	L	Т	P	Credit
Human Resource Manag	HS	3	0	0	3

- To enable the students to understand the basics of HRM
- To gain the knowledge about strategies required to select and manage manpower resources
- To understand the role of training and development in the organisation
- To understand job-based compensation scheme and career management
- To give an insights about performance evaluation and grievance redressal methods

Pre-requisites

• Basic Knowledge of Human Resource Management

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Understand the various aspects of HRM and its relevance in the organization.	Understand
CO2	Identify the knowledge of plan, recruit, select and manage the job candidate	Understand
CO3	Develop the training needs and able to train using various methods of Training	Apply
CO4	Interpret the implement of Employee benefits and Welfare measures, Employee safety and Health Measures	Apply
CO5	Examine the Performance of the employees and able to devise the strategies to handle the employee issues.	Analyse

Mapping with Programme Outcomes

mapp			· g. ~.																			
COs		POs													PSOs							
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3							
CO1	3	2	3	2	2	-	-	3	2	3	3	-	-	-	-							
CO2	3	2	3	2	-	-	-	3	2	3	2	-	-	-	-							
CO3	3	2	2	-	-	-	-	3	3	3	2	-	-	-	-							
CO4	3	3	3	-	-	-	-	3	3	3	3	3	-	3	-							
CO5	3	3		-	-	-	-	3	3	3	3	3	-	3	-							
3 - St	rong; 2	2 - Me	dium	; 1 - Some	9																	

Bloom's	Continuous As (Ma	sessment Tests Irks)	End Sem Examination (Marks)
Category	1	2	
Remember	20	20	20
Understand	20	20	20
Apply	20	20	30
Analyse	-	-	30
Evaluate	-	-	-
Create	-	-	-
Total	60	60	100

Syllabus									
K.S.Rangasamy College of Technology – Autonomous R2022									
		B.Tech – C	Computer S	cience and	l Business	Systems			
60 HS 007- Human Resource Management									
Somos	stor	Hours/Wee	k	Total	Credit	Ма	ximum Mai	ks	
ocifica	L	Т	P	Hours	С	CA	ES	Total	
VII	3	0	0	45	3	40	60	100	
Perspectives in Human Resource Management									
Evolution	on of human	resource ma	anagement-	 importanc 	e of the hu	uman capit	al-Role of	[9]	
human resource manager - Challenges for human resource managers - Functions and								[0]	
trends	in Human reso	urce.							
Humar	n Resource Pla	anning and	Recruitme	nt					
Importa	ance of Huma	n Resource	Planning-	Forecasting	human re	esource rec	quirement-	[9]	
Deerwit	ng supply and	demand In	ternal and I	=xternal sol	urces - Orga	anizational	Attraction-		
Recruit	iment, Selection	n, induction a	and Socializ	zation.					
	of training	mothode n	urnoso bor	ofite register		outivo do	volonmont	[0]	
regramme Common practices. Panefite Self Development Knowledge management								[9]	
Employee Engagement									
Compensation plan - Reward-Motivation - Application of theories of motivation -Career									
manag	ement- Mento	ring - Dev	elopment	of mentor-	· Protege	relationshi	os - Job	[9]	
Satisfa	ction. Employe	e Engagem	ent. Organ	izational Ci	tizenship B	ehaviour -	Theories.	[0]	
Models	8	5×5×	- , - 3 -				,		
Perfor	mance Evalua	tion and Co	ntrol						
Method	d of performand	e evaluation	– Feedbac	k - Industry	practices.	Promotion,	Demotion,		
Transfe	er and Separat	on - Implica	tion of job o	change. The	e control pro	ocess – Imp	oortance -	[9]	
Method	ds - Requireme	nt of effectiv	ve control sy	ystems griev	vances – ca	auses – imp	olications -		
Redres	ssal methods.								
-						Tot	tal Hours:	45	
Text B	ook(s):								
1 V	Nayne F Casci	o, "Managing	g Human Re	esources: P	roductivity,	Quality of V	Vork Life, Pı	ofits",	
·· N	McGraw-Hill Ed	ucation, 12tl	n Edition 20	21.					
2. (Gary Dessler, "l	Human Reso	ource Mana	gement", Pe	earson, 16th	n Edition202	20		
Refere	Reference(s):								
1. Human Resource Management, 8th Edition, K. Aswathappa, Tata McGraw Hill, 2017									
2. 8	Seema Sanghi,	"Human Re	source Man	agement", \	Vikas Publis	shing House	e, 2nd Editic	on 2017.	
3. A	Aswathappa K ,	"Human Res	source Man	agement",]	MH ,8th Ec	2017, dition		_	
4. E	Dessler Human	Resource M	lanagemen	t, Pearson E	ducation L	imited, 14th	Edition,201	5.	



S. No.	Topics	No. of
1.0	Perspectives in Human Resource Management	nours
1.0	Evolution of human resource management	1
1.1	importance of the human capital	1
1.2	Role of human resource manager	1
1.4	Challenges for human resource managers	1
1.5	Functions	1
1.6	Trends in Human resource	1
2.0	Human Resource Planning and Recruitment	I
2.1	Importance of Human Resource Planning	1
2.2	Forecasting human resource requirement	1
2.3	Matching supply and demand	1
2.4	Internal and External sources	1
2.5	Organizational Attraction	1
2.6	Recruitment, Selection	1
2.7	Induction and Socialization	1
3.0	Training and Development	•
3.1	Types of training methods	1
3.2	Purpose, benefits, resistance	1
3.3	Executive development programme	2
3.4	Common practices	1
3.5	Benefits, Self Development	2
3.6	Knowledge management	1
4.0	Employee Engagement	
4.1	Compensation, Reward, Motivation	1
4.2	Application of theories of motivation	2
4.3	Career management	1
4.4	Mentoring, Development of mentor	2
4.5	Protege relationships, Job Satisfaction	1
4.6	Employee Engagement, Organizational	1
4.7	Citizenship Behaviour, Theories, Models	1
5.0	Performance Evaluation and Control	
5.1	Method of performance evaluation	1
5.2	Feedback, Industry practices	1
5.3	Promotion, Demotion, Transfer and Separation	2
5.4	Implication of job change	1
5.5	The control process, Importance, Methods	1
5.6	Requirement of effective control systems grievances	1
5.7	Causes, implications, Redressal methods	2

.

Course Designer(s)

.



1. Dr.M.Mohanraj – mohanrajm@ksrct.ac.in

60 CB 701	Cloud Application	Category	L	Т	Ρ	Credit
00 CB 701	Development	PC	3	0	0	3

Objectives

- To provide a comprehensive understanding of the strategic, technical, and operational aspects of cloud computing
- To compare and contrast web applications with cloud applications, explore popular frameworks
- To understand the principles of cloud-native application development, including micro services architecture and containerization with Docker
- To understand and address security challenges in cloud computing
- To emphasize the significance of monitoring in cloud environments

Pre-requisites

• Proficiency in Languages like Python / Java / Java Script

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Apply knowledge and skills necessary to effectively leverage cloud technologies to drive innovation, agility, and efficiency in organizations.	Apply
CO2	Discuss the prominent cloud platforms used across industries, facilitating their readiness for cloud application development roles in the workforce.	Understand
CO3	Design, develop, and deploy scalable cloud-native applications using appropriate database and storage solutions.	Apply
CO4	Recognize the best practices to enhance the security of cloud applications, ensuring data confidentiality, integrity, and availability.	Remember
CO5	Analyse the robust monitoring solutions for cloud applications, utilizing leading cloud monitoring tools.	Analyse

Mapping with Programme Outcomes

<u> </u>	POs												PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	3	1	3	-	-	-	-	-	-	-	2	-	2
CO2	3	2	2	2	3	-	-	-	-	-	-	-	2	-	2
CO3	3	3	3	3	3	-	-	-	-	-	-	-	3	-	2
CO4	3	2	3	2	3	-	-	-	-	-	-	-	2	-	2
CO5	3	3	2	2	3	-	-	-	-	-	-	-	2	-	2
3 - St	rona: 2	2 - Mec	lium:	1 – So	me										

Bloom's	Continuous A (N	ssessment Tests Iarks)	End Sem Examination (Marks)							
Calegory	1	2								
Remember	-	20	10							
Understand	20	40	16							
Apply	40	-	60							
Analyse	-	-	14							
Evaluate	-	-	-							
Create	-	-	-							
Total	60	60	100							

Syllabus										
K.S.Rangasamy College of Technology – Autonomous R2022										
			B.Tech – C	Computer S	cience and	Business	Systems			
			60 CB	701 – Clou	d Applicati	on Develop	oment	-	-	
Sem	ester	F	lours/Wee	k –	Total	Credit	Ma	iximum Ma	rks	
		L	T	Р	Hours	C	CA	ES	Total	
V		3	0	0	45	3	40	60	100	
Basi	Basic Concepts and Techniques*									
Business Case for Implementing Cloud Application: Requirements Collection for Cloud										
Application Development, Cloud Service Models and Deployment Models - Open									[9]	
Chall	enges		omputing:	Cloud Inter	-Operability	and Stand	dards, Scal	ability and		
Fault	TOIER	nce, Secur	ity, Trust an							
				ention vo C	Noud Applic	otion From	noworko: M	ladal Viaw		
Cont	ssilly i rollor (I			Callor vs C	rme in indus	try: Google		Microsoft	[9]	
		nshift Clour	s, Spring - v dfoundry	Sloud platio		ary. Google	Appengine			
Clou	d-Nati		tion Devel	onment and	d Database	¢*				
Princ	inles (of Cloud -	Native A	polication [Developmer	s nt - Micros	ervices Ar	chitecture:		
Cont	aineriz	ation with I	Docker - F)atabase Oi	ptions in th	e Cloud (S	Sal Nosal	Newsal) -	[10]	
Over	Overview of Cloud Storage Services									
Cloud Security and Compliance*										
Secu	rity Ch	allenges in	the Cloud-	Identity - Ac	cess Mana	gement (IA	M) – Encry	otion - Key	[0]	
Mana	agemei	nt - Complia	ance Fram	eworks – G	DPR - HIP	ĂA - SÔC	2 - Best Pr	actices for	[8]	
Secu	ring Cl	oud Applica	ations.							
Clou	d App	lication Mo	nitoring a	nd Manage	ment*					
Impo	rtance	of Monitorin	ng in the Cl	oud - Cloud	I Monitoring	Tools (AW	S CloudWa	tch, Azure	ΓΩΊ	
Moni	tor, Go	ogle Cloud	Monitoring) - Application	on Performa	ance Monito	oring (APM)	- Logging	[9]	
and [Debugo	ging in the C	Cloud Envir	onment						
							To	tal Hours:	45	
Text	Book(s):			_					
1.	Rajku Editio	imar Buyya n, TataMcG	, Christian Graw Hill Ec	Vecchiola, ducation Priv	S Thamara vate Limitec	ai Selvi,"N I, New Delh	/lastering C ni, 2024.	loud Comp	uting", 2 nd	
2	Boris	Scholl, Tre	nt Swansor	n, and Peter	Jausovec,	"Cloud Nat	ive: Using C	Containers, I	Functions,	
Ζ.	and D	ata to Build	d Next-Gen	eration App	lications", 1	st Edition, C	Dreilly,Bosto	on, 2019.		
Refe	rence(s):								
1	Jez H	lumble and	David Farle	ey,"Continuo	ous Delivery	/: Reliable \$	Software Re	eleases thro	ugh Build,	
1.	Test,	and Deploy	ment Auto	mation", 2 nd	Edition, Ad	dison-Wesl	ey Professi	onal,UK, 20	22.	
	Tinu	Philips and	d Lakshma	inan Ganes	san, "Hands	s-On Mach	ine Learnir	ng on Goo	gle Cloud	
2.	Platfo	orm: Implei	menting E	nd-to-End	Real-Time	Predictive	Analytics"	, 1 st Editio	on, Packt	
	Publis	shing, 2018								
3	Zaigh	am Mahmo	od, Ricard	o Puttini, Th	nomas Erl,"	Cloud Corr	nputing: Co	ncepts, Tec	hnology &	
0.	Archi	tecture", 2 nd	Edition, P	earson, 202	3.					
4	Antho	ony T .Velte	e, Toby J. ∖	/elte, Rober	t Elsenpete	r, "Cloud C	computing a	Practical A	vpproach",	
	1 st Ec	lition, Tata I	McGraw-HI	LL, New De	elhi, 2010 Ec	dition.				

*SDG 4 Business Case for Implementing Cloud Application



Course Contents and Lecture Schedule								
S. No.	Topics	No. of hours						
1.0	Basic Concepts & Techniques							
1.1	Business Case for Implementing Cloud Application	1						
1.2	Requirements Collection For Cloud Application Development	1						
1.3	Cloud Service Models and Deployment Models	1						
1.4	Open Challenges in Cloud Computing	1						
1.5	Cloud Inter-operability and Standards	1						
1.6	Scalability and Fault Tolerance	2						
1.7	Security	1						
1.8	Trust and Privacy	1						
2.0	Application Development Framework							
2.1	Accessing the Clouds	1						
2.2	Web Application vs Cloud Application	1						
2.3	Frameworks: Model View Controller (MVC)	1						
2.4	Struts, Spring.	1						
2.5	Cloud Platforms in Industry	1						
2.6	Google AppEngine	1						
2.7	Microsoft Azure	1						
2.8	Openshift	1						
2.9	CloudFoundry	1						
3.0	Cloud-Native Application Development and Databases							
3.1	Principles of cloud	1						
3.2	Native application development	1						
3.3	Microservices architecture.	1						
3.4	Containerization with Docker	2						
3.5	Database options in the cloud	2						
3.6	SQL, NoSQL, NewSQL	1						
3.7	Overview of Cloud Storage Services	1						
4.0	Cloud Security and Compliance							
4.1	Security Challenges in the Cloud-Identity	1						
4.2	Access Management (IAM)	1						
4.3	Encryption	1						
4.4	Key Management	1						
4.5	Compliance Frameworks	1						
4.6	GDPR	1						
4.7	НІРАА	1						
4.8	SOC 2	1						
4.9	Best Practices for Securing Cloud Applications	1						
5.0	Cloud Application Monitoring and Management							
5.1	Importance of Monitoring in the Cloud	1						



5.2	Cloud Monitoring Tools	1
5.3	AWS CloudWatch	1
5.4	Azure Monitor	2
5.5	Google Cloud Monitoring	1
5.6	Application Performance Monitoring (APM)	2
5.7	Logging and Debugging in the Cloud Environment	1

Course Designer(s)

1. S.Vignesh - vigneshs@ksrct.ac.in



60 CB 702	Data Analytics	Category	L	Т	Ρ	Credit
80 CB 702	Data Analytics	PC	3	0	0	3

- To understand the data science fundamentals and process
- To learn to describe the data for the data science process
- To learn to describe the relationship between data
- To utilize the Python libraries for Data Wrangling
- To present and interpret data using visualization libraries in Python

Pre-requisites

• NIL

Course Outcomes

On the su	On the successful completion of the course, students will be able to							
CO1	Define the data science process Remember							
CO2	Understand different types of data description for data science process	Understand						
CO3	Gain knowledge on relationships between data	Understand						
CO4	Use the Python Libraries for Data Wrangling	Apply						
CO5	Apply visualization Libraries in Python to interpret and explore data	Apply						

Mapping with Programme Outcomes

	U		U												
<u> </u>	POs											PSOs			
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2	1	2	2	-	-	-	1	1	1	2	2	2	2
CO2	2	1	-	1	1	-	-	-	2	1	1	2	2	3	1
CO3	2	2	1	2	2	1	1	-	1	2	1	3	2	2	3
CO4	3	2	2	1	2	-	-	-	1	1	2	2	3	3	2
CO5	2	2	1	2	2	-	-	-	1	1	1	2	2	2	2
3 - St	rona: 2	2 - Mec	dium: 1	- Som	e										

Assessment Pattern											
Bloom's	Continuous As (Ma	sessment Tests arks)	End Sem Examination (Marks)								
Calegory	1	2									
Remember	20	20	34								
Understand	40	40	66								
Apply	-	-	-								
Analyse	-	-	-								
Evaluate	-	-	-								
Create	-	-	-								
Total	60	60	100								



Syllabus											
K.S.Rangasamy College of Technology – Autonomous R2022											
B.Tech – Computer Science And Business Systems											
60 CB 702 – Data Analytics											
Semester Hours/Week Total Credit Maximum Marks											
L T P Hours C CA ES Tota	al										
VII 3 0 0 45 3 40 60 100)										
Introduction:*											
Data Science: Benefits and Uses – Facets of Data – Data Science Process: Overview –											
Defining Research Goals – Retrieving Data – Data Preparation - Exploratory Data Analysis [9]											
– Build the Model – Presenting Findings and Building Applications – Data Mining – Data											
Warehousing – Basic Statistical Descriptions of Data											
Describing Data:*											
Types of Data – Types of Variables – Describing Data with Tables and Graphs – Describing [9]											
Data with Averages – Describing Variability – Normal Distributions and Standard (z) Scores											
Describing Relationships:*											
Correlation – Scatter Plots – Correlation Coefficient for Quantitative Data – Computational											
Formula for Correlation Coefficient – Regression – Regression Line – Least Squares [9]											
Regression Line – Standard Error of Estimate – Interpretation of r2 – Multiple Regression											
Equations – Regression Towards the Mean											
Python Libraries for Data Wrangling:											
Basics of Numpy Arrays – Aggregations – Computations on Arrays – Comparisons, Masks,											
Boolean Logic – Fancy Indexing – Structured Arrays – Data Manipulation with Pandas – [9]											
Data Indexing and Selection – Operating on Data – Missing Data – Hierarchical Indexing –											
Combining Data Sets – Aggregation and Grouping – Pivot Tables											
Data Visualization:											
Importing Matplotlib – Line Plots – Scatter Plots – Visualizing Errors – Density and Contour											
Plots – Histograms – Legends – Colors – Subplots – Text and Annotation – Customization [9]											
- Three Dimensional Plotting - Geographic Data with Basemap - Visualization with											
Seaborn.											
Total Hours: 45											
Text Book(s):											
1. David Cielen, Arno D. B. Meysman, and Mohamed Ali, "Introducing Data Science", Mannii	ing										
Publications, 2016.											
2. Robert S. Witte and John S. Witte, "Statistics", Eleventh Edition, Wiley Publications, 2017.											
Reference(s):											
1. Allen B. Downey, "Think Stats: Exploratory Data Analysis in Python", Green Tea Press, 2014.											
2. Jake VanderPlas, "Python Data Science Handbook", O'Reilly, 2016.											
3. Wes McKinney "Python for Data Analysis" O'Reilly Media,02017.											
Jiawei Han, Micheline Kamber, and Jian Pei "Data Mining: Concepts and Techniques" Morga	an										
Kautmann, 2011.											

* SDG 4: - Quality Education



Course Contents and Lecture Schedule										
S. No.	Topics									
1.0	Introduction									
1.1	Benefits and uses – Facets of Data	1								
1.2	Overview – Defining Research Goals									
1.3	Retrieving Data									
1.4	Data Preparation									
1.5	Exploratory Data Analysis	1								
1.6	Build the Model	1								
1.7	Presenting Findings and Building Applications	1								
1.8	Data Mining - Data Warehousing	1								
1.9	Basic Statistical Descriptions of Data	1								
2.0	Describing Data									
2.1	Types of Data	1								
2.2	Types of Variables	1								
2.3	Describing Data with Tables and Graphs	2								
2.4	Describing Data with Averages									
2.5	Describing Variability									
2.6	Normal Distributions and Standard (z) Scores 2									
3.0	Describing Relationships									
3.1	Correlation – Scatter Plots	1								
3.2	Correlation Coefficient for Quantitative Data									
3.3	Computational Formula for Correlation Coefficient	1								
3.4	Regression - Regression Line	1								
3.5	Least Squares Regression Line	1								
3.6	Standard Error of Estimate	1								
3.7	Interpretation of r2	1								
3.8	Multiple Regression Equations	1								
3.9	Regression Towards the Mean	1								
4.0	Python Libraries for Data Wrangling									
4.1	Basics of Numpy Arrays – Aggregations	1								
4.2	Computations on Arrays – Comparisons	1								
4.3	Masks - Boolean Logic	1								
4.4	Fancy Indexing - Structured Arrays	1								
4.5	Data Manipulation with Pandas 1									
4.6	Data Indexing and Selection									
4.7	Operating on Data – Missing Data	1								
4.8	Hierarchical Indexing - Combining Data Sets	1								
4.9	Aggregation and Grouping - Pivot Tables	1								
5.0	Data Visualization	1								
5.1	Importing Matplotlib – Line Plots	1								



5.2	Scatter Plots – Visualizing Errors						
5.3	Density and Contour Plots						
5.4	Histograms – Legends						
5.5	Colors – Subplots						
5.6	Text and Annotation – Customization						
5.7	Three Dimensional Plotting						
5.8	Geographic Data with Basemap	1					
5.9	Visualization with Seaborn.						

Course Designer(s)

1. R.Karthik - karthikr@ksrct.ac.in



60 CB 702	Software Testing and	Category	L	Т	Ρ	Credit
80 CB 703	Automation	PC	3	0	0	3

- To study the basics of software testing
- To learn about white box and black box testing techniques
- To explain about test planning and review of test activities
- To learn test design and execution of test cases
- To learn about test automation and the tools used for test automation

Pre-requisites

• Programming languages, Software Engineering.

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Know the fundamentals of software testing.	Remember
CO2	Understand the techniques of white box and black box testing.	Understand
CO3	Know the process and procedures involved in test planning and test review.	Remember
CO4	Understand the design, execution and test reporting.	Understand
CO5	Implement the basic tools used in web automation.	Apply

Mapping with Programme Outcomes

000	POs												PSC)s
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	-	-	-	-	-	-	-	-	-	-	-	1	1
CO2	3	3	1	-	-	-	-	-	-	-	-	-	3	1
CO3	3	-	-	1	-	-	-	-	-	-	-	-	1	3
CO4	3	-	-	2	-	-	-	-	-	-	-	-	1	3
CO5	3	1	2	-	3	-	-	-	-	-	-	-	3	1
3 - St	Strong: 2 Modium: 1 Somo													

3 - Strong; 2 - Medium; 1 – Some

Bloom's	Continuous As (Ma	ssessment Tests arks)	End Sem Examination (Marks)
Category	1	2]
Remember	30	10	50
Understand	20	30	30
Apply	10	20	20
Analyse	-	-	-
Evaluate	-	-	-
Create	-	-	-
Total	60	60	100



Syllabus										
	K.S.F	Rangasamy	v College o	f Technolo	ogy – Autor	nomous R2	2022			
		B.Tech – C	computer S	cience and	d Business	Systems				
	n	60 CB 7	03 – Softw	are Testing	and Auto	mation				
Semester	ŀ	lours/Weel	K	Total	Credit	Ma	iximum Mai	rks		
Ochicater	L	Т	Р	Hours	С	CA	ES	Total		
VII	3	0	0	45	3	40	60	100		
Introductio	on to Softw	are Testing	*							
 Software Testing Life Cycle - V model of Software Testing - Program Correctness and Verification - Reliability versus Safety - Failures, Errors, Faults, Defects - Origins and Cost of Defects - Software Testing Principles - Verification and Validation - Types of Functional Testing - Types of Non Functional Testing. 										
Testing Techniques* White Box Testing Techniques - Statement Coverage, Decision Coverage, Basic Path Testing, Control Flow Graph Coverage, Branch Coverage, Conditional Coverage - McCabe's Cyclomatic Complexity - Mutation Testing. Black Box Test Techniques - Boundary Value Analysis, Equivalent Class Partition, Error Guessing, Decision Table, State Transition Table, Pair Wise Testing, Use Case Testing										
Test Planning and Review Process* Software Test Planning: The Goal of Test Planning - High Level Expectations - Intergroup Responsibilities - Test Phases - Test Strategy - Resource Requirements - Tester Assignments - Test Schedule - Test Cases - Metrics and Statistics. Software Testing Review: Objectives - Types of Reviews - Peer Review - Walkthrough - Inspection - Checklists of Review Process - Review Log.										
Test Design and Execution * Test Objective - Test Design Factors - Test Requirements - Identification, Analyzing the Requirements, Classifying the Functional and Non Functional Requirements with their types, Testable Requirements - Model-Driven Test Design - Test Design Preparedness Metrics - Test Case Design - Standards, Guidelines and Naming Conventions - Characteristics of Good Test Cases - Templates - Traceability Matrix - Test Case Review - Test Case Organization and Tracking - Test Execution - Test Log - Bug Reporting - Bug										
Test Auton Automated Architecture Elements, Testng.xml TestNG Re	nation and Software e, Web Driv Understand , TestSuite. ports.	Tools * Testing - ver and We ling Web D xml, Annota	Automate b Elements river Even ations, Gro	Testing of , Locating ts. TestNG uping the T	f Web Ap Web Eleme : Why Tes Festcases,	plications. ents, Action tNG?, Unde Exclusion o	Selenium: s on Web erstanding of Groups,	[9]		
						То	tal Hours:	45		
Text Book	(s):									
1. Paul 2. Unmo Pack	 Paul C. Jorgensen, "Software Testing: A Craftsman's Approach", 4th Edition, CRC Press, 2014. Unmesh Gundecha, Satya Avasarala, "Selenium WebDriver 3 Practical Guide", 2nd Edition, Packt Publishing, 2018. 									
Keterence	(S):									
1. Yoge	sn Singh, "S	Software Le	sting", Can	noridge Univ	versity Pres	s, 2012.				
2. Ron 3. Glent Publi	Patton, "Sol ford J. Myer shers, 2015	rtware testin s, Corey Sa 5.	ndler, Tom	tion, Sams Badgett, "T	Publishing, he Art of Sc	2006. ftware Test	ing, 3rd Edit	ion, Wiley		
4. Varu	n Menon, "T	estng Begir	nner's Guid	e", Packt P	ublishing, 2	013.				

*SDG 4 – Quality Education



S. No.	Topics	No. of hours
1.0	Introduction to Software Testing	
1.1	Definition, Objective and Limits of Testing, Roles and Responsibilities of a Software Tester, Software Testing Life Cycle	1
1.2	V model of Software Testing - Program Correctness and Verification - Reliability versus Safety - Failures, Errors, Faults, Defects	1
1.3	Origins ,Cost of Defects, Software Testing Principles, Verification & Validation	1
1.4	Types of Functional Testing	3
1.5	Types of Non Functional Testing	3
2.0	Testing Techniques	
2.1	Statement Coverage, Decision Coverage	1
2.2	Basic Path Testing, Control Flow Graph Coverage	1
2.3	Branch Coverage, Conditional Coverage	1
2.4	McCabe's Cyclomatic Complexity	1
2.5	Boundary Value Analysis, Mutation Testing	1
2.6	Equivalent Class Partition, Error Guessing	1
2.7	Decision Table	1
2.8	State Transition Table, Pair Wise Testing	1
2.9	Use Case Testing	1
3.0	Test Planning and Review Process	
3.1	Goal of Test Planning, High Level Expectations, Intergroup Responsibilities	1
3.2	Test Phases - Test Strategy	1
3.3	Resource Requirements, Tester Assignments, Test Schedule	1
3.4	Test Cases	2
3.5	Metrics and Statistics, Software Testing Review: Objectives	2
3.6	Peer Review, Walkthrough, Inspection	1
3.7	Checklists of Review Process, Review Log.	1
4.0	Test Design and Execution	
4.1	Test Objective - Test Design Factors - Test Requirements	1
4.2	Identification. Analyzing the Requirements	1
4.3	Classifying the Functional and Non Functional Requirements with their types., Testable Requirements	1
4.4	Model-Driven Test Design	1
4.5	Test Design Preparedness Metrics - Test Case Design	1
4.6	Standards, Guidelines and Naming Conventions, Characteristics of Good Test Cases, Templates	1
4.7	Traceability Matrix, Test Case Review	1
4.8	Test Case Organization and Tracking, Test Execution, Test Log	1
4.9	Bug Reporting - Bug Life Cycle	1
5.0	Test Automation and Tools	



5.1	Automated Software Testing - Automate Testing of Web Applications. Selenium: Architecture	1
5.2	Web Driver and Web Elements, Locating Web Elements	3
5.3	Actions on Web Elements, Understanding Web Driver Events	1
5.4	TestNG: Why TestNG?, Understanding Testng.xml	1
5.5	TestSuite.xml, Annotations	1
5.6	Grouping the testcases, Exclusion of groups	1
5.7	TestNG Reports	1

Course Designer(s)

1. P. Venkatesh - venkateshp@ksrct.ac.in



60 AB 001	National Cadet Corps - AIR WING	Category	L	Т	Ρ	Credit
	National Cadet Corps - AIR WING	PC	2	0	2	3

- To designed especially for NCC Cadets
- To develop character, camaraderie, discipline, secular outlook
- To inculcate spirit of adventure, sportsman spirit
- To teach selfless service amongst cadets by working in teams
- To learning military subjects including weapon training and motivate them to join in tri-services

Pre-requisites

• Nil

Course Outcomes

On the suc	ccessful completion of the course, students will be able to	
CO1	Display sense of patriotism, secular values and shall be transformed into motivated youth who will carry out nation building through national unity and social cohesion.	Remember
CO2	Demonstrate the sense of discipline with smartness and have basic knowledge of weapons and their use and handling.	Remember
CO3	Illustrate various forces and moments acting on aircraft.	Understand
CO4	Outline the concepts of aircraft engine and rocket propulsion.	Understand
CO5	Design, build and fly chuck gliders/model airplanes and display static models.	Create

Mapping with Programme Outcomes

COs		POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	-	-	-	-	-	3	3	3	3	3	-	-	-	-	-	
CO2	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	
CO3	3	2	1	1	-	-	-	-	-	-	-	-	-	-	-	
CO4	3	2	1	1	-	-	-	-	-	-	-	-	-	-	-	
CO5	3	2	1	1	-	-	-	-	-	-	-	-	-	-	-	
3 - St	rong; 2	2 - Me	dium	; 1 - Some	Э											

Ploom'o	Continuous	Assessment Test	s (Marks)	End Sem
Category	DST(20)	AM(20)	SBM(10)	Examination (Marks)
Remember	10	-	-	40
Understand	10	-	10	60
Apply	-	-	-	-
Analyse	-	-	-	-
Evaluate	-	-	-	-
Create	-	20	-	-
Total	20	-	-	40
	DST – Drill Square Test	AM – Aero Modeling	SBM- Swachh Bharat Mission	



Syllabus										
	ŀ	K.S.Rangas	amy Colle	ge of Tech	nology – A	utonomou	s R2022			
		B.Tech	i – Compu	ter Science	and Busir	less Syste	ms			
		60	AB 001- Na	ational Cad	et Corps -	AIR WING				
Semeste	r ł	lours/Weel	(Total	Credit		Maximum	n Marks		
ocinesi	' L	Т	Р	Hours	C	CA	ES	Total		
VII	2	0	2	60	3	50	50	100		
NCC Or	anisation and	d National I	ntegration	* Organizatio	n- NCC Tr	aining- NC(
– Promo	tion of NCC	cadets – Ai	m and adv	antages of	NCC Train	ina- NCC I	badges of			
Rank- H	onors" and A	Awards – Ir	icentives f	or NCC ca	dets by ce	ntral and s	tate govt.	[12]		
History a	nd Organizat	tion of IAF-	Indo-Pak	War-1971-	Operation	Safed Saga	ar. National			
Integratio	- Unity in dive	rsity- Contribu	ution of yout	h in nation b	uilding- Natio	onal integrati	on council-			
Images a	nd Slogans o	n National Ir	ntegration.		-	_				
Drill and	Weapon Tra	ining*								
Basic ph	sical Training/	J- Various ex	ercises for	fitness (with	n Demonstra	ation)- Food	d- Hygiene			
and Clea	nliness. Drill-	Words of co	mmands- I	Position and	commands	s- Sizing an	d forming-	[12]		
Saluting-	Marching- Tu	urning on the	e march ar	nd wheeling	 Saluting 	on the ma	arch- Side			
pace, Pa	ice forward a	and to the	rear- Mark	king time- [Drill with a	rms- Cerem	onial drill-			
Guard m	ounting (WITH	DEMONST	RATION).							
Principle	es of Flight *			D = =	h			[40]		
Laws of surfaces	Secondarv co	es acting or	es- Aircraft- E	recoanition	neorem- St	alling-Prima	ary control	[12]		
Aero En	gines *									
Introducti	on of Aero eng	gine- Types o	of engine- P	iston engine	- Jet engine	s- Turbopro	p engines-	[12]		
Basic Flig	ht Instrument	s- Modern t	rends.	-	-					
Aero Mo	deling *									
History o	Aero modelir	ng- Material	s used in A	ero modelin	g- Types of	Aero mode	els – Static	[12]		
Models-	Gliders- Contr	ol line mode	els- Radio	Control Mod	dels- Buildir	ng and Flyir	ng of Aero	٢٢٢		
models.										
						To	tal Hours:	60		
Text Bo	0K(S):	0		IL S. L. S.C.N.	00.0.1.1.1	" D !				
1. ^{"N} 20	1. "National Cadet Corps- A Concise handbook of NCC Cadets", Ramesh Publishing House, New Delhi, 2014.									
Referen	e(s):									
1. "C	adets Handbo	ok – Comm	ion Subject	ts SD/SW",	published b	by DG NCC	, New Delhi			
2. "C	adets Handbo	ok- Specializ	zed Subjec	ts SD/SW",	published b	y DG NCC,	New Delhi			
3. "N	COTA Preci	se", publishe	ed by DG N	ICC, New D	elhi					

*SDG 4 – Quality Education



	ASSESSMENT PATTERN - THEORY											
Tes Bloom'sC	st / ategory*	Knowledge (K1) %	Apply (K2) %	Analyzing(K3) %	Creating(K4) %	Total %						
CA	\T1	-	-	-	-	-						
CA	T2	-	-			-						
CA	AT3	-	-	-	-	-						
ESE The examination and award of marks will be done by the Ministry of Defence, Government of India which includes all K1 to K4 knowledge levels. The maximum marks for the End Semester Examination is 500 marks. It will be converted to 100 marks.												
Course Desi	gner(s)											

1. Flt Lt V.R.SADASIVAM - sadasivam@ksrct.ac.in



	National Cadet Corps - Army	Category	L	Т	Ρ	Credit
60 AB 002	Wing Common to all Branches	HS	2	0	2	3

- Develop character, camaraderie
- Inculcate discipline, secular outlook
- Enrich the spirit of adventure, sportsman spirit
- Ideals of selfless service amongst cadets by working in teams
- Improve qualities such as self-discipline, self-confidence, self-reliance and dignity of labour in the cadets.

Pre-requisites

NIL

Course Outcomes

On the suc	In the successful completion of the course, students will be able to									
CO1	Display sense of patriotism, secular values and shall be transformed into motivated youth who will carry out nation building through national unity and social cohesion.	Understand								
CO2	Demonstrate Health Exercises, the sense of discipline, improve bearing, smartness, turn out, and develop the quality of immediate and implicit obedience of orders.	Apply								
CO3	Basic knowledge of weapons and their use and handling.	Understand								
CO4	Aware about social evils and shall inculcate sense of whistle blowing against such evils and ways to eradicate such evils.	Analyze								
CO5	Acquaint, expose & provide knowledge about Army/Navy/ Air force and to acquire information about expansion of Armed Forces, service subjects and important battles.	Apply								

Mapping with Programme Outcomes

CO 2		POs													PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
CO1	-	-	-	-	-	1	-	3	-	-	-	-	-	-	-		
CO2	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-		
CO3	-	-	-	-	-	1	-	3	-	-	-	-	-	-	-		
CO4	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-		
CO5	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-		
3 - St	rong; 2	2 - Med	lium	; 1 - Some													

Bloom's Category	Continuous Ass (Ma	sessment Tests rks)	Model Examination	End Sem Examination		
Oategory	1	2	(Marks)	(Marks)		
Remember	10	-	40	40		
Understand	10	-	60	60		
Apply	-	-	-	-		
Analyse	-	-	-	-		
Evaluate	-	-	-	-		
Create	-	20	-	-		
Total	20	20	100	100		



Sylla	bus									
K.S.Rangasamy College of Technology – Autonomous R2022										
Common to all Branches										
60 AB 002 – National Cadet Corps (Army Wing)										
Seme	ester	Н	ours/Week		Total	Credit	Maximum Marks			
001110		L	T	Р	Hours	С	CA	ES	Total	
		2	0	2	60	3	50	50	100	
NCC Organization & National Integration NCC Organization – History of NCC- NCC Organization- NCC Training- NCC Uniform – Promotion of NCCcadets –Aim and advantages of NCC Training- NCC badges of Rank- Honors' and Awards – Incentives for NCC cadets by central and state govt. National Integration - Unity in diversity- contribution of youth in nation building- national integration council- Images and Slogans on National Integration									[12]	
Basic Basic and C salutin pace (WITH	Physi physi Cleanli ng- ma forwar H DEM	sical Training cal Training – ness. Drill- V arching- turni rd and to the 10NSTRATIC	g & Drill - various ex Vords of co ng on the r rear- markii DN).	ercises for f mmands- p narch and o ng time- Dri	fitness (with osition and wheeling- s Il with arms	Demonstra commands aluting on t ceremonial	ation)-Food s- sizing an he march- drill- guard	– Hygiene d forming- side pace, mounting.	[12]	
Weapon Training Main Parts of a Rifle Characteristics of .303 rifle- Characteristics of .22 rifle- loading and unloading – position and holding safety precautions range procedure- MPI and Elevation- Group and Snap shooting- Long/Short range firing(WITH PRACTICE SESSION) - Characteristics of 5.56mm rifle- Characteristics of 7.62mm SLR- LMG- carbine machine gun pistol.								[12]		
Social Awareness and Community Development Aims of Social service-Various Means and ways of social services- family planning – HIV and AIDS- Cancer its causes and preventive measures- NGO and their activities- Drug trafficking- Rural development programmes-MGNREGASGSYJGSY-NSAP-PMGSY- Terrorism and counter terrorism- Corruption – female foeticide dowry – child abuse-RTI Act- RTE Act- Protection of children from sexual offences act- civic sense and responsibility.							[12]			
Specialized Subject (ARMY) Basic structure of Armed Forces- Military History – War heroes- battles of Indo-Pak war- Param Vir Chakra- Career inthe Defence forces- Service tests and interviews.									[12]	
							То	tal Hours:	60	
Text	Book((s):								
1. National Cadet Corps- A Concise handbook of NCC Cadets by Ramesh Publishing House, New Delhi, 2014.										
2.	2. Cadets Handbook- Specialized Subjects SD/SW published by DG NCC, New Delhi,2014.									
Refer	ence((s):								
1.	"Cade	ets Handbool	Commo Comm Commo Commo	n Subjects	SD/SW" by	DG NCC, N	lew Delhi,2	019		
2.	"Cade	ets Handbool	 Speciali 	sed Subject	ts SD/SW" t	by DG NCC	, New Delh	i,2017		
*SDC	0 Ir	dustry Innov	ation and Ir	fractructure	د د					

SDG 9 – Industry Innovation and Infrastructure

Course Designer(s)

CT E CHANDRA KUMAR - chandrakumar@ksrct.ac.in 1.



60 AC 001	Possarch Mothodology	Category	L	Т	Ρ	Credit
	Research Methodology	AC	1	0	0	0
Ohisstings						

- To identify research problems, formulate hypotheses, collect data and test hypotheses
- To prepare and submit quality manuscripts and understand peer review process
- To utilize software tools for effective manuscript preparation and visualization of research data
- To familiarize different journal metrics and author-level quality indicators
- To protect creative works, inventions, and branding elements using IPR

Pre-requisites

• Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Develop structured scientific approach to plan and execute research work	Apply
CO2	Comply with the journal requirements to publish research findings effectively	Understand
CO3	Apply various software tools during the manuscript preparation	Apply
CO4	Select suitable journals to publish the work using different publication metrics	Analyse
CO5	Apply the appropriate form of IP protection to a specific invention or creation	Apply

Mapping with Programme Outcomes

COs	POs									PSOs					
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	2	2	2	-	2	2	3	3	3	-	3	-	-	-
CO2	-	-	-	-	-	-	-	3	3	3	-	3	-	-	-
CO3	-	-	-	-	3	-	-	3	3	3	-	3	-	-	-
CO4	-	-	-	-	-	-	-	3	3	-	-	3	-	-	-
CO5	-	-	2	2	-	-	-	3	3	3	-	3	-	-	-

3 - Strong; 2 - Medium; 1 - Some

One review at end of the semester						
Parameters	Weightage (Marks)					
Research Problem Identification (Research gap, SDG, Objectives)	10					
Literature Review preparation (Clarity, Number and quality of sources)	20					
Patent Draft/ Manuscript Preparation (Structure, Content)	20					
Use of software tools (Plagiarism, Reference Management, etc.,)	10					
Journal Identification (Aim & scope of the journal, journal metrics)	10					
Presentation & Viva voce	30					
Total	100					



Sylla	bus									
K.S.Rangasamy College of Technology – Autonomous R2022										
60 AC 001 – Research Methodology										
Sam	ootor	Hours/Week		Total	Credit	Ма	ximum Marks			
Sem	ester	L	Т	Р	Hours	С	CA	ES	Total	
V	'll	1	0	0	15	0	100	-	100	
Research - Scientific Approach* Types of Research - Identification and Clarification of the problem – Formulating hypothesis, Selection of sample and tools of data collection - Testing the hypothesis - Conclusion									[3]	
Manuscript Preparation* Structure of a manuscript - Types of manuscript - Graphical abstract - Highlights - Literature Review - Citation - Reference style - Plagiarism – Journal selection - Peer review process									[3]	
Research Toolkit* Software Tools for Writing enhancement - Literature review - Reference management - Data analysis and visualization - Drawing - Plagiarism								[3]		
Research Publication Metrics* Journal Index: Scopus - Web of Science - SCI - UGC Care - Q Journal; Journal Metrics: Impact Factor, Cite Score; Quality Indicators: h-index - i-10 index - citations								[3]		
Intellectual Property Rights* Patents - Industrial Designs - Copyright - Trademarks - Geographical Indications - Trade Secrets								[3]		
Total Hours:									15	
Refe	rence(s):								
1.	1. Kothari, C.R. and Gaurav Garg, "Research Methodology: Methods and Techniques", New Age International Publishers, 2023									
2.	Chaw Priva	/la H S., "li te Limited, 2	ntroduction 2019	to Intellect	ual Propert	y Rights", (CBS Publis	hers and Distri	butors	

*SDG 9 - Industry Innovation and Infrastructure


Course	Contents and Lecture Schedule	
S. No.	Topics	No. of hours
1	Research - Scientific Approach	
1.1	Types of Research - Identification and Clarification of the problem - Formulating hypothesis	2
1.2	Selection of sample and tools of data collection - Testing the hypothesis - Conclusion	1
2	Manuscript Preparation	
2.1	Structure of a manuscript - Types of manuscript - Graphical abstract - Highlights	1
2.2	Literature Review	1
2.3	Citation - Reference style – Plagiarism, Journal selection - Peer review process	1
3	Research Toolkit	
3.1	Software Tools for Writing enhancement	1
3.2	Literature review, Reference management	1
3.3	Data analysis and visualization – Drawing, Plagiarism	1
4	Research Publication Metrics	
4.1	Journal Index: Scopus - Web of Science - SCI - UGC Care - Q Journal;	1
4.2	Journal Metrics: Impact Factor, Cite Score	1
4.3	Quality Indicators: h-index - i-10 index - citations	1
5	Intellectual Property Rights	
5.1	Patents	1
5.2	Industrial Designs - Copyright	1
5.3	Trademarks - Geographical Indications - Trade Secrets	1

1. Dr.M.Kathirselvam - mkathirselvam@ksrct.ac.in



60 CB 7B1	Data Analytics Lab	Category	L	Т	Ρ	Credit
80 CB / PT	Data Analytics Lab	PC	0	0	4	2

- To understand the python libraries for data science
- To understand the basic Statistical and Probability measures for data science
- To learn descriptive analytics on the benchmark data sets
- To apply correlation and regression analytics on standard data sets
- To present and interpret data using visualization packages in Python

Pre-requisites

NIL

Course Outcomes

On the suc	ccessful completion of the course, students will be able to	
CO1	Make use of the python libraries for data science.	Apply
CO2	Make use of the basic Statistical and Probability measures for data science.	Apply
CO3	Perform descriptive analytics on the benchmark data sets.	Analyze
CO4	Perform correlation and regression analytics on standard data sets.	Analyze
CO5	Present and interpret data using visualization packages in Python.	Analyze

Mapping with Programme Outcomes

CO6	POs												PSOs		
005	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	1	1	-	-	-	-	1	3	3	3	1	3	-
CO2	3	2	2	3	1	-	-	-	3	1	3	2	1	3	-
CO3	3	2	1	3	1	-	-	-	2	1	1	1	3	2	-
CO4	2	3	1	3	-	-	-	-	2	3	2	3	3	3	-
CO5	1	2	3	1	1	-	-	-	2	1	3	1	1	3	-
3 - St	3 - Strong: 2 - Medium: 1 - Some														

Bloom's Category	Lab Experimen (Ma	ts Assessment rks)	Assessment Model) Examination (Marks)					
	Lab	Activity	(IVIAI KS)	(IVIALKS)				
Remember	-	-	-	-	-			
Understand	-	-	-	-	-			
Apply	25	12	50		50			
Analyse	25	13	50		50			
Evaluate	-	-	-	-	-			
Create	-	-	-	-	-			
Total	50	25	100	-	100			

		14 6	.		(
		K.S.	Rangasamy	College o	of Technolo	gy – Autor	iomous R2	2022					
			D. Tech – C	SO CB 7P1	– Data Δna	lytics Lab	Systems						
-			Hours/Wee	k	Total	Credit	Ма	ximum Ma	arks				
Semes	ter	L	Т	Р	Hrs	С	CA	ES	Total				
VII		0	0	4	60	2	60	40	100				
LIST OF 1.	Down Panda	load, ins as packa	tall and exp ges.	lore the fea	tures of Nur	nPy, SciPy,	Jupyter, St	tatsmodels	and				
2.	Creat 10. C	e a 2D N alculate t	lumPy array the sum of a	with dimer all elements	nsions 3x4 fi in the array	lled with rar '.	ndom intege	ers betweer	n 1 and				
3.	Creat conta	e a Panc ining san	las DataFra nple data.	me from a o	dictionary w	ith columns	'Name', 'Ag	ge', and 'Cit	ty'				
4.	Read descr	ing data	from text file	es, Excel an e Iris data s	id the web a set.	ind explorin	g various c	ommands f	or doing				
5.	Use t	ne diabet	tes data set	from UCI a	nd Pima Inc	lians Diabe	tes data set	t for perforr	ning the				
	follow	following: *											
	a	Univa	riate analysi	s: Frequen	cy, Mean, N	ledian, Mod	e, Variance	e, Standard					
		Deviat	tion, Skewn	ess and Ku	rtosis.								
	b	Bivaria	ate analysis	: Linear and	d logistic reg	ression mo	deling						
6.	Apply	and exp	lore various	plotting fur	nctions on U	CI data sets	S. *						
	a	Norma	al curves										
	b	. Densit	ty and conto	our plots									
	C.	Correl	ation and so	catter plots									
7.	Creat	e a basic	c map using	Basemap o	centered at a	a specific la	titude and l	ongitude w	ith a				
	given	width an	id height.										
8.	Gene	rate a lin	e plot of a n	nathematica	al function a	nd annotate	a specific	point on the	e curve				
	with to	ext.											
Design	Expe	riments:											
9.	Desig	n an exp	eriment to i	nvestigate t	he impact o	f varying bii	n sizes on t	he visual					
	appea	arance of	f a histogran	n.									

10. Design and perform aggregation operations such as sum, mean, count, min, max on

numeric columns to understand data summarization.

Lab Manual

1. "Data Science Lab Manual", Department of Computer Science and Business Systems, KSRCT. *SDG 4 – Quality Education

Course Designer(s)

1. R.Karthik - karthikr@ksrct.ac.in



60 CB 7D2	Project Work Phase	Category	L	Т	Р	Credit
00 CB 7 FZ	FIDJECT WORK FILASE-1	CG	0	0	4	2

- To impart practical knowledge to the students
- To apply the gained engineering concepts in their project work
- To provide an exposure to the students to collect and review the research articles, journals, conference proceedings relevant to their project work
- To design an innovative project work
- To implement the project with the recent IT tools

Pre-requisites

• Nil

Course Outcomes

On the successful completion of the course, students will be able to								
CO1	Identify engineering problems relevant to the domain and perform related literature survey.	Apply						
CO2	Analyze and identify an appropriate methodology to solve the problem.	Analyse						
CO3	Do experimentation / simulation / programming / fabrication, collect and interpret data.	Apply						
CO4	Prepare and present their technical report with relevant project work details	Analyse						
CO5	Demonstrate their responsibility as an individual and as a leader in a team.	Apply						

Mapping w	Mapping with Programme Outcomes														
						POs								PSOs	
COs	1	2	3	4	5	6	7	8	9	1 0	11	12	1	2	3
CO1	3	3	3	3	3	2	3	3	3	3	3	3	2	2	2
CO2	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3
CO4	3	2	2	3	2	2	2	3	3	3	3	3	2	2	2
CO5	3	-	3	-	-	-	2	3	3	3	3	3	2	2	3
3 - Strong: 2 - Medium: 1 - Some															

Review I (R1)			Review	Re	eview III (R3)	I	Total (R1+R2+R3)	Internal	
Literature Survey	Topic Identification & Justification	Work Plan	Approach	Conclusion	Demo- Existing System	Pres entati on	Report	Total	
10	10	10	20	20	10	10	10	100	100





	K.S.Rangasamy College of Technology – Autonomous R2022 60 CB 7P2 - Project Work - Phase I											
			60 CB 1	7P2 - Proje	ct Work - Pl	nase I						
	1			CSI	BS							
Semester		Hours/Wee	k	Total	Credit		Maximum	Marks				
Comocion	L	Т	P	Hrs	C	CA	ES	Total				
VII 0 0 4 60 2 100 00 100												
Methodology:												
1. Pro	ject Wor	k Phase-I shal	l be evalua	ted by the p	project review	v committe	e (Project					
coo	ordinator	, Project Guide	e and HOD	/Subject exp	erts in the d	epartment)					
2. Thr	ee reviev	ws shall be co	nducted wit	h subject ex	opert and the	student(s) shall make a					
pre	sentatio	n on the progre	ess made b	y him / her ,	/ them during	g the revie	WS					
3. Stu	dent(s) s	shall submit a p	project tech	nical report	comprising	of title, pro	blem					
sta	tement, i	importance of	work, modi	fications, pro	oof of conce	pt, method	ology and					
rev	iew of lit	erature during	the 3rd rev	riew								
4. Th	e total m	arks obtained	in the three	e reviews sh	all be reduc	ed to 100 r	narks and					
rc	rounded to the nearest integer											
5. Th	5. The schedule will be announced by the Project Coordinator and Head of the											
De	Department											
		-										

1. R.Logapriya - logapriyar@ksrct.ac.in



S.No.	Course Code	Name of the Course	Duration of Internal	Weightag	Weightage of Marks				
			Exam	Continuous Assessment *	End Semes ter Exam	Max. Marks	End Semes ter Exam	Total	
			THEOR	Y		•			
1	60 CB E5*	Professional Elective V	2	50	50	100	45	100	
			PRACTICA	LS					
2	60 CB 8P1	Project Work Phase-II	2	60	40	100	45	100	
3	60 CG 0P6	Internship	-	100	-	100	-	100	

EIGHTH SEMESTER

- * CA evaluation pattern will differ from course to course and for different tests. This will have to be declared in advance to students. The department will put a process in place to ensure that the actual test paper follow the declared pattern.
- ** End Semester Examination will be conducted for maximum marks of 100 and subsequently be reduced to 60 marks for the award of terminal examination marks

Brainet Work Bhase II	Category	L	Т	Ρ	Credit
FIDJECT WORK FILASE- II	CG	0	0	16	8

- To impart practical knowledge to the students
- To apply the gained engineering concepts in their project work
- To provide an exposure to the students to collect and review the research articles, journals, conference proceedings relevant to their project work
- To design an innovative project work
- To implement the project with the recent IT tools

Pre-requisites

• Project Work - Phase I

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Identify engineering problems relevant to the domain and carry out a literature survey for its support.	Apply
CO2	Apply algorithm and design techniques in the project and experience their outcome in their own real time project scenario.	Apply
CO3	Do experiment / simulate / program / fabricate, collect and interpret data.	Apply
CO4	Document the results in the form of technical report / presentation.	Analyse
CO5	Develop the management skills to achieve the project goal by working as a team and demonstrate the technical skills acquire to provide feasible solution for real-life problems.	Apply

Марр	ing w	Mapping with Programme Outcomes														
<u> </u>		POs												PSOs		
005	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	3	3	3	3	2	3	3	3	3	3	3	2	2	2	
CO2	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3	
CO3	3	3	3	3	3	2	2	3	3	3	3	3	3	3	З	
CO4	3	2	2	3	2	2	2	3	3	3	3	3	2	2	2	
CO5	3	-	3	-	-	-	2	3	3	3	3	3	2	2	З	
3 - St	rong;	2 - M	ediu	m; 1 - S	Some											

Assessment Pattern

	End Semester (40)				
Items	Review 1	Review 2	Review 3	Publication*	
Marks	5	10	15	30	40
	40				

Note:

*Publication marks shall be awarded based on the following criteria

1. SCI / WoS Journal

= 30 Marks

- 2. Scopus Indexed Journal / Scopus Indexed Book Chapters/ IEEE Conference
- 3. Journals listed in UGC Care
- = 27 Marks = 25 Marks



K.S.Rangasamy College of Technology – Autonomous R2022											
		60	CB 8P1 - I	Project Wo	rk - Phase						
Semest	er – F	lours/Wee	k _	Total	Credit	Ma					
1/11	L		P 10	Hrs	C	CA	ES 40	I otal			
VIII Mothod		0	16	240	8	60	40	100			
The	objective of Pr	niect Work	& Dissertati	on is to ena	hle the stur	lent to exte	nd further				
investia	ative a study or	the projec	t								
1 · ·	Three reviews	shall be co	nducted by	project revie	ew committe	ee (Proiect	coordinato	or			
				orto in the d			oooraniato	.,			
	Project Guide		subject exp	ens in the d	epartment						
2.	Student(s) sha	ll make a p	resentation	on the prog	ress made	by him / he	r / them dui	ring the			
	reviews										
3.	Student(s) sha	all submit a	project tech	nical report	comprising	of title, pro	blem state	ment,			
	importance of	work meth	, , odology ev	, vnerimental	work and o	utcome of t	he work ca	rried out			
			iouology, c/	(pennentai							
	during the 3rd	review									
4.	The work carrie	ed out may	be either u	nder the gui	dance of a	supervisor f	rom the				
	department or	jointly with	a supervisc	or drawn froi	m other dep	artment / a	cademic in	stitution			
	/ R& D laborat	orv / Indust	rv								
5	The project rev		, , , , , , , , , , , , , , , , , , ,	chall carry	a mavimum	of 60 mark	10				
5.			(2+1(3+1(4)	Shall Carry							
6.	The project rep	oort shall be	submitted	as per the a	approved gu	iidelines giv	en by the c	college,			
	the viva-voce	examinatior	shall carry	40 marks							
7.	Marks are awa	rded to eac	h student o	f the project	t group base	ed on the in	dividual				
1	performance in	the viva-vo	oce examina	ation							
I											
*SDG 4	 – Quality Educ 	ation									

1. Dr.K.Sakthivel - sakthivelk@ksrct.ac.in



Elective I											
	Bythen Full Stock	Category	L	Т	Ρ	Credit					
80 CB ETT	Python Full Stack	PE	1	0	4	3					

• To apply the basic and advanced concepts in Python for real-time problems.

- To develop applications using ReactPy.
- To install Flask and develop applications using Flask Framework.
- To develop applications using Django with database integration.
- To integrate AI with applications using Django.

Pre-requisites

• Basic knowledge of HTML, CSS and Javascript programming languages

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Apply the concepts of Python programming for real-time problems	Apply
CO2	Develop applications using ReactPy	Apply
CO3	Develop applications using Flask Framework	Apply
CO4	Develop applications using Django with database integration	Apply
CO5	Integration of AI with applications using Django	Apply

Mapping with Programme Outcomes

<u> </u>		POs												PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	3	3	3	2	-	•	•	-	I	-	-	3	-	-	
CO2	3	3	3	3	2	-	-	-	-	I	-	-	3	-	-	
CO3	3	3	3	3	2	-	-	-	-	-	-	-	3	-	-	
CO4	3	3	3	3	2	-	-	-	-	-	-	-	3	-	-	
CO5	3	3	3	3	2	-	-	-	-	-	-	-	3	-	-	
2 04	rona			Som	~											

3 - Strong; 2 - Medium; 1 - Some

Bloom's	Continuous As (Ma	sessment Tests Irks)	Model Examination	End Sem Examination
Calegory	1	2	(Marks)	(Marks)
Remember	-	-	-	-
Understand	-	-	-	-
Apply	30	30	50	50
Analyse	-	-	-	-
Evaluate	-	-	-	-
Create	30	30	50	50
Total	60	60	100	100



Syllab	bus										
		K.S.F	Rangasamy	College o	f Technolo	gy – Autor	nomous R2	022			
			B.Tech - C	omputer S	cience and	l Business	Systems				
	60 CB E11– Python Full Stack										
Seme	stor	ŀ	lours/Wee	ĸ	Total	Credit	Ma	ximum Mar	ks		
Seme	5101	L	Т	P	Hours	С	CA	ES	Total		
V		1	0	4	75	4	50	50	100		
Introduction to Python* Basics: Variables, Strings, Python Data Structures, Control Flow and Looping statements - Functions - Exception Handling - Object Oriented Programming: Class, Attributes, Methods, Inheritance, Polymorphism, Modules and Packages - Regular Expressions - File Handling - Database Connectivity											
React Introd - Rout	t Py * uction ter	to ReactP	/ - Creating	User Interf	aces - Com	ponents - S	tates - Evei	nt Handling	[3+12]		
Flask Install Temp	Flask* Installation - Basic Application Structure - Variable Rules – Routing - URL Building - [3+12] Templates - Web Forms - File Uploading - Mail Extension - Database Integration										
Djang Introd - Djan - Data	Django * Introduction to Django Framework - Views – Routing - Templates - Models - URL Mapping - Django Template Language - Sending E-mails - Forms - File Handling - Static Files - APIs - Databases using Diango										
Al Inte Introd Learn	egrati uction ing Mo	on* to Data Sci odels - Dee	ence - Pre- p Learning	Processing Neural Nets	- Basic Visu	alization - I	ntegrating th	ne Machine	[3+12]		
							Тс	otal Hours:	75		
Text I 1.	Book(Jeff F Educa	s): Forcier, Par ation, First	ul Bissex, \ Edition, 200	Vesley Chu 9.	un, "Python	Web Deve	elopment w	ith Django",	Pearson		
2.	Migue	el Grinberg,	"Flask Wel	o Developm	ient", O'Rei	lly Publicati	on, Second	Edition, 201	8.		
Refer	ence(s):									
1.	Gowr	ishankar S,	Veena A, "	Introduction	n to Python	Programmi	ng", Taylor	and Francis,	2019.		
2.	Willia Indep	m S Vincer endently P	nt, "Django i ublished, 20	for Beginne)18.	ers: Build we	ebsites with	Python and	d Django Pa	perback",		
3.	Kirup: React	a Chinnatha t and Redu	ambi, "Learı x", Addison	ning React: Wesley Pro	A Hands-C ofessional, 2	n Guide to 2018.	Building We	eb Applicatio	ons using		
4.	https:	//www.udei	my.com/cou	irse/python-	-and-djangc	-full-stack-	web-develo	per-bootcam	р/		
5.	https:	//www.udei	my.com/cou	irse/unaicoi	n/?coupon(Code=IND2	1PM				

*SDG 4:- Quality Education



S. No.	Topics	No. of
1	Introduction to Python	nours
1.1	Basics, Functions and Exception Handling	1
1.2	Object Oriented Programming	1
1.3	Regular Expressions, File Handling and Database Connectivity	1
2	ReactPy	
2.1	Introduction to ReactPy, Creating User Interfaces	1
2.2	Components, States, Event Handling	1
2.3	Router	1
3	Flask	
3.1	Installation, Basic Application Structure and Variable Rules	1
3.2	Routing, URL Building, Templates, Web Forms and File Uploading	1
3.3	Mail Extension and Database Integration	1
4	Django	
4.1	Introduction to Django Framework, Views, Routing, Templates and Models	1
4.2	URL Mapping, Django Template Language, Sending E-mails and Forms	1
4.3	File Handling, Static Files, APIs and Databases using Django	1
5	AI Integration	
5.1	Introduction to Data Science, Pre-Processing and Basic Visualization	1
5.2	Integrating the Machine Learning Models	1
5.3	Deep Learning Neural Nets	1
6	Project	
6.1	Problem Identification	10
6.2	Solution for Problem	15
6.3	Implementation	20
6.4	Presentation	5
6.5	Report	5
6.6	Demo	5

Course Contents and Lecture Schedule

Course Designer(s)

1. Dr. M.Tamilarasi - tamilarasi@ksrct.ac.in



60 CR E12	MEAN Stock	Category	L	Т	Ρ	Credit
OUCB ET2	MEAN Stack	PE	1	0	4	3

- To understand the various components of full stack development
- To learn Node.js features and applications
- To understand the use of Express .js
- To develop simple web applications with Angular
- To develop applications with MongoDB.

Pre-requisites

• Basic knowledge of HTML, CSS and JavaScript programming languages

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Understand the various stacks available for web application development	Understand
CO2	Use Node.js for application development	Apply
CO3	Use Express.js for application development	Apply
CO4	Build and deploy Angular applications	Apply
CO5	Develop applications with MongoDB	Apply

Mapping with Programme Outcomes

000						P	Os							PSOs	
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	2	2	-	-	-	2	2	2	2	-	-	-
CO2	3	3	3	3	2	-	-	-	2	2	2	2	-	-	-
CO3	3	3	3	3	2	-	-	-	2	2	2	2	-	-	-
CO4	3	3	3	3	2	-	-	-	2	2	2	2	-	-	-
CO5	3	3	3	3	2	-	-	-	2	2	2	2	-	-	-
3 - St	rong. 2	2 - Mec	lium 1	- Son	ne										

Bloom's	Continuous As (Ma	sessment Tests Irks)	Model Examination	End Sem Examination
Calegory	1	2	(Marks)	(Marks)
Remember	-	-	-	-
Understand	-	-	-	-
Apply	30	30	50	50
Analyse	30	30	50	50
Evaluate	-	-	-	-
Create	-	-	-	-
Total	60	60	100	100



K.S.Rangasamy College of Technology – Autonomous R2022 B.Tech - Computer Science and Business Systems 60 CB E12-MEAN Stack Semester Hours/Week Total Maximum Marks Semester L Total Maximum Marks Semester L Total C CA ES Semester L Total Credit Maximum Marks L Total C CA ES Total Basics of Full Stack * Understanding the Basic Web Development Framework - User - Browser – Webserver - Backend Services – MVCA Architecture - Understanding the different stacks – The role of Express – Angular – Node - Mongo DB - Basics of Typescript. Node JS * Node JS * Second Editor – Working with Node packages – Using Node package manager – Creating a simple Node, is application – Using Events – Listeners – Timers - Callbacks – Handling Data I/O – Implementing HTTP services in Node, is. Express JS Fortal Mangular * Introduction to Express.js-Routing in Express.js-Serving static	Syllabus												
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	2. "Ari I	_erner",ng-b	ook - The C	Complete Bo	ook on Angu	ularJS 1st E	dition,2013						
Chris Northwood, 'The Full Stack Developer: Your Essential Guide to the Everyday Skills	2 Chri	s Northwoo	d, 'The Fu	II Stack De	eveloper: Yo	our Essenti	al Guide to	the Every	day Skills				
Expected of a Modern Full Stack Web Developer', Apress; 1st edition, 2018	S. Expe	ected of a M	odern Full S	Stack Web I	Developer',	Apress; 1st	edition, 20	18					
4. https://www.udemy.com/course/master-the-mean-stack/	4. http:	s://www.ude	my.com/co	urse/maste	r-the-mean-	stack/							

*SDG 4:- Quality Education



Course Contents and Lecture Schedule							
S. No.	Topics	No. of hours					
1.0	Basics of Full Stack						
1.1	Understanding the Basic Web Development Framework 1	1					
1.2	User - Browser	1					
1.3	Webserver	1					
1.4	Backend Services	1					
1.5	MVC Architecture	1					
1.6	Understanding the different stacks	1					
1.7	The role of Express	1					
1.8	Angular – Node	1					
1.9	Mongo DB	1					
2.0	Node JS						
2.1	Basics of Node JS	1					
2.2	Installation	1					
2.3	Working with Node packages	1					
2.4	Using Node package manager	1					
2.5	Creating a simple Node.js application	1					
2.6	Using Events- Listeners- Timers	1					
2.7	Callbacks – Handling Data I/O	1					
2.8	Implementing HTTP services in Node.js.	2					
3.0	Express JS						
3.1	Introduction to Express.js	1					
3.2	Routing in Express.js	2					
3.3	Using Request and Response objects	1					
3.4	Sending HTML & JSON data using Express.js	2					
3.5	Serving static website using Express.js	1					
3.6	Express.js and API.	2					
4.0	Angular						
4.1	Introduction to Angular	1					
4.2	Expressions- Components- Modules	2					
4.3	Directives- Data Binding-Controllers	2					
4.4	Scopes-Filters-Services	2					
4.5	Http- Events-Forms	1					
4.6	API -Routing-Applications	1					
5.0	Mongo DB						
5.1	Understanding NoSQL and MongoDB	1					
5.2	Building MongoDB Environmen	1					
5.3	User accounts – Access control – Administering databases	2					
5.4	Managing collectionsCRUD Operations:Connecting and inserting data, Updating and Deleting data	2					
5.5	Restful APIs	1					



5.6	Connecting to MongoDB from Node.js	1
5.7	Simple applications	1
6	Project	
6.1	Problem Identification	10
6.2	Solution for Problem	15
6.3	Implementation	20
6.4	Presentation	5
6.5	Report	5
6.6	Demo	5
Course D	locianor(c)	

1. Dr. M.Tamilarasi - tamilarasi@ksrct.ac.in



60 CB E12	Android Application Dovelopment	Category	L	Т	Ρ	Credit
00 CB E13	Android Application Development	PE	1	0	4	3

- To provide overview of Android Application Development
- To develop basic UI Interface of android apps.
- To implement app services and explain notifications, broadcast receivers and access file-system and databases
- To explain Multimedia, Location awareness, Native hardware access, Telephony and SMS APIs
- To provide overview of testing, debugging and to packaging and publishing apps to market places.

Pre-requisites

• Object Oriented Programming in Java, SQL.

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Familiarize and understand the ecosystem and the tools required for Android App development	Remember
CO2	Build apps using UI components, Intents and Activities.	Apply
CO3	Familiarize with Functionality beyond user interface such as Threads, Services, Notifications, Broadcast receivers, Databases.	Understand
CO4	Illustrate the working of Multimedia, Location awareness, Sensors, Telephony and SMS APIs.	Apply
CO5	Discuss testing, debugging and to packaging and publishing apps.	Understand

Mapping with Programme Outcomes PSOs POs COs 1 2 3 4 5 6 7 8 9 10 11 12 1 2 CO1 2 1 3 2 1 1 3 1 3 -----CO2 2 -3 2 2 1 1 3 1 3 ----CO3 2 -3 2 2 1 1 3 -1 3 ---CO4 2 3 2 3 1 1 3 1 3 -----CO5 2 1 3 1 3 2 -3 3 1 ----3 - Strong; 2 - Medium; 1 - Some

Bloom's	Continuous Ass (Mai	essment Tests ks)	Model Examination	End Sem Examination (Marks)
Calegory	1		(Marks)	
Remember	-	-	-	-
Understand	30	-	50	50
Apply	30	50	50	50
Analyse	-	50	-	-
Evaluate	-	-	-	-
Create	-	-	-	-
Total	60	100	100	100



Sylla	bus											
	K.S.Rangasamy College of Technology – Autonomous R2022											
	B.Tech – Computer Science and Business Systems											
			60 CB E	13- Andro	id Applicat	ion Develo	pment					
Som	ostor	H	ours / Wee	ek 🛛	Total	Credit	Ma	ximum Ma	rks			
Sent	ester	L	Т	Р	Hours	С	CA	ES	Total			
\	/	1	0	4	75	3	50	50	100			
Intro Intro & Co Emul LogC Proje Using	Introduction to Android and Development Environment Setup Introduction to Android: Architecture and Stack, Activities, Services, Broadcast Receivers & Content providers, Views & Notifications, Intents & Intent Filters, Android API levels, Emulator. Android Studio: Overview, Android and File Structure, AVD Manager, DDMS, LogCat. Development environment Setup: Eclipse and SDK installation, AVD creation, Project Structure. Hello World - Creating a Project, Working with the AndroidManifest.xml, Using the log system Activities.											
UI De Basic Optic state Dialo	esign * UI de on mer s and gs & T	sign: Form au, Context life cycle. oast, Popu	widgets, T menu, Sub UI Design: p.	ext Fields, menu. Inte Time and	Layouts, [di ents: Explici Date, Image	ip, dp, sip, t Intents, In es and me	sp] versus nplicit inten dia, Compo	px. Menu: ts. Activity osite, Alert	[3+12]			
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Spru Multin hardv APIs	cing u media ware a	p mobile a –audio/vide ccess (Usi	pps * o playback ng Orientat	and record, ion and Ac	Location av	wareness & • sensors),	Google Ma Telephony	ps, Native and SMS	[3+12]			
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							То	tal Hours:	75			
Text	Book(s):										
1.	Dawn <u>Med</u> ia	i Griffi & Da <u>a Inc, USA</u> ,	vid Griffi, "H <u>2017.</u>	lead First A	ndroid Deve	elopment -	A Brain Frie	endly Guide	", O'Reilly			
2.	2. Anubhav Pradhan, Anil V. Deshpande, "Composing Mobile Apps: Learn/Explore/Apply/ Using Android", Wiley India Private Limited, 1st Edition, 2014.											
Refe	rence((s):										
1.	Frank Editic	Ableson Von,2012.	V, Sen R ,	Chrisking, "	Android in	Action", Dr	eam tech F	Press, New	Delhi, 3rd			
2.	2. Rodger," Beginning Mobile Application Development In The Cloud", Wiley Publication, 2011.											
3.	Carm Educ	en Delessi ation.	io," Android	d Applicatio	on Develop	ment In 24	4 Hours",	4th Edition,	Pearson			
4.	Erik H	lellman, "Ar	ndroid Prog	ramming – F	Pushing the	Limits", 1st	Edition, Wi	ley India Pvt	Ltd,2014.			
*SDG	6 4 – C	uality Educ	ation									



S. No.	. Topics				
1	Introduction to Android and Development Environment Setup				
1.1	Introduction to Android: Architecture and Stack, Activities, Services	1			
1.2	Introduction to Android: Broadcast Receivers & Content providers, Views & Notifications.	1			
1.3	Introduction to Android: Intents & Intent Filters, Android API levels, Emulator.	1			
1.4	Android Studio: Overview, Android and File Structure, AVD Manager, DDMS, LogCat.	1			
1.5	Dev env Setup: Eclipse and SDK installation, AVD creation, Project Structure.	1			
1.6	Hello World - Creating a Project, Working with AndroidManifest.xml, Using log system Activities.	1			
2	UI Design				
2.1	Basic UI design: Form widgets, Text Fields, Layouts, [dip, dp, sip, sp] vs px.	1			
2.2	Menu: Option menu, Context menu, Sub menu - Intents: Explicit Intents, Implicit intents - Activity states and life cycle.	1			
2.3	UI Design: Time and Date, Images and media, Composite, UI Design: Alert Dialogs & Toast, Popup.	1			
3	Functionality beyond user interface				
3.1	Threads, Async task - Services -states and lifecycle, Notifications	1			
3.2	Broadcast receivers, Nativedata handling –on-device file I/O - Shared preferences	1			
3.3	Mobile databases: SQLite, Enterprise data access (via internet/ Intranet).	1			
4	Sprucing up mobile apps				
4.1	Multimedia –audio/video playback and record.	1			
4.2	Location Based Services and Google Maps	2			
4.3	Native hardware access (Using Orientation and Accelerometer sensors)	1			
4.4	Telephony and SMS APIs.	2			
5	Testing and Taking Apps to Market				
5.1	Debugging mobile apps	1			
5.2	White box testing, Black box testing, and test automation of mobile apps	1			
5.3	JUnit for Android	1			
5.4	Robotium	1			
5.5	MonkeyTalk, Versioning, signing	1			
5.6	Packaging mobile apps, distributing apps on mobile market place.	1			
6	Project				
6.1	Problem Identification	10			
6.2	Solution for Problem	15			
6.3	Implementation	20			
6.4	Presentation	5			
6.5	Report	5			
6.6	Demo	5			

Course Contents and Lecture Schedule

Course Designer(s)

1. P. Venkatesh - venkateshp@ksrct.ac.in



60 CB E14	Swift Coding and App	Category	L	Т	Ρ	Credit
	Development	PE	1	0	4	3

- To understand and apply fundamental of Go language and Swift programming concepts
- To enable students to design user-friendly and visually appealing user interfaces for software applications, utilizing fundamental design principles and the UIKit framework
- To develop the knowledge and skills required to manipulate and displaying data from APIs and using Core Data for local data storage in iOS app development
- To provide a solid foundation in networking principles, including HTTP and REST APIs
- To develop iOS applications that leverage advanced Swift concepts

Pre-requisites

• Basic knowledge of Machine Learning

Course Outcomes

On the suc	On the successful completion of the course, students will be able to							
CO1	Develop Swift code within the Swift Playground environment for real- time experimentation and learning.	Apply						
CO2	Implement aesthetically pleasing user interfaces for software applications by leveraging Interface Builder.	Apply						
CO3	Design and implement user interfaces with navigation and view controllers.	Apply						
CO4	Design and develop iOS applications that seamlessly interact with RESTful APIs, perform JSON parsing, integrate data persistently using Core Data.	Apply						
CO5	Apply app testing and debugging techniques effectively, ensuring the reliability and stability of their iOS applications before deployment.	Apply						

Mapp	Mapping with Programme Outcomes															
<u> </u>	POs													PSOs		
005	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	3	3	3	2	-	-	-	2	-	-	1	-	-	-	
CO2	3	3	3	3	2	-	-	-	2	-	-	2	-	-	-	
CO3	3	3	3	3	2	-	-	-	2	-	-	1	-	-	-	
CO4	3	3	3	3	2	-	-	-	2	-	-	2	-	-	-	
CO5	3	3	3	3	2	-	-	-	2	-		2	-	-	-	
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Bloom's	Continuous Ass (Ma	sessment Tests rks)	Model Examination	End Sem Examination
Calegory	1	2	(Marks)	(Marks)
Remember	-	-	-	-
Understand	-	-	-	-
Apply	30	50	30	50
Analyse	30	50	30	50
Evaluate	-	-	-	-
Create	-	-	-	-
Total	60	100	60	100



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			60 CB E1	4 - Swift C	oding and	App Devel	opment		
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Sem	ester	L	Т	Р	Hours	С	CA	ES	Total
\	/	1	0	4	75	3	50	50	100
Intro	ductio	n to Swift*							
Introd	duction	to Swift P	rogramming	g Language	e - Variable	s, Constan	its and Dat	a Types -	[3+12]
Cont	rol Flov	v: if Stateme	ents, Loops	 Functions 	and Basic C	Code Struct	ure - Swift P	layground	[3+12]
for Experimentation.									
User	Interfa	aces and D	esign*						[3+12]
Introd	duction	to User Int	erfaces and	Design Pr	inciples - Int	erface Buil	der and UIK	Kit .	
Fram	ework	- Creating	JI Elements	s: Labels, B	uttons, Text	: Fields, etc	Layout C	constraints	
- Har		Jser Interac	tions.	±					10 101
App	Develo	pment Fu	ndamental	S*					[3+12]
Navię	gation a	and view C	ontrollers -	I able View	/s and Colle		s - Data Ma	nagement	
and Model – View - Controller (MVC) Architecture - Accessing and Displaying Data from									
APIS - Core Data for Local Data Storage.								[2, 10]	
Networking and Data Persistence"							[3+12]		
	ntearat	ion - Core l	Data for Da	ta Persister	LOESSION an	efaults and	Kevchain	arsing and	
Adva	nced (Concents :	and Ann Fe	atures*			rteyonam.		[3+12]
Adva	nced S	wift Conce	ots: Optiona	al. Closures	Protocols ·	Animation	s and Visua	l Effects –	[0112]
Integ	rating I	Multimedia:	Images. A	udio. Video	– Location	Based Serv	vices and M	laps - App	
Testi	ng and	Debugging	Technique	S.					
Tool	s used	I: Open So	urce - SWI	FT/LLVM	/ CLANG				
		•					Тс	tal Hours	75
Text	Book(s):							
1.	Ahma	d Sahar, "i	OS 14 Prog	ramming fo	r Beginners	", 5 th Editio	n, Packt Pu	blishing, Uk	2020
2	Matth	ew Mathias	and John	Gallagher,	"Swift Prog	Iramming: 7	The Big Ne	rd Ranch G	iuide", 2 nd
۷.	Editio	n, Big Nerd	Ranch Gui	des, USA, 2	2015				
Refe	rence(s):							
1	Christ	tian Keur ar	nd Aaron Hi	llegass, "iO	S Programm	ning: The Bi	g Nerd Ran	ch Guide", 7	^{7th} Edition,
1.	Big N	erd Ranch	Guides, US	A, 2020					
2.	Matt N	Veuburg, "i	DS 14 Prog	ramming Fu	Indamentals	with Swift:	Swift, Xcod	le, and Coco	oa Basics"
3	Josh	Berlin, Re	ene Cachea	aux, et al,	"Advanced	d iOS App	Architectu	ire: Real-W	orld App
	Archit	ecture in S	wift", 3rd Ed	dition, Apres	ss, UK, 202	1.			
4.	Apple	Inc, "App I	Jevelopme	nt with Swif	t" 1 st Edition	, Apple Inc,	USA, 2017	′ .	

*SDG 4 – Quality Education



Course Contents and Lecture Schedule									
S. No.	Topics	No. of Hours							
1	Introduction to Swift								
1.1	Introduction To Swift Programming Language - Variables, Constants	1							
1.2	Data Types - Control Flow, If Statements, Loops	1							
1.3	Functions and Basic Code Structure - Swift Playground For Experimentation	1							
2	User Interfaces and Design								
2.1	Introduction To User Interfaces And Design Principles - Interface Builder	1							
2.2	Uikit Framework - Creating UI Elements: Labels, Buttons, Text Fields	1							
2.3	Layout Constraints - Handling User Interactions	1							
3	App Development Fundamentals								
3.1	Navigation And View Controllers - Table Views - Collection Views	1							
3.2	Model-View-Controller Introduction	1							
3.3	MVC Architecture - Local Data Storage Local Data Storage	1							
4	Networking and Data Persistence								
4.1	Networking Basics (HTTP, REST APIs) - URLSession and Alamofire	1							
4.2	JSON Parsing - API Integration	1							
4.3	Core Data for Data Persistence - User Defaults and Keychain	1							
5	Electric and Autonomous Vehicles								
5.1	Advanced Swift Concepts - Optional, Closures, Protocols	1							
5.2	Animations and Visual Effects - Integrating Multimedia	1							
5.3	Location- B ased Services and Maps - App Testing and Debugging Techniques	1							
6	Project								
6.1	Problem Identification	10							
6.2	Solution for Problem	15							
6.3	Implementation	20							
6.4	Presentation	5							
6.5	Report	5							
6.6	Demo	5							

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60 CB E15	Robotic Process	Category	L	Т	Ρ	Credit
60 CB E15	Automation	PC	1	0	4	3

- To interpret the usage of tools and workflows in Robotic Process Automation framework
- To implement data scrapping and automation in UiPath Studio
- To implement different types of recording in UiPath Studio
- To implement the various document understanding activities for automation
- To implement a robot using UI automation

Pre-requisites

• Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Infer the tools and workflows used in Robotic Process Automation framework	Apply
CO2	Implement data scrapping and automation in real-time environment	Apply
CO3	Implement different types of recording in UiPath Studio	Apply
CO4	Implement the various document understanding activities for automation	Apply
CO5	Implement a robot using UI automation	Apply

Mapping with Programme Outcomes

<u> </u>		POs												PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	2	3	2	3	-	-	-	-	-	-	-	3	-	-	
CO2	3	2	3	2	3	-	-	-	-	-	-	-	3	-	-	
CO3	3	2	3	2	3	-	-	-	-	-	-	-	3	-	-	
CO4	3	2	3	2	3	-	-	-	-	-	-	-	3	-	-	
CO5	3	2	3	2	3	-	-	-	-	-	-	-	3	-	-	
3 - St	rong; 2	3 - Strong; 2 - Medium; 1 - Some														

Bloom's	Continuous As (Ma	sessment Tests arks)	Model Examination	End Sem Examination
Calegory	1	2	(Marks)	(Marks)
Remember	-	-	-	-
Understand	-	-	-	-
Apply	30	30	50	50
Analyse	30	30	50	50
Evaluate	-	-	-	-
Create	-	-	-	-
Total	60	60	100	100



Syllab	us									
		K.S.F	Rangasamy	/ College o	f Technolo	gy – Autor	omous R2	2022		
	B.Tech - Computer Science and Business Systems									
	60 CB E15– Robotic Process Automation									
Somos	stor	F	lours/Wee	k	Total	Credit	Ма	ximum Ma	ks	
Ocifica	5101	L	Т	P	Hours	С	CA	ES	Total	
V		1	0	4	75	3	50	50	100	
Introd	uctio	n	_							
Introdu	iction	to Roboti	c Process	Automatio	n - Introdu	iction to U	iPath - Ui	Path Tool	[3+12]	
Installation – Workflows: Sequences, Flowcharts and State Machines - Data Types –								r. 1		
Variab	les - (W - Error Ha	andling						
Data T		ı . File and	l Eoldor Au	tomation -	Excel Autor	mation - PC		ion - Web	[3+12]	
Form F	Filling	- Web Date	a Scranning	iomalion - 1 - Database		nalion - FL	utomation	lon - web	[3+12]	
Record	dina*			j - Dalabasi			utomation			
Introdu	iction	to Recordi	ina - Recor	dina Types	: Automatic	Recording	Manual R	ecordina -		
Basic F	Recor	dina - Desk	top Record	lina - Web F	Recordina -	Input Metho	ds - Screer	n Scraping	[3+12]	
- Data	Scrap	bing		5	5	1		5		
User E	vent	s, Image a	nd Text Au	tomation*						
Introdu	iction	to Selector	rs - Selecto	rs with Wild	cards - Full	versus Par	tial Selector	rs - Mouse	[3+12]	
and Ke	eyboa	rd Activities	s - Image a	nd Text Aut	omation - Ir	nage Activi	ties - OCR	Activities -	[3+12]	
Text A	ctivitie	es.								
UI Aut	omat	ion*		-			.			
Introdu	iction	to Activitie	es, Activity	Properties	and Input	Methods -	Output act	ivities and	[3+12]	
		NOOS - US Draigat	ing App/w	ed Recorde	er - Table	Extraction	- Build an	a Run UI		
Autom	alion	Projeci.					То	tal Hours:	75	
Toyt B	ook	e).					10	lai nours.	75	
	Alok N	3j. Jani Trinatł	ni "Learning	n Robotic Pr	ocess Auto	mation Pac	kt Publishir	na First Edit	ion 2018	
2 1	Vaihh	av Jain "C	risper Lear	na: For Lli	Path" Inder	endently P	ublished L	atest Edition	2018	
Refere	encel	s):		ing. For Or		Jonaonay 1			, 2010.	
1. 1	https:/	//www.uipa [.]	th.com/rpa/	academv/tra	aining					
2. I	https:/	//www.uder	ny.com/cou	Irse/robotic-	process-au	tomation-fo	r-developer	'S		
3. I	https:/	//www.uder	ny.com/cou	irse/rpa-uip	ath		1			

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Course C	Contents and Lecture Schedule	
S. No.	Topics	No. of hours
1	Introduction	
1.1	Introduction to Robotic Process Automation, Introduction to UiPath and UiPath Tool Installation	1
1.2	Workflows: Sequences, Flowcharts and State Machines	1
1.3	Data Types, Variables, Control Flow and Error Handling	1
2	Automation	
2.1	Data Tables, File and Folder Automation, Excel Automation, PDF Automation	1
2.2	Web Form Filling, Web Data Scrapping	1
2.3	Database Automation, Email Automation	1
3	Recording	
3.1	Introduction to Recording, Automatic Recording, Manual Recording	1
3.2	Basic Recording, Desktop Recording	1
3.3	Web Recording, Input Methods, Screen Scraping, Data Scraping	1
4	User Events, Image and Text Automation	
4.1	Introduction to Selectors, Selectors with Wildcards, Full versus Partial Selectors	1
4.2	Mouse and Keyboard Activities	1
4.3	Image Activities, OCR Activities, Text Activities.	1
5	UI Automation	
5.1	Introduction to Activities, Activity Properties, Input Methods, Output Methods	1
5.2	Using App/Web Recorder, Table Extraction	1
5.3	Build and Run UI Automation Project	1
6	Project	
6.1	Problem Identification	10
6.2	Solution for Problem	15
6.3	Implementation	20
6.4	Presentation	5
6.5	Report	5
6.6	Demo	5

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60 CB E16	Game Development	Category	L	Т	Ρ	Credit
60 CB ET6		PE	1	0	4	3

- To understand the different types of games and navigations.
- To Apply creative and competent to work with 2D Character and vector graphics.
- To remember the basic concepts of computer graphics.
- To apply the necessary theoretical background and demonstrate the application of application of computer science to graphics.
- To Understand 3D Animation and its Importance.

Pre-requisites

• Al Technology and tools, Software Engineering, Programming Language C, C++ and Java

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Apply any Gaming Project with the different gaming components	Apply
CO2	Apply on the workflow of 2D game design	Apply
CO3	Remember the fundamental graphic system and models	Remember
CO4	Apply Programming with Two-Dimensional Applications and concepts	Apply
CO5	Understand digital imaging and video.	Understand

Mapping with Programme Outcomes

000						P	Os						PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	2	3	-	-	-	2	-	-	-	-	-	-
CO2	3	3	3	2	3	-	-	-	2	-	-	-	-	-	-
CO3	3	3	3	2	3	-	-	-	2	-	-	-	-	-	-
CO4	3	3	3	2	3	-	-	-	2	-	-	-	-	-	-
CO5	3	3	3	2	3	-	-	-	2	-	-	-	-	-	-
3 - St	rong; 2	2 - Mec	lium; 1	- Som	e										

/						
Bloom's	Continuous Ass (Ma	sessment Tests rks)	Model Examination	End Sem Examination		
Calegory	1	2	(Marks)	(Marks)		
Remember	20	20	20	20		
Understand	-	-	30	30		
Apply	40	40	50	50		
Analyse	-	-	-	-		
Evaluate	-	-	-	-		
Create	-	-	-	-		
Total	60	60	100	100		



Sylla	bus										
	K.S.Rangasamy College of Technology – Autonomous R2022										
			B.Tech – C	computer S	science and	d Business	Systems				
				60 CB E16 ·	- Game Dev	velopment	•				
Sem	ester	ŀ	lours/Wee	k	Total	Credit	Ma	ximum Ma	rks		
Ocini	Color	L	Т	Р	Hours	C	CA	ES	Total		
\	/	1	0	4	75	3	50	50	100		
Intro	ductio	on To 2D Ga	ame Desig	n							
Gam	e deve	lopment - D	ifferent typ	es of game	and use cas	ses: FPS, R	PG, Racing	g, Fighting,			
Casu	al, Mo	ney, Spinn	er, Real Ti	me Strateg	y (RTS) - F	Puzzle, Acti	on - Stealth	h Shooter,	[3+12]		
Com	bat - C	ustomizing	the UI – Na	vigation - M	lanipulating	Objects - P	osition Gan	ne Objects			
- Plac	ce Ligh	t Probes.									
Work	king 2	2									
2D c	2D characters - Characters from Different Countries and Styles - Asian characters vs. [3+12]										
West	ern ch	aracters - N	laking sprit	es - Working	g with vecto	or graphics.					
Grap	Graphics Systems And Models										
Appli	cations	s of Compu	ter Graphic	s - A Graph	ics System	-Images - F	hysical and	Synthetic	[3+12]		
Imaging Systems - The Synthetic - Camera Model - The Programmer's Interface - Graphics											
Archi	Cranbias Programming										
The Sierningki Casket Dragramming Two Dimensional Applications The OpenCl											
Ine Sierpinski Gasket - Programming Two Dimensional Applications - The OpenGL								[2,40]			
Appli	tions	The Coske	ng menac		es and Roci	Indutes – C	Dior Viewir	ng Control	[3+12]		
Gask	1015	Ine Gaske	ction Mor		s and Reci			mensional			
30 4	nimati	ion		103.							
Defin	ing 30) Animation		1 3D animat	tion Industry	v - Underst	anding the	production			
nineli	ing oc	moonents .	• Working	on 3D anir	nation proc	Juction: La	vout - Res	earch and	[3+12]		
Deve	lonme	nt - Modelir	na - Textur	ina – Riaair	na / Setup	- Animation		al Effects -	[3112]		
Light	ina / R	enderina - F	Postproduct	tion	ig / Cotup	/		Encoto			
g		endening i	0010100000				То	tal Hours:	75		
Text	Book	(s):									
1.	Adam	ns. "Fundam	nentals of G	ame Desig	n". Third ed	lition. New I	Riders Publi	ication. 201	5.		
_	Edwa	ard Angel. "I	nteractive (Computer G	iraphics- A	Top-Down	Approach w	ith Shader-I	Based		
2.	Open	GL", Sixth I	Edition, Pea	arson Public	ation, 2012) 	11				
Refe	rence(s):	,		,						
	Alan	Thorn, "Gar	ne Develop	ment Princi	iples", Ceno	age Learni	ng PTR Pul	olications, F	irst		
1.	Editic	on, 2014	•			, 0	0	,			
2	Chris	Solarski, "	Drawing Ba	asics and Vi	deo Game	Art: Classic	to Cutting-	Edge Art Te	chniques		
۷.	for W	inning Vide	o Game De	sign", First	Edition, Wa	atson – Gup	till Publicati	on, 2012.			
3.	Andy	Beane, " 3	D Animatio	n Essentials	s", 1 st Editi	on, John W	iley & Sons	, 2012.			
1	Kelvi	n Sung, Pe	eter Shirley	, "Essentia	als of Inter	active Corr	nputer Grap	phics Conce	epts and		
4.	Imple	mentation",	First Edition	on, Steven E	Baer publica	ation, 2008.					



Course C	Course Contents and Lecture Schedule									
S. No.	Topics	No. of hours								
1.0	Introduction To 2D Game Design									
1.1	Game development	1								
1.2	Different types of game and use cases - FPS, RPG, Racing, Fighting, Casual, Money, Spinner	1								
1.3	Real Time Strategy (RTS) - Puzzle, Action - Stealth Shooter	1								
1.4	Combat - Customizing the UI – Navigation - Manipulating Objects - Position Game Objects - Place Light Probes	1								
2.0	Working 2D									
2.1	2D characters - Characters from Different Countries and Styles	1								
2.2	Asian characters vs. Western characters	1								
2.3	Making sprites - Working with vector graphics	1								
3.0	Graphics Systems And Models									
3.1	Applications of Computer Graphics	1								
3.2	A Graphics System-Images: Physical and Synthetic Imaging Systems	1								
3.3	The SyntheticCamera Model - The Programmer's Interface - Graphics Architectures - Programmable Pipelines - Performance Characteristics	1								
4.0	Graphics Programming									
4.1	The Sierpinski Gasket - Programming Two Dimensional Applications	1								
4.2	The OpenGL Application Programming Interface - Primitives and Attributes	1								
4.3	Color Viewing Control Functions - The Gasket Program - The Three- Dimensional Gasket - Adding Interaction ,Menus	1								
5.0	3D Animation									
5.1	Defining 3D Animation - Exploring 3D animation Industry	1								
5.2	Understanding the production pipeline components - Working on 3D animation production: Layout-Research and Development	1								
5.3	Modeling - Texturing – Rigging / Setup – Animation -3D Visual Effects - Postproduction	1								
6	Project									
6.1	Problem Identification	10								
6.2	Solution for Problem	15								
6.3	Implementation	20								
6.4	Presentation	5								
6.5	Report	5								
6.6	Demo	5								

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ELECTIVE II

	Marketing Research	Category	L	Т	Ρ	Credit
60 CB E21	& Marketing Management	PE	3	0	0	3

Objectives

- To understand the changing business environment in management.
- To examine the fundamental premise underlying market driven strategies.
- To identify the indicators of management thoughts and practices.
- To analyze the nature of consumer buying behaviour
- To understanding the marketing research and new trends in the arena of marketing

Pre-requisites

NIL

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Understand knowledge of contemporary marketing theories to the demands of business and management practice.	Understand
CO2	Identify knowledge of marketing strategies for consumer and industrial marketing	Remember
CO3	Acquire the choice of marketing mix elements and managing integrated marketing channels	Understand
CO4	Ability to analyze the nature of consumer buying behaviour	Apply
CO5	Apply the marketing research and new trends in the arena of marketing	Apply

Mapping with Programme Outcomes

			9			-										
COc						P	Os						PSOs			
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	3	3	2	3	3	2		2	3	3	3	2	3		
CO2	2	3		3		3	2	2	3	2	2			3		
CO3	3	3	2	2		3	3	2	3		2	3	2	3		
CO4	3	3	3	2		2	3		2	3		2		3		
CO5	3	2	3	2	3		2	3	3	3	2	3		3		
3 - St	rona: 2	2 - Meo	dium: 1	- Som	ie											

Bloom's	Continuous Ass (Ma	sessment Tests rks)	End Sem Examination (Marks)				
Category	1	2					
Remember	20	20	20				
Understand	20	20	40				
Apply	20	20	30				
Analyse	-	-	10				
Evaluate	-	-	-				
Create	-	-	-				
Total	60	60	100				



Syllabus												
	K.S.Rangasamy College of Technology – Autonomous R2022											
		60 (CB E21 - M	larketing Ro	esearch &	Marketing I	Manageme	ent				
					СВ							
Somo	stor	F	lours/Wee	k	Total	Credit	Ma	iximum Ma	rks			
Seine	3101	L	Т	Р	Hours	С	CA	ES	Total			
VI		3	0	0	45	3	40	60	100			
Introd	uctio	n*										
Definir	ng Ma	arketing – C	Core conce	pts in Mark	eting – Evo	olution of M	larketing -	Marketing				
Planni	ng Pr	ocess – Sc	anning Bus	iness enviro	onment: Inte	ernal and Ex	kternal – –	PESTEL -	[9]			
SWOT	Ana	ilysis - Ma	rketing in	global envir	onment –	Internationa	al Marketin	g – Rural				
Marke	ting –	Prospects	and Challe	nges.								
Marketing Strategy*												
Marke	ting s	strategy for	mulations -	- Key Drive	ers of Mark	eting Strate	egies - Stra	ategies for	[0]			
Indust	rial M	arketing – (Consumer	Marketing -	Services n	narketing –	Competitio	n Analysis	[0]			
- Anal	lysis c	of consume	r and indus	trial markets	S.							
Marke	ting l	Mix Decisio	ons*									
Produc	ct pla	nning and o	developme	nt – Produc	t life cycle -	- New prod	uct Develop	oment and				
Manag	Management – Defining Market Segmentation – Targeting and Positioning – Brand [9]											
Positic	Positioning and Differentiation –Managing Retailing, Wholesaling and Logistics –											
Advert	Advertising and Sales Promotions – Pricing Objectives, Policies and Methods.											
Buyer	Buyer Benaviour											
Under	stand	ing Industri	al and Cor	nsumer Buy	er Behavio	ur – Influer	icing factor	s – Buyer	[9]			
Benav	iour	Models -	Customer	relationshi	ps manage	ement – C	ustomer a	icquisition,				
Retain	iirig, L	Delection -				onsnips						
Morke	ting i			Morkoti	l na Bosocr	oh Drocco	a Con	onto ond				
	etione	· Droduct	Advorticing	– Markeli Promotic	ng Resear	CII FIUCES	s – Curic	Ethics in	[9]			
marko	ting _	Online mai	Ruvenisinų rkotina tron	de - social r	nedia and d	ligital marke	otina	- Ethos III				
marke	ung	Offinite ma	incling tren	us social I		ingital marke		tal Hours	45			
Text F	Book(s).					10					
	Philin	Kotler Kev	vin Lane Ke	ller Alexan	der Cherney	/ Jandish N	Sheth St	nainesh G "	Marketing			
1.	Mana	dement" P	earson Edu	cation 16th	Fdition 20)22			Marketing			
	Philip	T Kotler a	nd Kevin La	ane Keller M	larketing M	anagement	Prentice H	all India 15	th Edition			
2.	2017				lanteting m	anagomon	, 1 101110011		Landon,			
Refere	ence	s):										
	Lamh	. Hair. Shar	ma. Mc Da	niel– Marke	ting – An In	novative ar	proach to l	earning and	teaching-			
1.	A sou	ith Asian pe	erspective.	Cenaaae Le	arning, 201	2.		oannig and	loacing			
	KS C	handraseka	ar. "Market	ing manage	ement-Text	and Cases	". Tata Mo	Graw Hill	-ducation.			
2.	2012		,				,		,			
	Rama	asamv. V.S.	Namakum	ari, S. Mark	eting Mana	aement: Gl	obal Perso	ective India	n Context.			
3.	Macm	nillan Educa	ation, New	Delhi, 6 th e	dition. 2018	6.			,			
	Paul	Baines, Chr	is Fill, Kellv	Page, Mark	eting, Asiar	n edition, Ox	ford Unive	rsity Press.	5thedition.			
4.	2019.		, ,		. <u>.</u> ,	····, •·		.,,	· · · · · ,			

*SDG 8:- Sustainable economic growth



1.0 Introduction 1.1 Defining Marketing , Core concepts in Marketing 1 1.2 Evolution of Marketing, Marketing Planning Process 1 1.3 Scanning Business environment: Internal and External 2 1.4 PESTEL, SWOT Analysis, Marketing in global environment 2 1.5 International Marketing, Rural Marketing. 1 1.6 Prospects and Challenges 2 2.0 Marketing Strategy 2 2.1 Marketing strategy formulations 2 2.2 Key Drivers of Marketing Strategies ,Strategies for Industrial Marketing 2 2.3 Consumer Marketing, Services marketing 2 2.4 Competition Analysis 1 2.5 Analysis of consumer and industrial markets 2 3.0 Marketing Mix Decisions 1 3.1 Product Iple cycle, New product Development and Management 2 3.3 Defining Market Segmentation , Targeting and Positioning 2 3.4 Brand Positioning and Differentiation , Managing Retailing, 1 3.6 Pricing Objectives, Policies and Methods. 2 2 <t< th=""><th>S. No.</th><th>Topics</th><th>No. of hours</th></t<>	S. No.	Topics	No. of hours
1.1 Defining Marketing ,Core concepts in Marketing 1 1.2 Evolution of Marketing , Marketing Planning Process 1 1.3 Scanning Business environment: Internal and External 2 1.4 PESTEL , SWOT Analysis ,Marketing in global environment 2 1.4 PESTEL , SWOT Analysis ,Marketing in global environment 2 1.5 International Marketing, Rural Marketing. 1 1.6 Prospects and Challenges 2 2.0 Marketing Strategy 2 2.1 Marketing strategy formulations 2 2.2 Key Drivers of Marketing, Services marketing 2 2.3 Consumer Marketing, Services marketing 2 2.4 Competition Analysis 1 2.5 Analysis of consumer and industrial markets 2 3.0 Marketing Mix Decisions 1 3.1 Product planning and development 1 3.2 Product life cycle, New product Development and Management 2 3.4 Brand Positioning and Differentiation , Managing Retailing, 1 3.5 Wholesaling and Logistics ,Advertising and Sales Promotions 1 <tr< th=""><th>1.0</th><th>Introduction</th><th>inetite</th></tr<>	1.0	Introduction	inetite
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1.5 International Marketing, Rural Marketing. 1 1.6 Prospects and Challenges 2 2.0 Marketing Strategy 2 2.1 Marketing Strategy formulations 2 2.2 Key Drivers of Marketing Strategies ,Strategies for Industrial Marketing 2 2.3 Consumer Marketing, Services marketing 2 2.4 Competition Analysis 1 2.5 Analysis of consumer and industrial markets 2 3.0 Marketing Mix Decisions 1 3.1 Product planning and development 1 3.2 Product planning and development and Management 2 3.3 Defining Market Segmentation , Targeting and Positioning 2 3.4 Brand Positioning and Differentiation , Managing Retailing, 1 3.5 Wholesaling and Logistics ,Advertising and Sales Promotions 1 3.6 Pricing Objectives, Policies and Methods. 2 4.1 Understanding Industrial and Consumer Buyer Behaviour 1 4.2 Influencing factors – Buyer Behaviour Models 2 4.3 Customer relationships management 1 4.4	1.4	PESTEL, SWOT Analysis, Marketing in global environment	2
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2.4Competition Analysis12.5Analysis of consumer and industrial markets23.0Marketing Mix Decisions3.1Product planning and development13.2Product life cycle , New product Development and Management23.3Defining Market Segmentation , Targeting and Positioning23.4Brand Positioning and Differentiation , Managing Retailing,13.5Wholesaling and Logistics ,Advertising and Sales Promotions13.6Pricing Objectives, Policies and Methods.24.0Buyer Behaviour14.1Understanding Industrial and Consumer Buyer Behaviour14.2Influencing factors – Buyer Behaviour Models24.3Customer relationships management14.4Customer acquisition24.5Retaining, Defection24.6Creating Long Term Loyalty Relationships15.1Marketing Research & Trends in Marketing25.2Marketing Information System , Marketing Research Process15.3Advertising , Promotion , Consumer Behaviour25.4Retail ,Ethics in marketing25.5Online marketing trends ,social media and digital marketing2	2.3	Consumer Marketing, Services marketing	2
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3.3Defining Market Segmentation , Targeting and Positioning23.4Brand Positioning and Differentiation , Managing Retailing,13.5Wholesaling and Logistics ,Advertising and Sales Promotions13.6Pricing Objectives, Policies and Methods.24.0Buyer Behaviour24.1Understanding Industrial and Consumer Buyer Behaviour14.2Influencing factors – Buyer Behaviour Models24.3Customer relationships management14.4Customer acquisition24.5Retaining, Defection24.6Creating Long Term Loyalty Relationships15.1Marketing Information System , Marketing Research Process25.2Marketing Information System , Marketing Research Process25.3Advertising , Promotion , Consumer Behaviour25.4Retail ,Ethics in marketing25.5Online marketing trends ,social media and digital marketing2	3.2	Product life cycle, New product Development and Management	2
3.4Brand Positioning and Differentiation , Managing Retailing,13.5Wholesaling and Logistics ,Advertising and Sales Promotions13.6Pricing Objectives, Policies and Methods.24.0Buyer Behaviour14.1Understanding Industrial and Consumer Buyer Behaviour14.2Influencing factors – Buyer Behaviour Models24.3Customer relationships management14.4Customer acquisition24.5Retaining, Defection24.6Creating Long Term Loyalty Relationships15.1Marketing Information System , Marketing Research Process25.2Marketing Information System , Marketing Research Process25.3Advertising , Promotion , Consumer Behaviour25.4Retail ,Ethics in marketing25.5Online marketing trends ,social media and digital marketing2	3.3	Defining Market Segmentation, Targeting and Positioning	2
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3.6Pricing Objectives, Policies and Methods.24.0Buyer Behaviour14.1Understanding Industrial and Consumer Buyer Behaviour14.2Influencing factors – Buyer Behaviour Models24.3Customer relationships management14.4Customer acquisition24.5Retaining, Defection24.6Creating Long Term Loyalty Relationships15.0Marketing Research & Trends in Marketing25.1Marketing Information System , Marketing Research Process25.2Marketing Information System , Marketing Research Process15.3Advertising , Promotion , Consumer Behaviour25.4Retail ,Ethics in marketing25.5Online marketing trends ,social media and digital marketing2	3.5	Wholesaling and Logistics ,Advertising and Sales Promotions	1
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4.1Understanding Industrial and Consumer Buyer Behaviour14.2Influencing factors – Buyer Behaviour Models24.3Customer relationships management14.4Customer acquisition24.5Retaining, Defection24.6Creating Long Term Loyalty Relationships15.0Marketing Research & Trends in Marketing15.1Marketing Information System , Marketing Research Process25.2Marketing Information System , Marketing Research Process15.3Advertising , Promotion , Consumer Behaviour25.4Retail ,Ethics in marketing25.5Online marketing trends ,social media and digital marketing2	4.0	Buyer Behaviour	
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4.3Customer relationships management14.4Customer acquisition24.5Retaining, Defection24.6Creating Long Term Loyalty Relationships15.0Marketing Research & Trends in Marketing15.1Marketing Information System , Marketing Research Process25.2Marketing Information System , Marketing Research Process15.3Advertising , Promotion , Consumer Behaviour25.4Retail ,Ethics in marketing25.5Online marketing trends ,social media and digital marketing2	4.2	Influencing factors – Buyer Behaviour Models	2
4.4Customer acquisition24.5Retaining, Defection24.6Creating Long Term Loyalty Relationships15.0Marketing Research & Trends in Marketing25.1Marketing Information System , Marketing Research Process25.2Marketing Information System , Marketing Research Process15.3Advertising , Promotion , Consumer Behaviour25.4Retail ,Ethics in marketing25.5Online marketing trends ,social media and digital marketing2	4.3	Customer relationships management	1
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5.2Marketing Information System , Marketing Research Process15.3Advertising , Promotion , Consumer Behaviour25.4Retail ,Ethics in marketing25.5Online marketing trends ,social media and digital marketing2	5.1	Marketing Information System, Marketing Research Process	2
5.3Advertising , Promotion , Consumer Behaviour25.4Retail ,Ethics in marketing25.5Online marketing trends ,social media and digital marketing2	5.2	Marketing Information System, Marketing Research Process	1
5.4Retail ,Ethics in marketing25.5Online marketing trends ,social media and digital marketing2	5.3	Advertising, Promotion, Consumer Behaviour	2
5.5 Online marketing trends ,social media and digital marketing 2	5.4	Retail ,Ethics in marketing	2
	5.5	Online marketing trends ,social media and digital marketing	2

Course Designer(s) 1. Dr.M.Mohanraj – mohanrajm@ksrct.ac.in



60 CB E22	Eineneiel Analytics	Category	L	Т	Ρ	Credit
60 CB E22		PE	3	0	0	3

- To understand modern analytical tools that specifically target finance applications
- To understand different management aspects
- To learn financial analysis for decision making
- To understand human resource management
- To learn different business strategy

Pre-requisites

• NIL

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Understand different management techniques	Understand
CO2	Apply analytical tools that specifically target finance applications.	Understand
CO3	Describe financial analysis for decision making	Apply
CO4	Understand human resource management	Apply
CO5	Adopt different business strategy	Understand

Mapping with Programme Outcomes

<u> </u>						P	Os							PSOs	
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	-	-	-	-	-	-	-	-	-	-	3	-
CO2	-	-	-	-	2	3	-	3	-	3	-	-	-	-	3
CO3	2	-	3	2	-	-	-	-	-	-	-	-	-	2	-
CO4	-	3	-	-	-	-	-	2	2	2	-	-	-	3	
CO5	2	3	-	2	2	-	-	-	-	-	-	-	3	-	2
3 - St	3 - Strong; 2 - Medium; 1 - Some														

Bloom's	Continuous As	sessment Tests	End Sem Examination (Marks)
Category	1	2	
Remember (Re)	-	-	-
Understand(Un)	25	25	45
Apply (Ap)	25	25	35
Analyse (An)	10	10	20
Evaluate (Ev)	-	-	-
Create (Cr)	-	-	-
Total	60	60	100



Syllabus									
		K.S.F	Rangasamy	College o	f Technolo	ogy – Autor	nomous R2	2022	
			B.Tech-Co	omputer So	cience and	Business 3	Systems		
60 CB E22 - Financial Analytics									
Some	ostor	F	lours/Weel	k	Total	Credit	Ma	ximum Ma	rks
Seine	53101	L	Т	Р	Hours	С	CA	ES	Total
VI 3 0 0 45 3 40 60									100
Foundations of Financial Analytics * Financial Analytics – Need - Data in Finance - Sources of Financial Data – Pre-processing of Financial Data - Applicability of Tools (Excel, SPSS, R, Python) for Exploratory Data Analysis									[9]
Corp Basic capita	orate l corpo al, Fina	Finance Ar rate financia ancial Break	nalysis * al predictive c even mode	e modelling elling, Capit	- Project ana tal Budget n	alysis- cash nodel-Payba	flow analys ack, NPV, I	sis- cost of RR.	[9]
Finar Estim series	ncial N lation a s exam	larket Anal and prediction	l ysis * on of risk ar e of data, V	nd return (b alue at risk	ond investm , ARMA, AR	nent and sto CH and GA	ock investmo ARCH.	ent) –Time	[9]
Portf Portfo binon	olio An olio An nial mo	nalysis * nalysis – ca odel for optio	apital asset ons, Black \$	t pricing m Scholes mo	odel, Sharp del and Opt	be ratio, Op tion implied	otion pricin volatility.	g models-	[9]
Tech Predi charts	nical A ction u s, simu	Analysis* sing charts ılating tradiı	and fundan ng strategie	nentals – R s. Predictio	SI, ROC, MA	ACD, movin prices.	g average a	and candle	[9]
							То	tal Hours:	45
Text	Book(s):							
1.	Finan	cial analytic	cs with R by	v Mark J. Be	ennett, Dirk	L. Hugen, C	Cambridge	university pr	ess
2.	Hask Pavel	ell Financia Ryzhov	I Data Mode	eling and P	redictive An	alytics Pap	erback – In	nport, 25 Oo	ct 2013 by
Refe	rence(s):							
1.	1. Quantitative Financial Analytics: The Path To Investment Profits Paperback – Import, 11 Sep 2017 by Edward F Williams (Author), John A Dobelman 2018								
2.	Pytho	on for Finan	ce - Paperb	ack – Impo	ort, 30 Jun 2	017 by Yux	ing Yan (Au	uthor)	
3.	Maste	ering Pytho epts, Techr	n for Finar	nce Papert	ack – Imp s", Wiley Pu	ort, 29 Apr blications, 2	2015 by	James Ma	Weiming.
4.	Jame	s Evans, "B	Business An	alytics", (2r	nd Edition) F	Pearson Pul	blications, 2	2018.	
*900	*SDG 8:-Sustainable economic growth								

SDG 8:–Sustainable economic growth



Course Contents and Lecture Schedule								
S. No.	Topics	No. of hours						
1.0	Foundations of Financial Analytics							
1.1	Financial Analytics	2						
1.2	Need - Data in Finance	1						
1.3	Sources of Financial Data	2						
1.4	Pre-processing of Financial Data	2						
1.5	Applicability of Tools (Excel, SPSS, R, Python) for Exploratory Data Analysis	3						
2.0	Corporate Finance Analysis							
2.1	Basic corporate financial predictive modelling	2						
2.2	Project analysis- cash flow analysis	2						
2.3	cost of capital, Financial Break even modelling	3						
2.4	Capital Budget model	1						
2.5	Payback, NPV, IRR	1						
3.0	Financial Market Analysis							
3.1	Estimation and prediction of risk and return (bond investment and stock investment)	3						
3.2	Time series examining nature of data	3						
3.3	Value at risk	2						
3.4	ARMA, ARCH and GARCH	1						
4.0	Portfolio Analysis							
4.1	Portfolio Analysis	2						
4.2	capital asset pricing model	1						
4.3	Sharpe ratio	2						
4.4	Option pricing models	2						
4.5	binomial model for options	2						
4.6	6 Black Scholes model and Option implied volatility	1						
5.0	Technical Analysis							
5.1	Prediction using charts and fundamentals	2						
5.2	RSI, ROC	2						
5.3	MACD	1						
5.4	moving average and candle charts	1						
5.5	simulating trading strategies	1						
5.6	Prediction of share prices	2						

1. Dr.H.Kalaiarasi - kalaiarasi@ksrct.ac.in



60 CB E22	Digital Markating	Category	L	Т	Ρ	Credit
60 CB E23	Digital Marketing	PE	3	0	0	3

- To examine and explore the role and importance of digital marketing in today's rapidly changing business environment
- It also focusses on how digital marketing can be utilized by organizations and how its effectiveness can measured
- To know the key elements of a digital marketing strategy
- To study how the effectiveness of a digital marketing campaign can be measured
- To demonstrate advanced practical skills in common digital marketing tools such as SEO, SEM, Social media and Blog

Pre-requisites

• NIL

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Understand the core concepts and principles of Digital marketing	Understand
CO2	Implement SEO techniques to improve website visibility and manage PPC campaigns for targeted advertising.	Apply
CO3	Design and execute email marketing campaigns for lead nurturing.	Create
CO4	Utilize social media platforms for marketing and engagement.	Create
CO5	Demonstrate advanced practical skills in common digital marketing tools such as SEO, SEM, Social media and Blogs.	Understand

Mapping with Programme Outcomes

<u> </u>						P	Os							PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	3	3	2	3	3	2	-	2	3	3	3	2	3	-	
CO2	2	3	-	3	-	3	2	2	3	2	2	-	-	3	-	
CO3	3	3	2	2	-	3	3	2	3	-	2	3	2	3	-	
CO4	3	3	3	2	-	2	3	-	2	3	-	2	-	3	-	
CO5	3	2	3	2	3	-	2	3	3	3	2	3	-	3	-	
3 - St	3 - Strong; 2 - Medium; 1 - Some															

Bloom's	Continuous Ass (Ma	sessment Tests rks)	End Sem Examination (Marks)
Calegory	1	2	
Remember	-	-	-
Understand	20	20	40
Apply	20	20	30
Analyse	-	-	10
Evaluate	-	-	-
Create	20	20	20
Total	60	60	100

Sylla	Syllabus										
	K.S.Rangasamy College of Technology – Autonomous R2022										
B.Tech – Computer Science and Business Systems											
				60 CB E23	3- Digital M	arketing					
Som	ostor	F	lours/Wee	k	Total	Credit	Ma	ximum Ma	rks		
Sem	ester	L	Т	Р	Hours	С	CA	ES	Total		
\	VI 3 0 0 45 3 40 60										
Introduction to Online Market *											
Onlin	e Mark	ket space, M	larket Place	e- Digital Ma	arketing Stra	ategy- Com	ponents Op	portunities	[9]		
for b	uilding	Brand Web	site -Planni	ing and Cre	ation- Conte	ent Marketir	ng.	-			
Sear	ch Eng	gine Optim	isation *								
Sear	ch Eng	ine optimiza	ation - Keyv	vord Strateg	y- SEO Stra	ategy - SEC) success fa	actors -On-	[0]		
Page	e Techr	niques - Off	-Page Tech	nniques. Se	arch Engine	e Marketing	- How Sear	ch Engine	[9]		
work	s- SEN	1 componer	nts- PPC ad	lvertising -D	isplay Adve	ertisement.					
E- M	ail Maı	rketing *									
E- M	ail Ma	rketing - Ty	pes of E- N	Mail Market	ing - Email	Automation	n - Lead Ge	eneration -			
Integ	rating	Email with	n Social M	ledia and	Mobile- Me	easuring ar	nd maximiz	zing email	101		
camp	baign e	effectivenes	s. Mobile N	Marketing- I	Mobile Inve	ntory/chanr	nels- Locati	on based;	[9]		
Cont	ext bas	sed; Coupo	ns and offe	ers, Mobile	Apps, Mobi	le Commer	ce, SMS C	ampaigns-			
Profi	ling an	d targeting									
Soci	al Med	lia Marketir	ng *								
Socia	al Med	ia Marketin	ig - Social	Media Cha	annels- Lev	eraging Sc	ocial media	for brand			
conv	ersatio	ns and buz	z. Success	stul /benchn	nark Social	media can	npaigns. En	gagement	[9]		
Mark	eting-	Building C	Customer r	elationships	s - Creatir	ng Loyalty	drivers -	Influencer			
Mark	eting.		<u>.</u>								
Digit		nstormatio	n ^ 8 Ohannal	A		A al a nala					
Digita	ai iran	stormation	& Channel	Attribution-	· Analytics-	Ad-words,	Email, Mod	olle, Social	[9]		
wedi	a, vvet	Analytics -	Changing	your strateg	y based on	analysis- R	ecent trend	s in Digital			
mark	eung.						То		45		
Toyt	Book	(c)·					10	lai nours.	40		
TOAL	Fund	amentals of	Digital Ma	rketing by P	uneet Sina	h Rhatia Pu	hlisher: Pe	arson Educa	ation: First		
1.	editio	n (July 201	7);ISBN-10	: 93325873	7X;ISBN-13	8: 978-9332	587373				
2.	Digita	al Marketing	by Vandar	ha Ahuja ;Ρι	ublisher: Ox	ford Univer	sity Press (April 2015).	ISBN-10:		
Refe	rence	s):									
	Mark	etina 4.0: M	loving from	Traditional	to Digital by	v Philip Kot	ler: Publishe	er: Wilev: 1s	st edition (
1.	April	2017); ISBN	N10: 97881	26566938;1	SBN13: 978	812656693	88;ASIN: 81	26566930.			
2.	Ryan Gene	, D. (2014). ration Kog	Understan	ding Digital nited.	Marketing:	Marketing S	Strategies fo	or Engaging	the Digital		
	Barke	er Barker F	Sormann ar	nd Neher(20)17) Social	Media Mar	ketina A Si	trategic App	roach 2F		
3.	South	n- Western	Cengage I	earning.	, ວິວິວິດີເຊັ						
4	Puliz	zi J Beginne	er's Guide to	o Digital Ma	rketing Ma	oraw Hill F	ducation				
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*SDG 9 – Industry Innovation and Infrastructure


Course Contents and Lecture Schedule								
S. No.	Topics	No. of hours						
1.0	Introduction to Online Market							
1.1	Online Market space, Market space	1						
1.2	Digital Marketing Strategy	2						
1.3	Components	1						
1.4	Opportunities for building Brand Website 1	1						
1.5	Planning and Creation	2						
1.6	Content Marketing.	2						
2.0	Search Engine Optimisation							
2.1	Search Engine optimization - Keyword Strategy	2						
2.2	SEO Strategy - SEO success factors -On-Page Techniques - Off-Page Techniques	2						
2.3	Search Engine Marketing- How Search Engine works	2						
2.4	SEM components	1						
2.5	PPC advertising -Display Advertisement	2						
3.0	E- Mail Marketing							
3.1	E- Mail Marketing - Types of E- Mail Marketing	1						
3.2	Email Automation - Lead Generation	1						
3.3	Integrating Email with Social Media and Mobile- Measuring and maximizing email campaign effectiveness	2						
3.4	Mobile Marketing- Mobile Inventory/channels- Location based-Context based	2						
3.5	Coupons and offers, Mobile Apps, Mobile Commerce	1						
3.6	SMS Campaigns-Profiling and targeting	2						
4.0	Social Media Marketing							
4.1	Social Media Marketing - Social Media Channels	1						
4.2	Leveraging Social media for brand conversations and buzz	1						
4.3	Successful /benchmark Social media campaigns	1						
4.4	Engagement Marketing	2						
4.5	Building Customer relationships- Creating Loyalty drivers	2						
4.6	Influencer Marketing	2						
5.0	Digital Transformation							
5.1	Digital Transformation & Channel Attribution	2						
5.2	Analytics- Ad-words, Email, Mobile, Social Media	2						
5.3	Web Analytics	2						
5.4	Changing your strategy based on analysis	1						
5.5	Recent trends in Digital marketing	2						

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OUCD E24 RISK Analytics PE 3 0 0 3	60 CB E24	Dick Apolytics	Category	L	Т	Ρ	Credit
	00 CB E24	RISK Analytics	PE	3	0	0	3

- To develop a basic understanding of risk assessment and its role within the risk management process.
- To understand risk assessment and its role within the risk management process.
- To differentiate between risk assessment and risk management.
- To develop a basic understanding of how to conduct and evaluate an uncertainty analysis for a risk assessment.
- To understand the risk management issues and challenges

Pre-requisites

NIL

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Identify the core types of project risks.	Understand
CO2	Use qualitative and quantitative risk assessment methods.	Understand
CO3	Competently use risk simulation techniques.	Apply
CO4	Use risk analysis tools/methods and work in a group to create a risk management plan based on the ISO 31000:2009.	Apply
CO5	Identify a range of risk management issues/challenges and the risks as complex systems cascade and be competent to initiate potential actions in response.	Understand

Mapping with Programme Outcomes

<u> </u>	POs									PSOs					
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	-	-	-	-	-	-	-	-	-	-	3	-
CO2	-	-	-	-	2	3	-	3	-	3	-	-	-	-	3
CO3	2	-	3	2	-	-	-	-	-	-	-	-	-	-	-
CO4	-	3	-	-	-	-	-	2	2	2	-	-	-	3	-
CO5	2	3	-	2	2	-	-	-	-	-	-	-	3	-	2

3 - Strong; 2 - Medium; 1 - Some

Bloom's	Continuous Ass	sessment Tests (Marks)	End Sem Examination
Category	1	2	(Marks)
Remember	-	-	-
Understand	25	25	45
Apply	25	25	35
Analyse	10	10	20
Evaluate	0	0	0
Create	0	0	0
Total	60	60	100



Syllabus										
K.S.Rangasamy College of Technology – Autonomous R2022										
B.Tech. Computer Science and Business Systems										
60 CB E24 - Risk Analytics										
Somo	stor	ŀ	lours/Wee	k	Total	Credit	Ma	ximum Ma	rks	
Seine	5101	L	Т	Р	Hours	С	CA	ES	Total	
VI 3 0 0 45 3 40 60 100										
Introd	duction *									
Introd	uction, Fu	ndame	ntals of Risk	k- Risk Plan	ning, Asses	sment and	Manageme	nt Process	[9]	
and th	ne System	s Appro	bach-Types	of Risk Ass	essment ar	nd Engineer	ing Risk As	sessment.		
Risk I	dentifica	tion *		_						
Risk I	dentificati	on- His	torical data,	comparativ	e analysis,	and checkli	ist- Taxonoi	my based,	101	
risk br	reakdown	structu	re, HHM, S	NOI, root o	cause analy	sis, influenc	ce diagram	- Expert/	[9]	
user/ s	stakenoid	er-base	ed elicitation	(Deipni, br	ainstorming	, interview)	, Scenario-I	based,		
experi	ience bas	ea, obje	ective-base	analysis.						
Drolim		noas te			a and One	robility Ano				
Sefet			Eciluro M	A), Hazaiu	footo Apol		IIYSIS (HAZ)	(DP) = JOD	[9]	
	Fvont Tr	(JSA) oo Ana	- Fallule Mi Iveis (ETA)			A-Conseque	- rault He			
(IIA)	(FTA), Event Tree Analysis (ETA), Decision Trees- Cause-Consequence Analysis (CCA).									
Risk F	Risk Prioritization & Treatment									
Analys	Analysis Sensitivity and Tradeoff Analysis Modeling and Simulation-Risk Attitude and									
Risk	Tolerance	. As Lo	ow As Rea	sonably Pr	acticable (A	LARP)- A	voidance. S	eparation.	[9]	
Reduc	ction. Tra	ansfer.	Acceptance	ce- Detect	ion. Contr	ol. Respoi	nse and	Recoverv-		
Perfor	mance M	onitorin	ig.		,	,		, , , , , , , , , , , , , , , , , , ,		
Appli	cation Or	iented	Areas *							
ISO 3	3100, Qu	ality a	nd Reliabil	ity- Supply	/ Chain R	isk Manag	ement- Pro	oject Risk	[9]	
Manag	gement.					-		-		
							То	tal Hours:	45	
Text E	Book(s):									
1. Marvin Rausand Stein Haugen, Risk Assessment: Theory, Methods, and Applications, Wiley, 2020.										
2. Mohammad Modarres, Risk Analysis in Engineering Techniques, Tools, and Trends, CRC Press, 2006.										
Reference(s):										
1. Eduardo Rodriguez Risk Analytics Data-Driven Decisions under Uncertainty, CRC Press, 2023										
2. Edward H. K. Ng Risk Analytics: From Concept To Deployment (2021) World Scientific										
	Publishin	y co. F	rie. Lid.			- 0000 F		DOsalia		
<u>う</u> .	Gerardus	BIOKO	/K KISK ANA	ytics A Con	npiete Guid	e - 2020 EC	11100, 551A	RUOOKS		
4.		SE KISK	Analysis: A		e Guide 3r	$u \models altion, W$	ney			
SDG	o o:- Susta	* SDG 8:- Sustainable economic growth								



S. No.	Topics	No. of
1.0	Introduction	nours
1.1	Introduction	2
1.2	Fundamentals of Risk	1
1.3	Risk Planning	2
1.4	Assessment and Management Process and the Systems Approach	2
1.5	Types of Risk Assessment and Engineering Risk Assessment	3
2.0	Risk Identification	
2.1	Risk Identification	2
2.2	Historical data, comparative analysis, and checklist	2
2.3	Taxonomy based, risk breakdown structure	3
2.4	HHM, SWOT, root cause analysis, influence diagram	1
2.5	Expert/ user/stakeholder-based elicitation (Delphi, brainstorming, interview), Scenario-based, experience based, objective-based analysis	1
3.0	Tools and Methods for Risk Assessment	
3.1	Preliminary Hazard Analysis (PHA)	3
3.2	Hazards and Operability Analysis (HAZOP) - Job Safety Analysis (JSA)	3
3.3	Failure Modes and Effects Analysis (FMEA)- Fault Tree Analysis (FTA), Event Tree Analysis (ETA)	2
3.4	Decision Trees- Cause-Consequence Analysis (CCA	1
4.0	Risk Prioritization & Treatment	
4.1	Risk Probability and Impact Assessment, Risk Index and Risk Ranking	2
4.2	Risk Matrix, EV Analysis	1
4.3	Sensitivity and Tradeoff Analysis, Modeling and Simulation- Risk Attitude and Risk Tolerance, As Low As Reasonably Practicable (ALARP)	2
4.4	Avoidance, Separation, Reduction, Transfer, Acceptance	2
4.5	Detection, Control, Response and Recovery	2
4.6	Performance Monitoring	1
5.0	APPLICATION ORIENTED AREAS	1
5.1	ISO 3100	2
5.2	Quality and Reliability	2
5.3	Supply Chain Risk Management	2
5.4	Project Risk Management	2
	Total	45

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60 CB E25	Financing New Business	Category	L	Т	Ρ	Credit
60 CB E25	Ventures	PE	3	0	0	3

- To understand the concepts of business ventures
- To develop the basics of business venture financing
- To impart the knowledge essential for entrepreneurs for financing new ventures
- To adopt the learners with the sources of debt and equity financing
- To empower the learners towards fund raising for new ventures effectively

Pre-requisites

• Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Explain the basics of starting a new business venture	Evaluate					
CO2	Understand the basics of venture financing	Understand					
CO3	Understand the sources of debt financing	Understand					
CO4	Understand the sources of equity financing	Understand					
CO5	Choose the methods of fund raising for new business ventures	Apply					
Mapping	Mapping with Programme Outcomes						

<u> </u>		POs										PSOs			
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	-	3	2	2	-	-	2	2	-	2	2	3	-
CO2	3	2	2	3	3	2	-	3	-	-	-	2	3	3	-
CO3	3	3	2	3	2	2	-	2	2	2	-	-	-	3	-
CO4	-	2	-	3	2	3	2	3	-	-	-	2	2	3	-
CO5	2	3	3	3	-	-	-	3	2	2	2	3	2	3	-
0.01		N N A	P 4	0											

3 - Strong; 2 - Medium; 1 – Some

Bloom's	Continuous Ass (Ma	sessment Tests rks)	End Sem Examination (Marks)
Calegory	1	2	
Remember	20	20	40
Understand	20	25	35
Apply	20	15	25
Analyse	0	0	0
Evaluate	0	0	0
Create	0	0	0
Total	60	60	100



K.S.Rangasamy College of Technology – Autonomous R2022 B.Tech – Computer Science and Business Systems 60 CB E25- Financing New Business Ventures Go CB E25- Financing New Business Ventures Hours/Week Total Credit Maximum Marks L T P Hours C CA ES Total L T P Hours C CA ES Total
B.Tech – Computer Science and Business Systems 60 CB E25- Financing New Business Ventures Semester Hours/Week Total Credit Maximum Marks L T P Hours C CA ES Total
60 CB E25- Financing New Business Ventures Semester Hours/Week Total Credit Maximum Marks L T P Hours C CA ES Total
Semester Hours/Week Total Credit Maximum Marks L T P Hours C CA ES Total
L T P Hours C CA ES Total
<u>VI 3 0 0 45 3 40 60 100</u>
Essentials of New Busines Venture *
Setting up new Business Ventures – Need - Scope - Franchising - Location Strategy,
Registration Process - State Directorate of Industries- Financing for New Ventures - Central [9]
and State Government Agencies - Types of loans – Financial Institutions - SFC, IDBI, NSIC
and SIDCO.
Introduction to Venture Financing *
Venture Finance – Definition – Historic Background - Funding New Ventures- Need –
Scope – Types - Cost of Project - Means of Financing - Estimation of Working Capital -
Requirement of funds – Mix of Debt and Equity - Challenges and Opportunities.
Sources of Debt Financing *
Fund for Capital Assets - Term Loans - Leasing and Hire-Purchase - Money Market
Instruments – Bonds, Corporate Papers – Preference Capital- Working Capital
Management- Fund based Credit Facilities - Cash Credit - Over Draft.
Sources of Equity Financing
Own Capital, Unsecured Loan - Government Subsidies, Margin Money- Equity Funding - [9]
Venture Capital
Methods of Fund Paising for New Ventures *
Investor Decision Process - Identifying the appropriate investors- Targeting investors-
Developing Relationships with investors - Investor Selection Criteria- Company Creation-
Raising Funds - Seed Funding- VC Selection Criteria – Process- Methods- Recent Trends.
Total Hours: 45
Text Book(s):
Principles of Corporate Finance by Brealey and Myers et al.,12TH ed, McGraw Hill Education
1. (India) Private.
Prasanna Chandra, Projects: Planning, Analysis, Selection, Financing, Implementation and
² Review, McGraw Hilld Education India Pvt Ltd , New Delhi , 2019.
Reference(s):
1. Introduction to Project Finance. Andrew Fight, Butterworth-Heinemann, 2006.
Metrick, Andrew; Yasuda, Ayako. Venture Capital And the Finance of Innovation. Venture
2. Capital and The Finance of Innovation, 2nd Edition, Andrew Metrick and Ayako Yasuda, Eds.,
John Wiley and Sons, Inc, 2010.
Lerner, Josh; Leamon, Ann; Hardymon, Felda. Venture Capital, Private Equity, And the
5. Financing of Entrepreneurship. 2012
Entrepreneurship. 2012. Camp, Justin J. Venture Capital Due Diligence: A Guide to Making
Smart Investment Choices And Increasing Your Portfolio Returns. John Wiley & Sons, 2002

*SDG 9 – Industry Innovation and Infrastructure



S. No. Topics No. of hours 1.0 Essentials of New Business Venture 1.1 Setting up new Business Ventures – Need - Scope 2 1.2 Franchising - Location Strategy, Registration Process- State Directorate of Industries 2 1.3 Financing for New Ventures - Central and State Government Agencies 2 1.4 Types of loans 1 1.5 Financial Institutions - SFC, IDBI, NSIC and SIDCO. 2 2.0 Introduction to Venture Financing 2 2.1 Venture Finance – Definition – Historic Background 2 2.2 Funding New Ventures - Need – Scope – Types 2 2.3 Cost of Project - Means of Financing - Estimation of Working Capital 3 2.4 Requirement of funds – Mix of Debt and Equity 1 2.5 Challenges and Opportunities 1 3.0 Sources of Debt Financing 2 3.1 Fund for Capital Assets - Term Loans 2 3.2 Leasing and Hire-Purchase - Money Market instruments 2 3.3 Money Market instruments – Bonds, Corporate Papers – Preference Capital 2	Course C	Contents and Lecture Schedule	
1.0 Essentials of New Busines Venture 1.1 Setting up new Business Ventures – Need - Scope 2 1.2 Franchising - Location Strategy, Registration Process- State Directorate of Industries 2 1.3 Financing for New Ventures - Central and State Government Agencies 2 1.4 Types of Ioans 1 1.5 Financial Institutions - SFC, IDBI, NSIC and SIDCO. 2 2.0 Introduction to Venture Financing 2 2.1 Venture Finance – Definition – Historic Background 2 2.2 Funding New Ventures- Need – Scope – Types 2 2.3 Cost of Project - Means of Financing - Estimation of Working Capital 3 2.4 Requirement of funds – Mix of Debt and Equity 1 2.5 Challenges and Opportunities 1 3.0 Sources of Debt Financing 2 3.1 Fund for Capital Assets - Term Loans 2 3.2 Leasing and Hire-Purchase - Money Market instruments 2 3.3 Money Market instruments – Bonds, Corporate Papers – Preference Capital 2 3.4 Working Capital Management 2 2 3.5 Fund based Credi	S. No.	Topics	No. of hours
1.1 Setting up new Business Ventures – Need - Scope 2 1.2 Franchising - Location Strategy, Registration Process- State Directorate of Industries 2 1.3 Financing for New Ventures - Central and State Government Agencies 2 1.4 Types of Ioans 1 1.5 Financing for New Ventures - Central and State Government Agencies 2 2.0 Introduction to Venture Financing 2 2.1 Venture Finance – Definition – Historic Background 2 2.2 Funding New Ventures- Need – Scope – Types 2 2.3 Cost of Project - Means of Financing - Estimation of Working Capital 3 2.4 Requirement of funds – Mix of Debt and Equity 1 2.5 Challenges and Opportunities 1 3.0 Sources of Debt Financing 2 3.1 Fund for Capital Assets - Term Loans 2 3.2 Leasing and Hire-Purchase - Money Market instruments 2 3.3 Money Market instruments – Bonds, Corporate Papers – Preference Capital 2 3.4 Working Capital Management 2 2 3.5 Fund based Credit Facilities - Cash Credit - Over Draft 1	1.0	Essentials of New Busines Venture	
1.2 Franchising - Location Strategy, Registration Process- State Directorate of Industries 2 1.3 Financing for New Ventures - Central and State Government Agencies 2 1.4 Types of loans 1 1.5 Financial Institutions - SFC, IDBI, NSIC and SIDCO. 2 2.0 Introduction to Venture Financing 2 2.1 Venture Finance – Definition – Historic Background 2 2.2 Funding New Ventures- Need – Scope – Types 2 2.3 Cost of Project - Means of Financing - Estimation of Working Capital 3 2.4 Requirement of funds – Mix of Debt and Equity 1 2.5 Challenges and Opportunities 1 3.0 Sources of Debt Financing 2 3.1 Fund for Capital Assets - Term Loans 2 3.2 Leasing and Hire-Purchase - Money Market instruments 2 3.3 Money Market instruments – Bonds, Corporate Papers – Preference Capital 2 3.4 Working Capital Management 2 2 3.5 Fund based Credit Financing 2 2 4.1 Own Capital, Unsecured Loan - Government Subsidies, Margin Money 2	1.1	Setting up new Business Ventures – Need - Scope	2
1.3 Financing for New Ventures - Central and State Government Agencies 2 1.4 Types of Ioans 1 1.5 Financial Institutions - SFC, IDBI, NSIC and SIDCO. 2 2.0 Introduction to Venture Financing 2 2.1 Venture Finance – Definition – Historic Background 2 2.2 Funding New Ventures- Need – Scope – Types 2 2.3 Cost of Project - Means of Financing - Estimation of Working Capital 3 2.4 Requirement of funds – Mix of Debt and Equity 1 2.5 Challenges and Opportunities 1 3.0 Sources of Debt Financing 2 3.1 Fund for Capital Assets - Term Loans 2 3.2 Leasing and Hire-Purchase - Money Market instruments 2 3.3 Money Market instruments – Bonds, Corporate Papers – Preference Capital 2 3.4 Working Capital Management 2 2 3.5 Fund based Credit Facilities - Cash Credit - Over Draft 1 4.0 Sources of Equity Financing 2 4.1 Own Capital, Unsecured Loan - Government Subsidies, Margin Money 2 4.1 Own Capital, Unsecu	1.2	Franchising - Location Strategy, Registration Process- State Directorate of Industries	2
1.4 Types of loans 1 1.5 Financial Institutions - SFC, IDBI, NSIC and SIDCO. 2 2.0 Introduction to Venture Financing 2 2.1 Venture Finance – Definition – Historic Background 2 2.2 Funding New Ventures- Need – Scope – Types 2 2.3 Cost of Project - Means of Financing - Estimation of Working Capital 3 2.4 Requirement of funds – Mix of Debt and Equity 1 2.5 Challenges and Opportunities 1 3.0 Sources of Debt Financing 1 3.1 Fund for Capital Assets - Term Loans 2 3.2 Leasing and Hire-Purchase - Money Market instruments 2 3.3 Money Market instruments – Bonds, Corporate Papers – Preference Capital 2 3.4 Working Capital Management 2 3.5 Fund based Credit Facilities - Cash Credit - Over Draft 1 4.0 Sources of Equity Financing 2 4.1 Own Capital, Unsecured Loan - Government Subsidies, Margin Money 2 4.2 Equity Funding – Private Equity Fund 2 4.3 Schemes of Commercial banks 2 <t< td=""><td>1.3</td><td>Financing for New Ventures - Central and State Government Agencies</td><td>2</td></t<>	1.3	Financing for New Ventures - Central and State Government Agencies	2
1.5 Financial Institutions - SFC, IDBI, NSIC and SIDCO. 2 2.0 Introduction to Venture Financing 2.1 Venture Finance – Definition – Historic Background 2 2.2 Funding New Ventures- Need – Scope – Types 2 2.3 Cost of Project - Means of Financing - Estimation of Working Capital 3 2.4 Requirement of funds – Mix of Debt and Equity 1 2.5 Challenges and Opportunities 1 3.0 Sources of Debt Financing 2 3.1 Fund for Capital Assets - Term Loans 2 3.2 Leasing and Hire-Purchase - Money Market instruments 2 3.3 Money Market instruments – Bonds, Corporate Papers – Preference Capital 2 3.4 Working Capital Management 2 2 3.5 Fund based Credit Facilities - Cash Credit - Over Draft 1 4.0 Sources of Equity Financing 2 4.1 Own Capital, Unsecured Loan - Government Subsidies, Margin Money 2 4.2 Equity Funding - Private Equity Fund 2 4.3 Schemes of Commercial banks 2 4.4 Angel Funding – Crowdfunding 2	1.4	Types of loans	1
2.0Introduction to Venture Financing2.1Venture Finance – Definition – Historic Background22.2Funding New Ventures- Need – Scope – Types22.3Cost of Project - Means of Financing - Estimation of Working Capital32.4Requirement of funds – Mix of Debt and Equity12.5Challenges and Opportunities13.0Sources of Debt Financing23.1Fund for Capital Assets - Term Loans23.2Leasing and Hire-Purchase - Money Market instruments23.3Money Market instruments – Bonds, Corporate Papers – Preference Capital23.4Working Capital Management23.5Fund based Credit Facilities - Cash Credit - Over Draft14.0Sources of Equity Financing24.1Own Capital, Unsecured Loan - Government Subsidies, Margin Money24.2Equity Funding - Private Equity Fund24.3Schemes of Commercial banks24.4Angel Funding – Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures25.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total45	1.5	Financial Institutions - SFC, IDBI, NSIC and SIDCO.	2
2.1Venture Finance – Definition – Historic Background22.2Funding New Ventures- Need – Scope – Types22.3Cost of Project - Means of Financing - Estimation of Working Capital32.4Requirement of funds – Mix of Debt and Equity12.5Challenges and Opportunities13.0Sources of Debt Financing13.1Fund for Capital Assets - Term Loans23.2Leasing and Hire-Purchase - Money Market instruments23.3Money Market instruments – Bonds, Corporate Papers – Preference Capital23.4Working Capital Management23.5Fund based Credit Facilities - Cash Credit - Over Draft14.1Own Capital, Unsecured Loan - Government Subsidies, Margin Money24.2Equity Funding - Private Equity Fund24.3Schemes of Commercial banks24.4Angel Funding – Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures25.1Investor Decision Process - Identifying the appropriate investors25.3Investor Selection Criteria - Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total45	2.0	Introduction to Venture Financing	
2.2Funding New Ventures- Need – Scope – Types22.3Cost of Project - Means of Financing - Estimation of Working Capital32.4Requirement of funds – Mix of Debt and Equity12.5Challenges and Opportunities13.0Sources of Debt Financing13.1Fund for Capital Assets - Term Loans23.2Leasing and Hire-Purchase - Money Market instruments23.3Money Market instruments – Bonds, Corporate Papers – Preference Capital23.4Working Capital Management23.5Fund based Credit Facilities - Cash Credit - Over Draft14.0Sources of Equity Financing24.1Own Capital, Unsecured Loan - Government Subsidies, Margin Money24.2Equity Funding - Private Equity Fund24.3Schemes of Commercial banks24.4Angel Funding – Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures25.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total4545	2.1	Venture Finance – Definition – Historic Background	2
2.3Cost of Project - Means of Financing - Estimation of Working Capital32.4Requirement of funds - Mix of Debt and Equity12.5Challenges and Opportunities13.0Sources of Debt Financing13.1Fund for Capital Assets - Term Loans23.2Leasing and Hire-Purchase - Money Market instruments23.3Money Market instruments - Bonds, Corporate Papers - Preference Capital23.4Working Capital Management23.5Fund based Credit Facilities - Cash Credit - Over Draft14.0Sources of Equity Financing24.1Own Capital, Unsecured Loan - Government Subsidies, Margin Money24.2Equity Funding - Private Equity Fund24.3Schemes of Commercial banks24.4Angel Funding - Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures25.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria - Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total4545	2.2	Funding New Ventures- Need – Scope – Types	2
2.4Requirement of funds – Mix of Debt and Equity12.5Challenges and Opportunities13.0Sources of Debt Financing3.1Fund for Capital Assets - Term Loans23.2Leasing and Hire-Purchase - Money Market instruments23.3Money Market instruments – Bonds, Corporate Papers – Preference Capital23.4Working Capital Management23.5Fund based Credit Facilities - Cash Credit - Over Draft14.0Sources of Equity Financing24.1Own Capital, Unsecured Loan - Government Subsidies, Margin Money24.2Equity Funding - Private Equity Fund24.3Schemes of Commercial banks24.4Angel Funding – Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures25.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1	2.3	Cost of Project - Means of Financing - Estimation of Working Capital	3
2.5Challenges and Opportunities13.0Sources of Debt Financing3.1Fund for Capital Assets - Term Loans23.2Leasing and Hire-Purchase - Money Market instruments23.3Money Market instruments - Bonds, Corporate Papers - Preference Capital23.4Working Capital Management23.5Fund based Credit Facilities - Cash Credit - Over Draft14.0Sources of Equity Financing24.1Own Capital, Unsecured Loan - Government Subsidies, Margin Money24.2Equity Funding - Private Equity Fund24.3Schemes of Commercial banks24.4Angel Funding - Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures25.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1TotalTotal45	2.4	Requirement of funds – Mix of Debt and Equity	1
3.0Sources of Debt Financing3.1Fund for Capital Assets - Term Loans23.2Leasing and Hire-Purchase - Money Market instruments23.3Money Market instruments - Bonds, Corporate Papers - Preference Capital23.4Working Capital Management23.5Fund based Credit Facilities - Cash Credit - Over Draft14.0Sources of Equity Financing24.1Own Capital, Unsecured Loan - Government Subsidies, Margin Money24.2Equity Funding - Private Equity Fund24.3Schemes of Commercial banks24.4Angel Funding - Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures25.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total45	2.5	Challenges and Opportunities	1
3.1Fund for Capital Assets - Term Loans23.2Leasing and Hire-Purchase - Money Market instruments23.3Money Market instruments - Bonds, Corporate Papers - Preference Capital23.4Working Capital Management23.5Fund based Credit Facilities - Cash Credit - Over Draft14.0Sources of Equity Financing24.1Own Capital, Unsecured Loan - Government Subsidies, Margin Money24.2Equity Funding - Private Equity Fund24.3Schemes of Commercial banks24.4Angel Funding - Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures25.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total45	3.0	Sources of Debt Financing	
3.2Leasing and Hire-Purchase - Money Market instruments23.3Money Market instruments - Bonds, Corporate Papers - Preference Capital23.4Working Capital Management23.5Fund based Credit Facilities - Cash Credit - Over Draft14.0Sources of Equity Financing14.1Own Capital, Unsecured Loan - Government Subsidies, Margin Money24.2Equity Funding - Private Equity Fund24.3Schemes of Commercial banks24.4Angel Funding - Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures25.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total45	3.1	Fund for Capital Assets - Term Loans	2
3.3Money Market instruments – Bonds, Corporate Papers – Preference Capital23.4Working Capital Management23.5Fund based Credit Facilities - Cash Credit - Over Draft14.0Sources of Equity Financing24.1Own Capital, Unsecured Loan - Government Subsidies, Margin Money24.2Equity Funding - Private Equity Fund24.3Schemes of Commercial banks24.4Angel Funding – Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures25.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total45	3.2	Leasing and Hire-Purchase - Money Market instruments	2
3.4Working Capital Management23.5Fund based Credit Facilities - Cash Credit - Over Draft14.0Sources of Equity Financing14.1Own Capital, Unsecured Loan - Government Subsidies, Margin Money24.2Equity Funding - Private Equity Fund24.3Schemes of Commercial banks24.4Angel Funding - Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures25.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total45	3.3	Money Market instruments – Bonds, Corporate Papers – Preference Capital	2
3.5Fund based Credit Facilities - Cash Credit - Over Draft14.0Sources of Equity Financing4.1Own Capital, Unsecured Loan - Government Subsidies, Margin Money24.2Equity Funding - Private Equity Fund24.3Schemes of Commercial banks24.4Angel Funding - Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures5.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total	3.4	Working Capital Management	2
4.0Sources of Equity Financing4.1Own Capital, Unsecured Loan - Government Subsidies, Margin Money24.2Equity Funding - Private Equity Fund24.3Schemes of Commercial banks24.4Angel Funding – Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures25.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total45	3.5	Fund based Credit Facilities - Cash Credit - Over Draft	1
4.1Own Capital, Unsecured Loan - Government Subsidies, Margin Money24.2Equity Funding - Private Equity Fund24.3Schemes of Commercial banks24.4Angel Funding – Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures25.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total45	4.0	Sources of Equity Financing	
4.2Equity Funding - Private Equity Fund24.3Schemes of Commercial banks24.4Angel Funding – Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures25.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total45	4.1	Own Capital, Unsecured Loan - Government Subsidies, Margin Money	2
4.3Schemes of Commercial banks24.4Angel Funding – Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures25.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total45	4.2	Equity Funding - Private Equity Fund	2
4.4Angel Funding – Crowdfunding24.5Venture Capital15.0Methods of Fund Raising for New Ventures5.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total	4.3	Schemes of Commercial banks	2
4.5Venture Capital15.0Methods of Fund Raising for New Ventures5.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total	4.4	Angel Funding – Crowdfunding	2
5.0Methods of Fund Raising for New Ventures5.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total45	4.5	Venture Capital	1
5.1Investor Decision Process - Identifying the appropriate investors25.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total45	5.0	Methods of Fund Raising for New Ventures	
5.2Targeting investors- Developing Relationships with investors25.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total45	5.1	Investor Decision Process - Identifying the appropriate investors	2
5.3Investor Selection Criteria- Company Creation25.4Raising Funds - Seed Funding- VC Selection Criteria25.5Process- Methods- Recent Trends1Total45	5.2	Targeting investors- Developing Relationships with investors	2
5.4 Raising Funds - Seed Funding- VC Selection Criteria 2 5.5 Process- Methods- Recent Trends 1 Total	5.3	Investor Selection Criteria- Company Creation	2
5.5 Process- Methods- Recent Trends 1 Total 45	5.4	Raising Funds - Seed Funding- VC Selection Criteria	2
Total 45	5.5	Process- Methods- Recent Trends	1
		Total	45

1. Mr.R.Murugaganesh - murugaganesh@ksrct.ac.in



	Creativity & Innovation in	Category	L	Т	Ρ	Credit
00 CB E20	Entrepreneurship	PC	3	0	0	3

- To develop the creativity skills among the learners
- To impart the knowledge of creative intelligence essential for entrepreneurs
- To know the applications of innovation in entrepreneurship
- To identify the applications of innovation in building successful ventures
- To develop innovative business models for business

Pre-requisites

• Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Apply the basics of creativity for developing Entrepreneurship.	Apply
CO2	Understand the significance of creative intelligence for business growth.	Understand
CO3	Understand the developments through Innovation in Industries.	Understand
CO4	Identify the applications of innovation in building successful ventures.	Understand
CO5	Articulate the innovative business models to run the business efficiently and effectively.	Apply

Mapping with Programme Outcomes

<u> </u>		POs												PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	2	-	-	-	-	3	-	-	3	2	-	2	-	-	3	
CO2	3	2	-	2	-	2	-	3	-	-	2	-	2	-	-	
CO3	3	-	-	I	-	I	2	-	-	3	-	-	-	I	2	
CO4	3	2	-	2	2	3	2	-	-	-	-	2	-	2	-	
CO5	2	-	-	-	-	-	-	-	2	-	-	-	2	-	-	
3 - St	3 - Strong; 2 - Medium; 1 - Some															

Bloom's	Continuous Ass (Mai	essment Tests ks)	End Sem Examination (Marks)
Calegory	1	2	
Remember	25	25	35
Understand	25	25	45
Apply	10	10	20
Analyse	-	-	-
Evaluate	-	-	-
Create	-	-	-
Total	60	60	100



Sylla	bus											
		K.S.F	Rangasamy	/ College o	of Technolo	gy – Autor	nomous R2	2022				
			B.Tech – C	computer S	Science and	d Business	Systems					
		60) CB E26- (Creativity 8	k Innovatio	n in Entrep	preneurship	0				
Som	ostor	F	lours/Wee	k	Total	Credit	Ма	ximum Ma	rks			
Senio	ester	L	Т	Р	Hours	С	CA	ES	Total			
VI 3 0 0 45 3 40 60												
Creativity *												
Defin	Definition- Forms of Creativity- Creative Personality and Motivation -Essence, Elaborative											
and	Expre	ssive Crea	ativities- C	uality of	Creativity-E	xistential,	Entreprene	eurial and	[9]			
Empo	owerm	ent Creativi	ties – Crea	itive Enviro	nment- Cre	ative Techi	nology- Imp	roving the				
quain	y of ou	ur creativity.	*									
	dol of (Croative Inte	olligopoo	onvorgent	thinking obi	ity Troito	Congonial t					
	dibla	Evaluation-	- Creative	Tools and	Techniques	- Blocks to	congeniar u	fears and				
Disat	vilities-	Strategies	s for Unbl	ocking- De	sianing Cu	eativity Fr	habling Env	vironment-	[9]			
Creat	tivitv T	rainingCri	teria for ev	aluating C	reativity- Ci	reative Per	sonality and	d forms of				
creat	ivity M	otivation an	d Creativity	- Energy fo	or your crea	tivity.	containty and					
Inno	vation	*	,		,	,						
Defin	ition-	Levels of Ir	nnovation-	Incrementa	I Vs Radic	al Innovatio	on- Charact	teristics of				
Innov	ation i	n Different S	Sectors- Th	eories in Ini	novation an	d Creativity	- Design Th	inking and	[9]			
Innov	ation-	Product In	novation ar	d Process-	Technolog	ical, Organ	izational Ini	novation –				
Indica	ators	- Innovatior	n as Collect	ive Change	-Innovation	as a syster	m.					
Inno	vation	and Entre	preneurshi	p *								
Entre	prene	urial Winds	et-Entrep			s- Entrepre	eneurial St	rategies -	[9]			
Linde	retand	ing - Tech	aviours- O	/Market Due	Analysis a sh Droduc	t Market fit	on waking	- industry				
Inno		Business I	Models *	iniai ket rut	sii – Fiuuu		ι.					
Custo	omer	Discoverv-(Customer	Seaments-	Prospect 1	Theory and	d Developi	ng Value				
Prop	osition	s- Developi	na Busines	s Models:	Elements of	of Business	Models –	Innovative	[9]			
Busir	ness I	Models: El	ements, D	esigning li	nnovative	Business I	Models- Re	esponsible	r., 1			
Innov	ation a	and Creativi	ty.	0 0				•				
							To	tal Hours:	45			
Text	Book(s):										
1.	H.Jar	nes Harring	ton,Creativ	ity and Inno	ovation in Ei	ntrepreneur	ship, Produ	ctivity Press	s,2018.			
2.	Vinni	e Jauhari, S	SudanshuBł	hushan, Inn	ovation Mai	nagement, 0	Oxford High	er Educatio	n, 2014.			
Refe	rence(s):										
1.	A Da	le l'impe, Cr	eativity, Jai	co Publishii	ng House, 2	2003.	THEND		4			
2.	Pradi	p N Khandv	valla, Lifelo	ng Creativit	y, An Unen	ding Quest,	Tata McGr	aw Hill, 200	4.			
<u>3</u> .	Brian	Destagi M	II BIRCH, Cre	eativity, Kog	an Page, 20	JUY.	Maamillan 0	000				
4.	P. IN.	rasiogi, Mana	anaging Cre		porporate E			UUY.				
5.	2010	auon wana	gement, C.	J. G. MISI	mamachary	uiu, R. Lali	uia, ⊓imala	iya Publishii	iy nouse,			
	2010											

*SDG 9 - Industry Innovation and Infrastructure



Course		No. of
S. No.	Topics	hours
1.0	Creativity	
1.1	Definition	1
1.2	Forms of Creativity	1
1.3	Creative Personality and Motivation	1
1.4	Essence, Elaborative and Expressive Creativities	1
1.5	Quality of Creativity	1
1.6	Existential, Entrepreneurial and Empowerment Creativities	1
1.7	Creative Technology	1
1.8	Creative Environment	1
1.9	Improving the quality of our creativity	1
2.0	Creative Intelligence	
2.1	A model of Creative Intelligence	1
2.2	Convergent thinking ability	1
2.3	Traits Congenial to creativity	1
2.4	Credible Evaluation , Creative Tools and Techniques	1
2.5	Blocks to creativity, fears and Disabilities	1
2.6	Strategies for Unblocking- Designing Creativity Enabling Environment	1
2.7	Creativity Training, Criteria for evaluating Creativity	1
2.8	Creative Personality and forms of creativity Motivation and Creativity	1
2.9	Energy for your creativity	1
3.0	Innovation	
3.1	Definition, Levels of Innovation	1
3.2	Incremental Vs Radical Innovation	1
3.3	Characteristics of Innovation in Different Sectors	1
3.4	Theories in Innovation and Creativity	1
3.5	Design Thinking and Innovation	1
3.6	Product Innovation and Process	1
3.7	Technological, Organizational Innovation	1
3.8	Indicators	1
3.9	Innovation as Collective Change-Innovation as a system	1
4.0	Innovation and Entrepreneurship	
4.1	Entrepreneurial Mindset	1
4.2	Entrepreneurial Opportunities	1
4.3	Entrepreneurial Strategies	1
4.4	Motivations and Behaviours	1
4.5	Opportunity Analysis and Decision Making	1
4.6	Industry Understanding	1
4.7	Technology Pull/Market Push	1



4.8	Product -Market fit	2
5.0	Innovative Business Models	
5.1	Customer Discovery	1
5.2	Customer Segments	1
5.3	Prospect Theory and Developing Value Propositions	2
5.4	Developing Business Models: Elements of Business Models	2
5.5	Innovative Business Models: Elements, Designing Innovative Business Models	2
5.6	Responsible Innovation and Creativity	1

1. Dr.E.Kalaivani - kalaivanie@ksrct.ac.in



		Category	L	Т	Ρ	Credit							
60 CB E31	Natural Language Processing	PC	2	0	2	3							

- To learn the fundamentals of natural language processing
- To apply the word level analysis in the given text
- To understand the use of CFG and PCFG in NLP
- To understand the role of semantics of sentences and pragmatics
- To apply the NLP techniques to IR applications

Pre-requisites

• Basic Knowledge of probability, linear algebra, and calculus

Course Outcomes

On the su	In the successful completion of the course, students will be able to									
CO1	Classify the different language modelling.	Remember								
CO2	Design an innovative application using NLP components.	Apply								
CO3	Implement a rule based system to tackle morphology/syntax of a language.	Understand, Apply								
CO4	Design a tag set used for statistical processing for real-time applications.	Understand, Apply								
CO5	Compare and contrast the use of different statistical approaches for different types of NLP applications.	Understand, Analyze								

Mapping with Programme Outcomes

<u> </u>							POs							PSOs	
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	2	3	3	2	-	-	-	-	-	-	3	-	3
CO2	2	2	3	3	3	-	2	-	-	-	-	-	-	2	2
CO3	2	2	3	3	3	-	-	-	-	2	-	-	-	2	2
CO4	2	2	3	2	3	-	-	2	-	-	3	-	-	-	2
CO5	2	2	3	3	2	-	-	-	2	-	-	3	-	-	2
3 - Hi	ah: 2	- Med	ium:	1 - Low											

Bloom's	Contin	uous Ass (Mai	sessment ⁻ rks)	Tests	Model	Exam	End Sem Examination		
Category	Tes	t 1	Test 2		(Mar	ks)	(Marks)		
	Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab	
Remember	20	-	20	-	40	-	40	-	
Understand	40	-	40	-	60	-	60	-	
Apply	-	50	-	50	-	50	-	50	
Analyse	-	50	-	50	-	50	-	50	
Evaluate	-	-	-	-	-	-	-	-	
Create	-	-	-	-	-	-	-	-	
Total	60	100	60	100	100	100	100	100	



Syllabus											
K.S.Rangasamy College of Technology – Autonomous R2022 60 CB E31– Natural Language Processing											
		60) CB E31–	Natural La	nguage Pro	ocessing					
Somostor	Н	lours / Wee	k	Total	Credit		Maximum Marks	;			
Ochicatel	L	Т	Р	Hours	C	CA	ES	Total			
VII	2	2 0 2 60 3 50 50									
Introduction*											
Origins and challenges of NLP – Language Modeling: Grammar-based LM, Statistical LM - Regular Expressions, Finite-State Automata – English Morphology, Transducers for lexicon and rules, Tokenization, Detecting and Correcting Spelling Errors, Text Normalization, Minimum Edit											
Word Leve Unsmoothe Classes, P	el Analysis* d N-grams art-of-Spee	s, Evaluatin ch Tagging	g N-grams , Named E	s, Smoothir Entities and	ng, Interpol Named Er	ation and htity Taggin	Backoff – Word g, HMM Part-of-	[6]			
Speech Ta tagging – H	lidden Mark	e-based, St ov and Max	ochastic a	nd Transfo opy models.	rmation-bas	sed tagging	, Issues in PoS				
Context-Fre Dependence parsing – structures,	e Gramma Gramma Grammar Probabilisti Unification	rs, Gramma – Syntactic c CFG, Pr of feature st	ar rules for Parsing, A obabilistic ructures.	English, Tr mbiguity, D CYK, Prol	eebanks, N ynamic Pro pabilistic Le	lormal Forn gramming p exicalized	ns for grammar – barsing – Shallow CFGs - Feature	[6]			
Semantics Requireme analysis, S selectional Thesaurus,	and Pragn nts for repre emantic atta restrictions Bootstrapp	natics* esentation, F achments - - Word S ing methods	First-Order Word Ser ense Disar s – Word Sir	Logic, Desc nses, Relati mbiguation, milarity usin	ription Logio ons betwee WSD usin g Thesauru	cs – Syntax en Senses, ig Supervis s and Distril	-Driven Semantic Thematic Roles, ed, Dictionary & outional methods.	[6]			
Discourse Discourse (Algorithm Answering Speech.	Analysis a Coherence - – Corefere Systems, C	nd Lexical - Reference ence Resol hatbots & D	Resources Phenomer ution –NLI ialogue Sys	s* na, Anaphor P Applicationstems, Auto	a Resolution ons: Inforr omatic Spee	n using Hob nation extr ech Recogn	bs and Centering action, Question ition and Text-to-	[6]			
Speech. Practical: 1.Implement a programs like Word Analysis 2 Implement a programs like Word Generation 3. Use the NLTK and spacy toolkit for NLP Programming. 4. Develop a programs using various pre-processing techniques for a given corpus. 5. Develop a programming logic using NLTK functions. 6. Build applications using various NLP techniques for a given corpus. 7. Implement a word Tokenizer, Sentence and Paragraph Tokenizers. 8. Implement a function that finds the 50 most frequently occurring words of a text that are not stop words. 8. Develop a program to find all the mis-spelled words in a paragraph. 10. Installation and exploring features of NLTK and spaCy tools. Download Word Cloud and few corpora											
				Tot	al Hours: (Lecture - 4	5; Practical - 15)	60			
Text Book	(s):				-		· · · /				
1. Danie Lang	el Jurafsky, uage Proce	James H. ssing, Com	Martin—S outational L	peech and inguistics a	Language nd Speech,	Processino Pearson P	g: An Introduction ublication, 2022.	to Natural			
2. Steve O_Re	en Bird, Ewa eilly Media, :	an Klein and 2009.	Edward Lo	oper, —Nati	ural Langua	ge Process	ing with Pythonll, F	irst Edition,			
Reference	(s):										

Passed in BoS Meeting held on 24/05/24 Approved in Academic Council Meeting held on 25/05/2024



1	Hobson lane, Cole Howard, Hannes Hapke, "Natural language processing in action" MANNING
1.	Publications, 2019.
2	Rajesh Arumugam, RajalingappaShanmugamani "Hands-on natural language processing with python: A
Ζ.	practical guide to applying deep learning architectures to your NLP application". PACKT publisher, 2018.
2	Alexander Clark, Chris Fox, Shalom Lappin, "The Handbook of Computational Linguistics and Natural
5.	Language Processing", Wiley-Blackwell, 2012
4	NitinIndurkhya, Fred J. Damerau "Handbook of Natural Language Processing", Second Edition, CRC
4.	Press, 2010.

Course Contents and Lecture Schedule

S. No.	Topics						
1	Introduction	L					
1.1	Origins and challenges of NLP – Language Modeling	1					
1.2	Grammar-based LM, Statistical LM -	1					
1.3	Regular Expressions	1					
1.4	Finite- State Automata	1					
1.5	English Morphology	1					
1.6	Transducers for lexicon and rules, Tokenization	1					
1.7	Detecting and Correcting Spelling Errors	1					
1.8	Text Normalization	1					
1.9	Minimum Edit distance	1					
2	Word Level Analysis						
2.1	Unsmoothed N-grams, Evaluating N-grams	1					
2.2	Smoothing, Smoothing, Interpolation and Backoff	1					
2.3	Word Classes, Part-of-Speech Tagging	1					
2.4	Named Entities and Named Entity Tagging	1					
2.5	HMM Part-of-Speech Tagging	1					
2.6	Rule-based, Stochastic	1					
2.7	Transformation-based tagging.	1					
2.8	Issues in PoS tagging	1					
2.9	Hidden Markov.Maximum Entropy models	1					
3	Syntactic Analysis	ŀ					
3.1	Context-Free Grammars	1					
3.2	Grammar rules for English, Treebanks,	1					
3.3	Normal Forms for grammar ,Dependency Grammar	1					
3.4	Syntactic Parsing, Ambiguity,	1					
3.5	Dynamic Programming parsing	1					
3.6	Shallow parsing – Probabilistic CFG, Probabilistic CYK	1					
3.7	Probabilistic Lexicalized CFGs	1					
3.8	Feature structures	1					
3.9	Unification of feature structures	1					
4	Semantics and Pragmatics						
4.1	Requirements for representation,	1					
4.2	First -Order Logic, Description Logics	1					



4.3	Syntax-Driven Semantic analysis, Semantic attachments	1
4.4	Word Senses, Relations between Senses	1
4.5	Thematic Roles, selectional restrictions	1
4.6	Word Sense Disambiguation	1
4.7	WSD using Supervised, Dictionary & Thesaurus	1
4.8	Bootstrapping methods	1
4.9	Word Similarity using Thesaurus, Distributional methods.	1
5	Discourse Analysis and Lexical Resources	
5.1	Discourse Coherence – Reference Phenomena,	1
5.2	Anaphora Resolution using Hobbs and Centering Algorithm	1
5.3	Coreference Resolution – Resources: Porter Stemmer	1
5.4	Lemmatizer, Penn Treebank, Brill's Tagger, WordNet, PropBank	1
5.5	FrameNet, Brown Corpus, British National Corpus (BNC)	1
5.6	Lexicons for Sentiment, Affect	1
5.7	Connotation- NLP Applications: Information extraction	1
5.8	Question Answering Systems	1
5.9	Chatbots & Dialogue Systems, Automatic Speech Recognition and Text-to- Speech	1
Practical		
1.	Implement a programs like Word Analysis	2
2.	Implement a programs like Word Generation	4
3.	Use the NLTK and spacy toolkit for NLP Programming.	4
4.	Develop a programs using various pre-processing techniques for a given corpus.	2
5.	Develop a programming logic using NLTK functions.	2
6.	Build applications using various NLP techniques for a given corpus.	4
7.	Implement a word Tokenizer, Sentence and Paragraph Tokenizers	3
8.	Implement a function that finds the 50 most frequently occurring words of a text that are not stop words	3
9.	Develop a program to find all the mis-spelled words in a paragraph	3
10.	Installation and exploring features of NLTK and spaCy tools. Download Word Cloud and few corpora	3

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60 CB E22	Conversational	Category	L	Т	Ρ	Credit
00 CB E32	Systems	PE	2	0	2	3

- To enable attendees to acquire knowledge on chatbots and their terminologies
- To understand the different techniques of natural language processing
- Work with ML Concepts and different algorithms to build a custom ML Model
- To involve AI in building conversational systems
- To know the various applications of conversational systems and its future developments

Pre-requisites

• Familiarity with foundational computer science concepts and a grasp of language structure and Logical Thinking. Proficiency in ML Algorithms

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Will be familiar with the basic technologies required for building a conversational system.	Understand
CO2	Will be familiar with the NLTK tool kit and the pre-processing techniques of natural language processing.	Remember
CO3	Build a Chabot for any application and deploy it.	Understand
CO4	Involve AI in building conversational systems and build advanced systems that can be cognitively inclined towards human behaviour.	Apply
CO5	Will be able to build a real-time working conversational system for social domain that can intelligently process inputs and generate relevant replies.	Apply

Mapping with Programme Outcomes

<u> </u>							POs							PSOs	\$
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	1	-	2	1	-	1	1	-	2	1	1	-	-
CO2	2	2	1	-	2	1	-	-	-	-	2	2	1	-	-
CO3	3	3	1	-	3	-	-	-	-	-	3	1	1	-	-
CO4	2	3	-	-	2	1	-	1	-	-	2	2	-	-	-
CO5	2	2	2	2	3	•	-	2	-	-	3	3	2	1	-

3 - Strong; 2 - Medium; 1 - Some

Bloom's	Contin	uous Ass (Ma	sessment rks)	Tests	Model (Mar	Exam ks)	End Sem Examination (Marks)	
Category	Tes	st 1	Test 2					
	Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab
Remember	-	-	-	-	-	-	-	-
Understand	40	-	20	-	40	-	40	-
Apply	10	50	40	50	60	50	60	50
Analyse	-	50	-	50	-	50	-	50
Evaluate	-	-	-	-	-	-	-	-
Create	-	-	-	-	-	-	-	-
Total	60	100	60	100	100	100	100	100



Syllabus										
K.S.Rangasamy College of Technology – Autonomous R2022										
B.Tech – Computer Science and Business Systems										
	-		60 CB E3	<u> 32 - Conver</u>	sational Sy	vstems				
Semester	ŀ	lours / Wee	K	Total	Credit		Maximum Marks			
Ochicater	L	Т	Р	Hours	С	CA	ES	Total		
VII	2	0	2	60	3	50	50	100		
Fundamentals of Conversational Systems *										
Overview, Explanation about different modes of engagement for a human being - Underlying										
technologies: Natural Language Processing, Artificial Intelligence and Machine Learning, Natural										
Language	Generation,	Speech-To-	Text, Text	-To-Speech	•					
Natural La	inguage Pro	ocessing *						101		
Introductio	n: Brief hist	ory, Basic C	oncepts, F	hases of N	LP, Applica	tion of chai	tbots. General chatbot	[6]		
architectur	e, Basic cor	cepts in cha		nts, Entities	, Otterances	, variables	and Slots, Fullilment.			
Building a			nal Al Sys	stems "		athat from	owark 9 Arabitaatura			
Fundamen	and Flow	versalional a	ysterns (r	NLU, DIVI al	MI and I		techniquee) Dielegue	[6]		
Managem	unal Fluw	anu uesiyn, ioc Natural		assincation	ui⊔ anu i n LIX desid		and SDKs Usage of	[0]		
Conversat	onal Design	Tools	Language	Generalic	in.ok desię	JII, AFIS 6	and SDNS, Usage of			
Role of M	/Al in Con	versational	Technolo	nies *						
Understan	ding how co	onversationa	l systems	Use MI te	chnologies	in ASR NI	P - Advanced Dialog			
managem	ent - Lang	uage Transl	ation - Er	notion/Sent	iment Anal	vsis - Info	prmation extraction to	[6]		
effectively	converse.	auge maner								
Conversa	ional Analy	vtics and the	Future o	f Conversa	tional Svst	em*				
Conversat	on Analytics	s: The need f	or it. Introc	luction to Co	onversationa	al Metrics -	Summary, Robots and	[0]		
Sensory A	pplications (overview - X	R Technol	ogies in Co	nversationa	I Systems,	XR-Commerce -What	[6]		
to expect r	 ext? – Futu	re technolog	ies and ma	arket innova	tions overvi	ew.				
Practical:										
1.Develop	a Python pr	ogram to ide	ntify morp	hological fea	atures of a v	vord by ana	alyzing it			
2.Write a l	ython prog	ram to gener	ate word fo	orms from ro	pot and suffi	x information	on.			
3. Implem	ent a Pythor	n program to	perform r	morphologic	al analysis	of a word	by the use of an Add-			
Delete t	able.									
4. Implem	ent an NLU	pipeline to ex	tract inten	its and entiti	es from use	er inputs.	alaulata tha analaab ilitu			
5. Create	a Python pro	ogram to calc	sulate the t	bigrams from	n a given co	rpus and c	alculate the probability			
or a ser	tence.							[30]		
6. Implem	ent intent cla	assification u	sing traditi	onai machir	ie learning t	ecnniques.				
7. Implem	ent a dialogi	ue managem	ent systen	n using reint	orcement le	earning.				
8. Write a	Python pro	gram to do s	entiment a	analysis for	the given c	lataset and	to classify sentences			
based o	n their cate	gories.		or o						
9. Implem	ent a Pythor	program to	find Parts	– Of - Spee	ch tags of w	ords in a s	entence.			
10.Calcula	te and visua	alize key con	versationa	l metrics.						
Tools use	d: Python,	Unity								
Test Dest	(-)				I otal Hou	rs: (Lectu	re - 30; Practical - 30)	60		
Text Book	(s):	"					A sector of Obsthete"	0		
	ael Niciear	, "Conversat	ional AI: D	nalogue Sys	stems, Conv	ersational	Agents, and Chatbots,	Second		
Edition, Moran and Claypool Publishers, 2020.										
2. Cathy Pearl, "Designing Voice User Interfaces: Principles of Conversational Experiences", O'RE								REILLY,		
Poforonac). .(c):									
	Eornanda (D Haro Zora	ida Callai	ac Satach	Nakamura	"Convorce	tional Dialogua System	e for the		
	· Decade" 1	st Edition 9	nua Calleja oringer 20	as, SaiUSII 121	ivanaiiiuid,	CONVEISE	uonai Dialogue System			
2 Srin	Janarthana	am "Chathot	s and Con	versational I		nent" 1st⊏	dition Packt Publishers	2017		
3 Anto	nio Maranh	an, Chalout	Engineeri	ng for Regi	nners · A C	omprehens	sive Guide to Ruilding I	Powerful		
J. And		ao, i iompi	Lingineen	ing for Degli		omprenens	Sive Guide to Dunully I	owenui		



	Conversational AI", Kindle Edition, 2023
4.	Erika Hall, "Conversation Design", A Book Apart publisher 2018

*SDG 4 – Quality Education

Course Contents and Lecture Schedule								
S. No.	Topics	No. of Hours						
1	Fundamentals of Conversational Systems							
1.1	Overview	1						
1.2	Explanation about different modes of engagement for a human being	1						
1.3	Underlying technologies: Natural Language Processing	1						
1.4	Artificial Intelligence and Machine Learning	1						
1.5	Natural Language Generation	1						
1.6	Speech-To-Text, Text-To-Speech	1						
2	Natural Language Processing							
2.1	Introduction: Brief history	1						
2.2	Basic Concepts, Phases of NLP	1						
2.3	Application of chatbots	1						
2.4	General chatbot architecture	1						
2.5	Basic concepts in chatbots: Intents, Entities, Utterances	1						
2.6	Variables and Slots, Fulfilment	1						
3	Building a Chatbot / Conversational Al Systems							
3.1	Fundamentals of Conversational Systems (NLU, DM and NLG)	1						
3.2	Chatbot framework & Architecture	1						
3.3	Conversational Flow and design	1						
3.4	Intent Classification (ML and DL-based techniques), Dialogue Management Strategies	1						
3.5	Natural Language Generation.UX design, APIs and SDKs	1						
3.6	Usage of Conversational Design Tools	1						
4	Role of ML/AI in Conversational Technologies							
4.1	Understanding how conversational systems Use ML technologies in ASR,	1						
4.2	NLP	1						
4.3	Advanced Dialog management	1						
4.4	Language Translation	1						
4.5	Emotion/Sentiment Analysis	1						
4.6	Information extraction to effectively converse	1						
5	Conversational Analytics and the Future of Conversational System							
5.1	Conversation Analytics: The need for it.	1						
5.2	Introduction to Conversational Metrics	1						
5.3	Summary, Robots and Sensory Applications overview	1						
5.4	XR Technologies in Conversational Systems	1						
5.5	XR-Commerce -What to expect next?	1						
5.6	Future technologies and market innovations overview	1						
Practical								



1.	Develop a Python program to identify morphological features of a word by analyzing it	3
2.	Write a Python program to generate word forms from root and suffix information.	3
3.	Implement a Python program to perform morphological analysis of a word by the use of an Add-Delete table.	3
4.	Implement an NLU pipeline to extract intents and entities from user inputs	3
5.	Create a Python program to calculate the bigrams from a given corpus and calculate the probability of a sentence	3
6.	Implement intent classification using traditional machine learning techniques	3
7.	Implement a dialogue management system using reinforcement learning	3
8.	Write a Python program to do sentiment analysis for the given dataset and to classify sentences based on their categories	3
9.	Implement a Python program to find Parts – Of - Speech tags of words in a sentence	3
10.	Calculate and visualize key conversational metrics.	3

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60 CB E33	Virtual and Augmented	Category	L	Т	Ρ	Credit
00 CB E33	Reality	PC	2	0	2	3

- To recognize the various components of Virtual Reality (VR) and Augmented Reality (AR)
- To interpret the interaction and immersive techniques in virtual environments
- To develop a simple VR enabled applications
- To develop AR enabled applications with interactivity
- To explore AR, VR and Mixed Reality based applications for different sectors

Pre-requisites

• Nil

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Recognize the various components of Virtual Reality (VR) and Augmented Reality (AR)	Remember
CO2	Interpret the interaction and immersive techniques in virtual environments	Understand
CO3	Implement a simple VR enabled applications with interactivity	Apply
CO4	Implement AR enabled applications with interactivity	Apply
CO5	Explore AR, VR and Mixed Reality based applications for different sectors	Analyse

Mapping with Programme Outcomes

COs		POs													PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
CO1	3	3	3	-	3	-	-	-	-	-	-	-	3	-	-		
CO2	3	3	3	-	3	-	-	-	-	-	-	-	3	-	-		
CO3	3	3	3	-	3	-	-	-	-	-	-	-	3	-	-		
CO4	3	3	3	-	3	-	-	-	-	-	-	-	3	-	-		
CO5	3	3	3	-	3	-	-	-	-	-	-	-	3	-	-		
3 - St	rona:	2 - Me	dium:	1 - So	me												

Bloom's	Contin	uous As: (Ma	sessment rks)	Tests	Model	Exam	End Sem Examination (Marks)		
Category	Tes	st 1	Tes	st 2	(เพเลเ	N 3)			
	Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab	
Remember	20	-	20	-	40	-	40	-	
Understand	40	-	40	-	60	-	60	-	
Apply	-	50	-	50	-	50	-	50	
Analyse	-	50	-	50	-	50	-	50	
Evaluate	-	-	-	-	-	-	-	-	
Create	-	-	-	-	-	-	-	-	
Total	60	100	60	100	100	100	100	100	



Syllabus										
	K.S.F	Rangasamy	/ College o	of Technolo	ogy – Autor	nomous R2	2022			
		B.Tech – C	Computer S	Science and	d Business	Systems				
		60 CB	E33 - Virtu	al and Aug	pmented Re	eality				
Semester	н	ours / Wee	ek 📃	Total	Credit	Ма	<u>iximum Ma</u>	rks		
Ochicater	L	Т	Р	Hours	С	CA	ES	Total		
VII	2	0	2	60	3	50	50	100		
Introductio	on									
Introduction	n to Virtual I	Reality (VR)	and Augm	ented Real	ity (AR) - Tr	ajectories a	and Hybrid			
Space - Three I's of Virtual Reality - Virtual Reality vs 3D Computer Graphics – AR and VR										
Technologi	es - Input D	evices: Typ	es of Track	ers, Naviga	tion and Ma	anipulation	Interfaces,	[0]		
Gesture Int	erfaces - O	utput Devic	es: Graphic	cs Display,	Human Vis	ual System	, Personal			
Graphics D	isplays, Lar	ge Volume	Displays, S	ound Displa	ays, Human	Auditory S	ystem			
Fundamen	tals of Virt	ual Enviror	nments							
Principles c	of 3D Graph	ics and Rer	ndering - Int	eraction Te	chniques in	Virtual Env	vironments	[6]		
- Immersive	Technolog	ies: Haptics	, Audio and	Visuals - D	esign Consi	derations fo	or Effective	[0]		
Virtual Expe	eriences									
VR Modeli	ng*									
Modeling -	Geometric	Modeling ·	· Virtual Ot	pject Shape	- Object \	/isual_Appe	arance -			
Kinematics	Modeling	- Transform	mation Mat	rices - Ob	ject Positio	on - Trans	formation	[6]		
Invariants -	Object Hie	erarchies -	Viewing the	a 3D World	- Physical	Modeling -	Collision	L-1		
Detection -	Surface De	formation -	Force Com	putation - F	orce Smoo	thing and N	Aapping -			
Benavior M	odeling - M	odel Manag	jement							
Augmente	d Reality^		•							
Introduction	to Augme	nted Reality	y - Comput	er Vision to	or AR - Inte	raction-Mo	deling and	[0]		
Annotation	Navigation	- vvearable	Devices - A	R Platforms	s and Develo	opment Env	/ironments	[6]		
- Marker-ba	ased and in	larker-less		echniques	- Integration	n of Real a	and virtual			
		e Design to		allons						
Application	ns Social M	ladia Cam	ving Educ	stion Hool	hooro Sha	nning and	Rusiness			
Smart Citle	S - Social IV	eula - Gan	footuring	Bobotice	Incare - Sho	pping and	business	[6]		
Entertainme	Application	ing Applicat	tions using			lity (MR)	1241011 -			
Practical:	ent - Linerg	ing Applica	lions using							
1 Study of t	ools like I Ir	nity Maya 3			/uforia and	Blender				
2 Demonstr	rate various	nroiection	types using	nrimitive of		Dichaci				
3 Apply lic	hting and s	hading effe	cts	printive of	5,0013					
4. Adding	audio and te	ext special e	effects							
5. Model th	ree dimens	sional object	ts using var	ious modeli	na techniau	es and app	lv textures			
over the	m	· · · · , · ·	J		5		,			
6. Create t	hree dimer	nsional reali	istic scenes	and devel	op simple v	/irtual realit	ty enabled	[30]		
mobile a	pplications	which have	limited inte	eractivity			2			
7. Develop	VR enable	d applicatio	ons using m	otion tracke	ers and sen	sors incorp	orating full			
haptic in	teractivity		-				-			
8. Develop	AR enable	d applicatio	ons with inte	eractivity like	e E-learning	g environme	ent, Virtual			
walkthro	oughs and V	isualization/	of historic	places						
9. Develop	AR enable	d applicatio	ns in health	icare						
10.Develop	simple MR	enabled ap	plication fo	r any real-ti	me problem	า				
				Total Hou	rs: (Lecture	e - 30; Pra	ctical - 30)	60		
Text Book	(s):									
1. Steve	en M LaVall	e, "Virtual R	Reality", Car	nbridge Uni	versity Pres	s, 2016.				
2. Olive	r Bimber a	nd Ramesh	n Raskar, "	Spatial Aug	gmented Re	eality: Merg	jing Real a	nd Virtual		
World	<u>is", A K Pet</u>	ers Ltd., 20	05.							
Reference	(s):									





1.	Alan B Craig, William R Sherman and Jeffrey D Will, "Developing Virtual Reality Applications: Foundations of Effective Design", Morgan Kaufmann, 2009.
2.	Doug A Bowman, Ernest Kuijff, Joseph J LaViola, Jr and Ivan Poupyrev, "3D User Interfaces, Theory and Practice", Addison Wesley, USA, 2005.
3.	Kaliraj P, Devi T, "Innovating with Augmented Reality: Applications in Education and Industry", First Edition, Auerbach Publications, 2021.
4.	Burdea, Grigore C and Philippe Coiffet, "Virtual Reality Technology", Wiley Inderscience, India, 2003.

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Course Contents and Lecture Schedule

S. No.	Topics	No. of Hours
1	Introduction	
1.1	Introduction to Virtual Reality (VR) and Augmented Reality (AR)	1
1.2	Trajectories and Hybrid Space	1
1.3	Three I's of Virtual Reality & Virtual Reality vs 3D Computer Graphics	1
1.4	AR and VR Technologies	1
1.5	Input Devices	1
1.6	Output Devices	1
2	Fundamentals of Virtual Environments	
2.1	Principles of 3D Graphics and Rendering	1
2.2	Interaction Techniques in Virtual Environments	1
2.3	Immersive Technologies	1
2.4	Haptics	1
2.5	Audio and Visuals	1
2.6	Design Considerations for Effective Virtual Experiences	1
3	VR Modeling	
3.1	Modeling	1
3.2	Geometric Modeling	1
3.3	Kinematics Modeling	1
3.4	Physical Modeling	1
3.5	Behavior Modeling	1
3.6	Model Management	1
4	Augmented Reality	
4.1	Introduction to Augmented Reality	1
4.2	Computer Vision for AR, Interaction	1
4.3	Modeling and Annotation Navigation, Wearable Devices	1
4.4	AR Platforms and Development Environments	1
4.5	Marker-based and Marker-less Tracking Techniques	1
4.6	User Interface Design for AR Applications, Integration of Real and Virtual Objects	1
5	Applications	
5.1	Smart Cities, Social Media, Gaming	1
5.2	Education, Healthcare, Shopping and Business	1

5.3	Military Applications	1
5.4	Manufacturing, Robotics	1
5.5	Information Visualization, Entertainment	1
5.6	Emerging Applications using AR, VR and Mixed Reality (MR)	1
Practical		
1.	Study of tools like Unity, Maya, 3DS MAX, AR Toolkit, Vuforia and Blender	2
2.	Demonstrate various projection types using primitive objects	2
3.	Apply lighting and shading effects	2
4.	Adding audio and text special effects	2
5.	Model three dimensional objects using various modeling techniques and apply textures over them	2
6.	Create three dimensional realistic scenes and develop simple virtual reality enabled mobile applications which have limited interactivity	4
7.	Develop VR enabled applications using motion trackers and sensors incorporating full haptic interactivity	4
8.	Develop AR enabled applications with interactivity like E-learning environment, Virtual walkthroughs and Visualization of historic places	4
9.	Develop AR enabled applications in healthcare	4
10.	Develop simple MR enabled application for any real-time problem	4

1. Dr. M. Tamilarasi - tamilarasi@ksrct.ac.in



60 CB E34	Cybor Socurity	Category	L	Т	Ρ	Credit
00 CB E34	Cyber Security	PE	2	0	2	3

- To learn cybercrime and cyber law
- To understand the cyber-attacks and tools for mitigating them
- To understand information gathering
- To learn how to detect a cyber-attack
- To learn how to prevent a cyber-attack

Pre-requisites

• Basic Knowledge of Cryptography and Network Security

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Explain the basics of cyber security, cybercrime and cyber law.	Understand
CO2	Classify various types of attacks and learn the tools to launch the attacks.	Remember
CO3	Apply various tools to perform information gathering.	Apply
CO4	Apply intrusion techniques to detect intrusion.	Apply
CO5	Apply intrusion prevention techniques to prevent intrusion.	Apply

Mapping with Programme Outcomes

			- 3													
COs	POs													PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	1	1	1	1		1					1		2	2	1	
CO2	1	3	1	3	2	1							2	2	1	
CO3	2	1	1	1		1					1		2	2	2	
CO4	3	3	2	2	2	1							2	2	3	
CO5	3	2	1	1	1	1		1			1		2	2	3	
3 - St	rona:	2 - Me	edium:	1 - So	me											

Bloom's	Contin	uous As: (Ma	sessment rks)	Tests	Model (Mar	Exam ks)	End Sem Examination (Marks)	
Category	Test 1		Test 2					
	Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab
Remember	20	-	20	50	40	-	40	-
Understand	40	50	40	-	60	50	60	50
Apply	-	50	-	50	-	50	-	50
Analyse	-	-	-	-	-	-	-	-
Evaluate	-	-	-	-	-	-	-	-
Create	-	-	-	-	-	-	-	-
Total	60	100	60	100	100	100	100	100



Syllabus									
K.S.Rangasamy College of Technology – Autonomous R2022									
B.Tech – Computer Science and Business Systems									
60 CB E34 – Cyber Security									
Somo	stor	ŀ	lours/Weel	K	Total	Credit	Ma	aximum Ma	rks
Seme	5101	L	Т	Р	Hours	C	CA	ES	Total
VII		2	0	2	60	3	50	50	100
Introd	uctio	n							
Cyber	Secu	rity – Histo	ry of Intern	et – Impac	t of Internet	 – CIA Triad 	d – Reason	for Cyber	[6]
Crime	– Nee	ed for Cybe	r Security –	History of C	Cyber Crime	e – Cybercrir	minals – Cla	assification	[0]
of Cyb	ercrir	nes							
Attack	(SAN	d Counteri	measures*	\ /					
DSVVA	λΡ – Ι\ - Τ	alicious At	tack Infeat	s and vuine	erabilities – 3	Scope of Cy	Der Attacks	S - Security	[6]
Social		ypes or Ma	nicious Alla		cious Soitw		HOH ALLACK	vectors -	
Recon	nais	sance	ICK						
Harves	stor _	Whois _	Netcraft _	Host - Ex	tracting Info	rmation fro	m DNS -	Extracting	
Inform	ation	from F-ma	il Servers –	Social En	nineering Ri	econnaissar	nce – Scan	ning. Port	[6]
Scann	ina. N	letwork Sca	annina. Vulr	erability Se	canning	soonnalooal	loo ooun	ning. i ort	
Intrus	ion D	etection*							
Host B	ased	Intrusion D	etection – N	etwork Bas	ed Intrusior	Detection -	- Distribute	d or Hybrid	[6]
Intrusio	on De	etection – Ir	ntrusion Det	ection Excl	nange Form	at – Honey	oots	•	
Intrus	ion P	revention*							
Firewa	alls ar	nd Intrusion	Prevention	Systems:	Need for F	irewalls, Fir	ewall Chara	acteristics,	[6]
Acces	s Poli	cy – Types	of Firewalls	– Firewall E	Basing – Fire	ewall Location	on and Con	figurations	
Practi	cal:								
1. Ide	entify	the Potentia	al Risks Inv	olved in Ex	perimenting	with Hacki	ng Tools. T	o address	
this	s, you	I've Decide	ed to set up	a virtual	environmen	it using Virt	ualBox to	install and	
EX	plore	Kali Linux.		ala a baab					
Z. EX	piore	Kali Linux	and levera	ging bash	scripting to	automate	certain cyt	bersecurity	
a Bord	form	Joon-Sour	co Intelligon	co Gathori	na Lleina N	atoraft Who	ie Lookupe	DNS	
Becc	nnai	seance Ha	rvester and	Maltego			is Lookups	, DNS	
4 Unc	lersta	nd the se	curity post	ure to uti	lize Nmap	to condu	ct a com	orehensive	
Ass	essm	ent of syste	ems and ide	ntify poten	tial vulnerat	pilities.			
5. Set	up M	etasploitab	le 2. a delib	erately vul	nerable virt	ual machine	e. on Virtua	lBox. Your	
goa	l is to	simulate	real-world a	attack scer	narios and i	dentify unp	atched vul	nerabilities	[20]
with	nin the	e system.							[30]
6. Ider	ntify a	in unpatche	ed vulnerab	ility in a cr	itical syster	n. use Meta	asploit, a w	videly-used	
pen	etrati	on testing f	ramework, t	o launch a	n attack aga	ainst the vul	nerable sys	stem.	
7. Dep	oloy a	Linux serv	er on Virtu	alBox and	configure S	SH (Secure	e Shell) for	encrypted	
Ren	note a	ACCESS.							
8. Imp	leme	nt Fail2Bar	n, a popula	ar intrusion	n preventio	n tool, to	monitor lo	g files for	
Suspicious activity and automatically block IP addresses exhibiting malicious Behaviour.									
9. 056	; nyui ./or	a, a power	iui passwor	u-cracking	loor, to lauri	ch brute-ion	CE allacks a	against the	
551751.									
Potential security threats as they occur.									
Tools used: VirtualBox 6.1 and Linux Operating System									
Total Hours: (Lecture - 30; Practical - 30)							60		
Text B	Book(s):				•	·		
1.	Anan	dShinde, "Ir	ntroduction	to Cyber Se	ecurity Guid	e to the Wo	orld of Cybe	r Security",	Notion
	Press	, 2021.					<u> </u>	-	
2.	Nina	Jodbole, S	unitBelapur	e, "Cyber S	Security: Un	derstanding	Cyber Crin	nes, Compu	ter
	roren	sics and Le	egai Perspe	cuves", Wil	ey Publishe	rs, 2011.			



Reference(s): 1. David Kim, Michael G. Solomon, "Fundamentals of Information Systems Security", Jones & Bartlett Learning Publishers, 2013. 2. Patrick Engebretson, "The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made easy", Elsevier, 2011. 3. Kimberly Graves, "CEH Official Certified Ethical hacker Review Guide", Wiley Publishers, 2007. 4. William Stallings, Lawrie Brown, "Computer Security Principles and Practice", Third Edition,

4. Pearson Education, 2015.

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S. No.	Topics	No. of Hours
1	Introduction	
1.1	Cyber Security – History of Internet – Impact of Internet	2
1.2	CIA Triad; Reason for Cyber Crime	1
1.3	Need for Cyber Security	1
1.4	History of Cyber Crime; Cybercriminals	1
1.5	Classification of Cybercrimes	1
2	Attacks And Countermeasures	
2.1	OSWAP; Malicious Attack Threats and Vulnerabilities	1
2.2	Scope of Cyber-Attacks	1
2.3	Security Breach – Types of Malicious Attacks	2
2.4	Malicious Software – Common Attack Vectors	1
2.5	Social engineering Attack	1
3	Reconnaissance	
3.1	Harvester – Whois – Netcraft – Host – Extracting Information from DNS	1
3.2	Extracting Information from E-mail Servers –	2
3.3	Social Engineering Reconnaissance.	1
3.4	Scanning – Port Scanning	1
3.5	Network Scanning and Vulnerability Scanning	1
4	Intrusion Detection	
4.1	Host Based Intrusion Detection	1
4.2	Network -Based Intrusion Detection	2
4.3	Distributed or Hybrid Intrusion Detection	1
4.4	Intrusion Detection Exchange Format	1
4.5	Honeypots	1
5	Intrusion Prevention	
5.1	Firewalls and Intrusion Prevention Systems: Need for Firewalls	1
5.2	Firewall Characteristics and Access Policy	2
5.3	Types of Firewalls	1
5.4	Firewall Basing	1
5.5	Firewall Location and Configurations	1
Practical		
1.	Identify the potential risks involved in experimenting with hacking tools. To	2

	address this, you've decided to set up a virtual environment using VirtualBox	
2.	Explore Kali Linux and leveraging bash scripting to automate certain cyber Security Tasks.	4
3.	Perform Open Source Intelligence Gathering Using Netcraft, Whois Lookups, DNSReconnaissance, Harvester and Maltego.	4
4.	Identify the security posture to utilize Nmap, to conduct a comprehensive assessment of systems and identify potential vulnerabilities.	2
5.	Set up Metasploitable 2, a deliberately vulnerable virtual machine, on VirtualBox. Your goal is to simulate real-world attack scenarios and identify unpatched vulnerabilities within the system.	2
6.	Identify an unpatched vulnerability in a critical system. Use Metasploit, a widely-used penetration testing framework, to launch an attack against the vulnerable system.	4
7.	Identify a Linux server on VirtualBox and configure SSH (Secure Shell) for encrypted remote access.	4
8.	Implement Fail2Ban, a popular intrusion prevention tool, to monitor log files for suspicious activity and automatically block IP addresses exhibiting malicious behaviour.	2
9.	Use Hydra, a powerful password-cracking tool, to launch brute-force attacks against the server.	4
10.	Perform real-time network traffic analysis and packet logging. to detect and Respond to potential security threats as they occur.	2

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	Cryptocurrency and	Category	L	Т	Ρ	Credit
00 CB E35	Blockchain Technologies	PE	2	0	2	3

- To understand the basics of Blockchain
- To learn Different protocols and consensus algorithms in Blockchain
- To learn the Blockchain Implementation Framework
- To understand the Blockchain Applications
- To experiment the Hyperledger Fabric, Ethereum networks

Pre-requisites

• Basic knowledge of Machine Learning

Course Outcomes

On the su	On the successful completion of the course, students will be able to						
CO1	Understand emerging abstract models for Blockchain Technology	Understand					
CO2	Identify major research challenges and technical gaps existing between theory and practice in the crypto currency domain.	Remember					
CO3	Apply the function of Blockchain as a method of securing distributed ledgers, how consensus on their contents is achieved, and the new applications that they enable.	Apply					
CO4	Apply key factors influencing the adoption and implementation of blockchain solutions.	Apply					
CO5	Execute transactions, query data, and monitor network activity using appropriate tools and interfaces.	Apply					

Mapp	Mapping with Programme Outcomes														
<u> </u>	POs											PSOs			
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	2	2	1	-	-	-	1	-	-	2	3	1	3
CO2	3	3	3	3	1	-	-	-	2	-	-	2	1	2	3
CO3	3	3	3	3	2	-	-	-	3	-	-	2	2	3	3
CO4	3	2	3	2	3	-	-	-	3	-	-	2	2	2	3
CO5	3	3	3	2	2	-	-	-	2	-	-	2	1	2	3
2 04		0 140		1 0.0											

3 - Strong; 2 - Medium; 1 - Some

Assessment Pattern										
Bloom's	Contin	uous Ass (Ma	sessment ˈ rks)	Tests	Model I	Exam	End Sem Examination			
Category	Tes	st 1	Test 2		(พลา	N3)	(IVIALKS)			
	Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab		
Remember	20	50	20	50	34	50	34	50		
Understand	-	-	-	-	-	-	-	-		
Apply	40	50	40	50	66	50	66	50		
Analyse	-	-	-	-	-		-			
Evaluate	-	-	-	-	-	-	-	-		
Create	-	-	-	-	-	-	-	-		
Total	60	100	60	100	100	100	100	100		



Syllabus									
K.S.Rangasamy College of Technology – Autonomous R2022									
B.Tech – Computer Science and Business Systems									
60 CB E35 - Cryptocurrency and Blockchain Technologies									
Semester		Hours/Weel	k –	Total	Credit	Ma	iximum Ma	rks	
	L	T	P	Hours	C	CA	ES	Total	
VII	2	0	2	60	3	50	50	100	
Introducti	on To Bloc	kchain		Dublic Lod			al ala ala		
BIOCKChair	: PUDIIC LE	eagers, Bloc	kchain as	Public Lea	gers - Bloo	CK IN A BIO	ockchain –	[6]	
Cryptogra	his - The Ci		e Longest (Shain - Pen			OCKCHAIN -		
Bitcoin ar	d Cryptoci	irrency							
Basic crvc	to currency:	Creation o	f Coins. Pa	avments and	d Double S	pendina. F(ORTH: the	101	
Precursor	for Bitcoin	scripting - E	Bitcoin Scri	pts - Bitcoi	n P2P Net	work - Trar	saction in	[6]	
Bitcoin Ne	work			•				L	
Bitcoin Co	onsensus								
Bitcoin Co	nsensus - P	roof of Wor	k (PoW): H	ashcashPo	W, BitcoinP	oW, Attack	s on PoW,	[6]	
Monopoly	problem - P	roof of Stake	e - Proof of	Burn - Proc	of of Elapse	d Time - Bit	coin Miner		
Hyperled	jer Fabric 8	Ethereum	: ::	hain aada			a a truca al c	[0]	
EVM Sm	e of Hyperie	Trufflo Do	nc v1.1 - C	nain code -		- Ethereum	network –	[0]	
Blockcha	n Annlicati		SIGH and IS	sue- DApps	- INF I.				
Blockchair	Application	ns in Supply	Chain Man	agement -	Logistics -	Smart Cities	s - Internet		
of Things-I	Medical Rec	ord Manage	ment Syste	m-Blockcha	ain in Gover	nment and I	Blockchain	[6]	
Security.		5	,						
Practical:									
1. Insta	ll and unde	rstand Dock	ker contain	er, Node.js,	Java and	Hyperledge	er Fabric,		
Ethe	eumand pe	erform nece	essary soft	ware instal	lation on lo	ocal machi	ne/create	1	
insta	nce on cloue	d torun.							
2. Crea	te and deplo	y a blockch	ain network	using Hype	erledger Fab	oric SDK for	Java Set		
up a	nd initialize t	the channel,	install and	instantiate	chain code	and perfor	m invoke	1	
and	query on you	ur blockchai	n network.					1	
3. Inter	act with a b	lockchain n	etwork. Ex	ecute trans	actions and	l requests a	against a		
block	chain netwo	ork by creati	ng an app t	to test the n	etwork and	its rules.			
4. Depl	oy an asset	transfer ap	p using blo	ockchain. L	earn app d	evelopment	t within a	1	
Нуре	rledger Fab	ric network.							
5. Use	olockchain te	o track fitnes	ss club rewa	ards. Build a	web app th	at uses Hy	perledger		
Fabr	с								
To tr	ack and trac	e member r	ewards.					[30]	
6. Car	auction netv	vork: A Hell	o World ex	ample with	Hyperledge	er Fabric N	ode SDK		
and	BM Blockch	ain Starter F	lan. Use H	vperledaer F	abric to inv	oke chain c	ode while		
storii	na results ar	nd data in th	e starter pla	an.				1	
7. Deve	op DeFi pro	tocols. dece	entralized e	xchanges (I	DEX), autor	nated mark	et		
Make	Makers (AMM) or other DeFi primitives								
 Explore blockchain platforms with native NFT support, such as Ethereum or 							1		
Spec	ialized NFT	Platforms li	ke Flow or	Tezos	,		•	1	
9 Build applications for creating managing and verifying digital identities using									
Block chain- based attestations and verifiable credentials									
10 Dove	lon annlicat	ions for tree	king and tr	acina nrodu	rts along th	e sunnly ch	ain		
	nop applicat	technology	, ,	aong prouu		o suppry of			
	Is Head De		Le jovo l	D_etudia A	nacondo				
100	13 USEU. DC	JUNEI, NUUE	; Jo, java, I	າ-ອເ ມ ຟປ, A	naconua				

	Total Hours: (Lecture - 30; Practical - 30)	60						
Text	Book(s):							
1.	1. Bashir and Imran, "Mastering Blockchain: Deeper insights into Decentralization, Cryptography, Bitcoin, and popular Blockchain Frameworks", 2017.							
2.	Andreas Antonopoulos, "Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O'Reilly, 2014.							
Refe	rence(s):							
1.	Daniel Drescher, "Blockchain Basics", First Edition, Apress, 2017.							
2.	Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Goldfeder.Bitcoin and cryptocurrency technologies: a comprehensive introduction. UniversityPress, 2016.	d Steven Princeton						
3.	Melanie Swan, "Blockchain: Blueprint for a New Economy", O'Reilly, 2015.							
4.	RiteshModi, "Solidity Programming Essentials: A Beginner's Guide to Build Smart Co forEthereum and Blockchain", Packt Publishing.	ntracts						

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Course Contents and Lecture Schedule							
S. No.	Topics	No. of Hours					
1	Introduction To Blockchain	•					
1.1	Blockchain	1					
1.2	Public Ledgers, Blockchain as Public Ledgers	1					
1.3	Block in a Blockchain, Transactions	1					
1.4	The Chain and the Longest Chain	1					
1.5	Permissioned Model of Blockchain, Cryptographic	2					
2	Bitcoin and Cryptocurrency						
2.1	Basic crypto currency, Creation of coins	1					
2.2	Payments and double spending	1					
2.3	FORTH – the precursor for Bitcoin scripting	1					
2.4	Bitcoin Scripts	1					
2.5	Bitcoin P2P Network	1					
2.6	Transaction in Bitcoin Network	1					
3	Bitcoin Consensus						
3.1	Bitcoin Consensus, Proof of Work (PoW)	1					
3.2	HashcashPoW	1					
3.3	BitcoinPoW	1					
3.4	Attacks on PoW	1					
3.5	monopoly problem- Proof of Stake- Proof of Burn	1					
3.6	Proof of Elapsed Time- Bitcoin Miner	1					
4.0	Hyperledger Fabric &Ethereum						
4.1	Architecture of Hyper ledger	1					
4.2	fabric v1.1	1					
4.3	chain code	1					
4.4	Ethereum	1					
4.5	Ethereum network	1					



4.6	EVM	1
5.0	Blockchain Applications	
5.1	Smart contracts	1
5.2	Truffle Design and issue	1
5.3	DApps	1
5.4	NFT. Blockchain Applications in Supply Chain Management	1
5.5	Logistics	1
5.6	Smart Cities	1
Practical		•
1.	Install and understand Docker container, Node.js, Java and Hyperledger Fabric, Ethereumand perform necessary software installation on local machine/create instance on cloud torun.	2
2.	Create and deploy a blockchain network using Hyperledger Fabric SDK for Java Set up and initialize the channel, install and instantiate chain code, and perform invoke and query on your blockchain network.	4
3.	Interact with a blockchain network. Execute transactions and requests against a blockchain network by creating an app to test the network and its rules.	4
4.	Deploy an asset-transfer app using blockchain. Learn app development within a Hyperledger Fabric network.	2
5.	Use blockchain to track fitness club rewards. Build a web app that uses Hyperledger Fabric.	2
6.	Car auction network: A Hello World example with Hyperledger Fabric Node SDK and IBM Blockchain Starter Plan. Use Hyperledger Fabric to invoke chain code while storing results and data in the starter plan.	4
7.	Develop DeFi protocols, decentralized exchanges (DEX), automated market Makers (AMM), or other DeFi primitives	4
8.	Explore blockchain platforms with native NFT support, such as Ethereum or Specialized NFT Platforms like Flow or Tezos	2
9.	Build applications for creating, managing, and verifying digital identities using Block chain- based attestations and verifiable credentials.	4
10.	Develop applications for tracking and tracing products along the supply chain Using blockchain technology.	2

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60 CB E26	Cognitivo Sojonoo	Category	L	Т	Ρ	Credit 3
00 CB E30	Cognitive Science	PE	2	0	2	3

- To know the theoretical background of cognition
- To understand the link between cognition and computational intelligence
- To explore probabilistic programming language
- To study the computational inference models of cognition
- To study the computational learning models of cognition

Pre-requisites

• Mathematics, Fundamentals of Programming Course

Course Outcomes

On the su	On the successful completion of the course, students will be able to						
CO1	Understand the underlying theory behind cognition.	Understand					
CO2	Connect to the cognition elements computationally.	Understand					
CO3	Implement mathematical functions through WebPPL.	Analyse					
CO4	Develop applications using cognitive inference model.	Apply					
CO5	Develop applications using cognitive learning model.	Apply					

Mapping with Programme Outcomes

<u> </u>		POs											PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	1	-	3	-	-	-	-	1	1	1	2	-
CO2	3	3	3	1	-	3	-	-	-	-	2	2	1	2	-
CO3	3	3	3	1	-	3	-	-	-	-	2	2	1	1	-
CO4	3	3	3	1	-	3	-	-	-	-	2	1	1	1	-
CO5	3	3	3	1	-	3	-	-	-	-	1	2	1	1	-

3 - Strong; 2 - Medium; 1 - Some

Bloom's	Contin	uous As: (Ma	sessment rks)	Tests	Model E	Exam	End Sem Examination (Marks)		
Category	Tes	st 1	Tes	st 2		(3)	(iviai KS)		
	Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab	
Remember	-	-	-	-	-	-	-	-	
Understand	40	-	-	-	40	-	40	-	
Apply	-	50	40	50	60	50	60	50	
Analyse	10	50	20	50	-	50	-	50	
Evaluate	-	-	-	-	-	-	-	-	
Create	-	-	-	-	-	-	-	-	
Total	60	100	60	100	100	100	100	100	



Syllabus								
K.S.Rangasamy College of Technology – Autonomous R2022								
B.Tech – Computer Science and Business Systems								
60 CB E36 – Cognitive Science								
Semester	Н	ours / We	ek	Total	Credit	Ma	aximum Ma	rks
Cemester	L	Т	P	Hours	С	CA	ES	Total
VII	2	0	2	60	3	50	50	100
Philosoph	y, Psycholo	ogy and No	euroscience	e*				
Philosophy	: Mental, Ph	nysical Rela	ation – Psyc	hology: Plac	ce of Psych	ology withir	Cognitive	[6]
Science, Science of Information Processing –Cognitive Neuroscience: Perception,								[-]
Decision, L	earning and	Memory.						
Computat		gence		A				
Nachines a	and Cognitic	on – Artificia	al Intelligend	ce – Archite	ctures of C	ognition – r		[6]
Based Sys	stems – Log	gical Repre	esentation a	and Reason	ling – Logi	cal Decisio	n Making,	
Learning.	tia Bragram	minalon	auoao*					
		Iming Lan	guage guage		Anninulating	norobobility	twoor and	
	anguage, Sy s Einding	Inforence	Corouting	Libraries, N	hanipulating	piùo contir	types and	[6]
Enumeration	s, Finuling	Interence		es. Function	is that let	eive contii	iualions –	
Inference	Models of (Constion*						
Generative	Models	Conditionir	leaue Don	and statio	stical dene	ndence (Conditional	[6]
dependenc	e Data Ana	alvsis Alao	rithms for In	ference			onational	[0]
Learning	Adels of C	ognition*						
Learning a	s Condition	al Inferenc	e. Learning	ı with a Lar	nanage of .	Thought, H	lierarchical	[6]
Models, an	d Learning ((Deep) Cor	tinuous Fur	nctions. Mixt	ture Models	i.	loraronical	[0]
Practical:	a _cag ((2000) 00.				-		
1.Impleme	ntation of rea	asoning alo	orithms and	d frame it w	ithin a real-	world conte	ext	
2.Investiga	ting the neu	ural correla	, tes of mora	l decision-m	naking usin	g functiona	I magnetic	
resonanc	e imaging (f	fMRI).			5	0	0	
3. Develop	ing a knowle	edge-based	d system for	medical dia	agnosis usir	ng logical re	easoning.	
4. Demons	trate the us	e of mathe	ematical fun	ctions in W	ebPPL and	I frame eac	ch function	
within a	real-world c	ontext						
5. Compar	ing reaction	times betw	ween visual	and audito	ry stimuli to	o understar	nd sensory	
process	ng differenc	es.			-		-	
6. Training	and evalu	lating a ne	eural netwo	ork model t	for classific	cation task	s using a	[30]
benchm	ark dataset.	•					0	
7. Impleme	entation of a	a generativ	e model to	simulate ne	ural activity	y patterns a	associated	
with a sp	pecific cogni	tive task, s	uch as merr	nory recall				
8. Develop	ing an Appli	cation syst	em using ge	enerative mo	odel and fra	me this in t	he context	
of gener	ating persor	nalized wor	kout plans b	based on us	er preferen	ces and fitn	ess goals	
9. Develop	ing an Appli	cation usin	g conditiona	al inference	learning mo	odel	-	
10. Applica	tion develop	ment using	Mixture mo	odel.	0			
Tools use	d: NLTK (Na	atural Lang	, uage Toolki	t).				
Total Hours: (Lecture - 30: Practical - 30) 60								
Text Book	(s):						,	
↓ Vijay	V Raghava	an,Venkat	N.Gudivada	a, VenuGov	indaraju, C	.R. Rao, "	Cognitive C	omputing:
1. Theory and Applications": (Handbook of Statistics 35). Elsevier publications. 2016.								
Judith Hurwitz, Marcia Kaufman, Adrian Bowles, "Cognitive Computing and Big Data Analytics",								
² Wiley Publications, 2015.								
Reference	Reference(s):							
1 Robe	Robert A. Wilson, Frank C. Keil, "The MIT Encyclopedia of the Cognitive Sciences". The MIT							",The MIT
^{1.} Pres	s, 199 <mark>9</mark> .				-	~		
Jose	Luis Bermú	idez, Cogni	tive Science	e -An Introdu	uction to the	Science of	f the Mind, C	Cambridge
2. University Press 2020								



- 3. Noah D. Goodman, Andreas Stuhlmuller, "The Design and Implementation of Probabilistic Programming Languages", Electronic version of book, https://dippl.org/.
- 4. Noah D. Goodman, Joshua B. Tenenbaum, The ProbMods Contributors, "Probabilistic Models of Cognition", Second Edition, 2016, https://probmods.org/

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Course Contents and Lecture Schedule							
S. No.	Topics	No. of Hours					
1	Philosophy, Psychology and Neuroscience						
1.1	Philosophy: Mental, Physical Relation	1					
1.2	Psychology: Place of Psychology within Cognitive Science	1					
1.3	Science of Information Processing 1						
1.4	Cognitive Neuroscience	1					
1.5	Perception, Decision	1					
1.6	Learning and Memory	1					
2	Computational Intelligence						
2.1	Machines and Cognition	1					
2.2	Artificial Intelligence	1					
2.3	Architectures of Cognition	1					
2.4	Knowledge Based Systems	1					
2.5	Logical Representation and Reasoning	1					
2.6	Logical Decision Making , Learning						
3	Probabilistic Programming Language						
3.1	WebPPL Language	1					
3.2	Syntax, Using Javascript Libraries	1					
3.3	Manipulating probability types and distributions	1					
3.4	Finding Inference	1					
3.5	Coroutines: Functions that receive continuations	1					
3.6	Enumeration	1					
4	Inference Models of Cognition	L					
4.1	Generative Models	1					
4.2	Conditioning	1					
4.3	Causal and statistical dependence	1					
4.4	Conditional dependence	1					
4.5	Data Analysis	1					
4.6	Algorithms for Inference	1					
5	Learning Models of Cognition						
5.1	Learning as Conditional Inference	1					
5.2	Learning with a Language of Thought	1					
5.3	Hierarchical Models	1					
5.4	Learning (Deep) Continuous Functions	1					
5.5	Mixture Models	2					



Practical	:	
1.	Implementation of reasoning algorithms and frame it within a real-world context	2
2.	Investigating the neural correlates of moral decision-making using functional magnetic resonance imaging (fMRI)	4
3.	Developing a knowledge-based system for medical diagnosis using logical reasoning	4
4.	Demonstrate the use of mathematical functions in WebPPL and frame each function within a real-world context	2
5.	Comparing reaction times between visual and auditory stimuli to understand sensory processing differences	2
6.	Training and evaluating a neural network model for classification tasks using a benchmark dataset	4
7.	Implementation of a generative model to simulate neural activity patterns associated with a specific cognitive task, such as memory recall	2
8.	Developing an Application system using generative model and frame this in the context of generating personalized workout plans based on user preferences and fitness goals	4
9.	Developing an Application using conditional inference learning model	4
10.	Application development using Mixture model	2

1. Mrs. R. Logapriya - logapriyar@ksrct.ac.in



ELECTIVE IV

	Bobayioral Economics	Category	L	Т	Ρ	Credit
00 CB E41	Benavioral Economics	PC	3	0	0	3

Objectives

- Imparting knowledge on concepts regarding decision making in behavioral Economics perspective
- Incorporating psychological assumptions into economic models and interpret the implications of these assumptions
- Exposing the various choice available under uncertain economic situations
- Divulging the beliefs and heuristics in trading behavior
- Analyzing the social preferences under various anomalies

Pre-requisites

• Nil

Course Outcomes

On the suc	On the successful completion of the course, students will be able to					
CO1	Understand basic theories of behavioural economics	Understand				
CO2	Demonstrate about choice anamolies and its implications	Apply				
CO3	Analyse the choices under uncertainty	Analyse				
CO4	Analyse the beliefes and heurstics in trading behavior	Analyse				
CO5	Analyse the social preferences and anamolies	Analyse				

Mapping with Programme Outcomes

CO2	POs											PSOs			
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	-	-	-	-	-	-	-	-	3	-	3	-	-	3	-
CO2	-	-	-	-	-	-	-	-	3	-	3	-	-	-	-
CO3	-	-	-	-	-	-	-	-	3	-	3	-	-	-	-
CO4	-	-	-	-	-	-	-	-	3	-	3	-	-	-	-
CO5	-	-	-	-	-	-	-	-	3	-	3	-	-	3	-
3 - St	3 - Strong: 2 - Medium: 1 - Some														

3 - Strong; 2 - Medium; 1 - Some

Assessment Pattern										
Bloom's	Continuous A (N	ssessment Tests Iarks)	End Sem Examination (Marks)							
Calegory	1	2								
Remember	10	10	10							
Understand	30	20	30							
Apply	20	20	30							
Analyse	-	10	30							
Evaluate	-	-	-							
Create	-	-	-							
Total	60	60	100							
Syllabus										
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K.S.Rangasamy College of Technology – Autonomous R2022										
			60	CB E41- I	Behavioral	Economics	5			
Sem	ester		lours/Weel	(Total	Credit	Ма	ximum Ma	rks	
Cent	00101	L	Т	Р	Hours	С	CA	ES	Total	
V	'II	3	0	0	45	3	40	60	100	
Intro	ductio	n *								
The	neocla	assical/stan	dard mode	and bel	navioral ec	onomics ir	o contrast;	historical	[0]	
back	ground	; benaviora		s and other	SOCIAI SCIE	nces; theor	y and evide	ence in the	[9]	
social sciences and in benavioral economics; applications – gains and losses, money										
Baci	on, cha									
Povie		he neocla	ssical mod	ol: utility i	n economi	ce and ne	vehology:	models of		
ration	ality.	connection	s with evo	lutionary h	iology and	cognitive	neuroscien		[Q]	
analy	ianty, /sis – c	onsumption	and addicti	on environ	mental prot	ection retai	I therapy: a	onlications	[0]	
– pric	cina. va	aluation, pu	blic goods.	choice ano	malies	001011, 10101	r thorapy, a	philoadono		
Choi	ce Un	der Uncert	aintv *							
Back	ground	and expec	ted utility th	eory: prosp	ect theory a	and other th	eories: loss	s aversion;	[0]	
marg	inal ut	ility; decisio	on and prob	ability wei	ghting; appl	lications -	ownership	and trade,	[9]	
incon	income and consumption.									
Belie	Beliefs, Heuristics and Biases *									
Revis	siting r	ationality; c	ausal aspec	cts of irration	onality; diffe	erent kinds o	of biases a	nd beliefs;		
self-evaluation and self-projection; inconsistent and biased beliefs; probability estimation; [9]									[9]	
trading applications - trade in counterfeit goods, financial trading behavior, trade in										
mem	orabilia	a.								
Socia	al Pref	erence*			,					
Indivi	idual p	references;	choice anor	malies and	inconsisten	cies; social	preferences	s; altruism;		
fairne	ess; re	ciprocity; tr	ust; learning	g; commur	ilcation; inte	ention; dem	ographic al	nd cultural	[9]	
aspe	cis, so	cial norms, markata lal	hor markets	e and punk morket ek	snment, me	quity avers	non, policy	logic and		
know	is anu i Iedae	voluntary c		compensa	tion design	ic goous, ap	plications -	- logic and		
KIIOW	icuge,	voluntary c	ontribution,	compensa	don design		То	tal Hours:	45	
Text	Book(s):								
	N. W	ilkinson and	d M. Klaes.	"An Introdu	ction to Bel	havioral Eco	onomics". 2	017. 3rd Ed	lition. Red	
1.	Globe	e Press	,				,	- , -	,	
0	M. Alt	man, Hand	book of Con	temporary	Behavioura	I Economics	s: Foundatio	on and Deve	lopments,	
Ζ.	Prent	ice Hall Ind	ia,2007						• •	
Refe	rence(s):								
1	Baze	rman, Max	and Don M	oore. Judg	ment in Mar	nagerial De	cision Maki	ng, 2012. 8	th Edition,	
1.	John Wiley & Sons.									
2.	Kahn	eman, Dan	iel.Thinking,	Fast and S	Slow, 2011,	New York:	Farrar, Stra	us and Girc	ux	
3	Sanji	: Dhami, "T	he Founda	tions of Be	havioral Ec	onomic An	alysis", Oxt	ford Univers	sity Press,	
<u> </u>	2016									
4.	Erik A	Angner, "A (Course in Be	ehavioral E	conomics",	Palgrave M	acmillan.			
*SDG	34: Qu	ality Educat	tion							



S. No.	Topics	No. of						
1.0	Introduction	nouis						
1.1	The neoclassical/standard model and behavioral economics in contrast	2						
1.2	historical background: behavioral economics	2						
1.3	Theory and evidence in the social sciences and in behavioral economics	2						
1.4	applications – gains and losses	1						
1.5	money illusion, charitable donation	2						
2.0	Basics of Choice Theory							
2.1	Revisiting the neoclassical model; utility in economics and psychology	2						
2.2	models of rationality; connections with evolutionary biology and cognitive neuroscience							
2.3	policy analysis – consumption and addiction	2						
2.4	environmental protection, retail therapy; applications							
2.5	pricing, valuation, public goods, choice anomalies	2						
3.0	Choice Under Uncertainty *							
3.1	Background and expected utility theory	1						
3.2	prospect theory and other theories	1						
3.3	loss aversion	1						
3.4	marginal utility	2						
3.5	decision and probability weighting	1						
3.6	applications	1						
3.7	ownership and trade	1						
3.8	income and consumption	1						
4.0	Beliefs, Heuristics and Biases *							
4.1	Revisiting rationality	1						
4.2	causal aspects of irrationality; different kinds of biases and beliefs	1						
4.3	self-evaluation and self-projection	1						
4.4	inconsistent and biased beliefs	1						
4.5	probability estimation	1						
4.6	trading applications	1						
4.7	trade in counterfeit goods	1						
4.8	financial trading behavior	2						
4.9	trade in memorabilia	1						
5.0	Social Preference*	•						
5.1	Individual preferences; choice anomalies and inconsistencies	2						
5.2	social preferences; altruism; fairness; reciprocity; trust	1						
5.3	learning; communication; intention; demographic and cultural aspects	1						
5.4	social norms; compliance and punishment; inequity aversion; policy analysis	2						
5.5	norms and markets, labor markets, market clearing, public goods	1						
5.6	applications – logic and knowledge	1						
5.7	voluntary contribution, compensation design	1						

Course Contents and Lecture Schedul

Course Designer(s)

1. Dr.H.KALAIARASI - kalaiarasi@ksrct.ac.in



	Customer Polation Management	Category	L	Т	Ρ	Credit
00 CD E42	Customer Relation Management	PE	3	0	0	3

- To enable the students to understand the fundamentals of Customer Relationship Management
- To gain the knowledge about customer behaviour and their perception
- To understand the CRM process and strategies for customer retention
- To impart knowledge on the process of CRM strategy development
- To give an insights about CRM IN E- Business and its change perspectives

Pre-requisites

Marketing Management

Course Outcomes

On the suc	On the successful completion of the course, students will be able to							
CO1	Understand the concept of CRM, the benefits delivered by CRM and its context.	Understand						
CO2	Identify the knowledge on customer perception and expectation.	Understand						
CO3	Interpret the concept of CRM Structure, strategies for customer acquisition and retention.	Apply						
CO4	Apply the implement CRM Process and Campaign Management	Apply						
CO5	Examine the trends and issues in E - CRM and measures effectiveness of CRM.	Analyse						

Mapping with Programme Outcomes

	<u> </u>		<u> </u>													
<u> </u>		POs												PSOs		
CUS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	2	3	3	2	-	-	3	2	3	3	-	-	-	-	
CO2	3	3	3	2	3	-	-	3	2	3	2	-	-	-	-	
CO3	3	2	2	3	-	-	-	2	3	2	2	-	-	-	-	
CO4	3	3	3	-	-	-	-	3	3	3	3	2	-	3	-	
CO5	3	3	-	-	-	-	-	3	3	3	3	3	-	3	-	
3 . St	rona. (2 - Mo	dium	· 1 - Some	<u> </u>											

3 - Strong; 2 - Medium; 1 - Some

Assessment Pattern										
Bloom's	Continuous As (M	ssessment Tests arks)	End Sem Examination (Marks)							
Calegory	1	2								
Remember	20	20	20							
Understand	20	20	20							
Apply	20	20	30							
Analyse	-	-	30							
Evaluate	-	-	-							
Create	-	-	-							
Total	60	60	100							

Syllab	Syllabus									
	K.S.Rangasamy College of Technology – Autonomous R2022									
		60 CB	E42- Custo	omer Relati	on Manage	ment				
Seme	ster	Hours/Wee	k	Total	Credit	Maximum Ma		rks		
	L	Т	P	Hours	С	CA	ES	Total		
VI	<u> 3</u>	0	0	45	3	40	60	100		
Conc Relati Custo Strate	Conceptual Foundation ^ Relationship Marketing: Evolution – Stages – Types – Purpose - Importance. Concepts of Customer Value - Strategic CRM: Significance – Growth – Elements - Developing CRM Strategies									
Unde Custo Expec group	Understanding Customers* Customer information Database – Customer Profile Analysis - Customer perception, Expectations analysis – Customer behavior in relationship perspectives; individual and group customer's - Customer life time value – Selection of Profitable customer segments [9]									
CRM Eleme Preve	CRM Structures * Elements of CRM – CRM Process – Strategies for Customer acquisition – Retention and Prevention of defection – Models of CRM – CRM road map for business applications [9]									
CRM Custo Progra Manag	CRM Process and Implementation * Customer Retention Management - Customer Experience Management - Loyalty Programs: Design- Drivers - Issues. Campaign Management - Customer Complaint [9] Management - Role of Marketing Channels in CRM - Employee Factors in CRM									
Trend CRM Influer Featu	Is and Issues in in e-Business (ncing the Future res of e-CRM - A	CRM* (B2B & B2 of CRM. E dvantage o	C) - Meas E-CRM in E f e-CRM.	uring the E Business - (ffectivenes CRM: A Ch	s of CRM anging Per	- Factors rspective -	[9]		
						To	tal Hours:	45		
Text I	Book(s):									
1.	Peelen "Custor	ner Relatior	nship Mana	gement" Pe	arson Educ	ation, 1st E	dition ,2022			
2.	Harikrishnan K House Pvt Itd,	T,"Custor 1 January 2	mer Relatio 022.	nship Mana	igement", R	tomanson F	Printing & P	ublishing		
Refer	ence(s):									
1.	Dr.B.Kavitha "Cu	ustomer Rel	ationship M	anagemenť	" OrangeBo	oks Publica	ation, 1st Edi	ition 2020.		
2.	2. Francis & Stan Maklan Buttle "Customer Relationship Management : Concepts And Technologies, 4th Edition, 2019.									
3.	3. V. Kumar, Werner Reinartz "Customer Relationship Management Concept, Strategy, and Tools", Springer Berlin Heidelberg, 3rd Edition 2018.									
4.	Alok Kumar Ra Pvt Ltd, Delhi, 2	ai," Custom nd Edition,	er Relation	ship Manag	ement : Cor	ncepts And	Cases", PH	I Learning		
*000	1 0 11 E I									

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Course Contents and Lecture Schedule									
S. No.	Topics	No. of hours							
1.0	Conceptual Foundation								
1.1	Relationship Marketing: Evolution	1							
1.2	Stages ,Types ,Purpose	2							
1.3	Importance. Concepts of Customer Value	2							
1.4	Strategic CRM: Significance								
1.5	Growth, Elements	1							
1.6	Developing CRM Strategies	2							
2.0	Understanding Customers								
2.1	Customer information Database	1							
2.2	Customer Profile Analysis	1							
2.3	Customer perception, Expectations analysis	2							
2.4	Customer behavior in relationship perspectives	2							
2.5	Individual and group customer's	1							
2.6	Customer life time value	1							
2.7	Selection of Profitable customer segments	1							
3.0	CRM Structures								
3.1	Elements of CRM	1							
3.2	CRM Process	1							
3.3	Strategies for Customer acquisition	2							
3.4	Retention and Prevention of defection	2							
3.5	Models of CRM	2							
3.6	CRM road map for business applications	1							
4.0	CRM Process and Implementation								
4.1	Customer Retention Management	1							
4.2	Customer Experience Management	2							
4.3	Loyalty Programs: Design, Drivers, Issues	2							
4.4	Campaign Management, Customer Complaint Management	2							
4.5	Role of Marketing Channels in CRM	1							
4.6	Employee Factors in CRM	1							
5.0	Trends and Issues in Crm	1							
5.1	CRM in e-Business (B2B & B2C)	1							
5.2	Measuring the Effectiveness of CRM	1							
5.3	Factors Influencing the Future of CRM	2							
5.4	E-CRM in Business	2							
5.5	CRM: A Changing Perspective	1							
5.6	Features of e-CRM	1							
5.7	Advantage of e-CRM	1							

Course Designer(s) 1.Dr.M.Mohanraj - mohanrajm@ksrct.ac.in



		Category	L	Т	Ρ	Credit
60 CB E43	Financial Management	PE	3	0	0	3

- To understand the operational functions of a Finance Manager
- To Comprehend the technique of making decisions related to finance function
- To Possess the techniques of managing finance in an organization
- To provide them knowledge on working capital management
- To make them to understand the concepts of Indian capital market and stock market

Pre-requisites

• NIL

Course Outcomes

On the suc	On the successful completion of the course, students will be able to							
CO1	Understand the economic and industry environment, domestic and	Understand						
	international							
CO2	Apply the hands-on, pro forma modeling skills using.	Apply						
CO3	Interpret the concept of cost of capital and valuation.	Apply						
CO4	Apply the Financial Statements to obtain Cash Flows for the firm and	Apply						
004	equity holders.							
CO5	Analyze the financial Statements to evaluate firm performance.	Analyze						

Mapping with Programme Outcomes

	_		-													
COs		POs												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	-	3	-	3	-	-	-	-	-	-	3	3	-	3	-	
CO2	-	3	-	3	-	-	-	-	-	-	3	2	-	3	-	
CO3	-	3	-	3	-	-	-	-	-	-	3	2	-	3	-	
CO4	-	3	-	3	-	-	-	-	-	-	3	3	-	3	-	
CO5	-	3	-	3	-	-	-	-	-	-	3	3	-	3	-	
3 - St	rong: (2 - Mec	lium 1	- Som												

3 - Strong; 2 - Medium; 1 - Some

Assessment Pattern										
Bloom's	Continuous A (N	ssessment Tests Iarks)	End Sem Examination (Marks)							
Calegory	1	2								
Remember	-	-	-							
Understand	30	20	20							
Apply	30	20	50							
Analyse	0	20	30							
Evaluate	-	-	-							
Create	-	-	-							
Total	60	60	100							



Syllab	Syllabus									
	K.S.Rangasamy College of Technology – Autonomous R2022									
			60) CB E43- F	inancial M	anagemen	t			
Seme	stor	ŀ	lours/Wee	k	Total	Credit	Ма	ximum Ma	rks	
Ocilie	3101	L	Т	Р	Hours	С	CA	ES	Total	
VII	I	3	0	0	45	3	40	60	100	
Found	dation	s of Finan	ce							
Financ	cial ma	anagement	– An overv	iew-limev	alue of mon	ey-Introduc	ction to the	concept of	[9]	
funder	na reti montol	urn of a si	ngle asset	and of a p	orttollo- Fin	iancial deci	sion in a fi	rm - The		
Invost	tmont		s innance -	RISK Telum	liade oli - F		siness orga	nization.		
Capita	al Rud	acting: Dri	ncinles and	l technique	s - Naturo	of capital k	oudaetina-	Identifying		
releva	nt cas	sh flows -	Evaluation	Technique	s Pavhack	Accountin	a rate of r	eturn Net	[9]	
Prese	nt Valu	ue. Internal	Rate of Re	turn. Profita	ability Index		g late of i			
Finan	cing a	nd Divide	nd Decisio	n	, <u> </u>					
Finan	icial a	nd operati	ng leverage	e - capital	structure -	Cost of ca	pital and v	aluation –	[0]	
desigr	designing capital structure. Dividend policy - Aspects of dividend policy - practical									
consideration - forms of dividend policy - forms of dividends - share splits										
Working Capital Management										
Princip	ples of	f working o	capital: Cor	icepts, Nee	ds, Determ	inants, issu	ies and est	imation of	[0]	
workin	ng ca	pital - Ad	ccounts Re	eceivables	Manageme	ent and fa	actoring -	Inventory	[9]	
manag	gemer	it – Cash n Ircial paper	nanagemer	it - working	capital fina	ince : Trade	e credit, Ba	nk finance		
	Term	Sources of	of Finance							
Indian	capita	al and stock	k market. Ne	w issues m	arket Long	term finance	e: Shares. d	lebentures	[9]	
and te	erm loa	ans, lease,	hire purcha	se, venture	capital final	ncing, Priva	te Equity.		[-]	
			•			0	To	tal Hours:	45	
Text E	Book(s	s):								
1	M.Y.	Khan and F	P.K.Jain Fir	ancial man	agement, T	ext, Problei	ms and cas	es Tata Mo	Graw Hill,	
1.	6th ed	lition, 2011	•							
2.	M. Pa	ndey Finar	ncial Manag	ement, Vika	as Publishin	g House P∖	/t. Ltd., 10th	n edition, 20	12.	
Refere	Reference(s):									
1.	Aswat	Damodara	an, Corpora	te Finance	Theory and	practice, Jo	ohn Wiley 8	Sons, 201	1	
2.	2. James C. Vanhorne – Fundamentals of Financial Management– PHI Learning, 11th Edition,									
┝──┼										
3.	Dright	am, ⊨nmar	ui, Financia	iwanagem	ent meory a	and Practice	e, i∠th editio	on, Cengage	ellearning	
4	Prasa	nna Chanc	Ira Financi	al Manager	nent Othed	ition Tata M	AcGraw Hill	2012		
<u>т.</u>	1 1 4 3 4			a manayen	ioni, sin eu	non, rata i		, 2012		

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Course Contents and Lecture Schedule								
S. No.	Topics	No. of hours						
1.0	Foundations of Finance							
1.1	Financial management – An overview	2						
1.2	Time value of money	4						
1.3	Introduction to the concept of risk and return of a single asset and of a portfolio	3						
2.0	Investment Decisions							
2.1	Capital Budgeting: Principles and techniques	2						
2.2	Nature of capital budgeting	2						
2.3	Identifying relevant cash flows	1						
2.4	Evaluation Techniques: Payback, Accounting rate of return, Net Present Value	2						
2.5	Internal Rate of Return, Profitability Index	2						
3.0	Financing and Dividend Decision							
3.1	Financial and operating leverage	1						
3.2	Capital structure - Cost of capital and valuation	2						
3.3	Designing capital structure.	2						
3.4	Dividend policy - Aspects of dividend policy	2						
3.5	Practical consideration - forms of dividend policy	1						
3.6	Forms of dividends - share splits	1						
4.0	Working Capital Management							
4.1	Principles of working capital: Concepts & Needs	2						
4.2	Determinants & issues and estimation of working capital	2						
4.3	Accounts Receivables Management and factoring	1						
4.4	Inventory management – Cash management	1						
4.5	Working capital finance : Trade credit, Bank finance and Commercial paper.	3						
5.0	Electric and Autonomous Vehicles							
5.1	Indian capital and stock market	2						
5.2	New issues market Long term finance: Shares, debentures and term loans, lease, hire purchase, venture capital financing, Private Equity	7						

1. Mr.P.Sabareesh

- sabareesh@ksrct.ac.in



	Fintech Personal Finance	Category	L	Т	Ρ	Credit
00 CD E44	and Payments	PE	3	0	0	3

- Identify the currency payment methods
- Understanding the digitalization of finance
- Analysing about Insure technology and its implications
- Critically evaluating about Peer to Peer lending
- Analysing about Fintech and Regtech Eco system

Pre-requisites

• NIL

Course Outcomes

On the suc	On the successful completion of the course, students will be able to						
CO1	Understand about currency payments and differents methods of exchange.	Understand					
CO2	Understand about the Cryptocurrencies and Digital finance.	Understand					
CO3	Interpret about Insurtech and fraud detection.	Apply					
CO4	Demonstrate about Peer to Peer lending.	Apply					
CO5	Analyse about the regaulatory issues pertaining to digital finance.	Analyse					

Mapping with Programme Outcomes

<u> </u>			-			PC	Ds						PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	-	-	-	-	-	-	-	-	3	-	3	-	-	3	-
CO2	-	-	I	-	-	-	-	-	3	-	2	2	-	3	-
CO3	-	-	-	-	-	-	-	3	-	-	3	-	-	3	-
CO4	-	-	I	-	-	-	-	-	3	-	3	-	-	2	-
CO5	-	-	-	-	-	-	-	3	-	-	3	3	-	3	-
3 - St	rong; 2	2 - Mec	dium	; 1 - Som	е										

Accessment Dottorn

Assessment Fattern										
Bloom's	Continuous Ass (Ma	sessment Tests rks)	End Sem Examination (Marks)							
Calegory	1	2								
Remember	10	10	10							
Understand	50	20	30							
Apply	-	20	30							
Analyse	-	10	30							
Evaluate	-	-	-							
Create	-	-	-							
Total	60	60	100							



K.S.Rangasamy College of Technology – Autonomous R2022 60 CB E44 - Fintech Personal Finance and Payments Semester L T P Hours Credit Maximum Marks Currency Payment and Exchange Total C CA ES Total Cardia Outonomous Cards, Stored-Value Cards, EC Micropayments, Payment Gateways, Mobile Payments, Digital and Virtual Currencies, Security, Ethical, Legal, Privacy, and Technology Issues. [9] Cryptocurrency and Digital FINANCE Understand the concept of Crypto currencies - Cryptocurrencies and Applications, block chain, Artificial Intelligence, machine learning. A Brief History of Financial Innovation, Digitization of Financial Services. [9] Insurfech Insurfech Introduction, Business model disruption Al/ML in InsurTech IoT and InsurTech, Risk Modeling, Fraud Detection Processing claims and Underwriting Innovations in Insurance Services. [9] P2P and Marketplace Lending, New Models and New Products in market place lending P2P Infrastructure and technologies, P2P and Crowd funding unicorns and business models, SME/MSME Lending: Unique opportunities and Challenges, Solutions and Innovations. [9] P4P and Marketplace Lending, New Models and New Products in market place lending P2P Infrastructure and technologies, P2P and Crowd funding unicorns and business models, SME/MSME Lending: Unique opportunities and Challenges, Solutions and Innovations. [9]	Syllabus										
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Text Book(s):1.Swanson Seth, Fintech for Beginners: Understanding and Utilizing the power of technology, Create space Independent Publishing Platform,20162.Models AuTanda, Fintech Bigtech And Banks Digitalization and Its Impact On Banking Business, Springer, 2019Reference(s):1.Henning Diedrich, Ethereum: Blockchains, Digital Assets, Smart Contracts, Decentralized Autonomous Organizations, Wildfire Publishing, 20162.Jacob William, FinTech: The Beginner's Guide to Financial Technology, Create space Independent Publishing Platform, 20163.IIBF, Digital Banking, Taxmann Publication, 20164.Jacob William, Financial Technology, Create space Independent Pub, 2016									Total Hours:	45	
1. Swanson Seth, Fintech for Beginners: Understanding and Utilizing the power of technology, Create space Independent Publishing Platform,2016 2. Models AuTanda, Fintech Bigtech And Banks Digitalization and Its Impact On Banking Business, Springer, 2019 Reference(s): 1. Henning Diedrich, Ethereum: Blockchains, Digital Assets, Smart Contracts, Decentralized Autonomous Organizations, Wildfire Publishing, 2016 2. Jacob William, FinTech: The Beginner's Guide to Financial Technology, Create space Independent Publishing Platform, 2016 3. IIBF, Digital Banking, Taxmann Publication, 2016 4. Jacob William, Financial Technology, Create space Independent Pub, 2016	Text E	Book(s)		Fintach for	Doginara	Indereter	طنمم متطال	+	nower of tost		
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4. Jacob William, Financial Technology, Create space Independent Pub, 2016	3.	3. IIBF, Digital Banking, Taxmann Publication, 2016									
	4.	Jacob V	Villiam, F	inancial Te	chnology, C	reate space	e Independe	ent Pub, 20	16		

SDG4 – Quality Education



Course Contents and Lecture Schedule										
S. No.	Topics	No. of hours								
1.0	Currency Exchange and Digital Payment									
1.1	Fintech users, Individual Payments	2								
1.2	RTGS, IMPS, UPI Systems, Digital Payments Smart Cards	2								
1.3	Stored-Value Cards, EC Micropayments, Payment Gateways	2								
1.4	Mobile Payments, Digital and Virtual Currencies,	1								
1.5	Security, Ethical, Legal, Privacy, and Technology Issues	2								
2.0	Digital Finance									
2.1	Understand the concept of Crypto currency	2								
2.2	Bitcoin and Applications									
2.3	Cryptocurrencies and Digital Crypto WalletsTypes of Cryptocurrencies	2								
2.4	Cryptocurrencies and Applications, block chain, Artificial Intelligence, machine learning	2								
2.5	A Brief History of Financial Innovation	2								
3.0	Insuretech									
3.1	InsurTech Introduction	2								
3.2	Business model disruption AI/ML in Insur Tech IoT	1								
3.3	InsurTech ,Risk Modeling	2								
3.4	Fraud Detection Processing claims	2								
3.5	Underwriting Innovations in Insurance Services	2								
3.8	Tyre: Function, Types and Construction	2								
4.0	Steering, Brakes and Suspension Systems									
4.1	P2P and Marketplace Lending	2								
4.2	New Models and New Products in market place lending P2P Infrastructure and technologies	2								
4.3	P2P and Crowd funding unicorns and business models	2								
4.4	SME/MSME Lending: Unique opportunities and Challenges, Solutions and Innovations	3								
5.0	Electric and Autonomous Vehicles									
5.1	FinTech Regulations: Global Regulations and Domestic Regulations,	1								
5.2	Evolution of RegTech,	1								
5.3	RegTech Ecosystem: Financial Institutions	1								
5.4	RegTech Ecosystem: StartupsRegTech,	2								
5.5	Startups: Challenges	1								
5.6	RegTech Ecosystem: Regulators	2								
5.7	Use of AI in regulation and Fraud detection	1								

Course Designer(s) 1. Dr.H.KALAIARASI – kalaiarasi@ksrct.ac.in



	Fundamentals of Investment	Category	L	Т	Ρ	Credit
00 CD E43	Fundamentals of investment	PE	3	0	0	3

- To familiarize the students with different investment alternatives.
- To know how to evaluate different investment products by discounting techniques
- To understand concept of investment risks, returns of prospective investors in the market.
- To introduce them to the framework of portfolio analysis
- To highlight the role of SEBI and Stock Exchanges in investors protection

Pre-requisites

• Basic knowledge of Higher Secondary Mathematics, Binary Operations & Mathematical Logic

Course Outcomes

On the suc	On the successful completion of the course, students will be able to							
CO1	Understand the different investment alternatives and market participants	Understand the different investment alternatives and market participants Understand						
CO2	Apply the concept of time value of money and discounting techniques	Apply						
CO3	Understand the concept of risk and return	Understand						
CO4	Understand the concept of Portfolio Analysis and Financial Derivatives	Understand						
CO5	Understand the role of SEBI and Stock Exchanges in investor protection	Understand						

Mapping with Programme Outcomes

<u> </u>		POs												PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	-	-	3	-	-	-	2	-	-	2	-	-	-	-	
CO2	-	-	-	-	-	3	-	-	-	-	3	-	-	-	3	
CO3	-	3	-	-	-	-	-	3	-	-	I	-	2	-	-	
CO4	-	-	3	-	-	-	3	-	-	3	-	-	-	-	-	
CO5	-	-	-	3	-	-	-	-	-	-	3	-	-	3	-	

3 - Strong; 2 - Medium; 1 - Some

Assessment Patte											
Bloom's	Continuous As (Ma	sessment Tests rks)	End Sem Examination (Marks)								
Calegory	1	2									
Remember	25	25	35								
Understand	25	25	45								
Apply	10	10	20								
Analyse	-	-	-								
Evaluate	-	-	-								
Create	-	-	-								
Total	60	60	100								



Syllab	ous											
		K.S.F	Rangasamy	/ College o	f Technolo	<mark>ogy – Auto</mark> r	nomous R2	2022				
			60 C	B E45- Fun	damentals	of Investm	nent					
Somo	stor	ŀ	lours/Wee	k	Total	Credit	Ma	ximum Ma	rks			
Seme	5101	L	Т	Р	Hours	С	CA	ES	Total			
VI		3	0	0	45	3	40	60	100			
Investment Environment:												
The in	nvestme	ent decisio	on process,	Types of Ir	nvestments	 Commod 	ities, Real I	Estate and				
Financ	cial Ass	sets (Equi	ity, Mutual	funds, Deb	t), the India	an securitie	s market, t	he market	[9]			
partici	ipants (Stock exc	changes, St	ock brokers	s, Clearing	House, Dep	positories, I	Depository				
Partici	ipants,	FIIs, Dom	estic institu	tional inves	tors, Individ	ual investor	ːs).					
Time	value c	of money:				•						
Basic	Conce	pts, Impo	rtance of	lime Value	of Money,	Compoun	ding and d	iscounting	[9]			
techni	iques, L	Difference	between N	ominal Inter	rest Rate (N	IR) and Eff	ective Intere	est Rate.				
Mana	ging In	vestment	RISK:						[0]			
Under	rstand ti	ne concep	ot of risk and	d return-Ca	iculation of	Expected R	eturn-Syste	ematic and	[9]			
Onsys		; risk. obygio ony	d Eineneiel	Derivativa								
Portic	JIIO ANA		u Financial	Derivative	s: and Daturn		undo: Intro	duction to	[0]			
Financ	cial Dor		Einancial De	rivativos M	and Return	i, Muluai F	unus, muo		[9]			
Invost	tor Pro	tection:				ula.						
Role		l and stor		es in invest	or protectio	n. Investor	arievances	and their	Γοι			
redres	sal svs	tem insid	er trading	nvestor aw	areness and	d activism	gnevances		[0]			
			, i i i i i i i i i i i i i i i i i i i				То	tal Hours:	45			
Text E	Book(s)):										
1.	Dhank	, har, J. N. ((2019). Indi	an Capital N	Market in Or	peration. Ne	w Delhi: Sl	vlark Public	cations.			
2.	Chand	ra, P. (201	19). Investm	ent Analysi	is. New Dell	hi: Tata Mc	Graw Hill.	,				
Refer	ence(s)):	/	,								
1.	Choud	, hry, M. (20	022). Capita	al Market In	struments.	London: Pre	entice Hall.					
2.	Madhu	soodanan	, E.D. (201	8). Indian C	apital Mark	ets. Delhi: C	Quest Public	cations.				
3.	Gurusa	amy, (2019	9). Capital N	Jarkets. Ne	w Delhi: Ta	ta McGraw	Hill.					
4	Srivast	ava, R.M	. (2022).	<i>l</i> anagemer	nt of Indian	Financial	Institutions	. Mumbai:	Himalaya			
4.	Publish	nina House	e	-					-			

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Course C	ontents and Lecture Schedule	
S. No.	Topics	No. of hours
1.0	Investment Environment:	
1.1	The investment decision process	1
1.2	Types of Investments – Commodities, Real Estate	1
1.3	Financial Assets (Equity, Mutual funds, Debt)	1
1.4	The Indian securities market	1
1.5	The market participants (Overview)	1
1.6	Stock exchanges, Stock brokers, Clearing House	1
1.7	Depositories, Depository Participants	1
1.8	FIIs, Domestic institutional investors	1
1.9	Individual investors	
2.0	Time value of money:	
2.1	Basic Concepts	2
2.2	Importance of Time Value of Money	2
2.3	Compounding and discounting techniques	3
2.4	Difference between Nominal Interest Rate (NIR) and Effective Interest Rate.	2
3.0	Managing Investment Risk:	
3.1	Understand the concept of risk and return	3
3.2	Calculation of Expected Return	3
3.3	Systematic and Unsystematic risk	3
4.0	Portfolio Analysis and Financial Derivatives:	
4.1	Portfolio and Diversification	1
4.2	Portfolio Risk and Return	3
4.3	Mutual Funds	2
4.4	Introduction to Financial Derivatives	1
4.5	Financial Derivatives Markets in India.	2
5.0	Investor Protection:	
5.1	Role of SEBI and stock exchanges in investor protection	3
5.2	Investor grievances and their redressal system	3
5.3	Insider trading, investor awareness and activism	3

1. Mr.R.Murugaganesh - murugaganesh@ksrct.ac.in



	Introduction to Fintoch	Category	L	Т	Ρ	Credit
00 CB E40		PE	3	0	0	3

- To learn about history, importance and evolution of Fintech.
- To acquire the knowledge of Fintech in payment industry
- To acquire the knowledge of Fintech in insurance industry. •
- To learn the Fintech developments around the world
- To know about the future of Fintech

Pre-requisites

Nil

Course Outcomes

On the suc	On the successful completion of the course, students will be able to								
CO1	Understand about history, importance and evolution of Fintech	Understand							
CO2	Understand the knowledge of Fintech in payment industry	Understand							
CO3	Understand the knowledge of Fintech in insurance industry	Understand							
CO4	Understand the Fintech developments around the world	Understand							
CO5	Understand the about the future of Fintech	Understand							

Mapping with Programme Outcomes

		POs												PSOs		
COs	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
CO1	3	-	-	3	-	-	-	2	-	-	2	-	-	-	-	
CO2	-	-	-	-	-	3	-	-	-	-	3	-	-	-	3	
CO3	-	3	-	-	-	-	-	3	-	-	-	-	2	-	-	
CO4	-	-	3	-	-	-	3	-	-	3	-	-	-	-	-	
CO5	-	-	-	3	-	-	-	-	-	-	3	-	-	3	-	

3 - Strong; 2 - Medium; 1 - Some Assessment Pattern

Bloom's	Continuous As (Ma	sessment Tests rks)	End Sem Examination (Marks)					
Calegory	1	2						
Remember	25	25	35					
Understand	25	25	45					
Apply	10	10	20					
Analyse	-	-	-					
Evaluate	-	-	-					
Create	-	-	-					
Total	60	60	100					



K.S.Rangasamy College of Technology – Autonomous R2022												
CO CD EAC Introduction to Eintech												
00 GB E40- INTroduction to Fintech												
Semester Hours/Week Total Credit Maximum Marks												
L T P Hours C CA ES To	otal											
VII 3 0 0 45 3 40 60 10	00											
Introduction *												
Fintech - Definition, History, concept, meaning, architecture, significance, Goals, key areas												
in Fintech, Importance of Fintech, role of Fintech in economic development, opportunities	0]											
and challenges in Fintech, Evolution of Fintech in different sectors of the industry.												
Payment Industry *												
Fin Lech in Payment Industry-Multichannel digital wallets, applications supporting wallets,	01											
onboarding and KYC application, Finitech in Lending Industry-Formal lending, Informal	9]											
Crowdfunding, P2P lending, P0S lending, Online lending, Payday lending, Microlinance,												
Insurance Industry *												
FinTech in Wealth Management Industry-Financial Advice, Automated investing, Socially												
responsible investing. Fractional Investing. Social Investing. FinTech in Insurance Industry-	9]											
P2P insurance On-Demand Insurance On-Demand Consultation												
Fintech around the Globe *												
FinTech developments - US, Europe and UK, Germany, Sweden, France, China, India,												
Africa, Australia, New Zealand, Brazil and Middle East, Regulatory and Policy Assessment	9]											
for Growth of FinTech. FinTech as disruptors.												
Future of Fintech *												
How emerging technologies will change financial services, the future of financial services,												
banking on innovation through data, why FinTech banks will rule the world, The FinTech	9]											
Supermarket, Banks partnering with FinTech start-ups, The rise of BankTech, Fintech												
impact on Retail Banking.												
Total Hours: 4	5											
Text Book(s):												
Arner D., Barbers J., Buckley R, The evolution of Fin Tech: a new post crisis paradigm, Univer	ersity											
of New South Wales Research Series, 2015.												
2. Susanne Chishti, Janos Barberis, The FINTECH Book: The Financial Technology Handboo	ok tor											
Investors, Entrepreneurs and Visionaries, Wiley Publications, 2016.												
Reference(s):	م ما 4 ام											
1. Financial Technology on Banking and Initiance of Financial Technology on Banking and	a the											
Finance industry, 2010. Parag V Ariupwadkar, FinTech: The Technology Driving Discuption in the financial se	nuico											
2. industry CRC Press 2018	IVICE											
Sanjav Phadke Fintech Future: The Digital DNA of Finance Panerback Sage Publicat	ione											
$3 \cdot 12020$												
4 Pranav Gupta T Mandy Tham Fintech: The New DNA of Financial Services Paperback 26	018											
*SDG4 – Quality Education												



Course C	ontents and Lecture Schedule	No. of
S. No.	Topics	hours
1.0	Introduction:	
1.1	Fintech - Definition, History	1
1.2	concept, meaning	1
1.3	architecture	1
1.4	significance, Goals	1
1.5	key areas in Fintech	1
1.6	Importance of Fintech	1
1.7	role of Fintech in economic development	1
1.8	opportunities and challenges in Fintech	1
1.9	Evolution of Fintech in different sectors of the industry	1
2.0	Payment Industry:	
2.1	FinTech in Payment Industry	2
2.2	Multichannel digital wallets	1
2.3	applications supporting wallets	1
2.4	onboarding and KYC application	1
2.5	FinTech in Lending Industry	1
2.6	Formal lending, Informal lending	1
2.7	P2P lending, POS lending	1
2.8	Online lending, Payday lending, Microfinance, Crowdfunding	1
3.0	Insurance Industry:	
3.1	FinTech in Wealth Management Industry	2
3.2	Financial Advice, Automated investing	1
3.3	Socially responsible investing	1
3.4	Fractional Investing	1
3.5	Social Investing. FinTech in Insurance Industry	1
3.6	P2P insurance	1
3.7	On-Demand Insurance	1
3.8	On-Demand Consultation	1
4.0	Fintech around the Globe:	1
4.1	FinTech developments	3
4.2	US, Europe and UK, Germany	3
4.3	Sweden, France, China, India, Africa	2
4.4	Australia, New Zealand, Brazil and Middle East	2
4.5	Regulatory and Policy Assessment for Growth of FinTech	2
4.6	FinTech as disruptors	2
5.0	Future of Fintech:	ſ
5.1	How emerging technologies will change financial services	2
5.2	the future of financial services	1
5.3	banking on innovation through data	1
5.4	why FinTech banks will rule the world	1
5.5	The FinTech Supermarket	1

5.6	Banks partnering with FinTech start-ups	1
5.7	The rise of BankTech	1
5.8	Fintech impact on Retail Banking	1

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ELECTIVE V

60 CB E51	Exploratory Data Analysis	Category	L	Т	Ρ	Credit
OU CB EST		PE	2	0	2	3

Objectives

- To outline an overview of exploratory data analysis
- To implement data visualization using Matplotlib
- To perform univariate data exploration and analysis
- To use Data exploration and visualization techniques for multivariate and time series data
- To learn about the stream mining concepts

Pre-requisites

• Basic knowledge of Data Mining and Machine Learning Techniques

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Understand the fundamentals of exploratory data analysis.	Understand
CO2	Analyze the data visualization using Matplotlib.	Analyse
CO3	Illustrate the working of univariate data exploration and analysis.	Apply
CO4	Use Data exploration and visualization techniques for multivariate and time series data.	Apply
CO5	Apply mining techniques for stream data.	Apply

Mapping with Programme Outcomes

COs						PC	Ds						PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	3	3	3	-	-	-	2	2	3	-	-	-	-
CO2	2	2	2	3	3	-	-	-	3	2	2	2	-	-	-
CO3	2	3	2	2	3	-	-	-	2	2	2	-	-	-	-
CO4	2	2	2	2	3	-	-	-	3	2	2	2	-	-	-
CO5	2	2	3	2	1	-	-	-	1	2	2	1	-	-	-
3 _ St	rona. C		lium	· 1 - Som	<u> </u>										

3 - Strong; 2 - Medium; 1 - Some

Assessment Pattern										
Bloom's	Contii	າuous As: (Ma	sessment rks)	Tests	Mo Exami	del nation	End Sem Examination			
Category	Tes	st 1	Tes	st 2	(Ma	rks)	(Marks)			
	Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab		
Remember	-	-	-	-	-	-	-	-		
Understand	30	-	-	-	34	-	-	-		
Apply	-	50	40	50	-	50	70	50		
Analyse	30	50	20	50	66	50	30	50		
Evaluate	-	-	-	-	-	-	-	I		
Create	-	-	-	-	-	-	-	-		
Total	60	100	60	100	100	100	100	100		



Syllab	us								
K.S.Rangasamy College of Technology – Autonomous R2022									
	B.Tech – Computer science and Business Systems								
60 CB E51 - Exploratory Data Analysis									
Semes	ster	H	ours / Wee	k	Total	Credit	Ма	ximum Ma	rks
Ociliec		L	Т	P	Hours	C	CA	ES	Total
VIII		2	0	2	60	3	50	50	100
Exploratory Data Analysis*									
EDA Fundamentals – Understanding Data Science – Significance of EDA – Making Sense									[6]
of Data	$\frac{a - Cc}{c}$	pmparing E	DA with Cla	issical and	Bayesian A	nalysis – So	ftware Tool	s for EDA.	
EDA u	sing	Python*	. .						[0]
Data N	lanip	ulation usin	ig Pandas -	- Pandas O	bjects – Da	ta Indexing	and Selecti	on –	[6]
Operat	ing o	n Data – H	andling Mis	sing Data –	- Hierarchica	ai indexing.			
Univar		to Single \	(orioble: Die		ariables Nu	marical Su	mmorios of	Loval and	[6]
Sprood			tondordizin		lity Polotio	nching botu			[0]
Multiv	ariate	anny and Cime	Sorios An		iity - Relatio	nships betw		anabies.	
Introdu	icina	a Third Va	riable - Cau	aiysis isal Explan	ations - Th	ree-Variable		cy Tables	
and B	evon	d – Funda	mentals of	TSA = CI	naracteristic	s of Time	Series Da	ta – Data	[6]
Cleani	na.						Cenes Du	ia Dala	
Mining	Data	a Streams	*						
Introdu	iction	To Stream	ms Concep	ots – Strea	m Data M	odel and A	rchitecture	- Stream	[0]
Compu	uting	-Sampling	Data in a Si	ream – Filt	ering Strea	ns – Counti	ing Distinct	Elements	[6]
in a Sti	ream				U		0		
Practic	cal:								
1. Inst	tall th	e data Ana	lysis and Vi	sualization	tool.				
2. Pe	rform	explorator	y data anal	ysis (EDA) y	with datase	ts like email	data set. E	xport all	
you	ir em	ails as a da	taset, impo	rt them insi	de a panda	s data frame	e, visualize	them and	
get	diffe	rent insight	s from the c	lata.					
3. Wor	king	with Nump	y arrays, Pa	indas data f	rames, Bas	ic plots usir	ng Matplotlil	D.	
4. Exp	lore v	arious vari	able and ro	w filters in F	R for cleanir	ng data. App	oly various p	olot	
feat	ures i	n R on san	nple data se	ets and visu	alize.	a a l'a a t' a a	4 .		
5. Peri	orm I	Time Series	s Analysis a	nd apply th	e various vi	sualization	tecnniques.	ooto with	[20]
o. Pen		Jala Analys	sis and repr		on a map u	sing various	s map data	sets with	[30]
	d car		icualization	for multiple	,. . datasots in	volving vari	oue countri	os of the	
worl	d can	ates and dis	stricts in Ind	ia etc		volving van			
8 Perf	form I	Exploratory	Data Analy	usis (FDA) d	on Wine Qu	ality Data S	et		
9. Use	a ca	se study or	a data set	and apply t	he various	EDA and vis	sualization		
tech	nique	es and pres	ent an anal	ysis report.					
10. Pe	erform	Sentimen	t Analysis	on X(Twitte	er app) Dat	a using teo	chniques lik	ke Bag-of-	
Words	, TF-I	DF, or pre-	trained mod	dels like VA	DER .	U	•	Ū	
Tools	used	: R / Pytho	on / Jupiter	Notebook.	•				
					Total Hou	rs: (Lectur	e - 30; Prac	ctical - 30)	60
Text B	ook(s)							
1	Jake \	Vander Pla	s, "Python [Data Scienc	e Handboo	k: Essential	Tools for W	orking with	Data", 2 nd
	ditio	n, O Reilly,	UK, 2022.					· · ··· -	
2.	Sures	h Kumar M	lukhiya, Usr	nan Ahmed	I, "Hands-O	n Explorato	ry Data Ana	alysis with P	ython", 1 st
	ditio	n, Packt Pu	ublishing, U	K, 2020.					
Refere	ence(s):		<u> </u>	1 1 10	NAL-LO C	Maasha	-1	.d F !'''
1. 6	unano Camb	u Rajaram pridge Univ	an and Je ersity Press	urey David , UK, 2020.	a Uilman, '	wining of	wassive D	atasets, 3	→ Edition,
2.	Vigne	sh Prajapa	iti, 'Big Data	Analytics	with R and	Hadoop', 1	st Edition, I	Packt Publis	shing, UK,
3. N	2013. Moha	mmedi Zak	kiand Wagn	er Meira 'l	Data Mining	and Analy	sis- Funda	mental Con	cepts and
			and magn						



	Algorithms', Cambridge University Press, 2014.
4.	Catherine Marsh, Jane Elliott, "Exploring Data: An Introduction to Data Analysis for Social Scientists", Wiley Publications, 2nd Edition, 2008.

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Course Contents and Lecture Schedule								
S. No.	Topics	No. of Hours						
1	Exploratory Data Analysis							
1.1	EDA Fundamentals	1						
1.2	Understanding data science	1						
1.3	Significance of EDA	1						
1.4	Making Sense of Data	1						
1.5	Comparing EDA with Classical and Bayesian Analysis	1						
1.6	Software Tools for EDA	1						
2	EDA Using Python							
2.1	Data Manipulation using Pandas	1						
2.2	Pandas Objects	1						
2.3	Data Indexing and Selection	1						
2.4	Operating on Data	1						
2.5	Handling Missing Data	1						
2.6	Hierarchical Indexing	1						
3	Univariate Analysis	·						
3.1	Introduction to Single Variable	1						
3.2	Distribution Variables	1						
3.3	Numerical Summaries of Level and Spread	1						
3.4	Scaling and Standardizing	1						
3.5	Inequality	1						
3.6	Relationships between Two Variables	1						
4	Multivariate and Time Series Analysis	·						
4.1	Introducing a Third Variable	1						
4.2	Causal Explanations	1						
4.3	Three-Variable Contingency Tables and Beyond	1						
4.4	Fundamentals of TSA	1						
4.5	Characteristics of Time Series Data	1						
4.6	Data Cleaning	1						
5	Mining Data Streams	·						
5.1	Introduction To Streams Concepts	1						
5.2	Stream Data Model and Architecture	1						
5.3	Stream Computing	1						
5.4	Sampling Data in a Stream	1						
5.5	Filtering Streams	1						
5.6	Counting Distinct Elements in a Stream	1						



Practical	:	
1.	Install the data Analysis and Visualization tool.	3
2.	Perform exploratory data analysis (EDA) with datasets like email data set. Export all your emails as a dataset, import them inside a pandas data frame, visualize them and get different insights from the data.	3
3.	Explore various variable and row filters in R for cleaning data. Apply various plot features in R on sample data sets and visualize.	3
4.	Perform Time Series Analysis and apply the various visualization techniques	3
5.	Perform Data Analysis and representation on a Map using various Map data sets with Mouse Rollover effect, user interaction, etc.	3
6.	Build cartographic visualization for multiple datasets involving various countries of the world; states and districts in India etc.	3
7.	Perform Exploratory Data Analysis (EDA) on Wine Quality Data Set.	3
8.	Perform Exploratory Data Analysis (EDA) on Wine Quality Data Set.	3
9.	Use a case study on a data set and apply the various EDA and visualization techniques and present an analysis report.	3
10.	Perform Sentiment Analysis on X(Twitter app) Data using techniques like Bag-of-Words, TF-IDF, or pre-trained models like VADER.	3

1. Mr. S. Vignesh - vigneshs@ksrct.ac.in



60 CB E52	Recommender Systems	Category	L	Т	Ρ	Credit
60 CB E52		PC	2	0	2	3

- To understand the foundations of the recommender system
- To learn the significance of machine learning and data mining algorithms for Recommender systems
- To learn about collaborative filtering
- To make students design and implement a recommender system
- To learn collaborative filtering

Pre-requisites

• NIL

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Understand the basic concepts of recommender systems.	Understand
CO2	Implement machine-learning and data-mining algorithms in recommender systems data sets	Understand
CO3	Implementation of Collaborative Filtering in carrying out performance evaluation of recommender systems based on various metrics.	Understand
CO4	Design and implement a simple recommender system.	Apply
CO5	Understand the strengths, weaknesses, and applicability of different advanced topics of recommender systems.	Understand

Mapp	Mapping with Programme Outcomes																
<u> </u>		POs													PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
CO1	2	2	1	2	1	-	-	-	1	-	-	1	-	-	-		
CO2	1	2	-	-	1	-	-	-	-	-	-	1	-	-	-		
CO3	2	3	1	-	1	-	-	-	2	-	-	-	-	-	-		
CO4	3	2	2	2	1	-	-	-	2	-	-	2	-	-	-		
CO5	1	1	-	1	1	-	-	-	-	-	-	1	-	-	-		
3 - St	rona: 2	2 - Meo	dium: 1	- Som	e												

Assessment Pattern

Bloom's	Contir	nuous As: (Ma	sessment rks)	Tests	Mo Exami	del nation	End Sem Examination		
Category	Tes	st 1	Tes	st 2	(Ma	rks)	(Marks)		
	Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab	
Remember	20	-	20	-	34	-	34	-	
Understand	40	-	40	-	66	-	66	-	
Apply	-	50	-	50	-	50	-	50	
Analyse	-	50	-	50	-	50	-	50	
Evaluate	-	-	-	-	-	-	-	-	
Create	-	-	-	-	-	-	-	-	
Total	60	100	60	100	100	100	100	100	



Syllabus									
K.S.Rangasamy College of Technology – Autonomous R2022									
B.Tech – Computer Science and Business Systems									
60 CB E52 – Recommender Systems									
Semester	H	lours / Wee	ek	Total	Credit	Ma	ximum Ma	rks	
L I P Hours C CA ES To									
VII 2 0 2 60 3 50 50									
Introduct	ion: *	. т				Tusslitisussl	and Nam		
Introductio	on and Basi	c laxonom	y of Reco	mmender :	of Doto I	Traditional	and Non-	[6]	
Recomme	eu Recomi	Similarit	Mageurae		oi Dala i nality Rodu	ction – Sing	ular Value	[0]	
Decompo	sition (SVD)		y measures	Dimensio	nanty iteuu				
Content-	Based Reco	mmendatio	n Svstems	:					
High-leve	Architecture	e of Contei	nt-based S	ystems - It	em Profiles	s, Represe	nting Item	[0]	
Profiles, N	lethods for L	earning Use	er Profiles,	Similarity-ba	ased Retrie	val, and Cla	ssification	[6]	
Algorithm	6.	_		-					
Collabora	tive Filterin	g:							
A System	atic Approac	ch, Nearest-	neighbor C	collaborative	Filtering (CF), User-k	based and	[6]	
Item-base	a CF, Comp	onents of P	veignborno	od Methods	Rating No	rmalization,	Similarity		
Attack-Re	sistant Rec	ommender	Systems:						
Introductio	on – Types of	Attacks – D	etectina At	tacks on Re	commende	r Svstems –	- Individual	101	
Attack –	Group Atta	ack – Stra	tegies for	Robust R	ecommende	er Design	- Robust	[6]	
Recomme	endation Algo	orithms.	0						
Evaluatin	g Recomme	ender Syste	ms:						
Evaluating	g Paradigms	_ User S	tudies – C	Online and	Offline Eva	aluation –	Goals of	[6]	
Evaluation	n Design –	Design Issi	ues – Accu	uracy Metri	cs – Limita	ations of E	valuation	[·]	
Practica	I Evoroisos								
1 In	nlement Dat	ta similarity	measures i	ising Pytho	n				
2. In	nplement dim	nension redu	uction techn	iques for re	commende	r svstems			
3. In	plement use	er profile lea	rning						
4. In	nplement con	ntent-based	recommen	dation syste	ms				
5. In	plement a	simple nea	arest-neight	oor collabo	rative filter	ing algorith	im using		
P	ython.								
6. In	nplement a u	ser-based c	ollaborative	e filtering alo	jorithm in P	ython.		[30]	
		lementing a	nd simulati	na an indivi	er systems idual attack	on a recor	nmender		
0. 1	/stem	ementing a		ng an muivi	uuai allach		IIIIeiluei		
9. In	nplement acc	uracv metri	cs like Rece	eiver Opera	ted Charact	eristic curv	es		
10. In	plementing l	baseline rec	commender	systems (p	opularity-ba	ased, rando	m		
re	commendati	on).							
LAB TO	OLS:								
Jupyter N	otebook			T - (-		00 D	(1		
Taxt Boo	k(c):			l otal Hou	rs: (Lectur	e - 30; Prac	ctical - 30)	60	
1 Cha	ru C. Aggary	val Recom	nender Svs	tems [.] The	Textbook S	nringer 20	16		
Diet	mar Jannach	n . Markus Z	anker Ale	xander Felf	ernig and G	erhard Frie	drich . Reco	mmender	
2. Sys	2. Systems: An Introduction, Cambridge University Press (2011), 1st ed								
Referenc	Reference(s):								
1 Fra	ncesco Ricci	, Lior Roka	ach, Brach	a Shapira	Recomme	nder Sytem	ns Handboo	k, 1st ed,	
'' Spr	inger (2011),		· · · ·			1			
2. Jure	e Leskovec,	Anand Raj	araman, Je	ettrey David	i Uliman, N	lining of m	assive data	asets, 3rd	
3 "Att	acks on the	Press In	urnalism o	n the Worl	d's Front I	ines" by C		n Protect	
0. Au	3. Allacks on the Press: Journalism on the World's Front Lines" by Committee to Protect								

9 BoS Chairman

	Journalists (2017, Wiley)
4.	Evaluating Learning Algorithms: A Classification Perspective" by Nathalie Japkowicz and Mohak Shah, Cambridge University Press, 2011
*000	

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S No		No. of
0.110.		Hours
1.0		
1.1	Introduction and Basic Taxonomy of Recommender Systems	1
1.2	I raditional and Non-personalized Recommender Systems	1
1.3	Overview of Data Mining Methods for Recommender Systems	1
1.4	Similarity Measures	1
1.5	Dimensionality Reduction	1
1.6	Singular Value Decomposition (SVD)	1
2.0	Content-Based Recommendation Systems:	
2.1	High-level Architecture of Content	1
2.2	Based Systems - Item Profiles	1
2.3	Representing Item Profiles	1
2.4	Methods for Learning User Profiles	1
2.5	Similarity-based Retrieval	1
2.6	Classification Algorithms	1
3.0	Collaborative Filtering:	
3.1	A Systematic Approach	1
3.2	Nearest-neighbor Collaborative Filtering (CF)	1
3.3	User-based and Item-based CF	1
3.4	Components of Neighborhood Methods Rating Normalization	1
3.5	Similarity Weight Computation	1
3.6	Neighborhood Selection	1
4.0	Attack-Resistant Recommender Systems:	·
4.1	Introduction – Types of Attacks	1
4.2	Detecting Attacks on Recommender Systems	1
4.3	Individual Attack	1
4.4	Group Attack	1
4.5	Strategies for Robust Recommender Design	1
4.6	Robust Recommendation Algorithms	1
5.0	Evaluating Recommender Systems:	·
5.1	Evaluating Paradigms – User Studies	1
5.2	Online and Offline Evaluation	1
5.3	Goals of Evaluation Design	1
5.4	Design Issues	1
5.5	Accuracy Metrics	1
5.6	Limitations of Evaluation Measures	1
Practical	•	I

1.	Implement Data similarity measures using Python	3
2.	Implement dimension reduction techniques for recommender systems	3
3.	Implement user profile learning	2
4.	Implement content-based recommendation systems	3
5.	Implement a simple nearest-neighbor collaborative filtering algorithm using Python.	4
6.	Implement a user-based collaborative filtering algorithm in Python.	3
7.	Create an attack for tampering with recommender systems	3
8.	Focus on implementing and simulating an individual attack on a recommender system.	3
9.	Implement accuracy metrics like Receiver Operated Characteristic curves	3
10.	Implementing baseline recommender systems (popularity-based, random recommendation).	3

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		Category	L	Т	Ρ	Credit
60 CB E53	Neural Networks and Deep Learning	PC	2	0	2	3

- To understand the basic ideas and principles of Neural Networks
- To understand the basic concepts of Big Data and Data Analysis
- To familiarize the student with the image processing facilities like Tensorflow and Keras
- To analyze Different Deep Learning models for different Applications
- To understand and implement Deep Learning Architectures

Pre-requisites

• Machine Learning Techniques

Course Outcomes

On the su	ccessful completion of the course, students will be able to	
CO1	Understand the building blocks of Deep learning	Remember,
001		Understand
CO2	Implement Feature extraction and feature learning by using	Understand,
002	TensorFlow/ Keras in Deep Learning Applications	Apply
000	Design and implement image recognition and image classification	Understand,
003	using a pretrained network Learning	Apply, Analyze
CO4	Analyze Different Deep Learning Models in Image Related Projects	Understand,
CO4		Analyze
COF	Design and implement case studies using Convolutional Neural	Understand,
005	Networks	Apply, Analyze

Mapping with	Programme	Outcomes
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			<u> </u>														
C0e		POs													PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
CO1	3	3	3	3	2	-	-	-	-	-	-	3	-	3	3		
CO2	3	3	3	3	2	-	-	-	-	-	-	3	-	3	3		
CO3	3	3	3	3	2	-	-	-	-	-	-	3	-	3	3		
CO4	3	3	3	2	2	-	-	-	-	-	-	3	-	3	3		
CO5	3	3	3	2	2	-	-	-	-	-	-	3	-	3	3		
3-⊦	liah. 2	– Med	dium	. 1 – Low.													

Assessment Pattern

Bloom's	Contin	uous Ass (Mai	sessment ⁻ rks)	Tests	Mo Exami	del nation	End Sem Examination		
Category	Tes	t 1	Tes	st 2	(Ma	rks)	(Marks)		
	Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab	
Remember	20	-	20	-	34	-	34	-	
Understand	40	-	40	-	66	-	66	-	
Apply	-	50	-	50	-	50	-	50	
Analyse	-	50	-	50	-	50	-	50	
Evaluate	-	-	-	-	-	-	-	-	
Create	-	-	-	-	-	-	-	-	
Total	60	100	60	100	100	100	100	100	



Syllabus											
K.S.Rangasamy College of Technology – Autonomous R2022											
		60 CB E5	53– Neural	Networks a	and Deep L	earning					
Somos	tor H	ours / Wee	ek 📃	Total	Credit	Ma	ximum Ma	rks			
Semes	L	Т	Р	Hours	С	CA	ES	Total			
VIII	2	0	2	60	3	50	50	100			
Basics of Neural Networks*											
Basic c	oncept of Neuro	ons – role o	f Neural Ne	tworks - Bu	ilding Block	s of Neural	Network -	[6]			
Optimiz	ers. Activation	Functions.	Loss Fun	ctions. Per	ceptron Ale	gorithm – I	Boltzmann	[0]			
Machin	e and Perceptro	on - Data Pi	e-processir	ng for neura	l networks.						
Introdu	ction to Deep	Learning*									
Feed F	orward Neural	Networks	 Gradient 	Descent -	- Back Pro	pagation A	lgorithm –				
Vanishi	ng Gradient pro	blem – Miti	gation – Re	U Heuristic	s for Avoid	ing Bad Loo	cal Minima	[6]			
– Heuri	stics for Faster	I raining –	Nestors Acc	celerated G	radient Des	scent – Reg	ularization				
– Dropo	out.		L.								
Convo		Networks'									
Role of	Convolutional I			earning Cr	NIN Architec	tures – Cor	icept of	[6]			
Convoi	ution – Pooling	Layers – I	ranster Lea	arning – Ima	age Classifi	ication using	g Transfer				
Learnin	y. Deen Leen	ning Archi	o oturoo								
	CRU Encoder	Decoder Ar	chitectures	Auto enc	odore Co	moression	of footures	[6]			
	uto encoders- S	Standard- S	narse – Dei	– Auto enc noising		Inpression	Ji leatures	[0]			
	ations of Deen	Learning*		noising.							
Image	Segmentation –	Object Det	ection – Aut	omatic Imag	ne Cantionir	na – Image (neneration	[6]			
with Ge	enerative Adver	rsarial Netv	vorks – Vic	leo to Text	with LSTN	/ Models -	- Attention	[•]			
Models	for Computer V	/ision – Cas	se Study: Na	amed Entity	Recognitio	n.	,				
Practic	al:			·····,							
1. Imp	lement Simple	Programs li	ke vector a	ddition in Te	ensorFlow.						
2. Imp	lement a simple	e problem li	ke regressi	on model in	Keras.						
3. Imp	lement Boltzma	ann Machin	es and Perc	ceptrons for	binary den	oising tasks		[30]			
4. Imp	lement a Feed-	Forward Ne	etwork in Te	ensorFlow/K	eras.	U					
5. Imp	ement Feature	Selection f	rom Video a	and Image [Data.						
6. Imp	lement an Imag	ge Classifie	r using CNN	I in TensorF	low/Keras.						
7. Sec	quence Prediction	on with LST	M, GRU, ar	nd Encoder/	Decoder A	rchitectures					
8. Te>	t Generation wi	ith LSTM, G	RU, and Er	ncoder/Deco	oder Archite	ectures.					
9. Der	noising Text with	h LSTM, Gł	RU, and End	coder/Deco	der Archited	ctures.					
10.lm	plement a Simp	le LSTM us	ing TensorF	-low/Keras.							
				Total Hou	rs: (Lectur	e - 30; Prac	ctical - 30)	60			
Text B	ook(s):										
1. la	an Good Fellow	, Yoshua Be	engio, Aaro	n Courville,	"Deep Lear	ning", MIT	Press, 2017				
2. F	rancois Chollet,	, "Deep Lea	rning with F	Python", Ma	nning Publi	cations, 201	8.				
Refere	nce(s):										
1. F	Phil Kim, "Matla ntelligence", Api	ab Deep L ress , 2017.	earning: W	ith Machine	e Learning,	Neural Ne	etworks an	d Artificial			
2. Z	Deep Learning A 2017	Practitione	er's Approac	h Josh Patt	erson and A	Adam Gibso	on O'Reilly N	Media, Inc.			
3. F	Ragav Venkates Press, 2018.	san, Baoxir	i Li, "Convo	olutional Ne	eural Netwo	orks in Visu	al Comput	ing", CRC			
4. N	lavin Kumar Ma	naswi, "De	ep Learning	with Applic	ations Usin	g Python", J	Apress, 201	18.			
* SDG	4 Quality Educ	ation		••			· · ·				



	Tonics	No. of
5. NO.		Hours
1.0	Basics of Neural Networks	Γ
1.1	Basic concept of Neurons - Building Blocks of Neural Network	1
1.2	Optimizers	1
1.3	Activation Functions, Loss Functions.	1
1.4	Perceptron Algorithm	1
1.5	Boltzmann Machine and Perceptron	1
1.6	Data Pre-processing for neural networks	1
2	Introduction to Deep Learning	1
2.1	Feed Forward Neural Networks	1
2.2	Gradient Descent	1
2.3	Back Propagation Algorithm	1
2.4	Vanishing Gradient problem – Mitigation	1
2.5	ReIU Heuristics for Avoiding Bad Local Minima	1
2.6	Gradient Descent – Regularization – Dropout	1
3	Convolutional Neural Networks	
3.1	Role of Convolutional Networks in Machine Learning	1
3.2	CNN Architectures	1
3.3	Concept of Convolution	1
3.4	Pooling Layers	1
3.5	Transfer Learning	1
3.6	Image Classification using Transfer Learning	1
4	Steering, Brakes and Suspension Systems	
4.1	More Deep Learning Architectures	1
4.2	LSTM	1
4.3	GRU	1
4.4	Encoder/Decoder Architectures, Auto encoders	1
4.5	Compression of features using Auto encoders	1
4.6	Standard- Sparse – Denoising	1
5	Applications Of Deep Learning	-
5.1	Image Segmentation – Object Detection	1
5.2	Automatic Image Captioning	1
5.3	Image generation with Generative Adversarial Networks	1
5.4	Video to Text with LSTM Models	1
5.5	Attention Models for Computer Vision	1
5.6	Case Study: Named Entity Recognition	1
Practical	:	
1.	Implement Simple Programs like vector addition in TensorFlow.	3
2.	Implement a simple problem like regression model in Keras.	3
3.	Implement Boltzmann Machines and Perceptrons for binary denoising tasks	3
4.	Implement a Feed-Forward Network in TensorFlow/Keras	3
5.	Implement Feature Selection from Video and Image Data	3

6.	Implement an Image Classifier using CNN in TensorFlow/Keras	3
7.	Sequence Prediction with LSTM, GRU, and Encoder/Decoder Architectures	3
8.	Text Generation with LSTM, GRU, and Encoder/Decoder Architectures	3
9.	Denoising Text with LSTM, GRU, and Encoder/Decoder Architectures	3
10.	Implement a Simple LSTM using TensorFlow/Keras.	3

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	Social Text and Media	Category	L	Т	Ρ	Credit
00 CB E34	Analytics	PE	2	0	2	3

- · To understand the basic issues and types of social, text and media mining
- Familiarize the learners with the concept of social, text and media analytics and understand its significance
- Familiarize the learners with the tools of social, text and media analytics
- Enable the learners to develop skills required for analyzing the effectiveness of social, text and media for business purposes
- To know the applications in real time systems

Pre-requisites

• Data Science, Natural Language Processing, Network Analysis

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Understand about social, text and media mining	Understand
CO2	Understand the significance of social text and media analytics.	Understand
CO3	Learn tools of social, text and media analytics.	Apply
CO4	Develop skills required for analyzing the effectiveness of social text and media for business purposes	Apply
CO5	Know the applications in real time systems.	Understand

Mapping with Programme Outcomes

C0e		POs PSOs												
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	2	-	-	2	-	-	-	-	-	-	-	2	1
CO2	3	2	1	2	2	-	-	-	-	-	-	-	2	1
CO3	3	3	2	-	1	-	-	-	-	-	-	-	2	1
CO4	3	2	2	2	3	-	-	-			-	-	2	2
CO5	3	1	1	1	3	-	-	-	-	-		-	2	2
3 - St	rong; 2	2 - Mec	lium; 1	- Som	e									

Assessment Pattern

Bloom's	Contii	nuous As: (Ma	sessment rks)	Tests	Mo Exami	del nation	End Sem Examination		
Category	Tes	st 1	Test 2		(Ma	rks)	(Marks)		
	Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab	
Remember	20	-	20	-	34	-	34	-	
Understand	40	50	-	50	66	50	66	50	
Apply	-	50	40	50	-	50	-	50	
Analyse	-	-	-	-	-	-	-	-	
Evaluate	-	-	-	-	-	-	-	-	
Create	-	-	-	-	-	-	-	-	
Total	60	100	60	100	100	100	100	100	



Syllabus										
	K.S.F	Rangasam	y College o	of Technolo	gy – Autor	omous R2	2022			
		B.Tech – C	Computer S	Science and	d Business	Systems				
		60 CB	E54 - Socia	al Text and	Media Ana	lytics				
Semester	н	ours / Wee	ek	Total	Credit	Ма	ximum Ma	rks		
Ochicater	L	Т	P	Hours	C	CA	ES	Total		
VIII 2 0 2 60 3 50 50										
Introductio	on to Socia	l Media An	alysis*							
Network Fu	Indamentals	s and Mode	els: The Soc	cial Network	s Perspect	ve - Nodes	, Ties and	[6]		
Influencers	- Social Ne	etwork and	Web Data	and Metho	ds. Graphs	and Matric	es - Basic	[0]		
measures f	or Individua	Is and Netv	vorks.							
Overview of	of Text Min	ing*					_			
Definition -	General Arc	chitecture –	Algorithms	- Core Ope	rations – Pr	e-processir	ng – Types	[6]		
of Problem	s. Basics o	of Documer	t Classifica	ition - Infor	mation Reti	ieval, Clus	tering and	[-]		
Organizing	Documents	s - Informati	on Extractio	on - Predicti	on and Eva	uation.				
l ext Minin	g for Inform	nation Ret	rieval and I	nformation	Extraction)* 				
Information	Retrieval a	and lext M	ining - Key	word Searc	n - Neares	t-ineignbor	Methods -	[0]		
Inverted Lis	sts. Informa	ation Extrac	Ction: Archi	ecture - Co	D-reference	- Named	Entity and	[6]		
Relation Ex	tion Influe	Dalabase (1. Text Sur	nmanzation	rechnique	es - ropic			
Kepresenta			lext - muica	itor Represe	entations.					
Click Stroop		A/R Tostin	a Onlina S			and Indovir	a Notural	[6]		
	Processing		y - Onine 3	ovt Analysis	Clawing		ig. Naturai	[0]		
Marketing	Pesearch 8	R Trends in	Market *	EXT Analysis).					
	Paramet	are Domo		Analyzina		ence - R	each and			
Engageme	n, Faramer Analysis	- Post-no	rformance	on FR So	raye Auu cial campa	iane: Meas	each and	[6]		
	Social Car	- Fusi-pe	Defining G	oals and F	valuatina (Nutcomes		[0]		
Analyzing		iipaigiis -	Denning O		valuating v	Jucomes				
Practical:										
1. Pre-pro	cessing tex	t document	using NLT	K of Pvthon						
a. Stop-w	ord eliminat	ion	. doing 1121	it of Fyulton						
b. Stemm	ina									
2. Pre-pro	cessina tex	t document	usina NLT	K of Pvthon						
a. Lemma	tization		5	-)						
b. POS ta	aaina									
c. Lexical	analysis									
3. Extract	on-based s	ummarizati	on using LS	SA Algorithm	າ.					
4. Sentime	ent analysis	s on custom	er review o	n products						
5. Web ar	alytics							[30]		
a. Web us	age data (v	veb server	log data, cli	ckstream ar	nalysis)					
b. Hyperli	nk data									
6. Use Go	ogle analyt	ics tools to	implement	the following	3					
a. Conver	sion Statisti	ics								
b. Visitor I	Profiles									
7. Use Go	ogle analyt	ics tools to	implement	the Traffic S	Sources					
8. Search engine optimization - implement spamdexing										
9. SEO and Search Engine Marketing using Google Adwords Keyword Planner										
10. RFM (Recency, Frequency and Monetary) Analysis using Excel and Google Analytics.										
I ools used	I: Python N	ILIK, GOO	gleAdword	s, Google A	Analytics, N	IS Excel				
Taxt Deal	(a).			i otal Hou	rs: (Lectur	e - 30; Prac	ctical - 30)	60		
	S):		India Arral	hino" M-O		1		L		
1. IVIAIS	I C Arron	Nol Charry	ieula Analyi	IICS, IVICGI'S	w ⊓III, 2017	inger: 0040)			
2. Charl	LC. Aggarw	vai, Uneng/	Nang Zhai,	winning rex	i Data , Spi	inger; 2012	<u>.</u>			
Reference)	Andreasta	Kabirlan "	Decial Mart	المعاملات	. Taskali	الحدم ممر	alabta fa		
1. Matth	iew Ganis,	Avinash	∧onirkar, "S	Social Med	ia Analytics	s: i ecnniqi	ues and In	signts for		





	Extracting Business Value Out of Social Media", Pearson, 2016.
2.	Jim Sterne, "Social Media Metrics: How to Measure and Optimize Your Marketing Investment", Wiley, 2010.
3.	Oliver Blanchard,"Social Media ROI: Managing and Measuring Social Media Efforts in Your
	Organization", Que Biz-Tech, 2019.
4	Sholom Weiss, Nitin Indurkhya, Tong Zhang, Fred Damerau, "The Text Mining Handbook:

4. Advanced Approaches in Analyzing Unstructured Data", Springer, 2010. *SDG 4 – Quality Education

Course Contents and Lecture Schedule

S. No.	Topics						
1.0	Introduction to Social Media Analysis						
1.1	The Social Networks Perspective - Nodes, Ties and Influencers	1					
1.2	Social Network and Web Data and Methods	2					
1.3	Graphs and Matrices	2					
1.4	Basic measures for Individuals and Networks	1					
2.0	Overview of Text Mining	·					
2.1	Overview of Text Mining: Definition - General Architecture, Algorithms	1					
2.2	Core Operations, Pre-processing, Types of Problems	2					
2.3	Basics of Document Classification, Information Retrieval	1					
2.4	Clustering and Organizing Documents	1					
2.5	Information Extraction - Prediction and Evaluation	1					
3.0	Text Mining for Information Retrieval and Information Extraction						
3.1	Keyword Search, Nearest-Neighbour Methods	1					
3.2	Inverted Lists. Information Extraction, Architecture	1					
3.3	Database Construction, Text Summarization Techniques	2					
3.4	Topic Representation	1					
3.5	Influence of Context, Indicator Representations	1					
4.0	Web Analytics Tools						
4.1	Click Stream Analysis	1					
4.2	A/B Testing , Online Surveys	1					
4.3	Web Crawling and Indexing	1					
4.4	Natural Language Processing Techniques for Micro-text Analysis	3					
5.0	Marketing Research & Trends in Market						
5.1	Introduction, Parameters, Demographics. Analyzing Page Audience	1					
5.2	Reach and Engagement Analysis - Post-performance on FB	1.5					
5.3	Social campaigns - Measuring and Analyzing Social Campaigns	1.5					
5.4	Defining Goals and Evaluating Outcomes - Network Analysis.	2					
Practical		·					
1.	Pre-processing text document using NLTK of Python a. Stop-word elimination b. Stemming	3					
2.	Pre-processing text document using NLTK of Python a. Lemmatization b. POS tagging	4					



	c. Lexical analysis	
3.	Extraction-based summarization using LSA Algorithm.	2
4.	Sentiment analysis on customer review on products	4
5.	Web analytics a. Web usage data (web server log data, clickstream analysis) b. Hyperlink data	4
6.	Use Google analytics tools to implement the following a. Conversion Statistics b. Visitor Profiles	2
7.	Use Google analytics tools to implement the Traffic Sources	2
8.	Search engine optimization - implement spamdexing	3
9.	SEO and Search Engine Marketing using Google Adwords Keyword Planner	3
10.	RFM (Recency, Frequency and Monetary) Analysis using Excel and Google Analytics.	3

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60 CB E55	Computer Vision	Category	L	Т	Ρ	Credit
60 CB E35	Computer vision	PE	2	0	2	3

- To understand the fundamental concepts related to Image formation and processing
- To learn feature detection, matching and detection
- To become familiar with feature failure based alignment and motion estimation
- To develop skills on 3D reconstruction
- To understand image based rendering and recognition

Pre-requisites

• Basic knowledge of Maths, Image Processing, Programming, Machine Learning, Deep Learning

Course Outcomes

On the suc	On the successful completion of the course, students will be able to								
CO1	Understand basic knowledge, theories and methods in image processing and computer vision.	Understanding							
CO2	Implement basic and some advanced image processing techniques in OpenCV.	Apply							
CO3	Apply 2D a feature-based based image alignment, segmentation and motion estimations.	Apply							
CO4	Apply 3D image reconstruction techniques	Apply							
CO5	Design and develop innovative image processing and computer vision applications.	Apply							

Mapping with Programme Outcomes

<u> </u>		POs													PSOs		
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
CO1	3	1	1	1	1	-	-	-	-	1	2	2	1	1	3		
CO2	3	2	3	2	3	-	-	-	-	1	2	2	1	1	3		
CO3	3	2	3	2	3	-	-	-	-	1	2	2	1	1	3		
CO4	3	2	3	2	3	-	-	-	-	1	2	2	2	1	3		
CO5	3	2	3	2	2	-	-	-	-	1	2	2	2	1	3		
3 - St	3 - Strong; 2 - Medium; 1 - Low																

Assessment Pattern

Bloom's	Contii	nuous As: (Ma	sessment rks)	Tests	Mo Exami	del nation	End Sem Examination		
Category	Tes	st 1	Test 2		(Ma	rks)	(Marks)		
	Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab	
Remember	20	-	20	-	34	-	34	-	
Understand	-	-	-	-	-	-	-	-	
Apply	40	50	40	50	66	50	66	50	
Analyse	-	50	-	50	-	50	-	50	
Evaluate	-	-	-	-	-	-	-	-	
Create	-	-	-	-	-	-	-	-	
Total	60	100	60	100	100	100	100	100	



Syllabus									
K.S.Rangasamy College of Technology – Autonomous R2022									
B.Tech – Computer Science and Business Systems									
			60 CB E5	5– Compute	er Vision				
Somostor	Н	ours / Wee	k	Total	Credit	Ma	ximum Marks	S	
Semester	L	Т	Р	Hours	С	CA	ES	Total	
VIII	2	0	2	60	3	50	50	100	
Introduction to Image Formation and Processing*									
Computer Vision - Geometric primitives and transformations - Photometric image formation -									
The digital camera - Point operators - Linear filtering - More neighborhood operators - Fourier									
transforms	- Pyramids	and wavele	ts - Geome	tric transfor	mations - G	lobal optim	ization.		
Feature D	etection, Ma	atching and	d Segment	ation*					
Points and	patches - Ee	dges - Lines	- Segment	ation - Activ	e contours -	 Split and n 	nerge - Mean	[6]	
shift and m	ode finding	 Normalize 	d cuts - Gra	aph cuts an	d energy-ba	ised metho	ds.		
Feature-B	ased Alignr	nent & Mot	ion Estima	ation*					
2D and 3I	D feature-ba	ased alignm	ent - Pose	e estimation	- Geometi	ric intrinsic	calibration -		
Triangulati	on - Two-fr	ame struct	ure from n	notion - Fa	ctorization	- Bundle a	adjustment -	[6]	
Constraine	ed structure	and motior	 Translat 	tional alignr	nent - Para	metric mot	ion - Spline-		
based mot	ion - Optical	flow - Laye	red motion.						
3D Recon	struction*								
Shape fror	n X - Active	range findin	g - Surface	representat	tions - Point	-based rep	resentations-	[6]	
Volumetric	representa	tions - Moo	lel-based r	econstructio	on - Recove	ering textur	e maps and	[0]	
albedosos									
Image-Ba	sed Render	ing and Re	cognition*						
View interp	olation Laye	ered depth i	mages - Lig	pht fields and	d Lumigrapł	ns - Enviror	ment mattes		
- Video-ba	ased render	ing - Objec	t detection	ı - Face re	ecognition -	Instance	recognition -	[6]	
Category r	ecognition -	Context ar	id scene ur	nderstanding	g - Recogni	tion databa	ses and test		
sets.									
Practical:									
1.Open C	/ installation	and Workir	ig with Pyth	ion		T I			
2. Basic I	mage Proce	essing - loa	iding image	es, Cropping	g, Resizing,	, I nresnoid	ing, Contour		
	S, DOID dele	Clion Drowing lin	oo toxt oirc	la rootanal	o ollingo or	imagaa			
3. Image P		Drawing in	es, lext circ	bout	e, empse or	images			
4. Image s		rusing Grap	alianmont			or phace			
5. Implem	ent intage i a Alian two i	images that	have unde	raone trans	lational mot	ion		[20]	
6 Implem	ent R-soline	or cubic soli	ne internol:	ation to mod	lel and smo	oth the moti	on of feature	[30]	
noints o	ver time in a	or cubic spir	of images						
7 3D Rec	onstruction -	- Creating F	enth man f	rom stereo	images				
8. Object I	Detection an	d Tracking	using Kalma	an Filter. Ca	amshift.				
9 Implem	ent real-time	object dete	ction using	the YOLO	algorithm				
10 Genera	ate intermedi	iate views b	etween two	images usi	ing interpola	ation techni	ques		
Tools: Pv	thon. OpenC	CV		in age a			4.001		
	- ,			Total H	ours: (Lect	ure - 30: P	ractical - 30)	60	
Text Book	(s):				,	,	,		
, Rich	ard Szeliski.	"Computer	Vision: Alc	orithms and	d Applicatio	ns". Spring	er- Texts in Co	omputer	
1. Scie	nce, Second	Edition, 20	22.	,		, I 3			
2. E.R	. Davies, Co	mputer and	Machine V	ision, Fourt	h Edition, A	cademic Pr	ess, 2012.		
Reference	e(s):)		, -		
Corr	puter Visior	n: A Moderr	Approach	, D. A. For	syth, J. Por	ice, Pearso	n Education.	Second	
^{1.} Editi	on, 2015.		11.20.00	,	, , <u>, ,</u>	-,	· · · · · · · · · · · · · · · · · · ·		
2. Chri	stopher M. E	Bishop: Patt	ern Recoar	ition and M	achine Lear	ning, Sprin	ger, 2006		
Rich	ard Hartlev	and Andrew	v Zisserma	n, Multiple V	view Geom	etry in Com	puter Vision.	Second	
3. Editi	on, Cambrid	lge Universi	ty Press, M	larch 2004.		-	. ,		


4. https://opencv.org/opencv-free-course/ *SDG 4 – Quality Education

S. No.	Topics	No. of Hours
1	Introduction to Image Formation and Processing	
1.1	Computer Vision	1
1.2	Geometric primitives and transformations - Photometric image formation	1
1.3	The digital camera - Point operators	1
1.4	Linear filtering - More neighborhood operators	1
1.5	Fourier transforms - Pyramids and wavelets	1
1.6	Geometric transformations - Global optimization.	1
2	Feature Detection, Matching and Segmentation	·
2.1	Points and patches	1
2.2	Edges - Lines	1
2.3	Segmentation -Active contours	1
2.4	Split and merge	1
2.5	Mean shift and mode finding - Normalized cuts	1
2.6	Graph cuts and energy-based methods.	1
3	Feature-Based Alignment & Motion Estimation	•
3.1	2D and 3D feature-based alignment - Pose estimation	1
3.2	Geometric intrinsic calibration - Triangulation - Two-frame structure from motion	1
3.3	Factorization - Bundle adjustment	1
3.4	Constrained structure and motion - Translational alignment	1
3.5	Parametric motion - Spline-based motion	1
3.6	Optical flow - Layered motion.	1
4	3D Reconstruction	
4.1	Shape from X	1
4.2	Active rangefinding	1
4.3	Surface representations	1
4.4	Point-based representations	1
4.5	Volumetric representations - Model-based reconstruction	1
4.6	Recovering texture maps and albedosos	1
5	Image-Based Rendering and Recognition	·
5.1	View interpolation Layered depth images	1
5.2	Light fields and Lumigraphs - Environment mattes	1
5.3	Video-based rendering-Object detection	1
5.4	Face recognition - Instance recognition	1
5.5	Category recognition - Context and scene understanding	1
5.6	Recognition databases and test sets	1



Practical		
1.	OpenCV Installation and working with Python	2
2.	Basic Image Processing - loading images, Cropping, Resizing, Thresholding, Contour analysis, Bolb detection	4
3.	Image Annotation – Drawing lines, text circle, rectangle, ellipse on images	4
4.	Image segmentation using Graphcut / Grabcut.	2
5.	3D Reconstruction – Creating Depth map from stereo images.	2
6.	Object Detection and Tracking using Kalman Filter, Camshift	4
7.	3D Reconstruction – Creating Depth map from stereo images	3
8.	Object Detection and Tracking using Kalman Filter, Camshift	3
9.	Implement real-time object detection using the YOLO algorithm	3
10.	Generate intermediate views between two images using interpolation techniques	3

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	Business Analytics	Category	L	Т	Ρ	Credit
00 CB E30	Business Analytics	PE	2	0	2	3

Objectives

- To understand the Analytics Life Cycle
- To comprehend the process of acquiring Business Intelligence
- To understand various types of analytics for Business Forecasting
- To model the supply chain management for Analytics
- To apply analytics for different functions of a business

Pre-requisites

• R and Python Programming

Course Outcomes

On the suc	On the successful completion of the course, students will be able to									
CO1	Explain the real world business problems and model with analytical solutions.	Remember								
CO2	Identify the business processes for extracting Business Intelligence.	Understand								
CO3	Apply predictive analytics for business fore-casting.	Apply								
CO4	Apply analytics for supply chain and logistics management.	Apply								
CO5	Use analytics for marketing and sales.	Analyse								

Mapping with Programme Outcomes

COs		POs													PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
CO1	3	2	3	1	1	3	-	-	-	-	1	1	1	2	-		
CO2	3	2	3	1	1	3	-	-	-	-	2	2	1	2	-		
CO3	3	2	3	1	1	3	-	-	-	-	2	2	1	1	-		
CO4	3	2	3	1	1	3	-	-	-	-	2	1	1	1	-		
CO5	3	2	3	1	1	3	-	-	-	-	1	2	1	1	-		

3 - Strong; 2 - Medium; 1 - Some

Assessment Pattern

Bloom's	Contii	nuous As (Ma	sessment rks)	Tests	Mo Exami	del nation	End Sem Examination		
Category	Tes	st 1	Tes	st 2	(Ma	rks)	(Marks)		
	Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab	
Remember	30	-	-	-	10	-	10	-	
Understand	30	-	-	-	25	-	25	-	
Apply	-	50	40	50	65	50	65	50	
Analyse	-	50	20	50	-	50	-	50	
Evaluate	-	-	-	-	-	-	-	-	
Create	-	-	-	-	-	-	-	-	
Total	60	100	60	100	100	100	100	100	



Syllab	bus										
K.S.Rangasamy College of Technology – Autonomous R2022											
			B.Tech	- Comput	ter Science	and Busir	iess Systei	ns			
				60 CB E	E56 – Busir	ness Analy	tics				
Somo	stor	Н	ours / Wee	k	Total	Credit		Maximum Marks			
Seme	Slei	L	Т	Р	Hours	С	CA	ES	Total		
VI	II	2	0	2	60	3	50	50	100		
Introc	ductio	n to Busin	ess Analyti	ics*							
Analy	tics ar	nd Data Sc	ience – Ana	alytics Life	Cycle – Ty	pes of Ana	lytics – Dat	a Analysis-Microsoft	[6]		
EXCE	EL - Po	wer BI-Bus	siness Intelli	gence (BI)-	• Power BI [Desktop (Po	wer Query,	Power Pivot, Power	[0]		
View)	- Pow	er BI Servic	e -Data Col	lection – D	ata Prepara	tion – Mode	eling.				
Busin	ness l	ntelligence	*				<i>.</i>				
Data	Wareh	ouses and	Data Mart -	Knowledge	e Managem	ent – Types	of Decision	ns - Decision Making	[6]		
Proce	ess - D	ecision Sup	port Syster	ns – Busine	ess Intellige	nce –OLAP					
Busin	ness F	orecasting	J*						101		
Introd	uction	to Busines	s Forecastir	ng and Pred	dictive analy	tics - Logic	and Data L	Priven Models – Data	[6]		
IVIINING	g and	Predictive A	Analysis Ivio	deling –ivia	chine Learr	ning for Pred	dictive analy	/tics.			
HR &	Supp	Iy Chain A	nalytics"				1		[0]		
Huma	in Res	Sources – P	ianning and	Recruitme	nt – Trainin	g and Deve		Supply chain network	[0]		
- Plan	ning L		ventory and	Supply –A	narytics app	lications in	πκ α συρρ	iy Chain.			
Morke		& Sales An	arytics	iv Custom	or Pohovia		Dragona	Soloo Dianning	[6]		
	tion or	Siralegy, iv	narketing w	ix, Custon	ier benavid	bur -seiling	Process -	- Sales Planning -	[o]		
Bract	iics ap	plications i	n marketing	and Sales	•						
1 Dot		rogetion on	d Statistical	functionali	Toblogu						
2 Dro	a Ayyı dict th	e Customer	r Crodit Risk	for Credit	r rabieau.	et usina Lin	oar Roaros	sion			
3 Pre	dict h		based on v	arious featu	ires such a	s square for	tage numb	or of bedrooms and			
	ation i	using linear	rearession	anous reall		s square roc	lage, nume	ci oi bearooniis, ana			
4 Pre	adict c	ustomer ch	urn based o	on various o	customer at	tributes usi	ng classific	ation algorithms and			
cor	npare	their perfor	mance.				ng claccine	adon algonanio ana			
5. Pre	edict s	ales based	on various f	eatures us	ina rearessi	on models a	and compar	e their performance.	[30]		
6. Apr	ply HF	R Analytics	to make a	prediction	of the dem	and for hou	irly-employe	ees for the following	[00]		
mo	onth or	for the nex	t few years.				, , ,	J			
7. Ap	ply HF	R Analytics t	to make a p	rediction of	the deman	d for hourly	employees	for a year.			
8. Do	predic	ctive analyti	ics for custo	mers' beha	viour in ma	rketing and	sales.				
9. Ap	ply an	alytics for fo	precasting a	nd inventor	ry planning	for a large r	etailer.				
10. Pe	erform	predictive a	analytics for	customers	behaviour	in marketin	g and sales	j.			
Tools	s used	: Pandas, I	Matplotlib, S	Scikit - learr	n						
			-			Total Hours	s: (Lecture	- 30; Practical - 30)	60		
Text I	Book(s):									
1.	Maha	devan B, "C	Operations N	/lanagemei	nt -Theory a	ind Practice	",3rd Editio	n, Pearson Education,	2018.		
2. Philip Kotler and Kevin Keller, "Marketing Management", 15th edition, PHI, 2016.											
Reference(s):											
1.	VSP	RAO, "Hum	an Resourc	e Manager	nent", 3rd E	dition, Exce	el Books, 20)10.			
2.	R. Ev	ans James	, "Business	Analytics",	2017						
3.	RNF	Prasad, See	ma Acharya	a, "Fundam	entals of Bu	usiness Ana	alytics", 201	6.			
4	https:	//www.uder	ny.com/cou	rse/the-bus	siness-intelli	gence-anal	<u>yst-course</u>				
4.	2018/	?couponCo	de=LEADE	RSALE24E	3						

*SDG 4 – Quality Education



S. No.	Topics	No. of Hours
1	Introduction to Business Analytics	neuro
1.1	Analytics and Data Science	1
1.2	Analytics Life Cycle	1
1.3	Types of Analytics	1
1.4	Business Problem Definition	1
1.5	Data Collection	1
1.6	Data Preparation – Modeling	1
2	Business Intelligence	
2.1	Data Warehouses and Data Mart	1
2.2	Knowledge Management	1
2.3	Types of Decisions	1
2.4	Decision Making Process	1
2.5	Decision Support Systems	1
2.6	Business Intelligence –OLAP	1
3	Business Forecasting	÷
3.1	Introduction to Business Forecasting and Predictive analytics	1
3.2	Logic Models	1
3.3	Data Driven Models	1
3.4	Data Mining	1
3.5	Predictive Analysis Modeling	1
3.6	Machine Learning for Predictive analytics	1
4	HR & Supply Chain Analytics	
4.1	Human Resources	1
4.2	Planning and Recruitment	1
4.3	Training and Development	1
4.4	Supply chain network	1
4.5	Planning Demand, Inventory and Supply	1
4.6	Analytics applications in HR & Supply Chain	1
5	Marketing & Sales Analytics	
5.1	Marketing Strategy	1
5.2	Marketing Mix	1
5.3	Customer Behaviour	1
5.4	Selling Process	1
5.5	Sales Planning	1
5.6	Analytics applications in Marketing and Sales	1
Practical	:	
1.	Implement Machine learning techniques for Predictive analytics.	2
2.	Predict the Customer Credit Risk for Credit card data-set using Linear Regression.	4
3.	Predict house prices based on various features such as square footage, number of bedrooms, and location using linear regression.	4

4.	Predict customer churn based on various customer attributes using classification algorithms and compare their performance.	2
5.	Predict sales based on various features using regression models and compare their performance.	2
6.	Apply HR Analytics to make a prediction of the demand for hourly-employees for the following month or for the next few years.	4
7.	Apply HR Analytics to make a prediction of the demand for hourly employees for a year.	2
8.	Do predictive analytics for customers' behaviour in marketing and sales.	4
9.	Apply analytics for forecasting and inventory planning for a large retailer.	4
10.	Perform predictive analytics for customers' behaviour in marketing and sales.	2

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Open Elective

60 CB 01	C# and.NET	Category	L	Т	Ρ	Credit
OC CB LUI	Programming	PC	3	0	0	3

Objectives

- To gain the fundamental skills in C# programming Language
- To understand object-oriented concepts in C#
- To develop cross-platform web-pages using ASP.NET Core platform
- To implement data access and manipulation using EF Core and Razor pages
- To develop cross-platform web-apps using MVC architecture in ASP.NET Core platform

Pre-requisites

• Basic knowledge of C or C++ or any programming language or programming fundamentals.

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Know the basic programming concepts of C#	Remember
CO2	Understand the Object-Oriented concepts in C#.	Understand
CO3	Develop cross-platform web pages using Razor pages in ASP.NET Core platform.	Apply
CO4	Implement the data manipulation concept using EF Core and Razor Pages.	Apply
CO5	Implement the MVC based web-apps using ASP.NET Core platform.	Apply

Mapping with Programme Outcomes

COs		POs												
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	1	-	3	2	2	1	-	1	3	-	-	1	3	-
CO2	2	-	3	2	2	1	-	1	3	-	-	1	3	-
CO3	2	-	3	2	2	1	-	1	3	-	-	1	3	-
CO4	2	-	3	2	3	1	-	1	3	-	-	1	3	-
CO5	2	-	3	2	3	1	-	1	3	-	-	1	3	-
2 04	ropar		1	Sam										

3 - Strong; 2 - Medium; 1 - Some

Assessment Pattern

Bloom's Category	Continuous Ass (Ma 1	sessment Tests rks) 2	_ End Sem Examination (Marks)				
Remember	15	10	20				
Understand	25	20	45				
Apply	20	30	35				
Analyse	-	-	-				
Evaluate	-	-	-				
Create	-	-	-				
Total	60	60	100				



Syllabus	;										
K.S.Rangasamy College of Technology – Autonomous R2022											
B.Tech – Computer Science and Business Systems											
60 CB L01- C# and.NET Programming											
Somosta	r H	lours/Weel	ĸ	Total	Credit	Ma	ximum Ma	rks			
Jemesia		Т	Р	Hours	С	CA	CA ES				
IV	3	0	0	45	3	40	60	100			
Introduc	tion to C# **										
Introduci	ng C# - Over	view of C#	- Literals,	Variables a	nd Data Ty	/pes - Ope	rators and	101			
Expressi	ons - Branch	ing and Lo	oping - Me	ethods - Ar	rays - Strir	ngs - Struc	ctures and	[0]			
Enumera	tions.										
Object C	riented Aspe	ects of C# *	*								
Classes	and Objects -	Inheritance	and Polym	orphism - li	nterfaces -	Operator O	verloading	[9]			
- Delega	es and Event	s - Errors ar	nd Exceptio	ns Collec	tions – Man	aging Files	ystem.				
ASP.NE	Core Web A	Application	using Raz	or Pages: *	_						
Introduct	ion to ASP.NI	ET Core We	eb Applicati	on – Enviro	nment Setu	up – Projec	t Layout –	[9]			
Static an	d Default File	s - Enabling	g and Defin	ing Razor F	Pages – Sha	ared Layou	ts – Using	[0]			
code-bel	hind files.										
Using E	ntity Framew	ork Core: *	*	.	5 4 1						
Setting u	p EF Core: De	efining and E		Core model	s - Defining	the entity a	nd context	[0]			
classes	Manipulating		- Core - I	ransactions	s. Manipulat	ling data us	sing Razor	[9]			
pages: C	nGet –OnPos	st – OnPostl	Jelete – Or	PostEdit –	OnPostViev	W. REST A	- IVIOdel				
and Con	roller for RES			D = == = *							
INIOGEI-V			ASP.NEI		AVC Mahai		Douting				
Controlle	ro and Action	- Setting up					Routing –	[9]			
Validatio			views – P	alameters	Passing – V						
valluatio	1.					То	tal Hours	45			
Toxt Bo	ok(e):					10	lai nours.	40			
	ork I Price "(*# 8 0 and 1		Nodor	n Cross-Pla	tform Deve	lonment" 1	th Edition			
1. Pa	ckt Publishing	Limited, 20	19.				iopinent, 4	ur Euluon,			
2. Dino Esposito, "Programming ASP.NET Core", 1st Edition, Pearson Education Inc., 2018.											
Reference(s):											
1. E.	Balagurusam	y, "Program	ming in C#'	', 4th Editior	n, Tata McG	Graw-Hill, 20	017.				
₂ An	Andrew Troelsen Phil Japikse, "Pro C# 8 with .NET Core 3: Foundational Principles and							iples and			
2. Practices in Programming", Apress, 2020.											
3. Jo	n Skeet, "C# i	n Depth",Fo	urth Edition	i, Manning F	Publications	Co. 2019.					
4. Ch	ristian Nagel,	"Profession	al C# 7 and	I.NET Core	e 2.0", 1st E	dition, Wile	y Publicatio	n, 2018.			
*SDG 9 -	*SDG 9 – Industry Innovation and Infrastructure										

**SDG 4 – Quality Education



Course Contents and Lecture Schedule								
S. No.	Topics	No. of hours						
1.0	Introduction to C#							
1.1	Introducing C# - Overview of C# - Literals, Variables	1						
1.2	Data Types, Operators and Expressions	1						
1.3	Branching and Looping	3						
1.4	Methods - Arrays - Strings	3						
1.5	Structures and Enumerations	1						
2.0	Object Oriented Aspects of C#							
2.1	Classes and Objects	1						
2.2	Inheritance and Polymorphism	2						
2.3	Interfaces, Operator Overloading							
2.4	Delegates and Events Errors and Exceptions	2						
2.5	Collections, Managing File system	2						
3.0	ASP.NET Core Web Application using Razor Pages:							
3.1	Introduction to ASP.NET Core Web Application	1						
3.2	Environment Setup , Project Layout	1						
3.3	Static and Default Files	1						
3.4	Enabling and Defining Razor Pages	1						
3.5	Shared Layouts	2						
3.6	Using code-behind files	3						
4.0	Using Entity Framework Core:							
4.1	Defining and Building EF Core models	1						
4.2	Defining the entity and context classes	2						
4.2	Manipulating data with EF Core - Transactions	3						
4.3	OnGet –OnPost – OnPostDelete – OnPostEdit – OnPostView	1						
4.4	REST API – Model and Controller for REST API	3						
5.0	Model-View-Controller (MVC) in ASP.NET Core:							
5.1	Introduction to MVC	.5						
5.2	Setting up an ASP.NET Core MVC Website	.5						
5.3	MVC Routing	1						
5.4	Controllers and Actions	2						
5.5	Model – Views	1						
5.6	Parameters Passing	1.5						
5.7	View Helpers	1.5						
5.8	Model Validation	1						

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60 CB L02	Automation Testing	Category	L	Т	Ρ	Credit
	Tools	OE	3	0	0	3

Objectives

- To understand the basics of software testing and test planning
- To build test cases and execute them
- To focus on automation testing using selenium
- To automate the testing using TestNG
- To get an insight about test automation using Cucumber

Pre-requisites

• Basic knowledge of programming languages

Course Outcomes

On the successful completion of the course, students will be able to

CO1	Understand the basic concepts of software testing and test planning.	Understand
CO2	Design effective test cases that can uncover critical defects in the application.	Apply
CO3	Automate the software testing using Selenium.	Analyse
CO4	Automate the software testing using TestNG.	Analyse
CO5	Automate the software testing using Cucumber.	Analyse

Mapping with Programme Outcomes

<u> </u>	POs										PSOs				
COS	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	3	1	1	-	-	-	-	-	-	-	-	1	-	2
CO2	2	2	1	2	2	2	-	-	-	-	-	-	1	-	2
CO3	2	2	2	1	3	2	-	-	-	-	-	-	-	2	2
CO4	1	2	1	1	-	-	-	-	-	-	-	-	1	-	1
CO5	1	1	1	2	-	-	-	-	-	-	-	-	-	2	1
3 - St	3 - Strong: 2 - Medium: 1 - Some														

Assessment Pattern

Bloom's	Continuous As: (Ma	sessment Tests rks)	End Sem Examination (Marks)			
Calegory	1	2				
Remember	-	-	-			
Understand	20	20	40			
Apply	40	-	30			
Analyse	-	40	30			
Evaluate	-	-	-			
Create	-	-	-			
Total	60	60	100			



Syllabus									
	K.S.Rangasamy College of Technology – Autonomous R2022								
B.Tech – Computer Science and Business Systems									
60 CB L02- Automation Testing Tools									
Semester	ŀ	lours/Weel	٢	Total	Credit	Ma	iximum Ma	rks	
Centester	L	Т	Р	Hours	С	CA	ES	Total	
V	3	0	0	45	3	40	60	100	
Introducti	on to Softw	are Testing	and Test	Planning*					
Why do w	e test Softw	are?, Black	-Box Testir	ng and Whit	e-Box Test	ing, Softwa	re Testing		
Life Cycle, v-model of Software Testing, Program Correctness and Verification, Kellability									
Inspections Stages of Testing: Unit Testing Integration Testing System Testing							[9]		
Performance Testing The Goal of Test Planning High Level Expectations, Integration									
Responsib	ilities Tes	t Phases	Test Str	rategy Re	source Re	ectations,	s Tester		
Assignme	nts. Test Sch	nedule. Test	Cases, Bu	a Reporting	. Metrics ar	nd Statistics	6, 100tor		
Test Desi	an and Exe	cution *		9					
Test Obje	ctive Identifi	cation, Test	Design Fa	actors, Req	uirement ic	lentification	, Testable		
Requireme	ents, Modelir	ng a Test De	esign Proce	ess, Modelir	ng Test Res	ults, Bound	dary Value	[0]	
Testing, E	quivalence	Class Test	ing, Path	Testing, D	ata Flow T	Testing, Te	st Design	[9]	
Preparedn	ess Metrics,	Test Case	Design Eff	ectiveness,	Model-Driv	en Test De	esign, Test		
Procedure	s, Test Case	e Organizatio	on and Trac	cking, Bug F	Reporting, E	Bug Life Cyo	cle.		
Selenium			- 1						
Introducing	y vveb Drive	r and web	Elements,	vvorking wi	IN FIRETOX, I	E, Chrome	browsers,		
box/button	vveb-Eleme	ints using id,	name, iink	name, class	s, xpain, iag	name- nam	aling input	[0]	
and other	S, IISI/Select Neh-Flemer	of a long up up	n Data from	WebTable	-Canturing	screenshot	s-Handling	[9]	
non-uns frames and windows- Exceptions in Selenium - Data driving from csy and excel									
using Java	APIs-Debu	aging Tests	Page Obje	ct Model.	Data dirii	ig nom oor			
TestNg *		00 0							
Introductio	n to TestNg	g-Advantage	es over Ju	init-Annotati	ions in Tes	stNg-Under	stand and		
Read Test	Ng Reports	-Testng and	its configu	iration-Grou	iping the te	stcases, Ex	clusion of	[9]	
groups, Pa	rtial Groups	-TestSuite.x	ml/Suite cr	eation-Type	es of param	eterization-	Parameter		
from Lest	lg.xml (pas	s value at Si	uite and Te	st level)-As	sertion, Veri	lication.			
	r [*] n to Dobov	ior Drivon I	Dovelonme		D from our	ark uning (Sucumber		
Proparing	n lo benav	d cucumber	Developine	nt creating	o footuro filo	ork using (Selusing Ch	orking and		
Gherkin sy	ntax-writing	features an	d scenario	Given – W	hen -Then s	structure -M	/riting alue	[9]	
code -Cuc	umber and .	lava step de	finitions-w	riting step d	efinition/ im	plementing	scenarios		
steps-Cuc	umber data	driven testin	a.			plomonang	ocontantoo		
			0			То	tal Hours:	45	
Text Book	(s):								
1. Yog	esh Singh, "	Software Te	sting", Can	nbridge Univ	versity Pres	s, 2012.			
2 Unm	nesh Gundeo	cha, Satya A	vasarala, "	Selenium W	ebDriver 3	Practical G	uide" - Seco	nd Edition	
² 2018.									
Reference(s):									
1. Glenford J. Myers, Corey Sandler, Tom Badgett, The Art of Software Testing, 3rd Edition, 2012								ion, 2012,	
John Wiley & Sons, Inc.									
	Fallon, SON	ware testing	<u>, ∠nu Eulti</u> . Tostina: /	$\frac{1}{2}$	anis Publisi	IIIIY h Eourth E	dition 2014	Toylor 9	
3. Fau	r c. Jurgens	en, sonware	e resung: A		is Abbioac	n, Fourth E	uilion, 2014	, rayior ox	
4. Carl	Cocchiaro	Selenium Fr	amework r)esian in Da	ata-Driven T	esting 201	8. Packt Pu	blishina	
*SDG 4 -	Quality Educ	ation					-, ·		





Course C	Contents and Lecture Schedule	No of
S. No.	Topics	hours
1.0	Introduction to Software Testing and Test Planning	
1.1	Why do we test Software?, Black-Box Testing and White-Box Testing	1
1.2	Software Testing Life Cycle, V-model of Software Testing	1
1.3	Program Correctness and Verification, Reliability versus Safety, Failures, Errors and Faults (Defects)	1
1.4	Software Testing Principles, Program Inspections, Stages of Testing: Unit Testing, Integration Testing	1
1.5	System Testing-Performance Testing-The Goal of Test Planning	1
1.6	High Level Expectations, Intergroup Responsibilities, Test Phases, Test Strategy, Resource Requirements	2
1.7	Tester Assignments, Test Schedule, Test Cases	1
1.8	Bug Reporting, Metrics and Statistics	1
2.0	Test Design and Execution	
2.1	Test Objective Identification, Test Design Factors	2
2.2	Requirement identification, Testable Requirements, Modeling a Test Design Process	2
2.3	Modeling Test Results, Boundary Value Testing	1
2.4	Equivalence Class Testing, Path Testing, Data Flow Testing, Test Design Preparedness Metrics	1
2.5	Test Case Design Effectiveness, Model-Driven Test Design, Test Procedures	1
2.6	Test Case Organization and Tracking, Bug Reporting, Bug Life Cycle	2
3.0	Selenium	
3.1	Introducing Web Driver and Web Elements, Working with Firefox	1
3.2	IE, Chrome browsers	1
3.3	Identifying Web-Elements using id, name, linkname, class, xpath, tagname	1
3.4	Handling Input box/buttons, list/selection	2
3.5	drop down boxes, radio buttons, check boxes	1
3.6	Extracting links and other Web-Elements-Extracting Data from WebTable	1
3.7	Capturing screenshots-Handling pop-ups, frames, and windows- Exceptions in Selenium	1
3.8	Data driving from csv and excel using Java APIs-Debugging Tests-Page Object Model	1
4.0	TestNg	-
4.1	Introduction to TestNg-Advantages over Junit	1
4.2	Annotations in TestNg-Understand and Read TestNg Reports	1
4.3	Testng and its configuration	1
4.4	Grouping the testcases, Exclusion of groups, Partial Groups	1
4.5	TestSuite.xml/Suite creation	1
4.6	Types of parameterization	1
4.7	Parameter from TestNg.xml (pass value at Suite and Test level)	1
4.8	Assertion, Verification	2
5.0	Cucumber	
5.1	Introduction to Behavior Driven Development(BDD)-BDD framework using Cucumber	1



5.2	Preparing selenium and cucumber environment	1
5.3	creating a feature files using Gherkins and Gherkin syntax	1
5.4	writing features and scenario, Given – When -Then structure -Writing glue code	2
5.5	Cucumber and Java step definitions	1
5.6	writing step definition/ implementing scenarios steps	2
5.7	Cucumber data driven testing	1

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60 CB 02	Usability Design of	Category	L	Т	Ρ	Credit
00 CB 203	Software Applications	PC	3	0	0	3

Objectives

- To learn the fundamentals of User Centered Design, their relevance and contribution to businesses
- To study the principles of heuristic evaluation for interactive design
- To understand the appreciation of user research, solution conceptualization and validation as interwoven activities in the design and development lifecycle
- To familiarize the facets of User Experience (UX) Design, particularly as applied to the digital artefacts
- To utilize scenarios and persona technique to enhance understanding, usability, and user-centred design in various contexts

Pre-requisites

• Basic Knowledge of Software Development and User Experience (UX) Fundamentals

Course Outcomes

On the successful completion of the course, students will be able to							
CO1	Summarize the fundamentals and importance of User-Centred design.	Understand					
CO2	Analyse the design evaluation by applying the heuristic principles.	Analysis					
CO3	Illustrate an application focusing on the design aspects.	Apply					
CO4	Remember the UX research techniques for analysing the application.	Remember					
CO5	Analyse the personal technique for different projects.	Analysis					

Mapping with Programme Outcomes

COs	POs											PSOs			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1	3	2	2	2	-	-	-	-	-	-	-	-	2	2
CO2	3	2	2	1	1	-	-	-	-	-	-	-	-	3	2
CO3	2	3	3	3	3	-	-	-	-	-	-	-	2	3	2
CO4	2	1	2	3	2	-	-	-	-	-	-	-	1	2	2
CO5	2	2	1	2	1	-	-	-	-	-	-	-	2	2	2
3 - Strong: 2 - Medium: 1 - Some															

3 - Strong; 2 - Medium; 1 - Some

Assessment Pattern									
Bloom's	Continuous A (M	ssessment Tests larks)	End Sem Examination (Marks)						
Calegory	1	2							
Remember	20	20	06						
Understand	40	-	14						
Apply	-	40	40						
Analyse	-	-	40						
Evaluate	-	-	-						
Create	-	-	-						
Total	60	60	100						



Syllabus									
K.S.Rangasamy College of Technology – Autonomous R2022									
B.Tech – Computer Science and Business Systems									
60 CB L03 - Usability Design of Software Applications									
Seme	ster	ŀ	lours/Wee	k	Total	Credit	Ma	rks	
ocine	3101	L	Т	Р	Hours	C	CA	ES	Total
Introd	Introduction to User Centred Design*								
Aspects of User Centred Design, Elements - Models and Approaches – User Centred									[9]
Desig	Design Principles - UCD Process - Analysis Tools: Personas, Scenarios, and Essential Use								
Cases	s with	Examples -	Agile Aspe	ects of User	Centred De	esign.			
Intera	ictive	Design Ev	aluation*	D	1				
Introduction to Interactive Design Process – Interactive Design in Practice – Introducing									[9]
Evaluation – Evaluation: Inspection, Analysis and Models – Inspection - Heuristic									
Evalu	alion.		c Plinciples	, Examples	- Case Siu	iuy.			
Case	Study	: Developm	callon	Application	lika Mohila	or Web Ba	end on Lieg	or Controd	
Desig	n _	Design Li	fecycle: F	stablishing	Requireme	onte Desid	n Prototy	vning and	[9]
Const	ructio	n		stabilistning	Requireme		gii, i lototy	ping and	
UXR	esear	ch*							
Understanding Users: Their Goals - Context of Use - Environment of Use - Research									[9]
Techniques - Contextual Enquiry - User Interviews - Competitive Analysis for UX.									[-]
Scena	Scenarios and Persona Technique*								
Prese	ntatio	n of Person	has for the 0	Group Proje	ect - Design	Thinking T	echnique -	Discovery	
and E	Brains	torming -	Concept D	evelopment	t - Task F	low Detaili	ng for the	Project -	[9]
Protot	typing	Techniques	s - Paper-E	lectronic - F	Prototyping	Tools.			
Tools used: Sketch/Figma									
Total Hours:									45
Text Book(s):									
1.	Jenny Preece, Helen Sharp and Yvonne Rogers, "Interaction Design: Beyond Human-Computer								
	Interaction", 5 th Edition, John Wiley & Sons, Inc, USA, 2019.								
2.	² Jonny Schneider, "Understanding Design Thinking, Lean, and Agile", 1 st Edition, Apress, USA,								
- 2020.									
Reference(s):									
1. I nomas Tullis and Bill Albert, "Measuring the User Experience: Collecting, Analyzing, and Presenting Usability Metrics", 3rd Edition, Elsevier, Netherlands, 2022.									
2.	2. Jesse James Garrett, "The Elements of User Experience User-Centered Design for the Web and Beyond", 2 nd Edition, New Riders, USA, 2021.								
3.	3. Alan Cooper and Robert Reimann, "About Face", 4 th Edition, John Wiley. USA. 2014.								
4.	4. Elizabeth Goodman, Mike Kuniavsky, Andrea Moed, "Observing the User Experience", 2 nd								ence", 2 nd
		n, worgan	⊾aurmann,	USA, 2012					

*SDG 4 – Quality Education



Course Contents and Lecture Schedule							
S. No.	Topics						
1.0	Introduction To User Centred Design						
1.1	Aspects of User Centred Design	1					
1.2	Elements - Models and approaches	1					
1.3	User Centred Design Principles	2					
1.4	UCD Process	1					
1.5	Analysis Tools: Personas, Scenarios	1					
1.6	Essential Use Cases with Examples	2					
1.7	Agile Aspects of User Centred Design	1					
2.0	Interactive Design Evaluation						
2.1	Introduction to Interactive Design Process	1					
2.2	Interactive Design in Practice	1					
2.3	Introducing Evaluation	1					
2.4	Evaluation: Inspection, Analysis and Models	2					
2.5	Inspection - Heuristic Evaluation	1					
2.6	10 Heuristic Principles	1					
2.7	Examples – Case Study	2					
3.0	Development of Application						
3.1	Case Study: Development of any Application like Mobile or Web Based on User Centred Design	3					
3.2	Design Lifecyle	1					
3.3	Lifecyle: Establishing Requirements	2					
3.4	Lifecyle: Design	1					
3.5	Prototyping and Construction	2					
4.0	UX Research						
4.1	Understanding users – their goals	1					
4.2	Context of use and environment of use	2					
4.3	Research Techniques	2					
4.4	Contextual Enquiry	2					
4.5	User Interviews	1					
4.6	Competitive Analysis for UX	1					
5.0	Scenarios and Persona Technique						
5.1	Presentation of Personas for the group project	1					
5.2	Design Thinking Technique	1					
5.3	Discovery and Brainstorming	2					
5.4	Concept Development	2					
5.5	Task flow detailing for the Project	1					
5.6	Prototyping Techniques	1					
5.7	Paper-Electronic -Prototyping Tools	1					

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