

KUMARAGURU COLLEGE OF TECHNOLOGY

An autonomous Institution affiliated to Anna University, Chennai

COIMBATORE – 641 049.

B.TECH. INFORMATION TECHNOLOGY

REGULATION 2024 (2025 Batch)



I to VIII Semesters

Department of Information Technology

2


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VISION

The department of Information Technology aspires to become a school of excellence in providing quality education, constructive research and professional opportunities in Information Technology.

MISSION

- To provide academic programs that engage, enlighten and empower the students to learn technology through practice, service and outreach
- To educate the students about social responsibilities and entrepreneurship
- To encourage research through continuous improvement in infrastructure, curriculum and faculty development in collaboration with industry and institutions.

PROGRAM SPECIFIC OUTCOMES (PSOs)

The Program Specific Outcomes of Information Technology Undergraduate Program are:

PSO1: IT Systems Innovation and Management

Graduates will design and manage secure, scalable IT systems that address real-world challenges with technological and social relevance.

PSO2: Emerging Tech for Business Impact

Graduates will apply cutting-edge technologies to create innovative, ethical solutions that drive business transformation and community advancement.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Graduates will demonstrate career progression in Information and Communication Technologies by acquiring higher qualifications or industry certifications and advancing in professional roles.

PEO2: Graduates will be leaders in their chosen field

PEO3: Graduates will utilize the acquired technical skills and knowledge for the benefit of society

PROGRAM OUTCOMES (POs)

Graduates of the Information Technology Undergraduate Program should have the ability to:

PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization to develop to the solution of complex engineering problems.



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PO2: Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development.

PO3: Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required.

PO4: Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions.

PO5: Engineering Tool Usage: Create, select, and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems.

PO6: The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture, and environment.

PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws.

PO8: Individual and Collaborative Teamwork: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

PO9: Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences.

PO10: Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

PO11: Life-Long Learning: Recognize the need for and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change.



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KUMARAGURU COLLEGE OF TECHNOLOGY									
INFORMATION TECHNOLOGY									
REGULATION 2024									
B. Tech. Information Technology – Curriculum									
2025 Batch Structure									
Semester I									
S. No	Course code	Course Title	Course Mode	Course Type	L	T	P	J	C
1	24HST103 / 24HST104 /	Effective Communication / Professional Communication /	Theory	HS	2	0	0	0	2
	24HSJ102	Fluency Through Practice	Practical		0	0	0	4	
2	24MAI114	Applied Linear Algebra and Calculus	Embedded	BS	3	0	2	0	4
3	24PHI101	Applied Physics for Computing	Embedded	BS	3	0	2	0	4
4	24CSI006	Programming in C	Embedded	ES	1	0	6	0	4
5	24CSI102	Digital Logic Circuits	Embedded	ES	2	0	2	0	3
6	24HST101	Heritage of Tamils	Theory	HS	1	0	0	0	1
7	24INP102	Innovation Practicum - 1	Practical	ES	0	0	2	0	1
8	24HSP111	Holistic Wellness - 1	Practical	HS	0	0	2	0	1
9	24INO101	FCLF- General Stack-1	Practical	OE	0	0	2	0	1
10	24CSV001	Emerging Domains	Embedded	VA	2	0	0	0	0
Total Credits									21
Total Contact Hours/week									32
Semester II									
S.No	Course code	Course Title	Course Mode	Course Type	L	T	P	J	C
1	24HSP005	Mastering Conversations	Practical	HS	0	0	2	0	1
2	24MAI124	Multivariate Calculus and Forecasting	Embedded	BS	3	0	2	0	4
3	24CSI007	Python For Computational Problem Solving	Embedded	ES	1	0	4	0	3
4	24ITI001	Embedded Systems for IoT	Embedded	ES	2	0	2	0	3
5	24ADT015	Finance, Economics and Marketing	Theory	HS	3	0	0	0	3
6	24HST102	Tamils and Technology	Theory	HS	1	0	0	0	1
7	24INP103	Innovation Practicum- 2	Practical	ES	0	0	2	0	1
8	24HSP112	Holistic Wellness-2	Practical	HS	0	0	2	0	1
9	24INO102	FCLF- General Stack-2	Practical	OE	0	0	2	0	1
10	24INP101	Design Thinking	Practical	HS	0	0	2	0	1
Total Credits									19
Total Contact Hours/week									28


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Semester III									
S.No	Course code	Course Title	Course Mode	Course Type	L	T	P	J	C
1	24MAI234	Computational Probability and Statistics	Embedded	BS	3	0	2	0	4
2	24CSI024	Data Structures and Algorithms	Embedded	PC	2	0	4	0	4
3	24CSI025	Object Oriented Programming	Embedded	PC	1	0	4	0	3
4	24ITT203	Computer Organization and Architecture	Embedded	PC	3	0	0	0	3
5	24ITI005	Operating Systems	Embedded	PC	3	0	2	0	4
6	24INM201	Universal Human Values-II	Theory	HS	1	0	0	0	1
7	24INP201	Innovation Practicum- 3	Practical	ES	0	0	2	0	1
8	24HSP006	Mastering Group Discussion and Presentation Skills	Practical	HS	0	0	2	0	1
9	24INOXY	FCLF- General Stack-3	Practical	OE	0	0	2	0	1
Total Credits									22
Total Contact Hours/week									33
Semester IV									
S.No	Course code	Course Title	Course Mode	Course Type	L	T	P	J	C
1	24MAT243	Discrete Mathematics and Optimization	Theory	BS	3	0	0	0	3
2	24CSI009	Database Management Systems	Embedded	PC	3	0	2	0	4
3	24CSI014	Design and Analysis of Algorithms	Embedded	PC	3	0	2	0	4
4	24CSI015	Software Engineering and Agile Practices	Embedded	PC	3	0	0	2	4
5	24_____	Artificial Intelligence and Machine Learning	Embedded	PC	3	0	2	0	4
6	24CSI011	Computer Networks and Security	Embedded	PC	3	0	2	0	4
7	24HSP007	Building Professional Readiness	Practical	HS	0	0	2	0	1
8	24INP202	Innovation Practicum – 4	Practical	ES	0	0	2	0	1
Total Credits									25
Total Contact Hours/week									33
Semester V									
S.No	Course code	Course Title	Course Mode	Course Type	L	T	P	J	C
1	24CSI013	Full Stack Development	Embedded	PC	3	0	2	0	4
2	24ITI006	Big Data Technology	Embedded	PC	3	0	2	0	4
3	24ITI007	Mobile Application Development	Embedded	PC	2	0	2	0	3
4	24HSTXY	Foreign Language	Practical	HS	0	0	4	0	2


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5	24INM202	Environmental Science and Sustainability	Embedded	HS	1	0	2	0	2
6	24-----	Professional Elective I	Theory	PE	3	0	0	0	3
7	24-----	Professional Elective II	Theory	PE	3	0	0	0	3
8	24ITOXY	Open Elective 2	Theory	OE	3	0	0	0	3
Total Credits									24
Total Contact Hours/week									32*
Semester VI									
S.No	Course code	Course Title	Course Mode	Course Type	L	T	P	J	C
1	24____	Cloud and DevOps	Embedded	PC	3	0	0	2	4
2	24____	Generative AI and Agentic AI Systems	Embedded	PC	3	0	2	0	4
3	24-----	Professional Elective III	Theory	PE	3	0	0	0	3
4	24-----	Professional Elective IV	Theory	PE	3	0	0	0	3
5	24-----	Professional Elective V	Theory	PE	3	0	0	0	3
6	24-----	Professional Elective VI	Theory	PE	3	0	0	0	3
7	24ITOXY	Open Elective 3	Theory	OE	3	0	0	0	3
8	24INMXY	Constitution of India	Theory	HS	2	0	0	0	0
Total Credits									23
Total Contact Hours/week									30*
Semester VII									
S.No	Course code	Course Title	Course Mode	Course Type	L	T	P	J	C
1	24-----	Professional Elective VII	Theory	PE	3	0	0	0	3
2	24-----	Professional Elective VIII	Theory	PE	3	0	0	0	3
3	24ITOXY	Open Elective 4	Theory	OE	3	0	0	0	3
4	24INM102	Indian Knowledge System in Science and Engineering	Theory	HS	1	0	0	0	1
5	24ITJ409	Project Phase-I	Project	PRJ	0	0	0	6	3
6	24ITJ415	Professional Internship/ Certification	Project	PRJ	0	0	0	6	3
Total Credits									16
Total Contact Hours/week									26*
Semester VIII									
S.No	Course code	Course Title	Course Mode	Course Type	L	T	P	J	C
1	24ITJ411	Project Phase-II	Project	PRJ	0	0	0	24	12
Total Credits									12


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Total Contact Hours/week	24
Grand Total Credits	162



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SEMESTER I

A handwritten signature in black ink, appearing to read "Shaulgim", enclosed within a rectangular box.

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24HST103	EFFECTIVE COMMUNICATION		L	T	P	J	C
2			0	0	0	2	
HS			SDG		4, 8		
Pre-requisite courses		-	Data Book / Code book (If any)		-		

Course Objectives:	
The purpose of taking this course is to	
1	enhance students' abilities to communicate ideas effectively, both orally and in writing, by developing skills in organizing thoughts clearly and logically and expressing them through well-structured paragraphs and concise summaries.
2	enable students to critically evaluate and synthesize information from multiple sources and utilize suitable writing techniques and formats to produce professional-quality content tailored to various contexts.
3	foster active listening, critical reading, and reflective thinking, empowering students to create engaging, relevant, and informative content by applying effective communication strategies across diverse platforms.

Course Outcomes	
After successful completion of this course, the students shall be able to	
	Revised Bloom's Taxonomy Levels (RBT)
CO1	demonstrate proficiency in delivering ideas effectively, both in speaking and writing, with a deeper understanding of the content and the ability to convey complex ideas through well-structured paragraphs and summaries.
CO2	create and present original content by evaluating information from multiple sources and employing appropriate formats and writing strategies across various professional contexts.
CO3	produce engaging and informative content through active listening, reading, reflection, and effective communication skills.

Course Outcomes (CO)	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11	PSO 1	PSO 2
	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning		
1							2	2	3		3		
2							2	2	3		3		
3							2	2	3		3		


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Course Content					
Text Analysis Composition of Coherent Paragraphs (Expository, Descriptive, Narrative, Evaluative) - Loud Reading (Reading Extracts will be given where students identify the main idea of paragraphs or sections and debrief)				6 Hours	
Visual & Written Analysis Process writing (Drafting effective introduction, process and conclusion using appropriate transition words and phrases) - Describing Visuals (Line graph, Bar Chart, Flow Chart, Pie Chart, Table, Tree diagram) - Note Making & Summarizing				6 Hours	
Professional Correspondence Crafting Professional Emails - Writing Instruction for Manuals – Reading technical documents (Reading extracts will be given to construct sentences from the new words found in the document)				6 Hours	
Research and Documentation Library Reading (Identify at least three sources and extract information, Summarize the main ideas and key findings from each source, compile them findings into a brief report that includes the main points, sources, and relevance to the topic)- Report Writing (Title Page, Abstract, Introduction, Methodology, Results, Discussion, Conclusion and recommendation)				6 Hours	
Talk Analysis and Podcast Skills Listening to and analyzing TED talks – Preparing Podcast-PRISM (Professional Rhetoric Improvement and Speech Mastery) to share facts, opinions and experiences - Writing Reviews on products.				6 Hours	
Theory Hours:	30	Tutorial Hours:	0	Practical Hours:	0
				Project Hours:	0
				Total Hours:	30

Learning Resources	
References:	
1. Swamy, V. R. Narayana. Strengthen Your Writing. Orient Longman, 2003. 2. Sasikumar, V., and P. V. Dhamija. Spoken English: A Self-Learning Guide to Conversation Practice. Tata McGraw Hill, New Delhi (1993). 3. Maisson, Margaret M. Examine Your English. Orient Longman, 1999. 4. Rizwi, Ashraf. Effective Technical Communication. Tata McGraw Hill, 2005. 5. Pickett, Nell Ann, and Ann A. Laster. Technical English: Writing, Reading, and Speaking. 6. Harpercollins College Div, 1993.	
Online Resources (Weblinks)	
1. https://owl.purdue.edu/owl/general_writing/academic_writing/paragraphs_and_paragraphing/index.html 2. https://learnenglish.britishcouncil.org/skills/writing/upper-intermediate/b2/describing-trends 3. https://hbr.org/2016/07/how-to-write-email-with-military-precision 4. https://owl.purdue.edu/owl/subject_specific_writing/professional_technical_writing/reports_and_memos/index.html	

Assessment (Theory course)
SA I, SA II, Activity and Learning Task(s), Mini project, MCQ, End Semester Examination (ESE)

Course Curated by


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Expert from Industry	Expert(s) from Higher Education Institution	Internal Expert(s)
Mr.Vijayan Ramanathan, Project manager, Toppan Merrill. Technologies, Coimbatore	Dr. Aninditha Sahoo, IIT, Madras Dr.P.R.Sujatha Priyadharshini, Anna University, Chennai Dr. E. Justin Ruben, CIT, Coimbatore	Dr. Arokia Lawrence Vijay Dr. Sreejana Dr. Tissaa Department of English
Recommended by BoS on	16.08.2024	
Academic Council Approval	No:27	Date 24.08.2024


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24HST104	PROFESSIONAL COMMUNICATION (Common to all Departments)	L	T	P	J	C
		2	0	0	0	2
HS		SDG		4, 8		
Pre-requisite courses	-	Data Book / Code book (If any)			-	

Course Objectives:	
The purpose of taking this course is to	
1	develop students' abilities to craft clear, concise, and well-structured technical content and professional communications
2	enhance students' communication skills in team settings
3	equip students with cross-cultural communication skills and effective listening techniques

Course Outcomes		
After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO1	demonstrate proficiency in crafting clear, concise, and well-structured technical content and professional communications, including emails that meet industry standards.	Ap
CO2	communicate effectively in team settings, showcasing collaboration, conflict resolution, and leadership skills, while employing creative writing techniques to convey complex ideas.	An
CO3	apply principles of cross-cultural communication and effective listening techniques to engage successfully in diverse, globalized professional environments.	Ap

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO 1	PSO 2
1						2	1	3	1		3		
2						2	3	3	2		3		
3						1	1	3	1		3		

Course Content	
Mastering Professional Communication Industry-specific terminology (Business / Technical Register) - Crafting professional emails - Essential elements of an effective email (subject line, salutation, body, closing)	6 Hours


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- reading and responding to email communication – Networking Emails - Analyzing and interpreting technical texts (Loud Reading).					
Navigating Digital Media Introduction to Digital media and online communication tools (instant messaging, video conferencing, social media, blogs, forums) - Listening and analysing advanced audio materials - Creative & Blog Writing (General & Technical).					6 Hours
Technical Writing Techniques Writing Reflective Essays / Experience Sharing, Process writing, Transcoding graphics (interpreting technical texts), Writing Reviews (Research Articles & Books).					6 Hours
Building a Professional Digital Presence Creating Digital Profile - Overview of different digital platforms (LinkedIn, GitHub, personal websites) - Setting Up a LinkedIn Profile – Crafting a Video Resume – Digital Etiquette and Professionalism - Cross-cultural communication and diversity awareness.					6 Hours
Social Responsibility in Practice Environmental and social responsibilities - Case studies and real-world applications - Project Work - Writing Project reports.					6 Hours
Theory Hours:	30	Tutorial Hours:	0	Practical Hours:	0
				Project Hours:	0
					Total Hours: 30

Learning Resources	
Reference books	
1. Baker, W., & Ishikawa, T. Transcultural Communication Through Global Englishes: An Advanced Textbook for Students. Routledge, 2021. 2. Bodnar, O., Fedak, S., Hinsirovska, I., Denysiuk, N., Perenchuk, O., Plavutska, I., ... & Shchur, N. English for Study and Work: A Coursebook In-class Activities. 2017. 3. Doff, A., Thaine, C., Puchta, H., Stranks, J., & Lewis-Jones, P. Cambridge English Empower Advanced Student's Book. Cambridge University Press, 2016. 4. Hewings, M., Thaine, C., & McCarthy, M. Cambridge Academic English C1 Advanced Student's Book: An Integrated Skills Course for EAP. Cambridge University Press, 2012. 5. Beer, D. F., & McMurrey, D. A. A Guide to Writing as an Engineer. John Wiley & Sons, 2019.	
Online Resources (Web Links)	
1. https://hbr.org/2016/07/how-to-write-email-with-military-precision 2. https://ocw.mit.edu/courses/comparative-media-studies-writing/21w-732-scientific-and-technical-communication-spring-2015/ 3. https://www.coursera.org/learn/digital-media 4. https://owl.purdue.edu/owl/subject_specific_writing/professional_technical_writing/reports_and_memos/index.html	

Assessment (Theory course)
SA I, SA II, Activity and Learning Task(s), Mini project, MCQ, End Semester Examination (ESE)

Course Curated by		
Expert from Industry	Expert(s) from Higher Education Institution	Internal Expert(s)
Mr. Vijayan Ramanathan , Project manager, Toppan Merrill. Technologies, Coimbatore	Dr. Aninditha Sahoo, IIT, Madras Dr.P.R.Sujatha Priyadharshini, Anna University, Chennai Dr. E. Justin Ruben,CIT, Coimbatore	Dr. Arokia Lawrence Vijay Dr. Hema Department of English


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Recommended by BoS on	16.08.2024		
Academic Council Approval	No: 27	Date	24.08.2024


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24HSJ102	FLUENCY THROUGH PRACTICE	L	T	P	J	C
		0	0	0	4	2
HS		SDG		4, 9, 12		

Pre-requisite courses	Nil	Data Book / Codes / Standards (If any)	
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Course Objectives:	The purpose of taking this course is to:
1	Develop professional communication skills, including technical writing, public speaking, and collaborative discourse.
2	Foster creativity and critical thinking by producing real-world academic and professional outputs such as book chapters, journal articles, and intellectual property.
3	Instil awareness of global and ethical communication practices, contributing to sustainability and social impact.
4	Enhance students' language fluency through project-based learning relevant to engineering

Course Outcomes:	After successful completion of this course, the students shall be able to	Bloom's Taxonomy Level (BTL)
CO 1	Analyze and apply effective communication techniques in professional contexts.	An
CO 2	Collaborate in teams to design and execute language-based projects with real-world applications.	Ap
CO 3	Develop critical thinking and problem-solving skills through research, analysis, and presentation of technical content.	An
CO 4	Produce publishable-quality written and spoken outputs, such as book chapters, journal articles, and copyrighted content.	C

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2
1		2	2	1			3	2	2	1	2		
2		3	2	1			3	2	2	1	2		
3		2	2	2			3	2	2	1	2		
4		3	1	1			3	2	2	1	1		

Course Content	
Introduction to Activity Based Learning Research and Initial Project Planning	60 Hours


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Technical Writing and Documentation Creative Writing Drafting and Editing Techniques Teamwork and Peer Collaboration Public Speaking and Presentation Skills Challenges to Opportunities Cross-Cultural Communication and Global Ethics Intellectual Property and Copyrighting Publication – English for research Writing Digital Communication & Social Responsibility	
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Theory Hours:	Tutorial Hours:	Practical Hours:	Project 60 Hours:	Total 60 Hours:
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Learning Resources
Reference books
1. Mahesh Kumar, Dr.Soma. Soft Skills: Enhancing Personal and Professional Success, McGraw Hill, 2023. 2. Maxwell, John C. Developing the leader within you, Harper Collins, 2018. 3. Ansarian, Loughman, and Teoh, Mei Lin. Problem-based Language Learning and Teaching: An Innovative Approach to Learn a New Language. Singapore, Springer Nature Singapore, 2018. 4. Savin Baden, M., Major, C. H. (2004). Foundations of Problem Based Learning. United Kingdom: McGraw-Hill Companies, Incorporated.
Online Resources
1. https://www.sciencedirect.com/science/article/pii/S2590291123002735 2. https://www.cal.org/adultesl/pdfs/problem-based-learning-and-adult-english-language-learners.pdf 3. https://www.apu.ac.jp/rcaps/uploads/fckeditor/publications/polyglossia/Polyglossia_V16_Ng.pdf

Assessment (Theory course)
Assignments, Quiz, Library Record, Draft submission, Oral Presentation, Project Review

Course Curated By		
Expert(s) from Industry	Expert(s) from Higher Education Institutions	Internal Expert(s)
Mr. Vijayan Ramanathan, Project Manager, Toppan Merrill, Technologies, Coimbatore	Dr. Aninditha Sahoo, IIT, Madras Dr.P.R.Sujatha Priyadharshini, Anna University, Chennai Dr. E. Justin Ruben, CIT, Coimbatore	Dr. Arokia Lawrence Vijay Dr. SG Mohanraj


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24MAI114	APPLIED LINEAR ALGEBRA AND CALCULUS (Common to CS, IT, AD)	L	T	P	J	C
BS		3	0	2	0	4
		SDG		4, 9		

Pre-requisite courses	-	Data Book / Code book (If any)	-
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Course Objectives:	
The purpose of taking this course is to:	
1	understand and apply the concepts of eigenvalues, eigenvectors, and matrix transformations to solve real-world linear algebra problems relevant to computing and data sciences.
2	develop proficiency in vector spaces, subspaces, and matrix decomposition techniques (LU and SVD) for effective analysis and solution of linear systems in engineering and data analytics.
3	apply differentiation and integration techniques, including optimization and calculation of areas and volumes, to solve practical problems in engineering and computational contexts.
4	master multivariate calculus concepts such as partial derivatives, Taylor series, and constrained optimization methods for applications in machine learning and data science algorithms.
5	provide MATLAB techniques for solving first-order and higher-order ordinary differential equations to model and analyse dynamic systems in computing and engineering.

Course Outcomes		
After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO1	apply the concepts of eigenvalues and eigenvectors to diagonalize matrices and solve systems of linear equations in real-world applications.	Ap
CO2	apply the concepts of vector spaces, subspaces and matrix decomposition techniques such as LU decomposition and Singular Value Decomposition to solve linear systems and reduce matrix complexity in data science and engineering problems.	Ap
CO3	apply differentiation techniques to solve optimization problems including finding maxima and minima and use integration methods to compute arc lengths, areas between curves and volumes of solids for practical engineering and computational applications.	Ap
CO4	apply multivariate calculus concepts such as partial derivatives and Taylor's series expansion to analyse and approximate multivariable functions for solving engineering and computational problems.	Ap
CO5	analyse and solve constrained and unconstrained optimization problems using the Lagrange multiplier method and determine the maxima and minima of functions with two or more variables relevant to machine learning and data science applications.	An
CO6	analyse methods for solving first-order and higher-order ordinary differential equations to model and analyse dynamic systems in engineering and computing, using appropriate solution techniques to address real-world problems.	An


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	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO 1	PSO 2
1	2				2								
2	1	3	1		2								
3	1	1		1	2								
4	1	1		1	2								
5	1			1	2								
6	2				2								

Course Content	
MATRICES Eigenvalues and eigenvectors of a real matrix – Properties of eigenvalues and eigenvectors (Statement only) – Cayley Hamilton theorem (excluding proof) - Orthogonal matrices – Orthogonal transformation of a symmetric matrix to diagonal form – Reduction of quadratic form to canonical form by orthogonal transformation. Practical Component Matrix operations like addition, subtraction, multiplication, inverse, rank and transpose, eigenvalues and eigenvectors of a given matrix and verify the diagonalization of the matrix. Cayley-Hamilton theorem to find the characteristic equation of a matrix and verify that the matrix satisfies its own characteristic equation.	9 Hours 6 Hours
VECTOR SPACES Vector spaces and subspaces over real space – Euclidean spaces - Linear independence and dependence - Basis and Dimension - Null spaces, column spaces and Linear transformations - LU decomposition method - Singular Value Decomposition method. (No proofs of any theorems, only problems based on these topics) Practical Component Linearly independent and dependent vectors and Singular Value Decomposition. Curve Tracing, 3D and Surface plotting.	9 Hours 6 Hours
APPLICATIONS OF CALCULUS Differentiation: Mean Value Theorem-Maxima and Minima – Integration: Arc Length, Area between two curves, Area of a Surface of Revolution, Volume of solids Practical Component	9 Hours



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First and second derivatives of a given function, area between two curves and the volume of a solid of revolution Optimization problems in single variables.					6 Hours
FUNCTIONS OF SEVERAL VARIABLES Partial derivatives – Homogeneous functions and Euler’s theorem – Total derivative – Taylor’s series expansion - Maxima and minima of functions of two variables – Constrained maxima and minima: Lagrange’s multiplier method with single constraints – Jacobians					9 Hours
Practical Component Computing partial derivatives of multivariable functions Optimization problems in multiple variables					6 Hours
ORDINARY DIFFERENTIAL EQUATIONS Solutions of first order linear ODE: Leibnitz equation and Bernoulli’s equation – Linear, homogeneous differential equations of second and higher order with constant coefficients.					9 Hours
Practical Component Solution of first order ordinary differential equations. Solution of second and higher order ordinary differential equations					6 Hours
Theory Hours:	45	Tutorial Hours:	0	Practical Hours:	30
				Project Hours:	0
					Total Hours: 75
Learning Resources					
Textbooks					
1. Grewal B.S., “Higher Engineering Mathematics”, Khanna Publishers, New Delhi, 44th Edition, 2021 2. Howard Anton and Chris Rorres, “Elementary Linear Algebra”, Applications Version, 12th Edition, 2019.					
Reference books					
1. Kreyszig E., “Advanced Engineering Mathematics”, 10 th Edition, John Wiley and Sons, 2011. 2. Ramana B.V., “Higher Engineering Mathematics”, Tata McGraw Hill Co. Ltd., New Delhi, 11th Reprint, 2018 3. David C. Lay, “Linear Algebra and its Applications”, Pearson Education Asia, New Delhi, 6th Edition, 2021 4. Weir, MD, Hass J, Giordano FR: “Thomas’ Calculus”, Pearson Education, 15th Edition, 2023.					
Online Resources (Web Links)					
1. Integral Calculus - Khan Academy https://www.khanacademy.org/math/integral-calculus 2. Linear Algebra by MIT Open Courseware (Free) https://ocw.mit.edu/courses/mathematics/18-06-linear-algebra-spring-2010/ 3. Multivariable Calculus by MIT Open Courseware (Free) https://ocw.mit.edu/courses/mathematics/18-02sc-multivariable-calculus-fall-2010/ 4. Khan Academy: Multivariable Calculus (Free) https://www.khanacademy.org/math/multivariable-calculus 5. Coursera: Introduction to MATLAB Programming by Vanderbilt University https://www.coursera.org/learn/matlab					

Assessment (Embedded course)



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SA I, SA II, Activity and Learning Task(s), Mini project, MCQ, End Semester Examination (ESE), Lab Workbook, Experimental Cycle tests, viva-voce

Course Curated by			
Expert(s) from Industry	Expert(s) from Higher Education Institution		Internal Expert(s)
Mr. Ramesh V.S., STEPS Knowledge Services Private Limited, Coimbatore. Mr.Jayakumar Venkatesan, Valles Marineris International Private Limited- Chennai. Mr. Imran Khan, GE Transportation Company, Bangalore	Dr.T.Govindan, Government College of Engineering, Srirangam, Trichy. Dr.C.Porkodi, PSG College of Technology, Coimbatore. Dr.P.Paramanathan, Amrita Vishwa Vidyapeetham, Coimbatore.		Dr. D. Arivuoli Dr. J. Dhivya Dr. Vijeta Iyer, Department of Mathematics
Recommended by BoS on	16.08.2024		
Academic Council Approval	No: 27	Date	24.08.2024



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24PHI101	APPLIED PHYSICS FOR COMPUTING (Common to AD, CS, IT)	L	T	P	J	C
		3	0	2	0	4
BS		SDG		7, 9, 12		

Pre-requisite courses	High School Education	Data Book / Code book (If any)	-
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Course Objectives:	
The purpose of taking this course is to:	
1	understand and apply fundamental principles of wave behaviour, optics, and acoustics, and their practical applications in engineering.
2	develop a solid understanding of quantum mechanics and quantum computing, and their relevance to modern technology.
3	integrate physics principles across mechanics, and thermal physics to solve real-world problems.
4	foster analytical and problem-solving skills by applying key concepts to real-world engineering and technological challenges.

Course Outcomes		
After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO 1	apply wave behaviour in optics and demonstrate its applications in real-world technologies.	Ap
CO 2	understand quantum mechanics principles and state their application in quantum information systems.	Ap
CO 3	implement qubits and quantum gates to demonstrate the advantages of quantum computing.	Ap
CO 4	examine the principles of heat transfer mechanisms for effective thermal management in engineering applications.	Ap
CO 5	apply vectors and moments to equilibrium problems in distributed-force systems with free body diagrams	Ap
CO 6	analyse and interpret acoustic principles to assess sound quality and design strategies for effective noise control in real-time applications.	An

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)
	1	2	3	4	5	6	7	8	9	10	11	
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO 1
												PSO 2


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1	3												
2	3												
3	3	2									2		
4	3										2		
5	3	2											
6	3	2											

Course Content													
Applied optics Wave Behaviour in Optics: Reflection, Refraction, Interference, Diffraction and Polarization (qualitative) - Interaction of light and matter - Absorption - Spontaneous emission - Stimulated emission - Population inversion - CO ₂ laser - Semiconductor lasers - Applications –Laser Imaging and Holography- Laser gyroscopes- LiDAR- Introduction and importance of Fiber Optics Technology- Propagation mechanism of rays in an optical fibre, Meridional rays, Skew rays- Types of optical fibres -Application of Optical Fibers, Optical fibre Communication system with block diagram.												9 Hours	
Practical Component - Semiconductor laser: - Determination of wavelength of laser - Determination acceptance angle and numerical aperture of an optical fibre. - Determination of particle size - Spectrometer – Determination of wavelength of mercury source using grating												6 Hours	
Quantum physics Introduction to Quantum Mechanics- Wave Particle duality- Heisenberg uncertainty principle- Wave function- Postulates of Quantum Mechanics- Schrodinger's Equations - Particle in a box- Eigen values and Eigen function- Quantum confinement – quantum wells, wires and dots – Quantum system for information processing - quantum states – classical bits – quantum bits or qubits –CNOT gate - multiple qubits – quantum gates – advantage of quantum computing over classical computing.												9 Hours	
Practical Component - Determination of band gap of a semiconductor - Determination of efficiency of solar cell - Determination of Planck's constant – Electroluminescence method												6 Hours	
Thermal Physics Transfer of heat energy – conduction, convection, and radiation – thermal expansion of solids and liquids – expansion joints – bimetallic strips – theory of heat conduction in solids – rectilinear flow of heat – determination of thermal conductivity of a bad conductor - Lee's & Charlton's disc method - Thermal Insulation – classification and properties – heat exchangers - applications – Thermal Physics in Virtual Reality and Haptics.												9 Hours	
Practical Component Lee's Disc method: Determination of thermal conductivity of a bad conductor												6 Hours	
Mechanics Introduction to position vector, force vector and moment vector- 3-D representation of force and couple- their moments about a point or line- Distributed-force systems- Free Body												9 Hours	



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diagram- Equilibrium of a body under 2D/3D force systems- Moment of inertia of plane areas; Perpendicular-axis and parallel axis theorems- Rectilinear and curvilinear motion of a particles- Work and energy- Impulse and momentum. Practical Component - Compound pendulum – Determination of acceleration due to gravity - Non-uniform bending – Determination of Young’s modulus	6 Hours
Acoustics Sound basic definitions - Human response to sound and vibration- Range of audible sound pressure levels and frequencies, infra sound, ultrasound-Pitch-Loudness: equal loudness contours and loudness level. Loudness calculations. Principle of superposition of waves, interference, beats, standing waves- Principle of active noise control- Doppler effect. Reverberation - Reverberation time - Absorption coefficient and its determination - Factors affecting the acoustics of the buildings and their remedies. Practical Component Melde’s string – Determination of frequency of a tuning fork	9 Hours
	6 Hours

Theory	Tutorial	Practical	Project	Total
Hours: 45	Hours: 0	Hours: 30	Hours: 0	Hours: 75

Learning Resources
Textbooks
- Optics, Light, and Lasers: The Practical Approach to Modern Aspects of Photonics and Laser Physics, Dieter Meschede, 3rd Edition, Wiley, 2017. - Quantum Mechanics, David H. McIntyre, Cambridge University Press, 2022. - Introduction to Quantum Control and Dynamics, Domenico D’Alessandro, 2nd Edition, Chapman and Hall/CRC, 2021. - Shames, Irving H. Engineering mechanics statics and dynamics. 2022. - Engineering Mechanics: Dynamics, James L. Meriam, L. G. Kraige, J. N. Bolton, John Wiley & Sons, 2020.
Reference books
- Engineering Acoustics: Noise and Vibration Control, Malcolm J. Crocker, Jorge P. Arenas, John Wiley & Sons, 2021. - Engineering Mechanics, Hibbeler, R. C., Pearson Education India, 2010. - Pain, Herbert John. The physics of vibrations and waves. 2022. - Introductory Quantum Optics, Christopher C. Gerry and Peter L. Knight, Cambridge university press, 2023. - Optics for Engineers, Charles A. DiMarzio, Crc Press, 2024.
Online Resources (Web Links)
https://ocw.mit.edu/courses/2-71-optics-spring-2009/ https://ocw.mit.edu/courses/8-04-quantum-physics-i-spring-2016/ https://ocw.mit.edu/courses/2-051-introduction-to-heat-transfer-fall-2015/ https://ocw.mit.edu/courses/2-001-mechanics-materials-i-fall-2006/ https://phet.colorado.edu/en/simulations/waves-intro https://www.nasa.gov/directorates/esdmd/hhp/acoustics-and-noise-control/

Assessment (Embedded course)
SA I, SA II, Activity and Learning Task(s), Mini project, MCQ, End Semester Examination (ESE) Lab Workbook, Experimental Cycle tests, viva-voce


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Course Curated by			
Expert(s) from Industry	Expert(s) from Higher Education Institution		Internal Expert(s)
			Capt A.R.Arul Dr. S.Nithya Department of Physics
Recommended by BoS on	16.08.2024		
Academic Council Approval	No: 27	Date	24.08.2024


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24CSI006	PROGRAMMING IN C	L	T	P	J	C
		1	0	6	0	4
ES		SDG		9		

Pre-requisite courses	Nil	Data Book / Codes / Standards (If any)	Nil
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Course Objectives:	The purpose of taking this course is to:
1	Gain proficiency in logical reasoning and problem-solving using algorithms and flowcharts.
2	Acquire knowledge of fundamental programming constructs in C, including data types, variables, control structures, and input/output operations.
3	Attain the capability to address real-world problems by utilizing arrays, strings, and modular programming with functions.
4	Introduce concepts of pointers, storage classes, and structures as tools for effective data representation and management.
5	Provide exposure to the development of C-based applications that integrate file operations and fundamental debugging methodologies.

Course Outcomes:	After successful completion of this course, the students shall be able to	Bloom's Taxonomy Level (BTL)
CO 1	Explain basic C programming constructs and problem-solving strategies using flowcharts and algorithms	U
CO 2	Demonstrate the implementation of conditional and iterative control structures in developing computational programs	Ap
CO 3	Apply arrays, strings, and functions to solve computational problems using modular programming.	Ap
CO 4	Apply pointers, storage classes, and structures to efficiently manage data in C programs	Ap
CO 5	Develop simple applications using file operations and debugging tools in C.	Ap

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2
1	3	2										3	
2	3		2		2							3	


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3	3		3		2							3	
4	3	2										3	
5		2	3									3	

Course Content													
INTRODUCTION TO PROBLEM SOLVING AND C BASICS Introduction to computer problem-solving – The problem-solving aspect- Top-down design -Building blocks, pseudocode notation, flowcharts – Implementation of algorithms –Simple algorithmic problem-solving scenarios – C programming: data types, variables, operators and expressions, input and output operations, control flow using if and switch statements. Practical Component Drawing flowcharts, Writing pseudocode for algorithmic problem scenarios, Programs using arithmetic, logical, and relational operators, Simple logic-based programs: prime number, palindrome, factorial, Fibonacci series												3 Hours	
FUNCTIONS AND STORAGE CLASSES Looping and Control Statements :for, while, break, continue, Patterns -Defining a function - Accessing a function - Function prototypes - Passing arguments to a function - Passing arrays to functions - Function with string - Recursion - Storage classes Practical Component Pattern printing using loops -Programs using functions with arguments and return values, Recursive functions (e.g., factorial, Fibonacci), Passing arrays and strings to functions, Programs demonstrating storage classes: auto, static, extern, register												18 Hours	
ARRAYS AND STRING Defining an array - Processing an array - Multidimensional Arrays-Character Arithmetic - Defining a string - NULL character - Initialization of Strings - Reading and Writing Strings - Processing Strings -Searching and Sorting of Strings. Practical Component Programs for defining and processing 1D and 2D arrays, Searching (linear and binary search), Sorting (bubble sort, selection sort), Matrix operations (addition, subtraction, transpose), String handling using standard functions (strlen, strcpy, etc.)												3 Hours	
POINTERS, STRUCTURES AND UNIONS Pointer Fundamentals - Pointer Declaration - Passing Pointers to a Function - Pointers and one-dimensional arrays - operations on pointers - Dynamic memory allocation- Structures and Unions: Defining a Structure - Processing a Structure - User defined data types (Typedef) -Unions Practical Component Pointer operations and arithmetic, swapping values using pointers, Pointer and array manipulation, Dynamic memory allocation using malloc, calloc, and free,												18 Hours	



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Programs using structures and unions, Accessing structure members using pointers	
FILES AND DEBUGGING Files- Opening and Closing a Data File - Reading and writing a data file - Processing a data file -Unformatted data files - Concept of binary files - Accessing a file randomly using fseek- Types of errors: Syntax, Logical, Runtime – Debugging techniques: Tracing with printf(), setting breakpoints, step-by-step execution – Introduction to debugging tools: gcc -g, GDB- Integrated Development Environment- – Best practices in debugging C programs.	3 Hours
Practical Component Student record system using structures and files, File read/write operations using text and binary files, Processing structured data from files, Accessing file data using fseek, Debugging C programs using printf() tracing and GDB, Identifying and fixing syntax, logical, and runtime errors	18 Hours

Theory	30	Tutorial	60	Project	Total
Hours:		Hours:		Hours:	90

Learning Resources
Textbooks
1. Byron S Gottfried and Jitendar Kumar Chhabra, “Programming with C”, Tata McGraw Hill Publishing Company, Third Edition, New Delhi, 2011. 2. E. Balagurusamy, Programming in ANSI C, 8th Edition, McGraw-Hill Education, 2019.
Reference books/ Web Links
1. Yashavant Kanetkar, Let Us C, 17th Edition, BPB Publications, 2023. 2. R. G. Dromey, <i>How to Solve It by Computer</i>, Pearson Education, First Edition, New Delhi, 2008. 3. Pradip Dey and Manas Ghosh, Programming in C, 2nd Edition, Oxford University Press, 2011. 4. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, 2nd Edition, Pearson Education, 2006. 5. Ashok N. Kamthane, Computer Programming, Pearson Education, 2007. 6. Reema Thareja, Programming in C, 2nd Edition, Oxford University Press, 2011.
Online Resources
1. https://www.geeksforgeeks.org/c-programming-language/ 2. https://www.w3schools.com/c/ 3. https://www.programiz.com/c-programming 4. https://www.coursera.org/learn/c-for-everyone 5. https://www.codingninjas.com/studio/library/c-programming

Assessment (Embedded course)		
MCQ, Experimental Cycle tests and End Semester Examination (Lab)		
Course Curated by		
Expert(s) from Industry	Expert(s) from Higher Education Institution	Internal Expert

Chulym.

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-	-	Ms. R. Nivetha Department of Computer Science and Engineering	
Recommended by BoS on	09.05.2025		
Academic Council Approval	No: 28	Date	26.06.2025


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24CSI102	DIGITAL LOGIC CIRCUITS (Common to AD, CS, IT)	L	T	P	J	C
		2	0	2	0	3
ES		SDG		9		
Pre-requisite courses		-		Data Book / Code book (If any)		-

Course Objectives:	
The purpose of taking this course is to:	
1	understand digital systems, number systems, and Boolean algebra for logic simplification and circuit design.
2	learn to analyse and design Combinational and Sequential Logic Circuits
3	explore digital logic families and implement logic circuits using programmable devices.

Course Outcomes		
After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO1	comprehend the fundamental concepts of digital number systems, Boolean algebra, and the basic principles of digital circuit design.	U
CO2	develop and implement logic functions using Boolean algebra, optimizing them through simplification and employing combinational circuit components.	Ap
CO3	construct and validate sequential circuits, such as flip-flops, counters, and shift registers, and integrate these into larger digital systems.	Ap
CO4	develop combinational logic circuits using programmable logic devices.	Ap

Course Outcomes (CO)	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11	PSO-1	PSO-2
	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning		
1	3												
2			3									3	
3			3									3	
4	3	2											

Course Content	
OVERVIEW OF DIGITAL SYSTEMS AND BOOLEAN ALGEBRA Introduction to Digital Systems - Analog vs. Digital Signals – Digital System Design Process- Number base conversions, complements, signed binary numbers – Binary codes-	7 Hours


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Boolean Algebra and its properties, Boolean functions, Simplification of Boolean functions using Boolean algebra- Canonical and standard forms. Practical Component Study of logic gates 1. Implement Boolean functions using logic gates and validate the outputs with truth tables				4 Hours	
COMBINATIONAL LOGIC CIRCUITS Overview of Digital Logic Circuits - Simplification of four-variable Boolean functions using Karnaugh maps- Realization of logic gates using NAND and NOR gates –Analysis and design of Combinational Logic Circuits -Half adder, Full adder, Half subtractor, Full subtractor-Code converters - Decoders, Encoders - Multiplexers, Demultiplexers. Practical Component 1. Design and construct half adders, full adders, half subtractors, and full subtractors. 2. Create combinational circuits to solve real-world problems. 3. Develop a code converter circuit using logic gates. 4. Design and implement decoder and encoder circuits. 5. Construct multiplexers and demultiplexers and incorporate them into circuit designs.				8 Hours	
SEQUENTIAL LOGIC CIRCUITS SR, JK, D, T flip-flops, Edge-triggering and level-triggering - Asynchronous and synchronous counters - Decade counter, Ring counter - Shift registers (SISO, SIPO, PISO, PIPO). Practical Component 1. Implement and test various types of shift registers. 2. Design and build a synchronous and asynchronous counter.				8 Hours	
LOGIC FAMILIES AND PROGRAMMABLE DEVICES Introduction to digital logic families, RTL, ECL, TTL and CMOS - Programmable Logic Devices - Programmable Logic Array (PLA), Programmable Array Logic (PAL) - Implementation of combinational logic circuits using PLA and PAL. Practical Component 1. Study of VHDL models for combinatorial circuits.				7 Hours	
Theory Hours: 30				Tutorial Hours: 0	
Practical Hours: 30				Project Hours: 0	
				Total Hours: 60	

Learning Resources	
Textbooks:	
1. M. Morris R. Mano, Michael D. Ciletti, “Digital Design: With an Introduction to the Verilog HDL, VHDL, and System Verilog”, 6 th Edition, Pearson, 2018.	
References:	
1. C. H. Roth Jr., Larry L. Kinney “Fundamentals of Logic Design”, 7 th Edition, Cengage Learning, 2014.	
2. John F. Wakerly, “Digital Design: Principles and Practices”, 5 th Edition, Pearson, 2018.	
3. Donald P leach, Albert Paul Malvino, Goutam Saha, “Digital Principles and Application”, 8 th Edition, McGraw Hill education Private Limited, 2015.	
4. Clive Woods, Brian Holdsworth, “Digital Logic Design”, 4 th Edition, O’Reilly Media, 2002.	
5. Donald D.Givone, “Digital Principles and Design”, 7 th Edition, McGraw Hill, 2010.	



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Online Resources (Weblinks)	
1.	Digital Systems: From Logic Gates to Processors Coursera
2.	Digital Logic Circuits and Design Udemy
3.	Digital Electronic Circuits - Course (nptel.ac.in)

Assessment (Embedded course)
SA I, SA II, Activity and Learning Task(s), Mini project, MCQ, End Semester Examination (ESE), Lab Workbook, Experimental Cycle tests, viva-voce

Course Curated by			
Expert(s) from Industry	Expert(s) from Higher Education Institution		Internal Expert(s)
			Ms. C. Bharathipriya, AP-II Ms. P. Anitha, AP-I Department of Computer Science and Engineering
Recommended by BoS on	16.08.2024		
Academic Council Approval	No: 27	Date	24.08.2024


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24HST101	தமிழர் மரபு / HERITAGE OF TAMILS (Common to all Departments)	L	T	P	J	C
HS		1	0	0	0	1
		SDG		4, 11, 16		
Pre-requisite courses	-	Data Book / Code book (If any)			-	

Course Objectives:

The purpose of taking this course is to:

1	தமிழ் மொழி மற்றும் இலக்கியத்தின் அடிப்படை அம்சங்களை அறிமுகப்படுத்துதல், அதன் தொன்மைக்காலம் முதல் நவீனகாலம் வரையிலான வளர்ச்சியை விளக்கம் செய்யுதல். Introduce students to the foundational aspects of Tamil language and literature, tracing its evolution from ancient to modern times.
2	தமிழகத்தின் செழுமையான கலாச்சார பாரம்பரியத்தை அறிமுகப்படுத்துதல், பாறை ஓவியக் கலையிலிருந்து நவீன சிற்ப கலையின்படி அதன் கலை வெளிப்பாடுகளை ஆராய்தல். Familiarize students with the rich cultural heritage of Tamil Nadu, exploring its artistic expressions from rock art paintings to contemporary sculptures.
3	தமிழகத்தின் நாட்டுப்புறக் கலைகள் மற்றும் வீரவிளையாட்டுகளை அறிதல்- திண்ணக்கோட்பாடுகளை ஆராய்தல்- இந்திய தேசிய இயக்கத்தில் தமிழர்களின் பங்கினை அறிதல். To know the folk arts and heroic ames of Tamilnadu-explore the concept of thinai -to know the role of Tamils in Indian National movement.

Course Outcomes

After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO1	தமிழ் மொழி மற்றும் இலக்கியத்தின் அடிப்படை அறிவை மேம்படுத்துதல். மொழி பண்பாட்டில் எவ்வாறு இணைந்துள்ளது என்பதை உணர்தல். Enhance the fundamental knowledge of Tamil language and literature	U
CO2	பழங்கால பாறை ஓவியங்கள், சிற்பம் என கலைகள் நவீன காலம்வரை எவ்வாறு பயணிக்கிறது என்பதை புரிந்துகொள்ளுதல். Understand the heritage, rock art paintings to modern art sculpture	U
CO3	நாட்டுப்புறக் கலைகள் தற்காப்புக் கலைகளாகவும், உடல் ஆரோக்கியத்தை மேம்படுத்தும் விதமாகவும் அமைவதை அறிந்து கலைகள் மீதான ஆர்வத்தை அதிகரிக்கச் செய்தல்- தமிழர்களின் அகத்திணை, புறத்திணை கோட்பாட்டினை புரிந்து கொள்ளுதல். இந்திய பண்பாட்டில் தமிழர்களின் பங்களிப்பை அறிதல். Acquire essential knowledge in the folk and martial arts-understanding the Agam and puram concept- to know the contribution of Tamils in Indian culture.	Ap

Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)
1	2	3	4	5	6	7	8	9	10	11	


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Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO 1	PSO 2
1							3	2	2		2		
2							3	3	2		2		
3							3	2	2		2		

Course Content

மொழி மற்றும் இலக்கியம்

இந்திய மொழிக் குடும்பங்கள் – திராவிட மொழிகள் – தமிழ் ஒரு செம்மொழி – தமிழ் செவ்விலக்கியங்கள் - சங்க இலக்கியத்தின் சமய சார்பற்ற தன்மை – சங்க இலக்கியத்தில் பகிர்தல் அறம் – திருக்குறளில் மேலாண்மைக் கருத்துக்கள் – தமிழ்க் காப்பியங்கள், தமிழகத்தில் சமண பௌத்த சமயங்களின் தொடக்கம் -பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் – சிற்றிலக்கியங்கள் – தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி – தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

3 Hours

LANGUAGE AND LITERATURE

Language Families in India - Dravidian Languages – Tamil as a Classical Language - Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature - Management Principles in Thirukural - Tamil Epics and Impact of Buddhism & Jainism in Tamil Land - Bakthi Literature Azhwars and Nayanmars - Forms of minor Poetry - Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan.

மரபு – பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை – சிற்பக்கலை

நடுகல் முதல் நவீன சிற்பங்கள் வரை – ஐம்பொன் சிலைகள்- பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் – தேர் செய்யும் கலை – சுடுமண் சிற்பங்கள் – நாட்டுப்புற தெய்வங்கள் – குமரிமுனையில் திருவள்ளுவர் சிலை – இசைக் கருவிகள் – மிருதங்கம், பறை, வீணை, யாழ், நாதஸ்வரம் – தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு.

3 Hours

HERITAGE – ROCK ART PAINTINGS TO MODERN ART SCULPTURES

Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.

நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள்

தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஓயிலாட்டம், தோல்பாவைக்கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.

3 Hours

FOLK AND MARTIAL ARTS



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Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Ciabatta, Valari, Tiger dance - Sports and Games of Tami						
தமிழர்களின் திணைக்கோட்பாடுகள் தமிழகத்தின் தாவரங்களும், விலங்குகளும் – தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக்கோட்பொருள் – தமிழர்கள் போற்றிய அறக்கோட்பாடு – சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும் – சங்ககால நகரங்களும் துறைமுகங்களும் – சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி – கடல்கடந்த நாடுகளில் தமிழர்களின் வெற்றி. THINAI CONCEPTS OF TAMIL Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.						
இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு இந்திய விடுதலைப் போரில் தமிழர்களின் பங்கு – இந்தியாவின் பிறப்பகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் – சுயமரியாதை இயக்கம் – இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு – கல்வெட்டுகள், கையெழுத்துப்படிக்கள் - தமிழ்ப் புத்தகங்களின் அச்ச வரலாறு. CONTRIBUTIONS OF TAMIL TO INDIAN NATIONAL MOMENT AND INDIAN CULTURE Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts – Print History of Tamil Books.						
Theory	Tutorial	Practical	Project	Total		
Hours: 15	Hours: 0	Hours: 0	Hours: 0	Hours: 15		
Learning Resources						
Reference books:						
1. தமிழக வரலாறு – மக்களும் பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்). 2. கணினித்தமிழ் – முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்). 3. கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு) 4. பொருநை – ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு) 5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print) 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.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies). 8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.) 9. Keeladi - ‘Sangam City Civilization on the banks of river Vaigai’ (Jointly Published by: Department of Archaeology & Tamil Nadu Textbook and Educational Services Corporation, Tamil Nadu) 10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Publishedby: The Author)						



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11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL)

Online Educational Resources:

1. https://www.youtube.com/watch?v=IKPwEmsmuZc&list=PLMMrJE4pHZmc0iJZIE6lBpFoPK_9Y325e
2. https://www.youtube.com/watch?v=j6_ddjn_gLc&list=PLMMrJE4pHZmc0iJZIE6lBpFoPK_9Y325e&index=2
3. <https://docs.google.com/presentation/d/1pf0jbyuDTNdvlcKMnOfoPjbqha7JqdOc/edit#slide=id.p1>
4. https://www.youtube.com/watch?v=IKPwEmsmuZc&list=PLMMrJE4pHZmc0iJZIE6lBpFoPK_9Y325e&index=1

Assessment (Theory course)

SA I, SA II, Activity and Learning Task(s), Mini project, MCQ, End Semester Examination (ESE), Assignments, Quiz, Library Record

Course Curated by

Expert from Industry	Expert(s) from Higher Education Institutions	Internal Expert
Mr. Vijayan Ramanathan , Project manager, Toppan Merrill. Technologies, Coimbatore	Dr. Aninditha Sahoo, IIT, Madras Dr. P.R. Sujatha Priyadarshini, Anna University, Chennai Dr. E. Justin Ruben, CIT, Coimbatore	Suriya Prakash Department of Language
Recommended by BoS on	16.08.2024	
Academic Council Approval	No: 27	Date 24.08.2024



Signature of BOS Chairman, IT

24INP102	INNOVATION PRACTICUM – 1 (Common to all Departments)	L	T	P	J	C
		0	0	2	0	1
ES		SDG	9, 11, 12			

Pre-requisite courses	-	Data Book / Code book (If any)	-
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Course Objectives:	
The purpose of taking this course is to:	
1	analyse the effectiveness of systems thinking and problem-solving methodologies in applying data-driven insights for innovative solution design.
2	evaluate the impact of transdisciplinary collaboration on creating functional hardware prototypes through fabrication techniques.
3	understand the future trends and implications of technology in developing innovative products.

Course Outcomes:		
After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO1	recall the fundamental principles of custom hardware design.	R
CO2	understand the appropriate tools and their applications for solving hardware-related problems.	U
CO3	apply systems engineering concepts to real-world hardware design challenges.	Ap

Course Outcomes (CO)	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO 1	PSO 2
1	2		1										
2	2				1								
3		2	2	1									

Course Content	
Engineering Fundamentals and Innovation Why engineering? The concept of street fight engineering - Real-world design process and problem-solving methodology - Data-driven insights and concept generation - Case studies of successful engineering innovations.	3 Hours
Transdisciplinary Systems and Manu'Futuring	6 Hours


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Transdisciplinary systems to accelerate innovation - Manu'Futuring: Technology in hardware manufacturing and manufacturing of hardware technologies - Future scopes with product case studies.		
Building Custom Hardware How to build a basic custom hardware - Electronics fundamentals and components - Software for hardware control - Fabrication techniques.		6 Hours
System Thinking and Engineering Introduction to system thinking - Real world as a system - Concept of system engineering and its application – iLenSys.		7 Hours
Creativity Time and Tech Teardown Creativity exercise: Apply system thinking to a real-world problem - Tech teardown: Analyse a product or system to understand its engineering principles - Presentation: Present your creative project and tech teardown with an engaging title		8 Hours
Theory Hours:	Tutorial Hours:	Practical Hours:
0	0	30
Project Hours:	Total Hours:	
0	30	

Learning Resources	
Textbooks:	
1.	Sanjoy Mahajan - Street Fighting Mathematics
2.	Donald Knuth - The Art of Computer Programming
3.	Think like a programmer: An introduction to creative problem solving
4.	Thinking in Systems: A Primer
References:	
1.	Learning to code: How to think like a programmer
2.	How to find innovative ideas: Ramesh Raskar's note
3.	Case study: How Tesla changed the auto industry
4.	Ultimate Guide: How to develop a new electronic hardware product
Online Resources (Weblinks)	
1.	https://www.ifixit.com/Teardown?srsId=AfmBOorwzDG9RhJoL3L5tLZ_Dr4sVcey-vPC-pkKTj2E0mWJWtFYlikY
2.	https://www.symmetryelectronics.com/technology-teardowns/

Assessment (Practical course)
Lab Workbook, Experimental Cycle tests, viva-voce

Course Curated by			
Expert from Industry	Expert from Higher Education Institutions	Internal Expert	
Dr. Mahesh Veezhinathan Director - Innovation Practicum Associate VP - Forge. Innovation	-	Dr. Samuel Ratna Kumar P S Assistant Professor – III Department Mechanical Engineering	
Recommended by BoS on	17.08.2024		
Academic Council Approval	No: 27	Date	24.08.2024


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24HSP111	HOLISTIC WELLNESS-1 (Common to all Department)		L	T	P	J	C
0			0	2	0	1	
HS			SDG		2, 3		
Pre-requisite courses		-	Data Book / Code book (If any)		-		

Course Objectives:	
The purpose of taking this course is to:	
1	introduce first-year students to the foundational concepts of holistic wellness, emphasizing the integration of physical, mental, emotional, and Internal well-being.
2	create a balanced lifestyle that promotes overall health and happiness through practical activities.

Course Outcomes		
After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO 1	understand the basic principles of holistic wellness.	U
CO 2	apply strategies for maintaining physical health, including nutrition and exercise	Ap
CO 3	practice mindfulness techniques to enhance mental and emotional well-being.	Ap
CO 4	develop a personal wellness plan incorporating various aspects of holistic health.	C

Course Outcomes (CO)	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11	PSO 1	PSO 2
	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning		
1						2		1					
2						2							
3						1					3		
4						2					3		

Course Content	
INTRODUCTION TO HOLISTIC WELLNESS: - Overview of holistic wellness: physical, mental, emotional, and internal health. - The importance of balance in overall well-being. - Hands-on activity: Self-assessment of current wellness status.	4 Hour
PHYSICAL WELLNESS:	14 Hours


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• Importance of physical activity and exercise. • Understanding nutrition and its role in health. • Sleep hygiene and its impact on well-being. • Hands-on activity: Designing a personalized fitness and nutrition plan.	
MENTAL AND EMOTIONAL WELLNESS: • Stress management techniques. • The role of Yoga, mindfulness and meditation in mental health. • Emotional intelligence and its impact on relationships. • Hands-on activity: Practicing Yoga, mindfulness and emotional regulation exercises.	6 Hours
INTERNAL WELLNESS: • Exploring the concept of Internal wellness. • The role of purpose and meaning in life. • Introduction to meditation and reflective practices. • Hands-on activity: Developing a personal reflection, Yoga and meditation routine.	4 Hours
INTEGRATING WELLNESS PRACTICES: • Combining physical, mental, emotional, and Internal wellness practices into daily life. • Developing a balanced wellness plan. • Hands-on activity: Creating a comprehensive personal wellness plan.	2 Hours
Theory Hours: 0	Tutorial Hours: 0
Practical Hours: 30	Project Hours: 0
Total Hours: 30	

Learning Resources
Textbooks:
1. Jayanna, Krishnamurthy., Science & Practice of Integrative Health & Wellbeing Lifestyle., White Falcon Publishing (2020). 2. Rosenberg, Marshall Bertram., Nonviolent Communication: A Language of Life., Puddle Dancer Press, Encinitas, CA (2015).
References:
1. B.K.S Iyengar., Yoga: The Path to Holistic Health., Dorling Kindersley Limited, City of Publication (2001) 2. Goleman Daniel., Emotional Intelligence., Bloomsbury India, India, (2021). 3. James Allen., As a Man Thinketh., Maple Press, Noida, (2010) 4. Swami Budhanandha., Will power and its development., Advaita Ashrama Mayavati, Pithoragarh, Himalayas from its Publication Department, Calcutta. (2001) 5. Kalderdon Adizes Ichak., What Matters in Life: Lessons I Learned from Opening My Heart ., WS Press, Newtown, PA (2023)
Online Resources (Weblinks)
1. Learning Suryanamskar 2. Yoga for well-being 3. Nutritional Educational contents 4. Introduction to Psychology 5. Guided Meditation 6. Simplified physical exercises instructions


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7. Simplified Physical Exercises
8. Life skills and value education
9. James Allen Library

Assessment (Practical course)

Participation, Practical activities and assignments, personal wellness plan and reflection.

Course Curated by

Expert(s) from Industry	Expert(s) from Higher Education Institution	Internal Expert(s)
		Dr. Ezhilarasi Principal- KCT
Recommended by BoS on	16.08.2024	
Academic Council Approval	No: 27	Date 24.08.2024



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24CSV001	EMERGING DOMAINS (Common to AD, CS, IT)	L	T	P	J	C
		2	0	0	0	0
VA		SDG		3, 9, 12, 15		
Pre-requisite courses		-		Data Book / Code book (If any)		-

Course Objectives:	
The purpose of taking this course is to:	
1	provide students with a comprehensive understanding of how emerging technologies like AI, IoT, blockchain, big data, and automation are revolutionizing various industries. Focusing on sectors such as agriculture, education, healthcare, gaming, music, law, and textiles, the course explores the application of these technologies to develop innovative solutions that enhance productivity, sustainability, and user engagement. Students will analyze the impact of digital tools on transforming key sectors and evaluate strategies to improve operational efficiency, creativity, and adaptability. Additionally, the course examines the disruption of traditional business models by these technologies, equipping students with the skills to leverage these changes for innovation and competitiveness in a rapidly evolving landscape.

Course Outcomes		
After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO1	understand the role of digital tools in education and healthcare for enhancing user engagement and fostering innovation.	U
CO2	outline the role of technologies in enhancing agricultural practices to demonstrate how these technologies can improve productivity and sustainability in farming.	U
CO3	relate the key technological applications of emerging domains that enhance operational efficiency and creativity.	R

Course Outcomes (CO)	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)												
	1	2	3	4	5	6	7	8	9	10	11		
	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning		
1	1					2		2	3		2		
2	2					3		2	3		3		
3	2					3		2	3		3		

Course Content	
EDUCATION LMS – LCMS – MOOC - Coursera equivalent for Indian languages - LLMs for educational content & answering queries of learners - Multiple Intelligence skills -	3 Hours


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Information Communication Technologies (ICT) - smart class rooms, Attendance management - Library Systems - use of LLMs to scan through books and respond to learner queries - Educational Software - Assessment software student learning progression - Social media for learning language learning apps - Making learning accessible to all - apps for social teaching - Direction for learning to attain learning outcomes - Connecting learning with opportunities					
AGRICULTURE (CROPS, DAIRY, POULTRY) Role of Agriculture in Indian Economy - Soil health and fertility management - Investment and Innovation in Agriculture - Government policies and subsidies for agriculture - Role of startups and agritech companies - Innovations in crop production, dairy, and poultry farming - Challenges in traditional farming methods - Integrating technology for sustainable agriculture - Mobile Apps for Agriculture - Digital marketplaces for agricultural products - Precision Farming - IoT in Agriculture - Drones in Agriculture - Aerial spraying of pesticides and fertilizers - Livestock monitoring and management with drone technology - Cloud Computing in Agriculture - Applications of Blockchain in Agriculture - Ensuring transparency and traceability in the supply chain - Blockchain for smart contracts and payments in agriculture.					6 Hours
HEALTHCARE - CLINICAL, PHARMACEUTICAL, MENTAL HEALTH AND REHABILITATION eHealth-Types of records in healthcare: EHR, EMR, PHR - Generative AI in healthcare - Telemedicine - Wearable IoT in Healthcare - Upgrading the legacy software and data security - Future trends and their Examples - Diabetics and pharmaceutical drugs - Digital twins in healthcare - Phases of clinical trial and their frameworks					6 Hours
ROLE OF AI AI in Music: Composition and Production - Sound Design and Mixing - Music Recommendation - Personalized Learning - Rights Management and Copyright AI in Law: Legal Research - Contract Analysis and Drafting - Predictive Analytics - Document Automation - Compliance Monitoring AI in Textiles: Design and Trend Prediction - Quality Control - Supply Chain Optimization - Personalization and Customization - Sustainability					6 Hours
GAMING Introduction to Gaming and Game design - Game Development Tools and Engines - Graphics and Animation in Games - Artificial Intelligence in Games - Game Programming Usecases - Virtual and Augmented Reality - The Future of Gaming and Emerging Technologies - Job Market and gamification.					3 Hours
TAMIL COMPUTING Introduction to types of AI - Data and Domain - Types of Models - Foundation Models (LLM) - Solving Usecases - Natural Language Processing - NLP Applications - NLP Pipeline - NLP Preprocessing - Why Tamil AI? - Building Tamil AI – Necessities - Data Curation Challenges - Data Curation Framework - Core Components - Models for Tamil - Generative AI: Research Directions - Limitations of Generative AI - Role of the community.					6 Hours
Theory Hours:	Tutorial Hours:	Practical Hours:	Project Hours:	Total Hours:	30

Learning Resources	
Online Resources (Weblinks)	
1. Get Interactive: Practical Teaching with Technology Coursera 2. What future for education? Coursera 3. Sustainable Agricultural Land Management Coursera	


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4. IoT Enabled Farming | Coursera
5. Introduction to Healthcare | Coursera
6. Game Design and Development 4: 3D Platformer | Coursera

Assessment

MCQ (10 questions) on every domain in Coursera / Poster Presentation.

Course Curated by

Expert(s) from Industry	Expert(s) from Higher Education Institution	Internal Expert(s)
-	-	Dr. K. Saranya, Mr. V. Senthilkumar, Dr. N. Jeba, Department of Computer Science and Engineering Ms. G. Shobana, Department of IT, Ms. P. R. Rupashini, Ms. G. Preethi, Department of AI&DS
Recommended by BoS on	16.08.2024	
Academic Council Approval	No: 27	Date 24.08.2024



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Semester – II

A handwritten signature in black ink, appearing to read "Shaulgim", enclosed within a rectangular box.

Signature of BOS Chairman, IT

24HSP005	MASTERING CONVERSATIONS (Common to AD, CS, IT)	L	T	P	J	C
		0	0	2	0	1
HS		SDG		4, 8		

Pre-requisite courses	-	Data Book / Codes books (If any)	-
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Course Objectives:	
The purpose of taking this course is to:	
1	Demonstrate understanding of different perspectives by analyzing complex personal and professional situations.
2	Engage in thoughtful dialogue and discussions about complex, real-world issues, utilizing critical thinking to assess different viewpoints.
3	Apply role-playing as a tool to enhance understanding of workplace dynamics, conflict resolution, and team collaboration.

Course Outcomes		
After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO 1	Empathize with and understand people in both professional and personal contexts, reflecting on situations from multiple perspectives and participating in activities that mirror career-related scenarios	Ap
CO 2	Analyze and converse critically on complex subjects, demonstrating the ability to approach and deal with various social contexts effectively	An
CO 3	Exhibit skills in role-playing and enacting given situations to navigate diverse social interactions and career-related contexts.	C

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team	Communication	Project Management and Finance	Life-Long Learning	PSO 1	PSO 2
1						3			3	2	3		
2									1	2			
3									3	2			

Course Content


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Practical Component / Roleplays Dynamics Introduction to Role play - Benefits of role plays - Importance of gesture, tone and modulation-Skill development through role play activities - Types of role plays - Conversation Building through communicative functions-Initiating a dialogue- Framing questions- Receiving feedback				6 Hours	
Practical Component /Roleplays on Social Skill Social Interactions: - (Ordering food at a restaurant- Making a reservation at a hotel-- Shopping at a store-- Attending a party or social gathering) Travel and Tourism:(Asking for directions- Booking a flight or hotel-- Exploring a new city- Interacting with local people) Community and Volunteering:(Participating in a charity event- Volunteering at a local organization- Discussing community issues- Organizing a community project)				6 Hours	
Practical Component / Roleplays on Education and Technology Education and Personal Growth:(Setting goals- (Short term & Long term)- Creating a study plan- Participating in a workshop- Reflecting on personal growth) Technology and Online Interactions:(Participating in an online meeting- Creating a social media post- Writing an email or text message- Making an online purchase) Technology and Science:(Explaining a scientific concept- Discussing emerging technologies- participating in Hackathons- Presenting a research paper)				6 Hours	
Practical Component / Roleplays on Strategic Insights Critical Thinking :(Evaluating a news article-solving a moral dilemma-Decision with incomplete information-Assessing a historical event) Problem-Solving:(Resolving a conflict- Negotiating a deal - Making a complaint- Apologizing for a mistake) Business and Entrepreneurship:(Pitching an idea- Negotiating a contract- Conducting a market Research- Presenting a product launch)				6 Hours	
Practical Component / Roleplays on Cultural Exchange Cultural Exchange:(Sharing customs and traditions- Discussing cultural differences- Exploring historical events- Participating in a cultural festival) Media and Entertainment:(Event planning- Creating an advertisement-Digital Marketing-Conducting interviews- Creating news broadcast- Writing and Performing a script- Enacting one act plays) Arts and Culture:(Visiting an art gallery - Attending/ organizing a concert or play - Discussing literature- Creating a piece of art)				6 Hours	
Theory Hours:	0	Tutorial Hours:	0	Practical Hours:	30
				Project Hours:	0
				Total Hours:	30

Learning Resources	
Reference books	
1. Bonwell, C. C., & Eison, J. A. (1991). Active learning: Creating excitement in the classroom. Washington, DC: The George Washington University. 2. Harbour, E., & Connick, J. (2005). Role playing games and activities rules and tips. Retrieved from https://www.businessballs.com/roleplayinggames.htm	


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3. Lebaron, J., & Miller, D. (2005). The potential of jigsaw role playing to promote the social construction of knowledge in an online graduate education course. Retrieved from http://paws.wcu.edu/jlebaron/Jigsaw-FnlTCRpdf_050812.pdf
4. Davies, A. (2018). Teaching and learning through role-play: A practical guide. Maidenhead, UK: McGraw-Hill Education.
5. Young, K. C. (2016). The art of role play: Developing realistic scenarios for skill development. Boston, MA: Pearson.
6. Yardley-Matwiejczuk, K. M. (1997). Role play: Theory and practice. London, UK: SAGE Publications Ltd.

Online Resources (Weblinks)

1. <https://www.niu.edu/citl/resources/guides/instructional-guide>
2. <https://positivepsychology.com/role-playing-scripts/>

Assessment (Practical course)

Assignments / Mini project, Quiz, Lab, Quizzes and written assignments, Participation in group activities

Course Curated by

Expert(s) from Industry	Expert(s) from Higher Education Institution	Internal Expert(s)
Mr. Vijayan Ramanathan, Project manager, Toppan Merrill. Technologies, Coimbatore	Dr. Aninditha Sahoo, IIT, Madras Dr. P.R. Sujatha Priyadharshini, Anna University, Chennai Dr. E. Justin Ruben, CIT, Coimbatore	Dr. Arokia Lawrence Vijay Dr. Tissaa Tony Department of English
Recommended by BoS on	16.08.2024	
Academic Council Approval	No:27	Date 24.08.2024



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24MAI124	MULTIVARIATE CALCULUS AND FORECASTING (Common to AD, CS, IT)	L	T	P	J	C
		3	0	2	0	4
BS		SDG		7, 9		
Pre-requisite courses	24MAI114/ Applied Linear Algebra and Calculus	Data Book / Codes books (If any)			-	

Course Objectives:

The purpose of taking this course is to:

1	understand the techniques of evaluating double and triple integrals and applying them to calculate areas and volumes.
2	familiarize students with vector field concepts such as gradient, divergence, and curl, and apply the theorems of Green, Gauss, and Stokes.
3	develop an understanding of the least squares method for fitting various types of curves and its application in forecasting.
4	equip students with knowledge of time series analysis, including construction, trend measurement, and seasonal variation determination.
5	introduce students to numerical methods such as interpolation, numerical differentiation, and numerical integration.

Course Outcomes

After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO 1	apply double and triple integrals with constant and variable limit concepts to compute areas and volumes in cartesian coordinates.	Ap
CO 2	calculate gradient, divergence, and curl, and verify Green's theorem, Gauss's divergence theorem, and Stokes' theorem in a given vector field.	Ap
CO 3	assess the reliability of predictions using goodness-of-fit measures like R^2 , RMSE, MAE, and MAPE for the method of least squares to fit linear, parabolic, cubic, and non-linear curves.	An
CO 4	analyze time series data, and measure trends using methods like moving averages and assess seasonal variations through appropriate techniques.	An
CO 5	apply Newton's interpolation techniques for both forward and backward interpolation, perform numerical differentiation.	Ap
CO 6	apply the concepts of Trapezoidal and Simpson's rules for numerical integration.	Ap

Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)
1	2	3	4	5	6	7	8	9	10	11	


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Practical Component					6 Hours				
- Time series construction and Measurement of Trend by Moving Averages. - Simple Average, Ratio to Trend Method and Ratio to Moving Average Method to determine seasonal variations in a time series dataset									
NUMERICAL DIFFERENTIATION AND INTEGRATION									
Interpolation – Newton’s forward and backward interpolation – Newton’s divided difference interpolation – Numerical differentiation by using Newton’s forward, backward and divided differences – Numerical integration by using Trapezoidal and Simpson’s 1/3rd and 3/8th rules					9 Hours				
Practical Component					6 Hours				
- Numerical Differentiation - Newton’s divided differences. - Numerical Integration using Trapezoidal and Simpson’s rule.									
Theory Hours:	45	Tutorial Hours:	0	Practical Hours:	30	Project Hours:	0	Total Hours:	75
Learning Resources									
Textbooks									
- Kreyzig E., “Advanced Engineering Mathematics”, 10th Edition, John Wiley and sons, 2023 A. Montgomery D.C., Johnson. L.A., Gardiner J.S., “Forecasting and Time series Analysis”, McGraw Hill, 1990 - Gerald, C. F. and Wheatley, P. O., “Applied Numerical Analysis”, 7th Edition, Pearson Education Asia, New Delhi - Numerical Methods for Scientific and Engineering Computation by M.K. Jain, S.R.K.Iyengar and R.K. Jain, New Age International Publishers 2007. - Gupta S.C and Kapoor V.K, “Fundamentals of Mathematical Statistics”, 11th extensively revised edition, Sultan Chand & Sons, 2007.									
Reference books									
- Grewal B.S., “Higher Engineering Mathematics”, Khanna Publishers, New Delhi, 44th Edition, 2014. - Weir, MD, Hass J, Giordano FR: “Thomas’ Calculus”, Pearson Education, 15th Edition, 2023 - Kandasamy P., Thilagavathy K. and Gunavathy K., “Numerical Methods”, S. Chand Co. Ltd., New Delhi, 2007. - David C. Lay, “Linear Algebra and its Applications”, Pearson Education Asia, New Delhi, 6th Edition, 2021 - Anderson, T. W, “An Introduction to Multivariate Statistical Analysis”, John Wiley and Sons, 2003.									
Online Resources (Web Links)									
Double and Triple Integrals (Khan Academy): https://www.khanacademy.org/math/multivariable-calculus/integrating-multivariable-functions Gradient, Divergence, and Curl (Paul’s Online Math Notes): http://tutorial.math.lamar.edu/Classes/CalcIII/CalcIII.aspx Method of Least Squares and Curve Fitting (Wolfram MathWorld): https://mathworld.wolfram.com/LeastSquaresFitting.html Introduction to Time Series Analysis (Coursera - University of London): https://www.coursera.org/learn/time-series-analysis Numerical Integration (Trapezoidal and Simpson's Rule) (Khan Academy): https://www.khanacademy.org/math/ap-calculus-bc/bc-integration-new/bc-6-14/a/numerical-integration									


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Assessment			
SA I, SA II, Activity and Learning Task(s), Mini project, MCQ, End Semester Examination (ESE), Lab Workbook, Experimental Cycle tests, viva-voce			
Course Curated by			
Expert(s) from Industry	Expert(s) from Higher Education Institution	Internal Expert(s)	
Mr. Ramesh V.S., STEPS Knowledge Services Private Limited, Coimbatore. Mr. Jayakumar Venkatesan, Valles Marineris International Private Limited- Chennai. Mr. Imran Khan, GE Transportation Company, Bangalore	Dr.T. Govindan, Government College of Engineering, Srirangam, Trichy. Dr.C. Porkodi, PSG College of Technology, Coimbatore. Dr.P. Paramanathan, Amrita Vishwa Vidyapeetham, Coimbatore.	Dr. Vijeta Iyer Dr.K.P. Thilagavathy Ms. Princy Flora Department of Mathematics	
Recommended by BoS on	16.08.2024		
Academic Council Approval	No: 27	Date	24.08.2024


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24CSI007 PC	PYTHON FOR COMPUTATIONAL PROBLEM SOLVING (Common to AD, CS, IT)	L	T	P	J	C
		1	0	4	0	3
		SDG		9		

Pre-requisite courses	NIL	Data Book / Code book (If any)	NIL
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Course Objectives:	
The purpose of taking this course is to:	
1	Introduce the basics of Python, including data types, operators, and control structures, with a focus on practical implementation.
2	Develop proficiency in iterative statements, string handling, and fundamental data structures like lists, tuples, and dictionaries through extensive lab work.
3	Provide foundational knowledge on modules, functions, object-oriented programming (OOP) concepts, and file handling.
4	Familiarize students with exception handling and Python's standard libraries like NumPy and Pandas for data manipulation.
5	Enable students to apply Python concepts to solve real-world problems through practical, hands-on experiments.

Course Outcomes		
After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO1	Understand Python syntax, data types, operators, and basic control structures.	U
CO2	Apply conditional and iterative constructs for solving logical problems.	Ap
CO3	Implement modular programming concepts, handle strings, and utilize data structures efficiently	Ap
CO4	Demonstrate object-oriented programming, file handling, and exception handling in Python.	Ap
CO5	Utilize libraries like NumPy and Pandas for data analysis and manipulation.	Ap

Course Outcome	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)										Program Specific Outcomes (PSO)
	1	2	3	4	5	6	7	8	9	10	11


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1. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist," Green Tea Press, 2nd Edition, 2015.
2. Zed A. Shaw, "Learn Python the Hard Way," Addison-Wesley, 5th Edition, 2024.

Online Educational Resources:

1. <https://docs.python.org/3/tutorial/index.html>
2. <https://learn.microsoft.com/en-us/shows/intro-to-python-development/>
3. <https://www.udacity.com/course/introduction-to-python--ud1110>
4. <https://www.geeksforgeeks.org/courses/python-course-certification-free>
5. https://onlinecourses.nptel.ac.in/noc24_cs57/preview
6. <https://www.coursera.org/projects/python-for-data-analysis-numpy>

Assessment (Embedded course)

MCQ, Experimental Cycle tests and End Semester Examination (Lab)

Course Curated by

Expert(s) from Industry	Expert(s) from Higher Education Institution	Internal Expert
-	-	Ms. Ruphashini Department of Artificial Intelligence and Data Science
Recommended by BoS on	29.11.2025	
Academic Council Approval	No: 29	Date 24.12.2025



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24ITI001	Embedded Systems for IoT	L	T	P	J	C
		2	0	2	0	3
		SDG		4,9		
ES						

Pre-requisite courses	24CSI102 Digital Logic Circuits	Data Book / Codes / Standards (If any)	Nil
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Course Objectives:	The purpose of taking this course is to:
1	Introduce the architecture and operational characteristics of embedded system, microprocessors and microcontroller
2	Learn IoT architecture, ecosystem components, and communication technologies used in connected systems.
3	Develop practical skills in Arduino and Raspberry Pi programming for sensor, actuator, and device interfacing
4	Apply IoT concepts to design smart solutions for real-world applications such as smart cities, healthcare, agriculture, manufacturing, and home automation.

Course Outcomes:	After successful completion of this course, the students shall be able to	Bloom's Taxonomy Level (BTL)
CO 1	Demonstrate knowledge of embedded system architecture, the functions of microprocessors and microcontrollers.	U
CO 2	Apply IoT concepts, characteristics, and architecture to explain real-world IoT systems.	Ap
CO 3	Apply Knowledge of sensors, actuators, and selection criteria to choose suitable devices for IoT applications.	Ap
CO 4	Analyze IoT applications, communication technologies, and recent trends to design smart solutions	An

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2
1	3	2			1							2	
2	2	2	2		2								


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3	2	2	2		2					2			
4	2	3	3		2					1		2	

<u>Course Content</u>	
INTRODUCTION Overview of Embedded System - Design Challenges - Introduction to Microprocessors- 8086 Architecture- Pin Configuration- Instruction Set- 8086 Assembly Language Programming-Interrupts -Introduction to Microcontroller- Microprocessors Vs Microcontroller- Role of microcontroller in IoT	7 Hours
Lab Components: Basic Assembly Program: ALP to perform 16-bit arithmetic operations	4 Hours
IOT Fundamentals Introduction to Internet of Things (IoT), Functional Characteristics and evolution of IoT – different layers of Architecture and their working - Elements of an IoT ecosystem- Different IoT boards, architecture - IDEs for IoT Prototyping- Programming -Structure-functions- Input and output operations- Serial communication - Libraries and code management	8 Hours
Lab Components: 1. LED Blink 2. Buzzer ON /OFF 3. Serial Communication 4. Random LED Game 5. LED pattern generator using function	8 Hours
IoT Hardware and Communication Sensors and actuators – Types and functions – Sensor characteristics – Sensor selection criteria – Actuator types and applications-Comparison of Arduino, Raspberry Pi and AI-enabled boards. Gateways in IoT- Network connectivity – Short-range Communication - Long-range communication - RaspberryPi: Introduction to RaspberryPi - Hardware Layout - Configuring RaspberryPi - Programming RaspberryPi	8 Hours
Lab Components Board (Arduino/ RaspberryPi) 1. Temperature and Humidity Monitoring 2. Measure the Distance of object 3. Detect Human motion and Turn ON LED 4. Monitor the Soil Moisture Level 5. Control LED Brightness based on Light Intensity	8 Hours
Case Studies on IOT Applications Recent Trends in the Adoption of IoT, Role of cloud in IoT. Case Studies: Smart Cities - Smart Waste Management, Smart Street Lights, Smart Street Parking. Healthcare - Baby Monitoring, Elderly Monitoring, Agriculture - Precision Agriculture, Connected Livestock, Food Safety. Manufacturing and Logistics - Smart Manufacturing- Smart Packaging, Smart Label-Home Automation.	7 Hours



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Lab component	10 Hours
1. Smart Street Light Automation 2. Smart Waste Bin Monitoring system 3. Health Monitoring system 4. Smart Home Automation	

Theory	30	Tutorial	0	Practical	30	Project	0	Total	60
Hours:		Hours:		Hours:		Hours:		Hours:	

Learning Resources		
Reference books/ Web Links		
1. “Internet of Things: A Hands-On Approach”, Arshdeep Bahga, Vijay Madiseti, Publisher Universities Press, 2016 2. Douglas V. Hall, “Microprocessors and Interfacing: Programming and hardware”, McGraw Hill Education, Third Edition, 2021 3. “Building the Internet of Things: Implement New Business Models, Disrupt Competitors, Transform Your Industry” by Maciej Kranz, ISBN: 978-1-119-28568-7, 2016. 4. “The Internet of Things: Key Applications and Protocols”, Olivier Hersent, David Boswarthick, Omar Elloumi, Wiley Publication, 2012. 5. “IOT Deployment Handbook: A practical Guide to Implementing Successful IOT Projects” By Richard G. Brown, 2022		
Online Resources		
1. https://onlinecourses.nptel.ac.in/noc26_cs37/preview 2. https://www.coursera.org/specializations/iot 3. https://www.udemy.com/course/introduction-to-internet-of-things-iot-using-arduino/?kw=internet+of+things+usi&src=sac		
Assessment (Embedded course)		
SA I, SA II, Activity and Learning Task(s), Mini project, MCQ, End Semester Examination (ESE), Lab Workbook, Experimental Cycle tests, viva-voce		
Course Curated by		
Expert(s) from Industry	Expert(s) from Higher Education Institution	Internal Expert(s)
-	-	Ms.G.Shobana , Assistant Professor Department of Information Technology Mr.M.Sathish Assistant Professor, Department of CSE
Recommended by BoS on		09.05.2025


 Signature of BOS Chairman, IT

Academic Council Approval	No: 28	Date	26.06.2025
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Signature of BOS Chairman, IT

24ADT015	FINANCE, ECONOMICS AND MARKETING (Common to AD, CS, IT)			L	T	P	J	C
				3	0	0	0	3
HS				SDG	8			
Pre-requisite courses	Nil		Data Book / Codes / Standards (If any)			Nil		

Course Objectives:	
The purpose of taking this course is to:	
1	Understand core concepts of managerial economics and apply demand estimation techniques in business decision-making.
2	Gain foundational knowledge of cost and financial accounting for analyzing and preparing basic financial statements.
3	Develop skills in financial statement analysis and cash-flow management for strategic financial planning.
4	Apply marketing principles and research analytics to formulate integrated, data-driven growth strategies.

Course Outcomes		
After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO1	Apply core economic concepts (demand, supply, elasticity, utility) to managerial decision-making.	Ap
CO2	Record, summarise and interpret fundamental financial transactions in accordance with generally accepted accounting principles (GAAP/Ind-AS).	Ap
CO3	Analyse and evaluate corporate performance using the three key financial statements and cash-flow-based metrics (EBITDA, FCF, EVA).	An
CO4	Design customer-centred marketing strategies that integrate traditional and digital channels to create, communicate and capture value.	Ap
CO5	Employ data-driven market research and analytics to segment, target and position offerings and to forecast demand under uncertainty.	An

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2
1	3		2	2									
2		2											


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3		2									2		
4		2									2		
5		2										3	3

Course Content	
MANAGERIAL ECONOMICS & DEMAND ESTIMATION Managerial goals vs. shareholder value; Law of demand & supply; elasticity (price, income, cross); marginal utility & consumer surplus; exceptions to the law of demand; quantitative & qualitative demand-forecasting techniques (time-series, causal models, Delphi, big-data tools); introduction to behavioural economics for managers.	9 Hours
COST & FINANCIAL ACCOUNTING FUNDAMENTALS Cost concepts—fixed, variable, stepped, sunk, opportunity, relevant; economies & diseconomies of scale; cost-volume-profit analysis; accounting principles & conventions, double-entry system, journal-ledger-trial balance; the accounting equation; preparation of basic Income Statement and Balance Sheet.	9 Hours
FINANCIAL STATEMENT ANALYSIS & CASH-FLOW MANAGEMENT Operating vs. financing & investing cash flows; preparation of the Statement of Cash Flows (IND-AS 7); working-capital management; ratio analysis—liquidity, leverage, profitability, efficiency; advanced cash-flow metrics (EBITDA, FCF, EVA); brief introduction to valuation multiples.	9 Hours
MARKETING PRINCIPLES IN THE DIGITAL ERA Evolution of marketing & the holistic marketing concept; Marketing vs. Selling; customer value & satisfaction; 7 Ps and extended service mix; product-life-cycle strategies; overview of digital marketing (SEO, SEM, social, content, influencer); omnichannel customer journeys.	9 Hours
MARKET RESEARCH, ANALYTICS & STRATEGIC INTEGRATION Marketing-information systems (MIS); environmental & competitor scanning (PESTLE & Porter 5-forces); STP—segmentation techniques, targeting criteria, positioning maps; basics of marketing analytics (A/B testing, RFM, CLV); integrating finance & marketing for growth strategy—profit-impact of marketing decisions, budgeting, ROI dashboards; capstone case discussion.	9 Hours

Theory Hours:45	Tutorial Hours: 0	Practical Hours: 0	Project Hours: 0	Total Hours:45
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Learning Resources
Textbooks
1. P. Geetika, P. Roy Chowdhury & P. Ghosh. Managerial Economics (3e), McGraw-Hill (2017). 2. V. G. Narayanan. An Easy Introduction to Financial Accounting: A Self-Study Guide (2020). 3. Philip Kotler, Kevin Lane Keller. Marketing Management (16e), Pearson (2022).
Reference
1. D. N. Gujarati & D. C. Porter. Essentials of Econometrics (4e), McGraw-Hill (2009). 2. C. Dougherty. Introduction to Econometrics (4e), OUP (2020). 3. Tapan K. Panda. Marketing Management: Text & Cases (3e), Excel Books (2023). 4. Mike Grigsby. Marketing Analytics: Strategic Models & Metrics, Kogan Page (2022). 5. Peter Atrill & Eddie McLaney. Financial Accounting for Decision Makers (9e), Pearson (2021).
Online Resources (Weblinks)


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1. <https://fulfillment.shiprocket.in/blog/demand-estimation/>
2. <https://www.coursera.org/learn/uva-darden-financial-accounting>
3. <https://www.investopedia.com/articles/stocks/07/easycashflow.asp>
4. <https://handbook.flinders.edu.au/topics/2025/busn1022>
5. <https://insight7.io/marketing-research-and-insights-8-integration-techniques/>

Assessment (Theory course)

SA I, SA II, Activity and Learning Task(s), MCQ, End Semester Examination (ESE)

Course Curated By

Expert(s) from Industry	Expert(s) from Higher Education Institutions	Internal Expert(s)	
-	-	Aman Kumar Dubey Assistant Professor & Program Head/MBA IEV	
Recommended by BoS on	09.05.2025		
Academic Council Approval	No: 28	Date	26.06.2025



Signature of BOS Chairman, IT

24HST102	தமிழரும் தொழில்நுட்பமும்/ TAMILS AND TECHNOLOGY	L	T	P	J	C
HS		1	0	0	0	1
		SDG		4, 8		
Pre-requisite courses	-	Data Book / Code book (If any)			-	

Course Objectives:

The purpose of taking this course is to:

1	தமிழர்களின் நெசவு மற்றும் பானைத் தொழில்நுட்பத்தை அறிமுகப்படுத்துதல், சங்க கால கட்டிட தொழில்நுட்பத்தை விளக்குதல், கோயில்கள் மற்றும் சிற்பக்கலைகளை ஆராய்தல். introducing weaving and pottery technology of Tamils -Explaining the building technology of the Sangam Period-Explore temples and sculptures.
2	கப்பல், இரும்பு, நாணயங்கள், மணி உருவாக்கும் தொழிற்சாலைகள், ஆகியவற்றை விளக்கம் செய்தல், தமிழகத்தின் தொல்லியல் சான்றுகளின் பழமையை உணர்த்துதல். explain Ship, Iron, Coins, Beads Making Factories. Realizing the Antiquity of Archaeological Evidence of Tamil Nadu
3	வேளாண்மை மற்றும் அறிவியல் தமிழைப் பற்றி அறிதல், இணையத்தில் தமிழின் தேவையை உணர்த்துதல், தமிழ் மென்பொருள்களை அறிமுகம் செய்தல். knowledge of Agricultural and Scientific Tamil, Realizing the need for Tamil on the Internet, Introducing Tamil software.

Course Outcomes:

After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO 1	தமிழர்களின் நெசவு மற்றும் பானைத் தொழில்நுட்பத்தின் முக்கியத்துவத்தினை அறிந்து கொள்ளுதல். சங்ககால தமிழர் வளர்த்த அழகுக் கலைகளைத் தெரிந்து கொள்ளுதல். know the importance of weaving and pottery technology of Tamils-To know the Aesthetics arts developed by Sangam Tamils	U
CO 2	கப்பல் கட்டும் கலை, இரும்புத் தொழிற்சாலை, நாணயங்கள் அச்சடித்தல், மணி உருவாக்கும் தொழிற்சாலைகள், சிலப்பதிகாரத்தில் உள்ள மணிகளின் வகையை அறிதல். knowledge of ship building, ironworks, coinage, minting, and beads making factories, Knowing the types of beads in Silapathikaram.	U
CO 3	வேளாண்மை மற்றும் நீர்ப்பாசன தொழில்நுட்பத்தை அறிந்து கொள்ளல். அறிவியல் தமிழ் மற்றும் கணினித் தமிழைப் புரிந்து கொள்ளுதல். know agriculture and irrigation technology. Understanding Scientific Tamil and Computer Tamil.	Ap

Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)
1	2	3	4	5	6	7	8	9	10	11	


 Signature of BOS Chairman, IT

Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO 1	PSO 2
1	2		2				3	2	2		2		
2	2		2				3	2	2		2		
3	2		2				3	2	2		2		

Course Content	
நெசவு மற்றும் பாணைத் தொழில்நுட்பம்: சங்க காலத்தில் நெசவுத் தொழில் - பாணைத் தொழில்நுட்பம் - கருப்பு சிவப்பு பாண்டங்கள் - பாண்டங்களில் கீறல் குறியீடுகள். Weaving Industry during Sangam Age - Ceramic technology - Black and Red Ware Potteries (BRW)-Graffiti on Potteries.	3 Hours
வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்: சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் ஓர் சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு - சங்க காலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் - சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் - மாமல்லபுரம் சிற்பங்களும், கோவில்களும் - சோழர் காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் - நாயக்கர் காலக் கோயில்கள் - மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் - செட்டிநாட்டு வீடுகள் - பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ-சாரோசெனிக் கட்டிடக் கலை. Designing and Structural construction House & Designs in household materials during Sangam Age - Building materials and Hero stones of Sangam age Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples 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.	3 Hours
உற்பத்தித் தொழில் நுட்பம்: கப்பல் கட்டும் கலை - உலோகவியல் - இரும்புத் தொழிற்சாலை - இரும்பை உருக்குதல், எஃகு - வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள்-நாணயங்கள் அச்சடித்தல் - மணி உருவாக்கும் தொழிற்சாலைகள் - கல்மணிகள், கண்ணாடி மணிகள் - சுடுமண் மணிகள் - சங்கு மணிகள் - எலும்புத்துண்டுகள் - தொல்லியல் சான்றுகள் - சிலப்பதிகாரத்தில் மணிகளின் வகைகள். 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 beads - Archeological evidence - Gem stone types described in Silappathikaram.	3 Hours
வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நுட்பம்: அணை, ஏரி, குளங்கள், மதகு - சோழர்காலக் குழுவித் தூம்பின் முக்கியத்துவம்-கால்நடை பராமரிப்பு - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள்-	


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வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள் - கடல்சார் அறிவு - மீன்வளம் - முத்து மற்றும் முத்துக்குளித்தல் - பெருங்கடல் குறித்த பண்டைய அறிவு - அறிவுசார் சமூகம். 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.	3 Hours
அறிவியல் தமிழ் மற்றும் கணித்தமிழ்: அறிவியல் தமிழின் வளர்ச்சி - கணித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின்பதிப்பு செய்தல் - தமிழ் மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக்கழகம் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ் அகராதிகள்- சொற்குவைத் திட்டம். 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.	3 Hours

Theory	Tutorial	Practical	Project	Total
Hours: 15	Hours: 0	Hours: 0	Hours: 0	Hours: 15

Reference books
1. தமிழக வரலாறு மக்களும் பண்பாடும் கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்). 2. கணினித் தமிழ் - முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்). 3. கீழடி - வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு). 4. பொருறை - ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு). 5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL- (in print) 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.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies). 8. The Contributions of the Tarnils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.) 9. Keeladi 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Textbook and Educational Services Corporation> Tamil Nadu) 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 Bookand Educational Services Corporation> Tamil Nadu) 12. Journey of Civilization Indus to Vaigai (R. Balakrishnan) (Published by: RMRL) - Reference Book.
Online Resources
1. https://www.youtube.com/watch?v=Gp1ratX2sOE&list=PLtyn2o7hocf40PtPibRqJTf_dQL3eOtL1 2. https://www.youtube.com/watch?v=jteRvnNiD6w

Assessment (Theory course)
SA I, SA II, Activity and Learning Task(s), Mini project, MCQ, End Semester Examination (ESE)


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Course Curated by			
Expert(s) from Industry	Expert(s) from Higher Education Institution		Internal Expert(s)
-	-		-
Recommended by BoS on	16.08.2024		
Academic Council Approval	No: 27	Date	24.08.2024


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24INP103	INNOVATION PRACTICUM – II (Common to All branches)	L	T	P	J	C
ES		0	0	2	0	1
		SDG		9, 11, 12		
Pre-requisite courses	-	Data Book / Code book (If any)			-	

Course Objectives:

The purpose of taking this course is to:

1	equip students with essential tools and techniques for leveraging open-source technologies to develop proof-of-concepts and prototypes
2	provide hands-on experience and participants will gain a comprehensive understanding of the entire product development process
3	final prototyping, empowering them to transform their ideas into tangible outcomes

Course Outcomes

After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO 1	analyse the effectiveness of various electronic tools and techniques in product development processes	An
CO 2	develop and implement functional software prototypes using open-source tools	Ap
CO 3	design and fabricate 3D models using digital fabrication techniques	Ap

Course Outcomes (CO)	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11	PSO 1	PSO 2
	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning		
1	3	2	2	2	2								
2	2	2	2		2								
3	2	2	3	2	2								

Course Content

INTRODUCTION TO OPEN-SOURCE TOOLS AND TECHNIQUES Explore the concept of open-source, its underlying principles and its contrast with proprietary software, Discuss the advantages of using open-source tools, such as lower costs, increased innovation, educational value, and community support, walk through to	3 Hours
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the commonly used open-source tools for electronics design (KiCad, FreeCAD), software development (Python, Eclipse), and fabrication (Cura, LinuxCNC).		
ELECTRONICS FUNDAMENTALS AND TOOLS Introduction to basic electronic components (resistors, capacitors, transistors, etc.), Understanding of electronic circuits and their functions, Hands-on practice with CircuitJS and Falstad, Simulating and analysing electronic circuits, Introduction to Arduino and Raspberry Pi, exploring their capabilities and applications, Designing PCBs using KiCad and EasyEDA, Understanding PCB fabrication processes		6 Hours
SOFTWARE PROTOTYPING AND TOOLS Benefits of rapid prototyping in product development, Iterative design and testing, Wireframing tools (Balsamiq, Figma), UI design tools (Sketch, Figma), Programming languages (Python, JavaScript), Testing frameworks (Selenium), No-code platforms (Bubble, Adalo, Wix, AppGyver), Building functional prototypes without extensive coding		6 Hours
FABRICATION AND PROTOTYPING Overview of fabrication techniques (3D printing, laser cutting, CNC machining), Prototyping methods for physical products, using tools like Blender, TinkerCAD, or Fusion 360, Creating 3D models for physical prototypes, Hands-on experience with laser cutting and engraving, Understanding their applications and limitations		7 Hours
SIMULATION & DEMONSTRATION Integrated project demonstration, explaining the design process, technical choices, and outcomes, simulation showcase to demonstrate their understanding of various technical tools and prototyping techniques		8 Hours
Theory Hours:	Tutorial Hours:	Project Hours:
0	0	30
		Total Hours: 30

Learning Resources	
Textbooks:	
1. Damir Godec, Joamin Gonzalez-Gutierrez, Axel Nordin, Eujin Pei, Julia Ureña Alcázar, A guide to additive manufacturing, Springer – 2022. https://doi.org/10.1007/978-3-031-05863-9 2. Introducing SolidWorks, Dassault Systems.	
References:	
1. Insight into Electronics 2. Microcontroller Programming with Arduino and Python 3. Fundamentals of 3D modelling	
Online Resources (Weblinks)	
1. Google Play store apps: a. https://play.google.com/store/apps/details?id=com.electronicslab b. https://play.google.com/store/apps/details?id=it.android.demi.elettronica 2. https://engservices-ece.sites.olt.ubc.ca/files/2020/01/SolidWorks-3D-Printing-Tutorial-R2.pdf	
Assessment (Practical course)	
Lab Workbook, Experimental Cycle tests, viva-voce	


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Course Curated by			
Expert from Industry	Expert(s) from Higher Education Institution		Internal Expert
Dr. Mahesh Veezhinathan Director - Innovation Practicum Associate VP - Forge. Innovation	-		Dr. Samuel Ratna Kumar P S Assistant Professor – III Department Mechanical Engineering
Recommended by BoS on	17.08.2024		
Academic Council Approval	No: 27	Date	24.08.2024


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24HSP112	HOLISTIC WELLNESS-II (Common to all Department)		L	T	P	J	C
0			0	2	0	1	
HS			SDG	3, 4			
Pre-requisite courses		24HSP111 / Holistic Wellness-I	Data Book / Code book (If any)			-	

Course Objectives:	
The purpose of taking this course is to:	
1	build on the foundation laid in Holistic Wellness -I and deepening into the practices and principles of holistic wellness.
2	explore advanced techniques in mental, emotional, and spiritual well-being, with an emphasis on creating sustainable wellness habits.

Course Outcomes		
After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO 1	apply advanced techniques in mindfulness, meditation, and stress management.	Ap
CO 2	understand the role of community and social connections in wellness.	U
CO 3	develop resilience and adaptability in maintaining wellness.	E
CO 4	refine and sustain a personalized holistic wellness plan.	E

Course Outcomes (CO)	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11	PSO 1	PSO 2
	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning		
1						2		2					
2						2							
3						2					3		
4						2					3		


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Course Content									
ADVANCED MINDFULNESS AND MEDITATION: • Deepening mindfulness practices for enhanced mental clarity. • Exploring different forms of meditation (e.g., guided, transcendental, movement-based). • Hands-on activity: Daily meditation practice and journaling reflections.				6 Hours					
EMOTIONAL RESILIENCE AND MENTAL HEALTH: • Building emotional resilience through positive psychology practices. • Cognitive-behavioural strategies for managing stress and anxiety. • Hands-on activity: Developing and practicing a resilience toolkit.				6 Hours					
SOCIAL AND ENVIRONMENTAL WELLNESS: • The impact of social connections and community on wellness. • Creating a supportive environment for personal growth. • Hands-on activity: Building a community wellness project or group activity.				6 Hours					
INTERNAL GROWTH AND PURPOSE: • Exploring the deeper aspects of internal wellness and self-actualization. • Reflective practices for discovering life purpose and meaning. • Hands-on activity: Creating a vision board or personal mission statement.				6 Hours					
SUSTAINING WELLNESS PRACTICES: • Strategies for maintaining wellness habits over the long term. • Adapting wellness plans to life changes and challenges. • Hands-on activity: Revising and finalizing a long-term personal wellness plan.				6 Hours					
Theory Hours:	0	Tutorial Hours:	0	Practical Hours:	30	Project Hours:		Total Hours:	30

Learning Resources	
Textbooks:	
1. Hanh, Thich Nhat. The Miracle of Mindfulness: An Introduction to the Practice of Meditation. Beacon Press, Boston (1975). 2. Tolle, Eckhart. The Power of Now: A Guide to Spiritual Enlightenment. New World Library, Novato (1997). 3. Patel, Kamlesh. Heartfulness Way: Heart-Based Meditations for Spiritual Transformation, Kamlesh Patel, 2018.	
References:	
1. Goleman Daniel., Emotional Intelligence., Bloomsbury India, India, (2021). 2. James Allen., As a Man Thinketh., Maple Press, Noida, (2010) 3. Swami Budhanandha., Will power and its development., Advaita Ashrama Mayavati, Pithoragarh, Himalayas from its Publication Department, Calcutta. (2001)	



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4. Rosenberg, Marshall Bertram., Nonviolent Communication: A Language of Life., Puddle Dancer Press, Encinitas, CA (2015).
5. Jayanna, Krishnamurthy., Science & Practice of Integrative Health & Wellbeing Lifestyle., White Falcon Publishing (2020).
6. Lipton, Bruce., The Biology of Belief 10th Anniversary Edition: Unleashing the Power of Consciousness, Matter & Miracles, Hay House, Carlsbad (2015).
7. Kalderdon Adizes Ichak., What Matters in Life: Lessons I Learned from Opening My Heart, WS Press, Newtown, PA(2023).
8. Murphy, Joseph., The Power of Your Subconscious Mind [Original Edition (Complete)], Prentice-Hall, Englewood Cliffs (1963).
9. Kamlesh D. Patel., Designing Destiny: The Heartfulness Way, Heartfulness Institute, Chennai (2021)

Online Resources (Weblinks)

- Introduction to Psychology
- Guided Meditation
- Life skills and value education
- James Allen Library

Assessment (Practical course)

Participation, Practical activities and assignments, personal wellness plan and reflection.

Course Curated by

Expert(s) from Industry	Expert(s) from Higher Education Institution	Internal Expert(s)
		Dr. Ezhilarasi Principal- KCT
Recommended by BoS on		
Academic Council Approval	No: 27	Date 24.08.2024



Signature of BOS Chairman, IT

24INP101	DESIGN THINKING (Common to all Department)	L	T	P	J	C
		0	0	2	0	1
ES		SDG	9			

Pre-requisite courses	-	Data Book / Code book (If any)	-
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Course Objectives:

The purpose of taking this course is to:

1	introduces first-year engineering students to Design Thinking, focusing on practical, user-centered problem-solving techniques
2	empathize with users, generate ideas, and create models to test and refine their solutions
3	understand iteration, empathy, and critical reflection to cultivate a creative mindset

Course Outcomes

After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO 1	apply problem-solving techniques and the Design Thinking process to engineering problems using simple models	Ap
CO 2	understand user needs through various empathy techniques and develop/refine models iteratively based on user insights.	U
CO 3	reflect critically on their learning journeys and the emotional demands of problem-solving. Collaborate effectively in teams to develop innovative solutions	Ap

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO 1	PSO 2
1	1		2			2		2			1		
2	1							2			1		
3	1		2			2		1			1		

Course Content

Introduction to Problem Solving and Ground Rules Introduction to problem-solving strategies without mentioning Design Thinking-Emphasize problem-solving attitudes, mindsets, and behaviours necessary for iterative problem solving (e.g., openness to failure, patience, empathy)-Set ground rules for the	6 Hours
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course, including incentives for creative risk-taking and penalties for non-participation or lack of reflection-Overview of the Design Thinking process and its importance.	
Empathy and Problem Definition Techniques for understanding user needs, including observation, interviews, surveys and focus groups-Importance of secondary research as a complement for the above-mentioned methods-Introduction to empathy cycles: involve students in two empathy cycles before and after problem definition-Finetuning problem definition based on user insights.	6 Hours
Ideation and Concept Modelling Brainstorming ideas and selecting feasible solution-Creating concept modelling to visualize ideas-Include an empathy cycle after students propose solutions, allowing them to revisit and reshape their solutions based on further insights from users.	6 Hours
Prototyping and Testing with Models Building basic prototypes using simple materials (e.g., cardboard, clay)- Introduction to different prototyping methods (e.g., low-fidelity vs high-fidelity models) for different contexts: product design, space design, policy, and digital/e-commerce solutions-Conduct an empathy cycle after the prototype is developed to gather user feedback and refine the prototype.	6 Hours
Iteration and Final Modelling Project Students refine their prototypes based on feedback from the empathy cycle-Finalize prototypes for presentation based on consistent feedback loops.	6 Hours
Presentation, Reflection, and Learning Summaries Students present their final projects and reflect on their learning journeys, including how their understanding of problem-solving and empathy evolved during the course- Learning Summary Activity: Each student presents their individual journey and learning outcomes from the empathy cycles and iterations-Peer review and group discussions.	

Theory	Tutorial	Practical	Project	Total
Hours: 0	Hours: 0	Hours: 30	Hours: 0	Hours: 30

Learning Resources

Textbooks:

1. Handbook of Design Thinking, Christian Muller – Roterberg, Kindly Direct Publishing
2. The Art of Innovation, Tom Kalley
3. E Balaguruswamy (2022), Developing Thinking Skills (The way to Success), Khanna Book Publishing Company

Online Resources (Weblinks)

1. Survey and focus group design guides
 2. Guidance on Designing, Administering and Analyzing Focus Groups and Interviews
 3. Empathy mapping tools
 4. How to Make a Concept Model
 5. Brainstorming Techniques: 15 Creative Activities
 6. 10 Brainstorming Techniques for Developing New Ideas
 7. Brainstorming templates
 8. 5 Common Low-Fidelity Prototypes and Their Best Practices
 9. UX Prototypes: Low Fidelity vs. High Fidelity
 10. Low-fidelity vs. High-fidelity Design Prototypes (and when to use which)
- Case study 1: Iterative Design and Prototype Testing of the NN/g Homepage
Case study 2: Using iterative design to optimise the user flow of a product
11. Reflective practice toolkit



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Assessment
Assignments, Mini project

Course Curated by			
Expert(s) from Industry	Expert(s) from Higher Education Institutions		Internal Expert(s)
			Dr. Padhmanand Sudhagar R Department of Bio-Tech Dr. Arul H Department of Physics
Recommended by BoS on	16.08.2024		
Academic Council Approval	No: 27	Date	24.08.2024


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Semester III

A handwritten signature in black ink, appearing to read "Shaulgim", enclosed within a rectangular box.

Signature of BOS Chairman, IT

24MAI234	COMPUTATIONAL PROBABILITY AND STATISTICS	L	T	P	J	C
		3	0	2	0	4
BS	(Common to CS, IT, AD)	SDG		3,8		
Pre-requisite courses		Data Book / Code book (If any)			Statistical tables	

Course Objectives:	
The purpose of taking this course is to:	
1	Introduce the concept of random variables and their probability distributions.
2	Expose students to two-dimensional random variables, correlation and regression analysis.
3	Explain the principal components from standardized variables.
4	Provide knowledge of hypothesis testing using small and large sample tests.
5	Explain the principles of experimental design and analysis of variance.

Course Outcomes		
After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO 1	Categorize and illustrate different types of random variables and their corresponding probability distributions.	An
CO2	Analyse joint distributions and relationships using correlation and regression techniques.	An
CO 3	Apply the concept of multivariate analysis to compute covariance and correlation matrices which forms the basis of principle component analysis.	Ap
CO 4	Examine large sample data by appropriate hypothesis testing techniques (Z-tests and Chi-square	An
CO 5	Test small sample data using t and F distributions, interpreting the results accurately.	An
CO 6	make use of ANOVA analysis in experimental design and interpret the results.	Ap

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)
	1	2	3	4	5	6	7	8	9	10	11	


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Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2
1	3	3			2								
2	3	3			2								
3	3	2			2								
4	3	3		2	2				1				
5	3	3		2	2				1				
6	3	2		2	2				1				

Course Content	
PROBABILITY AND RANDOM VARIABLES Axioms of probability - Conditional probability — Total probability — Bayes' theorem - Random variable —properties —Probability mass function—Probability density function — Distribution function —Moments- Normal Distribution. Practical Component • Introduction to R programming • Normal Distribution	10 Hours 6 Hours
TWO-DIMENSIONAL RANDOM VARIABLES Joint distributions — Marginal and conditional distributions — Expected values of functions of two variables- Correlation and regression (for discrete data only) - Central limit theorem (proof excluded). Practical Component • Correlation • Regression	9 Hours 6 Hours
MULTIVARIATE ANALYSIS Random vectors and matrices — Mean vectors and covariance matrices — Principal components — Population principal components — Principal components from standardized variables. Practical Component • Mean Vectors and Covariance matrices • Principal Components	8 Hours 6 Hours
TESTING OF HYPOTHESIS Large Sample tests (single mean, difference of means), Small sample tests based on Student-t test (single mean, difference of means, paired i- test) and F (variance ratio) test— Chi-square test for independence of attributes and goodness of fit. Practical Component • Student t-test • F test	9 Hours 6 Hours



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DESIGN OF EXPERIMENTS Analysis of Variance (ANOVA) — Completely Randomized Design (CRD) Randomized Block Design (RBD) — Latin Square Design (LSD). Practical Component	9 Hours
- Completely Randomized Design (CRD) - Randomized Block Design (RBD)	6 Hours

Theory 45	Tutorial Hours:	0	Practical Hours:	30	Project Hours:	0	Total Hours: Hours: 75
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Learning Resources
Textbooks:
- Johnson R. A., Miller & Freund's, "Probability and Statistics for Engineers", 9* Edition, Pearson Education, Delhi, 2018. - Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani, "An Introduction to Statistical Learning with Applications in R", Springer, 2017.
References:
- Walpole R. E., Myers S.L. & Keying Ye, "Probability and Statistics for Engineers and Scientists", Pearson Education Inc, 9* Edition, 2012. - Charles Henry Brase and Corrinne Pellillo Brase, "Understandable Statistics: Concepts and Methods", Cengage Learning, 12* Edition, 2018. - Richard A. Johnson and Dean W. Wichern, "Applied Multivariate Statistical Analysis", 6* Edition, Pearson Education, Asia, 2012. - Anderson, T. W, "An Introduction to Multivariate Statistical Analysis", John Wiley and Sons, 2003. - Gupta S.C and Kapoor V.K, "Fundamentals of Mathematical Statistics", 11^o extensively revised edition, Sultan Chand & Sons, 2020.
Online Resources (Weblinks)
- Probability and Random Variables https://archive.nptel.ac.in/courses/117/105/117105085 - Two Dimensional Random Variables https://nptel.ac.in/courses/117105085 - Multivariate Analysis https://www.coursera.org/learn/multivariate-calculus-machine-learning - Testing of Hypothesis https://archive.nptel.ac.in/courses/103/106/103106120/ - Design of Experiments https://www.coursera.org/learn/anova-and-experimental-design

Assessment
SA I and SA II, Activity and Learning Task(s), MCQ, End Semester Examination (ESE), Lab Workbook, Experimental Cycle tests, viva-voce

Course Curated by		
Expert(s) from Industry	Expert(s) from Higher Education Institution	Internal Expert(s)


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1. Dr. R Vasu Business Excellence and Management Systems Consultant Specialisation in Process Excellence, Six Sigma Quality, Health Safety & Environment Systems Vice President (Retired) Brakes India.	1. Dr. M. Sivakumar Àssistant Professor Sr. Grade Vellore Institute of Technology, Vellore 2. Dr. Ramesh Babu Àssistant Professor (SG) Amrita University COÎltbatore, Tamil Nadu.	1. Dr.R.Rajkumar, Assistant Professor III Department of Mathematics 2. Dr.K.P.Thilagavathy Assistant Professor III Department of Mathematics	
Recommended by BoS on	25.04.2025		
Academic Council Approval No.	28	Date	26.06.2025


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24CSI024	DATA STRUCTURES AND ALGORITHMS	L	T	P	J	C
		2	0	4	0	4
PC		SDG		9		

Pre-requisite courses	Nil	Data Book / Codes / Standards (If any)	Nil
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Course Objectives:	The purpose of taking this course is to: (3 to 5)
1.	Provide foundational knowledge of data structures, searching and sorting algorithms, string processing techniques, and algorithm analysis for developing efficient software solutions.
2.	Develop the ability to implement and analyze linear data structures such as stacks, queues, and linked lists for real-world applications.
3.	Apply non-linear data structures including trees and heaps for efficient storage, searching, and data organization.
4.	Analyze graph algorithms for solving complex computational and optimization problems.
5.	Understand and apply hashing techniques, hash functions, and collision resolution methods for efficient data storage, retrieval, and management in computing applications.

Course OutcomeS:	After successful completion of this course, the students shall be able to	Bloom's Taxonomy Level (BTL)
CO1	Apply searching, sorting, and string processing algorithms using appropriate data structures and analyze their efficiency using asymptotic notations.	Ap
CO2	Apply linear data structures such as arrays, stacks, queues, and linked lists for solving computational problems.	Ap
CO3	Implement and analyze tree-based data structures including BST, AVL trees, and heaps for efficient data processing.	Ap
CO4	Apply graph algorithms such as BFS, DFS, shortest path, and minimum spanning tree algorithms for problem solving.	Ap
CO5	Design efficient hashing techniques with suitable collision resolution methods and evaluate their performance in data storage and retrieval applications.	Ap

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2
1	3			2							2	3	2


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2	3	3	2									3	2
3	3	3	2	2							2	3	3
4	3	3		2							2	3	3
5	2	2											2

Course Content													
INTRODUCTION TO DATA STRUCTURES AND ALGORITHMS Introduction to Data Structures and Algorithms, Importance of data structures in programming and software development, data types vs data structures, Abstract Data Types (ADTs), arrays, two-pointer technique, sliding window, prefix sums. Searching: Linear, Binary search. Sorting Algorithms: Bubble Sort, Selection sort, insertion sort. Merge sort. string algorithms, anagram problems, palindrome problems. Algorithm analysis: Big O, Big Theta, Big Omega notations Practical Component Implementation of List ADT using arrays (insertion, deletion, Linear and Binary Search, Sorting)												6 Hours	
LINEAR DATA STRUCTURES Stacks: Implementation of stack and Applications (infix to postfix, expression evaluation, parenthesis matching) Queues: Implementation of Queue, Circular Queue, Applications, Linked Lists (Single, Double, and Circular linked implementation), Linked list implementation of Stack & Queue Practical Component Implement the applications of Linear Data structures: reverse and cycle detection problems, solve balanced parentheses and next greater element problems												7 Hours	
NON-LINEAR DATA STRUCTURES TREES Trees: Binary Trees, Binary Search Trees, Tree Traversals, AVL Trees, Heap tree, Complete Binary Tree, Practical Component Implement BST and AVL trees, solve tree traversal problems, implement heap operations, solve top-K problems.												14 Hours	
NON-LINEAR DATA STRUCTURES GRAPHS Graphs: Terminologies, Representation (Adjacency Matrix, List), Graph Traversal (BFS, DFS), Spanning Trees Prim's algorithm, Kruskal's algorithm, Shortest Path Algorithms (Dijkstra, Floyd-Warshall). Practical Component: Implement graph traversals, solve shortest path problems, implement MST algorithms, solve advanced graph problems including course scheduling and cheapest flight problems												6 Hours	
HASHING TECHNIQUES Hashing: Hash Functions, Collision Resolution Techniques, Linear probing, Quadratic probing, random probing, Double hashing and rehashing. Practical Component Implementation of Hash hashing techniques and collision resolution techniques												12 Hours	
AI Tools to be Used GitHub Copilot, ChatGPT API / LLM-assisted debugging, Online Competitive Coding Platforms, Complexity Visualizers												8 Hours	


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Theory Hours:	30	Tutorial Hours:	0	Practical Hours:	60	Project Hours:	0	Total Hours:	90
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Learning Resources	
Textbooks	
1. Horowitz, Ellis, Sartaj Sahni, and Susan Anderson-Freed. Fundamentals of Data Structures in C. Universities Press, Hyderabad (2021). 2. Tenenbaum, Aaron M., Yedidyah Langsam, and Moshe J. Augenstein. Data Structures Using C. Pearson, New York (2021). 3. Weiss, Mark Allen. Data Structures Using C. Pearson Education Asia, Singapore (2007).	
Reference books	
1. Tremblay, Jean Paul, and Paul G. Sorenson. An Introduction to Data Structures with Applications. Tata McGraw-Hill, New Delhi (2014). 2. Mehlhorn, Kurt, and Peter Sanders. Algorithms and Data Structures: The Basic Toolbox. Springer, Berlin (2011). 3. Aho, Alfred V., John E. Hopcroft, and Jeffrey D. Ullman. Data Structures & Algorithms. Pearson Education, New Delhi (2009).	
Online Resources (Weblinks)	
1. https://open.umn.edu/opentextbooks/textbooks/an-open-guide-to-data-structures-and-algorithms 2. https://www.oreilly.com/library/view/data-structures-and/9780133437483/ 3. https://www.khanacademy.org/computing/computer-science/algorithms 4. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-006-introduction-to-algorithms-fall-2011/ 5. https://www.geeksforgeeks.org/data-structures/	

Assessment (Embedded course)
SA-I, SA-II, Activity and Learning Task(s), Mini project, MCQ, End Semester Examination (ESE) Lab Workbook, Experimental Cycle tests, viva-voce

Course Curated by			
Expert(s) from Industry	Expert(s) from Higher Education Institution	Internal Expert(s)	
		Dr. P. Devaki, Professor/CSE Dr. V. P. Sumathi, ASP/CSE	
Recommended by BoS on	06.06.2026		
Academic Council Approval		Date	


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24CSI025	OBJECT ORIENTED PROGRAMMING	L	T	P	J	C
		1	0	4	0	3
PC		SDG		4,9		

Pre-requisite courses	Nil	Data Book / Codes / Standards (If any)	Nil
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Course Objectives:		The purpose of taking this course is to: (3 to 5)
1.	Understand the fundamentals of Java programming including program structure, data types, methods, and control statements.	
2.	Learn object-oriented programming concepts such as classes, inheritance, polymorphism, abstraction, and interfaces.	
3.	Develop skills in handling errors and working with strings and wrapper classes for efficient program development.	
4.	Understand multithreading, synchronization, and file handling concepts using Java I/O techniques.	
5.	Enable students to work with collections, database connectivity, and application development using Java technologies.	

Course OutcomeS:		After successful completion of this course, the students shall be able to	Bloom's Taxonomy Level (BTL)
CO1	Apply fundamental programming and object-oriented principles to develop programs using basic programming constructs.		Ap
CO2	Implement object-oriented features such as inheritance, polymorphism, abstraction, interfaces, and packages to develop reusable programs.		Ap
CO3	Apply exception handling and string processing techniques to develop reliable and robust programs.		Ap
CO4	Construct multithreaded programs and utilize input/output techniques for file handling and data processing.		Ap
CO5	Develop database-integrated applications using collection frameworks, modern programming features, and database connectivity techniques.		Ap

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2
1	3	2	2									3	


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SA I, SA II Activity and Learning Task(s), MCQ, End Semester Examination (ESE)
Lab Workbook, Experimental Cycle tests, viva-voce

Course Curated by			
Expert(s) from Industry	Expert(s) from Higher Education Institution		Internal Expert(s)
			Ms. P. Anitha, AP/CSE Ms. G. Shobana, AP/IT
Recommended by BoS on	06.06.2026		
Academic Council Approval		Date	



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24ITT203	COMPUTER ORGANIZATION AND ARCHITECTURE (Common to CS, IT)	L	T	P	J	C
		3	0	0	0	3
PC		SDG		4,9		

Pre-requisite courses	Nil	Data Book / Codes / Standards (If any)	Nil
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Course Objectives:	
The purpose of taking this course is to:	
1	Introduce the basic structure and functional components of a computer system, including its evolution, Von Neumann architecture, and performance parameters.
2	Explain the internal organization of a basic computer, focusing on instruction formats, addressing modes, and the distinction between CISC and RISC architectures.
3	Explore arithmetic and logic unit (ALU) operations including integer and floating-point computations.
4	Examine memory hierarchy, cache, and I/O system designs and their impact on performance.
5	Explore modern advancements in computer architecture, including multicore processors, parallel architectures, and multiprocessor systems with interconnection structures and synchronization techniques.

Course Outcomes:		
After successful completion of this course, the students shall be able to		Bloom's Taxonomy Level (BTL)
CO 1	Apply computer organization concepts to explain the functional units, performance characteristics and processor architectures.	U
CO 2	Solve computational problems by applying arithmetic algorithms for addition, subtraction, multiplication, and division with accuracy and efficiency.	Ap
CO 3	Utilize the concepts of instruction execution, multiple bus organization, and control unit design to implement control logic using hardwired and microprogrammed approaches.	Ap
CO 4	Apply the principles of I/O mechanisms and memory subsystems to interpret data transfer processes and memory management in computer systems.	U
CO 5	Use the principles of parallel processing and multicore architectures to explain data hazards, instruction hazards, and performance issues in modern computing systems	Ap

Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)
1	2	3	4	5	6	7	8	9	10	11	


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Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2
1	2	2											
2	2	2											
3	3		2									2	
4	3	2										2	
5	2	2										1	

Course Content	
FUNDAMENTALS OF COMPUTER ORGANIZATION Organization and Architecture- Structure and Function- Functional Units-Basic Operations and Concepts-Bus Structure-Performance. Memory Locations and Addresses - Memory Operations - Instruction and Instruction Sequencing - Addressing Modes - Basic I/O Operations. Case Study: Evolution of Intel, ARM Architectures/Processor Families	7 Hours
COMPUTER ARITHMETIC Addition and Subtraction of Signed Numbers-Design of Fast Adders-Multiplication of Positive Numbers-Signed Operand Multiplication-Fast Multiplication-Integer Division-Floating Point Numbers and Operation.	11 Hours
BASIC PROCESSING UNIT Fundamental Concepts - Execution of a Complete Instruction - Multiple Bus Organization - Hardwired Control – Microprogrammed Control – Microinstructions-Microprogram Sequencing-Wide Branch Addressing	9 Hours
I/O AND MEMORY The I/O Subsystem, -Programmed I/O- I/O Interrupts -Direct Memory Access (DMA) - The Components of Memory System – RAM Structure: The Logic Designer’s Perspective – Memory Boards and Modules-Memory Hierarchy – The Cache- The Memory Subsystem.	9 Hours
PIPELING AND PARALLEL PROCESSING Basic Concepts - Data Hazards - Instruction Hazards – Influence on instruction sets - Data path and control considerations - Superscalar operation. Multiple Processor Organization-Types, Parallel Organization. Multicore Computers Introduction – Organization- Software and Hardware performance issues. Case Study: GPU Acceleration in Real-Time System.	9 Hours

Theory Hours:	45	Tutorial Hours:	0	Practical Hours:	0	Project Hours:	0	Total Hours:	45
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Learning Resources
Textbooks



Signature of BOS Chairman, IT

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, Computer Organization, 5th Edition, McGraw-Hill, (2014). 2. Vincent P Heuring, Harry F Jordan, TG Venkatesh., Computer Systems Design and Architecture, 2nd Edition, Pearson, (2014). 3. William Stallings, Computer Organization and Architecture - Designing for Performance, 9th Edition, Prentice Hall, (2012).
Reference books/ Web Links
1. M. Moris Mano, Computer System Architecture, Revised 3rd Edition, Pearson, (2017). 2. John P.Hayes, Computer Architecture and Organization, 3rd Edition, McGraw Hill, (2002). 3. David A.Patterson and John L.Hennessy, Computer Organization and Design: The hardware / software interface, 5th Edition, Morgan Kaufmann, (2014). 4. Andrew S. Tanenbaum, Structured Computer Organization, 6th Edition Pearson Education, (2016)
Online Resources (Weblinks)
1. https://profile.iiita.ac.in/bibhas.ghoshal/teaching_coa_2021.html 2. https://www.cse.iitd.ac.in/~srsarangi/archbooksoft.html 3. https://onlinecourses.nptel.ac.in/noc22_cs88/preview 4. https://www.coursera.org/learn/comparch 5. https://www.udemy.com/course/computer-organization-and-architecture-j/?srsltid=AfmBOoo3L-F9CWPP3HioEoAzx57cX2iGGEU3Bi0UOLTD0aLRh_BAREfE&couponCode=ST21MT30625G1

Assessment (Theory course)
SA - I, SA - II, Activity and Learning Task(s), MCQ, End Semester Examination (ESE)

Course Curated by			
Expert(s) from Industry	Expert(s) from Higher Education Institution		Internal Expert
-	-		Mr. M. Sathish, Department of Computer Science and Engineering
Recommended by BoS on	09.05.2025		
Academic Council Approval	No: 28	Date	26.06.2025


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24ITI005	OPERATING SYSTEMS	L	T	P	J	C
		3	0	2	0	4
PC		SDG		8,9		

Pre-requisite courses	Nil	Data Book / Codes / Standards (If any)	Nil
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Course Objectives:	The purpose of taking this course is to:
1	Understand the basic concepts, structure, and key functions of operating systems.
2	Learn how operating systems manage hardware, processes, memory, and files.
3	Analyze different process scheduling, synchronization, and memory allocation techniques.
4	Gain hands-on experience in simulating and implementing OS functionalities.
5	Explore real-world applications of operating systems, including virtualization.

Course Outcomes:	After successful completion of this course, the students shall be able to	Bloom's Taxonomy Level (BTL)
CO 1	Interpret the evolution, architecture and functionalities of Operating Systems.	Ap
CO 2	Design and analyze process scheduling strategies and synchronization techniques.	An
CO 3	Apply inter-process communication and concurrency control in modern systems.	Ap
CO 4	Implement memory management schemes and virtualization strategies.	Ap
CO 5	Analyze the design and functionality of file systems and real-time operating systems.	An

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2
1	3												
2		3										3	
3					3								
4			3										
5				3									3


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Scheduling – RTOS Examples and Use cases - OS Performance, Scalability, Trends in Mobile OS Practical Component 1. Implement file locking mechanisms in Linux 2. Real-Time Task Scheduling and Synchronization using FreeRTOS (or any RTOS simulator)	6 Hours
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Theory 45 Hours:	Tutorial 0 Hours:	Practical 30 Hours:	Project 0 Hours:	Total 75 Hours:
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Learning Resources*
Textbooks
6. Fox, Richard, “Linux with Operating System Concepts”, 2 nd Edition, Chapman and Hall/CRC, UK 2022. 7. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, “Operating System Concepts”, 10 th Edition, Wiley, United States 2018.
Reference books/ Web Links
1. William Stallings, “Operating Systems: Internals and Design Principles”, 9 th Edition, Pearson, United Kingdom 2018. 2. Andrew S. Tanenbaum, “Modern Operating Systems”, 4 th Edition, Pearson, United Kingdom 2016. 3. Love, Robert, "Linux System Programming: talking directly to the kernel and C library", 2 nd Edition, O'Reilly Media, Inc, United States 2013.
Online Resources
7. https://www.scaler.com/topics/course/free-operating-system-course/ 8. https://www.coursera.org/specializations/codio-introduction-operating-systems

Assessment	
Formative	Summative
Assignments / Mini project, Quiz, Lab	SA - I, SA – II and End Semester Examination (ESE)

Course Curated By		
Expert(s) from Industry	Expert(s) from Higher Education Institutions	Internal Expert(s)
[Name, Organization]	[Name, Institution]	Mr. K. Manoj - CSE

Approved by: BoS Chairman	
BoS Approval date:	


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24INM201	Universal Human Values - II (Common to All Branches)	L	T	P	J	C
		1	0	0	0	1
HS		SDG	3,4,5,10,12,13,14, 15,16,17			
Pre-requisite courses		-		Data Book / Code book (If any)		-

Course Objectives:

The purpose of taking this course is to:

1	Introduce the concept and significance of value education in shaping a meaningful and fulfilling life.
2	Enable students to understand the human being as a co-existence of self and body and the harmony within.
3	Develop an understanding of harmony in relationships, family, and society.
4	Help students appreciate the interconnectedness and harmony in nature and existence.
5	Instill the importance of ethical behavior in personal, professional, and social contexts.

Course Outcomes

After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO1	Understand the foundational concepts of value education and human aspirations.	U
CO2	Analyze the human being as a holistic entity comprising self and body.	An
CO3	Evaluate and cultivate harmonious relationships within the family and society.	E
CO4	Interpret the interconnectedness in nature and recognize harmony in existence.	U
CO5	Apply holistic understanding to professional ethics and sustainable living.	Ap

Course Outcomes (CO)	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)		
	1	2	3	4	5	6	7	8	9	10	11	PSO-1	PSO-2	PSO-3
	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning			
1						3	3	3	3		3			
2						3	3	3	3		3			
3						3	3	3	3		3			
4						3	3	3	3		3			
5						3	3	3	3		3			



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Course Content						
Introduction to Value Education					3 Hours	
Value Education- Self-exploration as the Process for Value Education- Basic Human Aspirations and their Fulfilment- Right Understanding, Relationship and Physical Facility- Happiness and Prosperity – Current Scenario- Method to Fulfil the Basic Human Aspirations.						
Harmony in the Human Being					3 Hours	
Human Being as Co-existence of the Self and the Body- Distinguishing between the Needs of the Self and the Body- The Body as an Instrument of the Self- Understanding Harmony in the Self- Harmony of the Self with the Body- Programs to Ensure Self-regulation and Health.						
Harmony in the Family and Society					3 Hours	
Harmony in the Family –The Basic Unit of Human Interaction-‘Trust’ – The Foundational Value in Relationship-Respect – As the Right Evaluation- Other Values in Human-to-Human Relationship- Understanding Harmony in the Society Lecture Vision for the Universal Human Order.						
Harmony in the Nature (Existence)					3 Hours	
Understanding Harmony in Nature- Interconnectedness, Self-regulation and Mutual Fulfilment among the Four Orders of Nature- Realizing Existence as Co-existence at All Levels- The Holistic Perception of Harmony in Existence.						
Implications of the Holistic Understanding- A Look at Professional Ethics					3 Hours	
Basis for Universal Human Values-Definitiveness of (Ethical) Human Conduct - professional Ethics in the Light of Right Understanding-A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order-Holistic Technologies, Production Systems-and Management Models-Typical Case Studies Strategies for Transition towards Value-based Life and Profession						
Theory Hours:	15	Tutorial Hours:	0	Practical Hours:	0	Total Hours:
						15
Learning Resources						



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Textbooks:
1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010. 2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
References:
1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, Jeevan Vidya:Publishers, 1999.
Online Resources (Weblinks)
1. https://www.uhv.org.in/uhv-ii
Assessment (Theory course)
Presentation, MCQ, Assignment, Case Study and E Chart.

Course Curated by			
Expert(s) from Industry	Expert(s) from Higher Education Institution	Internal Expert(s)	
	Sh. Umesh Jadhav, NCCIP (National Co-ordination Committee)-AICTE	Dr.S.Sivakumar, Associate Professor, SFS Dr.R.Prakasam, Assistant Professor, Department of Physics Mr.J.Sivaguru, Assistant Professor, Department of Mechatronics	
Recommended by BoS on	03-05-2025		
Academic Council Approval	28	Date	26-06-2025


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24INP201	Innovation Practicum - III			L	T	P	J	C
				0	0	2	0	1
ES				SDG		4, 9, 11, 12		
Pre-requisite courses		-	Data Book / Code book (If any)			-		

Course Objectives:	
The purpose of taking this course is to:	
1	Develop a deep understanding of the innovation process and apply customer-centric thinking to innovation
2	Evaluate the feasibility and viability of innovation ideas.
3	Optimise innovation projects for efficiency and effectiveness and communicate the ideas effectively.

Course Outcomes	
After successful completion of this course, the students shall be able to	
CO 1	Analyse the various stages of innovation and their interdependencies
CO 2	Create innovative solutions that address specific customer needs
CO 3	Evaluate the potential impact and risks of different innovation concepts and present them clearly and persuasively.

Course Outcomes (CO)	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)		
	1	2	3	4	5	6	7	8	9	10	11	PSO-1	PSO-2	PSO-3
	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team	Communication	Project Management and Finance	Life-Long Learning			
1	2	2												
2			2											
3			2											

Course Content	
Idea Worth Prototyping Discuss potential risks and challenges associated with innovative ideas - Learn to refine and validate the initial concept - Develop a plan outlining key milestones and timelines for advancing from idea to prototype.	3 Hours


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Framing the Challenge Define the specific problem or opportunity that the innovation aims to address, understand customer needs and preferences - Identify the gaps in the market and potential obstacles to adoption, assess the potential market size, competition, and feasibility.	6 Hours
Crafting High-Value Solutions Generate Minimum Usable Prototype (MUP) concepts that address the identified challenge that provide high value, evaluate the potential of each solution concept based on criteria like feasibility, viability, and desirability.	6 Hours
Optimization and Planning Create Bill of Quantities (BOQ) and Bill of Materials (BOM) to estimate costs and resources - Develop a comprehensive innovation proposal outlining the innovation concept, goals, and benefits - Implement Lean principles to improve efficiency and reduce waste in the innovation process - Reflect on the activities to identify areas for improvement and learning.	7 Hours
Project Presentation Develop and deliver a compelling presentation of your minimum usable prototype (MUP) and innovation solution to effectively communicate its value and impact to a broader audience - Create a visually engaging presentation that clearly outlines the problem, the proposed solution, and the value of your minimum usable prototype - Utilise tools such as slides, infographics, and videos to enhance the visual appeal - Craft a compelling story around your innovation - Highlight the journey from problem identification to solution development, emphasising key insights and milestones.	8 Hours

Theory Hours:	Tutorial Hours:	Practical Hours:	30	Project Hours:	Total Hours:	30
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Learning Resources
Textbooks:
1.
References:


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1. Everything you need about value proposition:
<https://blog.forgeforward.in/everything-you-need-to-know-about-value-proposition-7247493c940c>
2. Test your Value Proposition: <http://businessmodelalchemy.com/2012/09/test-your-value-proposition-supercharge-lean-startup-and-customer-dev-principles.html>
3. Valuation Risk versus Validation Risk in Product Innovations:
<https://blog.forgeforward.in/valuation-risk-versus-validation-risk-in-product-innovations-49f253ca8624>
4. User Guide for Product Innovation Rubric: <https://blog.forgeforward.in/user-guide-for-product-innovation-rubric-857181b253dd>
5. Innovation Risk Diagnostic — Product Innovation Rubric:
<https://blog.forgeforward.in/product-innovation-rubric-adf5ebdfd356>
6. Evaluating Product Innovations — proof, potential, & progress:
<https://blog.forgeforward.in/evaluating-product-innovations-e8178e58b86e>

Online Educational Resources:

1. <https://formlabs.com/blog/ultimate-guide-to-prototyping-tools-for-hardware-and-product-design/>
2. <https://docs.kicad-pcb.org/>
3. <https://www.tinkercad.com/learn/circuits>
4. <https://docs.github.com/en/free-pro-team@latest/actions/guides>

Assessment (Practical course)

Lab Workbook, Experimental Cycle tests, viva-voce, etc...

Course Curated by

Expert(s) from Industry	Expert(s) from Higher Education Institution	Internal Expert(s)
Dr. Mahesh Veezhinathan Director - Innovation Practicum	-	Dr. Samuel Ratna Kumar P S Assistant Professor – III

		Department Mechanical Engineering	
Recommended by BoS on	07.05.2025		
Academic Council Approval	28	Date	26/06/2025



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24HSP006	MASTERING GROUP DISCUSSION AND PRESENTATION SKILLS	L	T	P	J	C
		0	0	2	0	1
Practical		SDG		4&8		

Pre-requisite courses	Nil	Data Book / Codes / Standards (If any)	
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Course Objectives:	The purpose of taking this course is to:
1	To equip learners with techniques for organizing and presenting ideas effectively, ensuring logical flow and engaging delivery through appropriate visual and verbal strategies.
2	To enhance students' ability to evaluate diverse viewpoints and articulate reasoned arguments, fostering meaningful participation in collaborative discussions.
3	To strengthen students' ability to adapt their speaking style and content to different audiences and contexts, utilizing digital tools for enhanced presentation effectiveness.

Course Outcomes:	After successful completion of this course, the students shall be able to	Bloom's Taxonomy Level (BTL)
CO 1	Create and deliver structured presentations with a clear introduction, body, and conclusion, utilizing effective visual tools and appropriate pacing to enhance clarity and impact.	C
CO 2	Analyse issues from multiple perspectives, articulate ideas effectively within group discussions	An
CO 3	Deliver confident presentations and speeches in professional and social settings, leveraging digital tools and technologies to enhance quality and effectiveness.	Ap

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)		
	1	2	3	4	5	6	7	8	9	10	11			
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2	PSO-3
1		2			1	2		3	3		3			
2		2			1	2		3	3		3			


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3		2			1	2		3	3		3			
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<u>Course Content</u>	
MODULE 1 Introduction to Group Discussions - Key skills for effective participation - Phases in a GD - Conversational Phrases in GD. Group Dynamics - Understanding group roles and dynamics - Conflict resolution and management in groups - Techniques for fostering collaboration. Presentations - Introduction to Visual Aids and Technology in Presentations.	6 Hours
Delivery Techniques - Voice modulation and speech clarity - Body language and gestures – audience analysis. Handling Q&A Sessions - Preparing for audience questions - Techniques for handling difficult questions - Mock Presentation with Q&A sessions.	
MODULE 2 Factual Group Discussions: Focus on sharing and verifying accurate information on a given topic. Participants base their contributions on verifiable data and concrete evidence. Opinion-based / Argumentative Group Discussion: Encourages participants to express and defend their point of view on a topic. Evaluate different perspectives and build critical thinking skills.	6 Hours
MODULE 3 Case Study Group Discussion: Involves analyzing the complexities, identifying key issues, and developing insights or solutions based on the group's collective knowledge. Abstract Discussion: Deals with intangible concepts, ideas, or themes without concrete reference points. Encourages creative thinking and theoretical exploration.	6 Hours
MODULE 4 Impromptu Presentations: Participants speak on a given topic with little to no preparation. Helps develop quick thinking and effective communication skills. Informative Presentation: Aims to educate the audience on a specific topic by providing clear, factual information. The focus is on clarity, accuracy, and comprehensiveness. Demonstrative Presentation: Interactive sessions where participants engage in hands-on activities to learn practical skills. Often includes exercises, demonstrations, and collaborative tasks.	6 Hours


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MODULE 5 Training and Technical Presentation: Designed to teach specific technical skills or procedures. Includes detailed instructions, demonstrations, and may involve technical jargon. Academic Presentation: Involves presenting research findings or theoretical concepts in an academic setting. Emphasizes clarity, evidence-based arguments, and adherence to scholarly standards. Pitch Presentation: A concise, persuasive presentation aimed at securing support, investment, or approval. Focuses on the value proposition, potential benefits, and unique selling points. Persuasive Presentation: Seeks to convince the audience to adopt a particular viewpoint or take a specific action. Utilizes logical arguments, emotional appeals, and credible evidence. Multimedia Presentations: Uses visual and auditory media to convey information and present arguments. Enhances engagement and aids in illustrating complex concepts.	6 Hours
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Theory Hours:	-	Tutorial Hours:	-	Practical Hours:	2	Project Hours:	-	Total Hours:	30
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Learning Resources*
Reference books/ Web Links
1. Powell, M. (2010). Dynamic presentations student's book with audio CDs (2). Cambridge University Press. 2. Reynolds, G. (2011). Presentation Zen: Simple ideas on presentation design and delivery. New Riders. 3. Galanes, G. J., Adams, K., & Brilhart, J. K. (2020). Effective group discussion: Theory and practice (15th ed.). McGraw-Hill Education. 4. Adams, K., & Galanes, G. (2018). Communicating in groups: Applications and skills, a practical guide (18th ed.). McGraw-Hill Education. 5. Ivy, D. K., & Backlund, P. (2018). Speak with confidence: A practical guide. Pearson. 6. Reynolds, G. (2019). Presentation Zen: Simple ideas on presentation design and delivery. New Riders.
Online Resources
1. https://www.coursera.org/learn/verbal-communications-and-presentation-skills 2. https://www.coursera.org/learn/present-with-purpose 3. https://www.coursera.org/learn/teamwork-skills-effective-communication

Assessment	
Formative	Summative
-----	1. Participation in group discussions (40%) 2. Individual presentations (40%) 3. Quizzes and written assignments (20%)


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Course Curated By		
Expert(s) from Industry	Expert(s) from Higher Education Institutions	Internal Expert(s)
Mr. Bhuvana Sundar Soorappaiah Program Manager Bosch, Coimbatore	Dr Kishore Selva Babu Head and Associate Professor Department of English and Cultural Studies Christ University Bangalore-560029	Dr. J Srikala- AP III Dr. C Tissaa Tony - AP III Dr. S G Mohanraj – AP III Dr. S Sreejan – AP III Dr. R Hema – AP II Dr. A S Mythili - AP II

Approved by: BoS Chairman	With Signature and date
BoS Approval date:	 25.04.2025


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Semester IV

A handwritten signature in black ink, appearing to read "Shaulgim", enclosed within a rectangular box.

Signature of BOS Chairman, IT

24MAT243	DISCRETE MATHEMATICS AND OPTIMIZATION (Common to CS, IT)	L	T	P	J	C
		3	0	0	0	3
BS		SDG		8,9		
Pre-requisite courses	-	Data Book / Codes books (If any)			-	

Course Objectives:	
The purpose of taking this course is to:	
1	Introduce students to the fundamentals of logical reasoning and the construction of mathematical proofs.
2	Develop problem solving skills using mathematical induction, permutations, combinations and recurrence relations.
3	Provide a strong foundation in graph theory concepts including graph isomorphism and shortest path algorithms.
4	Formulate real world optimization problems as linear programming models and solve them effectively using graphical, simplex and Big-M methods for optimal decision making.
5	Solve optimization problems with and without constraints using Lagrange multipliers and Kuhn-tucker conditions.

Course Outcomes		
After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO 1	Validate the logical arguments and develop basic mathematical proofs using formal reasoning techniques.	Ap
CO 2	Employ mathematical induction for validating mathematical statements, and apply the principles of permutations, combinations and recurrence relations in problem solving.	Ap
CO 3	Examine graph isomorphism and implement Dijkstra's algorithm to identify the shortest path in a graph.	An
CO 4	Formulate and solve linear programming problems using graphical, simplex and Big-M methods.	Ap
CO 5	Analyse and determine the extreme values of functions under unconstrained, equality constrained and inequality constrained conditions.	An

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2


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1	2	2											
2	3	3											
3	3	3											
4	3	2											
5	2	2											

Course Content				
LOGIC Propositional Logic- Logical operators Applications of Propositional Logic - Propositional Equivalences: Normal forms using truth table–Rules of inference- Consistency and inconsistency using truth table Rules of Inference: Introduction to Proofs - Direct proof method. Predicates and Quantifiers- Universe of discourse – Logical equivalences and implications for quantified statements- Rules of specification and generalization – Validity of arguments (Direct proof).				11 Hours
COMBINATORICS The Basics of Counting, The Pigeonhole Principle, Permutations and Combinations- Applications of Recurrence Relations- Solving Linear Recurrence Relations- Mathematical Induction.				7 Hours
GRAPH THEORY Graphs and Graph Models- Graph Terminology and Special Types of Graphs- Matrix Representation of Graphs: Adjacency and Incidence matrix representations - Graph Isomorphism - Connectivity - Euler and Hamiltonian Paths - Shortest Path Problems: Dijkstra’s Algorithm.				9 Hours
LINEAR PROGRAMMING Introduction to Operations Research – Formulation of Linear Programming Problem – graphical solution – Simplex algorithm – Artificial variables technique: Big-M method.				9 Hours
CLASSICAL OPTIMIZATION THEORY Unconstrained extremal problems – Equality constraints – Lagrange’s method – Inequality constraints - Kuhn -Tucker conditions.				9 Hours
Theory	Tutorial	Practical	Project	Total
Hours: 45	Hours: 0	Hours: 0	Hours: 0	Hours: 45
Learning Resources				
Textbooks				
1. Rosen, K.H., "Discrete Mathematics and its Applications", 7 th Edition, Tata McGraw Hill Pub. Co. Ltd., New Delhi, Special Indian Edition, 2017. 2. Tremblay J.P., Manohar R., “Discrete Mathematical Structures with applications to Computer Science”, Tata McGraw Hill, International Edition, 2017. 3. J.K. Sharma, “Operations Research: Theory and Applications”, 6 th Edition, New Delhi: Macmillan Publishers India Pvt. Ltd., 2017.				
Reference books				
6. Grimaldi, R.P. "Discrete and Combinatorial Mathematics: An Applied Introduction", 5th Edition, Pearson Education Asia, Delhi, 2016. 7. Liu C.L. “Elements of Discrete Mathematics”, 4 th Edition, McGraw Hill, 2017.				


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8. Mott J.L, Kandel A. and Baker T.P., “Discrete Mathematics for Computer Scientists and Mathematicians”, 2nd Edition, Prentice Hall India, 2015.
9. Wagner H.M., “Operations Research”, Prentice Hall of India, 2011.
10. Taha H.A., “Operations Research: An Introduction”, 10th Edition, Pearson Education, 2017.
11. Singiresu S Rao., "Engineering Optimization Theory and Practice", 5th Edition, John Wiley & Sons, Inc. 2020.

Online Resources (Web Links)

6. Logic:
Logic for Computer Science | Coursera
7. Combinatorics:
<http://i.stanford.edu/pub/cstr/reports/cs/tr/79/732/CS-TR-79-732.pdf>
8. Graph Theory (IIT Kanpur):
https://www.cse.iitk.ac.in/users/rmittal/prev_course/fl8/reports/5_graphs.pdf
9. Linear Programming:
<https://nptel.ac.in/courses/111102012>
10. Optimization Theory (Coursera): Operations Research | Coursera

Assessment

SA I and SA II Activity and Learning Task(s), MCQ, End Semester Examination (ESE), Lab Workbook, Experimental Cycle tests, viva-voce

Course Curated by

Expert(s) from Industry	Expert(s) from Higher Education Institution	Internal Expert(s)
1. Mr. Ramesh V.S., STEPS Knowledge Services Private Limited, Coimbatore.	1. Dr. M. Sivakumar Assistant Professor Sr. Grade Vellore Institute of Technology, Vellore 2. Dr. Ramesh Babu Assistant Professor (SG) Amrita University Coimbatore, Tamil Nadu.	Dr.D.Arivuoli Assistant Professor III Department of Mathematics,KCT Dr.K.Meena Assistant Professor III Department of Mathematics,KCT Dr.J.Dhivya Assistant Professor III Department of Mathematics,KCT
Recommended by BoS on	28.11.2025	
Academic Council Approval	29	Date 24.12.2025



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24CSI009	DATABASE MANAGEMENT SYSTEMS (Common to AD, CS, IT)	L	T	P	J	C
PC		3	0	2	0	4
Pre-requisite courses		SDG		9		
Pre-requisite courses	Nil	Data Book / Codes / Standards (If any)			Nil	

Course Objectives:	
The purpose of taking this course is to:	
1	Acquire knowledge of fundamental database concepts, data models, and database system architecture.
2	Develop practical skills in designing relational databases using Entity-Relationship modelling and normalization techniques.
3	Gain competency in using Structured Query Language for data definition, data manipulation, and complex data retrieval.
4	Understand the principles of query processing, optimization, transaction management, and concurrency control in database systems.
5	Develop the ability to analyze database design choices and query strategies for performance, integrity, and compare relational databases with NoSQL alternatives.

Course Outcomes		
After successful completion of this course, the students shall be able to		Bloom's Taxonomy Level (BTL)
CO 1	Apply relational database concepts to define structures and manage data effectively.	Ap
CO 2	Design and normalize relational database schemas using Entity-Relationship modelling and normalization techniques to ensure data integrity.	Ap
CO 3	Implement relational operations and join strategies using relational algebra and SQL to retrieve and combine data efficiently.	Ap
CO 4	Analyze transaction processing concepts, concurrency issues, and recovery techniques to ensure the consistency and correctness of database systems.	An
CO 5	Apply CRUD operations in NoSQL databases to manage semi-structured and unstructured data effectively.	Ap

Course Outcomes (CO)	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11	PSO-1	PSO-2
	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning		
1	2				3								2
2		2			3							3	



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3	2		3										2
4		3		2								2	3
5		3	2									2	

Course Content													
INTRODUCTION TO DATABASES AND DATA MODELLING												9 Hours	
Evolution from File Systems to DBMS – Advantages of Using DBMS approach - Types of Data - Data Models - DB Architecture and users - Relational Model Concepts - Attributes, Tuples, Relations and Constraints -Differences between OLAP and OLTP- Introduction to SQL: DDL, DML, Data Types, Constraints and Aggregate Functions.													
Practical Component												6 Hours	
Creation of a database and writing SQL queries to retrieve information from the database - Exploring the use of WHERE, ORDER BY, and limit clauses in SQL - Implement Aggregate Functions.													
RELATIONAL MODELLING AND DATABASE DESIGN												9 Hours	
Logical Database Design: Different approaches in Logical design, ER Modeling, ER notations - Steps in ER modeling. Physical database design: Converting ER Model to Relational Database Design, Normalization -Functional Dependency, 1NF, 2NF, 3NF, Boyce-Codd Normal Form (BCNF) - Decomposition properties.													
Practical Component:												6 Hours	
Implementation of ER Diagram and identifying its entities, relations, attributes and constraints – Converting the ER diagram into relational schema – Convert a relation to 1NF, 2NF, 3NF and BCNF.													
PHYSICAL DATABASE DESIGN AND QUERY PROCESSING												9 Hours	
Overview of File Organization – RAID concepts - Indexing: Single, Multilevel – Dynamic - B+-tree indexing – Hashing Techniques – Static and Dynamic Hashing – Relational Algebra – Translating SQL Queries into Relational Algebra – Joins – Query Optimization: Join Query Optimization – Query Optimization Rules – Tuple Relational Calculus.													
Practical Component:												6 Hours	
Simulation of relational Algebra operations – Performing joins using Relational Algebra – Implementation of various SQL joins.													
TRANSACTION MANAGEMENT AND CONCURRENCY CONTROL												9 Hours	
Transaction Concepts - ACID Properties - Transaction States – Transaction control Commands - Serializability Concepts - Recovery Mechanisms: Undo/Redo, Shadow Paging, Log Based Recovery - Concurrency Control: Locking Protocols, Timestamp Protocols, Deadlock Handling.													
Practical Component:												6 Hours	
Implement multiple transactions using SQL involving BEGIN, COMMIT & ROLLBACK – Write SQL Queries for Nested Transactions.													
NOSQL DATABASE MANAGEMENT												9 Hours	
Introduction to NoSQL Databases – Key Features and Principles of NoSQL – CAP Theorem – Classification of NoSQL Databases- Querying in NoSQL Systems: CRUD operations – NoSQL Query Language Overview													



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Practical Component: Creation of Database and Performing CRUD operations in NoSQL – Querying with NoSQL databases.	6 Hours
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Theory Hours: 45	Tutorial Hours: 0	Practical Hours: 30	Project Hours: 0	Total Hours: 75
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Learning Resources
Textbooks
1. Silberschatz, Abraham, Henry F. Korth, and S. Sudarshan. Database System Concepts. 7th Edition, McGraw Hill, 2019. 2. Elmasri, Ramez, and Shamkant B. Navathe. Fundamentals of Database Systems. 7th Edition, Pearson, 2017.
Reference books/ Web Links
1. Ramakrishnan, Raghu, and Johannes Gehrke. Database Management Systems. 4th Edition, McGraw Hill, 2015. 2. Sadalage, Pramod J., and Martin Fowler. NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence. Addison-Wesley Professional, 2012.
Online Resources
1. https://onlinecourses.nptel.ac.in/noc24_cs12/preview 2. https://online.stanford.edu/courses/soe-ydatabases0005-databases-relational-databases-and-sql 3. https://www.w3schools.com/sql/ 4. https://mode.com/sql-tutorial/ 5. https://www.scaler.com/topics/course/dbms/

Assessment (Embedded course)
SA - I, SA - II, Activity and Learning Task(s), MCQ, End Semester Examination (ESE), Lab Workbook, Experimental Cycle tests, viva-voce

Course Curated by			
Expert(s) from Industry	Expert(s) from Higher Education Institution		Internal Expert
-	-		Mr. K. Manoj, Department of Computer Science and Engineering
Recommended by BoS on	09.05.2025		
Academic Council Approval	No: 28	Date	26.06.2025


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24CSI014	Design and Analysis of Algorithms	L	T	P	J	C
		3	0	2	0	4
PC		SDG		9		

Pre-requisite courses	24CSI104 Data Structures and Algorithms	Data Book / Codes / Standards (If any)	NIL
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Course Objectives:

The purpose of taking this course is to:

1	Understand fundamental algorithmic problem-solving techniques and the importance of algorithmic analysis in various problem types, data structures, and efficiency classes.
2	Explore advanced algorithmic paradigms like Divide and Conquer, Greedy Strategy, Dynamic Programming, Backtracking, Branch and Bound for solving complex problems.
3	Analyze the efficiency of algorithms using theoretical and empirical methods considering their time complexity and space complexity.
4	Investigate computational complexity theory, including P, NP, NP-complete, and NP-hard problems, and the use of approximation algorithms in optimization.

Course Outcomes:

After successful completion of this course, the students shall be able to		Bloom's Taxonomy Level (BTL)
CO1	Apply algorithmic problem-solving strategies and analyze the performance of recursive and non-recursive algorithms using asymptotic notations.	Ap
CO2	Apply divide and conquer techniques to solve computational problems and use recurrence solving methods to determine the efficiency of recursive algorithms.	Ap
CO3	Apply greedy and dynamic programming approaches to solve optimization problems and evaluate their efficiency.	Ap
CO4	Analyze combinatorial problems using backtracking and branch-and-bound strategies to derive optimal solutions.	An
CO5	Analyze problem complexity to classify problems as P, NP, NP-complete, or NP-hard and examine approximation techniques for solving hard problems.	An

Course Outcomes (CO)	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11	PSO-1	PSO-2
	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Teamwork	Communication	Project Management and Finance	Life-Long Learning		
1	3	2		2								3	



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2	3	3	2	2								3	
3	3	3	2	2								3	
4	2	3		2								2	
5	2	2		2								2	

Course Content	
FOUNDATIONS OF ALGORITHM ANALYSIS Fundamentals of algorithmic problem solving – Important problem types – Analysis framework – Asymptotic notations and basic efficiency classes – Mathematical Analysis: Recursive algorithms, non-recursive algorithms - Brute Force String matching. Practical Component Implement and compare recursive vs. iterative algorithms - Analyze different algorithmic performance – Brute Force String matching.	7 Hours 4 Hours
DIVIDE AND CONQUER Divide and conquer: Solving recurrences: Substitution method, recursion-tree method, master method. The maximum-subarray problem - Multiplication of large integers – Strassen’s matrix multiplication. Practical Component Implement and analyze the maximum subarray problem using divide and conquer – Implement Strassen’s matrix multiplication algorithm.	10 Hours 6 Hours
GREEDY STRATEGY AND DYNAMIC PROGRAMMING Greedy algorithms: Fractional Knapsack Problem - Activity selection problem – Huffman codes. Elements of dynamic programming - Matrix chain multiplication - Longest Common Subsequence (LCS) - 0/1 Knapsack problem and memory functions – Optimal binary search trees - All Pairs Shortest Paths: Floyd-Warshall Algorithm. Practical Component Construct Huffman coding tree for data compression - Implement Matrix chain multiplication - Solve Longest Common Subsequence (LCS) Problem - Implement 0/1 knapsack problem using memory functions.	12 Hours 8 Hours
BACKTRACKING, BRANCH AND BOUND Backtracking strategy: N-Queens Problem – Hamiltonian circuit problem – Subset Sum problem – Graph Coloring. Branch and bound strategy: Assignment problem - Traveling Salesperson Problem - 0/1 knapsack problem. Practical Component Apply backtracking to solve the N-Queens problem - Implement backtracking approach to perform Graph Coloring using minimum number of colors - Apply Branch and Bound technique to solve the Travelling Salesman Problem for optimal tour cost.	9 Hours 8 Hours


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Expert(s) from Industry	Expert(s) from Higher Education Institution	Internal Expert
-	-	Dr. C. Bharathipriya AP II/CSE
Recommended by BoS on	06.06.2026	
Academic Council Approval	No: 30	Date 19.06.2026


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24CSI017	SOFTWARE ENGINEERING WITH AGILE PRACTICES	L	T	P	J	C
		3	0	0	2	4
PC		SDG		9		

Pre-requisite courses	24CSI008 Object Oriented Programming	Data Book / Codes / Standards (If any)	Nil
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Course Objectives:	The purpose of taking this course is to:
1	Understand fundamental software engineering principles, processes, and SDLC models for building quality software systems.
2	Apply software project management techniques including planning, scheduling, estimation, risk management, and team organization.
3	Comprehend Agile values, principles, and frameworks such as Scrum, Kanban, and Extreme Programming (XP).
4	Implement software testing strategies including unit, integration, system, and acceptance testing in both traditional and Agile contexts.
5	Apply software quality standards, metrics, and process improvement models (CMMI, ISO) to real-world software projects.

Course Outcomes:	After successful completion of this course, the students shall be able to	Bloom's Taxonomy Level (BTL)
CO 1	Explain SDLC phases and process models; analyze their applicability to real-world software projects using appropriate tools.	An
CO 2	Apply software project management techniques: effort estimation (COCOMO II), scheduling, risk analysis, and SCM using Git and JIRA.	Ap
CO 3	Implement Agile practices including Scrum ceremonies, Kanban boards, sprint planning, backlog grooming, and retrospectives.	Ap
CO 4	Design and execute comprehensive software testing strategies including TDD, black-box, white-box, and automated testing using JUnit/Selenium.	Ap
CO 5	Evaluate software quality using ISO/IEC 25010 metrics and CMMI; integrate DevOps practices using CI/CD pipelines in Agile environments.	E

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)										Program Specific Outcomes (PSO)
	1	2	3	4	5	6	7	8	9	10	11


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Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2
1	3	3	2		2	2	2	2		2	2	3	2
2	3	3	2	2	3	2		2	2	3	2	3	2
3	3	3	3	2	3	2	2	3	2	3	2	2	3
4	3	2	3	3	3	2	2	2	2	2	3	3	2
5	2	3	2	2	3	3	3	2	3	3	3	2	3

Course Content													
SOFTWARE ENGINEERING FUNDAMENTALS Introduction to Software Engineering – Software characteristics, types and myths – Software crisis – SDLC overview – Process models: Waterfall, Incremental, Spiral, RAD, and Prototype model – Unified Process – Requirements Engineering: elicitation, specification, functional and non-functional requirements, use case modelling – Software design concepts: cohesion, coupling, modularity, layered architecture – UML basics: class, sequence, and activity diagrams – Coding standards and best practices.												9	
Practical Component: Mini-Project: Requirements and Design Phase Students form project teams and identify a real-world problem. Activities include: (a) eliciting and documenting functional and non-functional requirements using a requirements specification template, (b) drawing use case diagrams and activity diagrams using draw.io or StarUML, (c) creating a class diagram for the proposed system, and (d) preparing a project charter document. Deliverable: Software Requirements Specification (SRS) document.												6	
AGILE METHODOLOGIES Agile Manifesto: 12 principles and 4 values – Agile vs Traditional approaches – Scrum framework: Product Owner, Scrum Master, Development Team – Scrum artefacts: Product Backlog, Sprint Backlog, Increment – Scrum ceremonies: Sprint Planning, Daily Stand-up, Sprint Review, Sprint Retrospective – Kanban: WIP limits, boards, flow metrics, cumulative flow diagrams – Extreme Programming (XP): pair programming, TDD, CI, refactoring – Lean Software Development principles – SAFe overview – Agile estimation: Story Points, Planning Poker – Agile metrics: velocity, burndown charts, cycle time.												9	
Practical Component: Mini-Project: Agile Sprint Simulation Students execute a two-sprint Agile simulation on their project: (a) groom the product backlog with at least 15 user stories with acceptance criteria, (b) conduct a Sprint Planning meeting and commit to a sprint backlog, (c) maintain a physical or digital Kanban board (Trello/JIRA) updating task status daily, (d) produce a sprint burndown chart, (e) conduct a Sprint Review and Retrospective and document outcomes, and (f) calculate team velocity and forecast the next sprint capacity. Deliverable: Sprint 1 report with burndown chart and retrospective notes.												6	
SOFTWARE TESTING												9	


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Theory Hours:	45	Tutorial Hours:	Practical Hours:	Project Hours:	30	Total Hours:	75
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Learning Resources	
Textbooks	
1. Pressman, Roger S., and Maxim, Bruce R., Software Engineering: A Practitioner's Approach, 9th Edition, 2019 2. Sommerville, Ian., Engineering Software Products: An Introduction to Modern Software Engineering, 1st Edition, 2020, Pearson Education. 3. Wohlin, Claes., Runeson, Per., and Olsson, Thomas., Experimentation in Software Engineering, 2nd Edition, 2024, Springer. 4. Dingsoeyr, Torgeir., Dybaa, Tore., Moe, Nils Brede., Agile Software Engineering Skills, 1st Edition, 2023, Springer	
Reference books/ Web Links	
1. Kim, Gene., Humble, Jez., Debois, Patrick., Willis, John., and Forsgren, Nicole., The DevOps Handbook: How to Create World-Class Agility, Reliability, and Security in Technology Organizations, 2nd Edition, 2021, IT Revolution Press.. 2. Jorgensen, Paul C., and DeVries, Byron., Software Testing: A Craftsman's Approach, 5th Edition, 2022, CRC Press / Taylor & Francis. 3. Martin, Robert C., Clean Agile: Back to Basics, 1st Edition, 2019 (Widely adopted post-2020), Prentice Hall. 4. Forsgren, Nicole., Humble, Jez., and Kim, Gene., Accelerate: The Science of Lean Software and DevOps, 1st Edition, 2018 (Widely adopted post-2020), IT Revolution Press. Note: Evidence-based research on high-performing software teams; pairs directly with DevOps Handbook for Unit V. 5. Schwaber, Ken., and Sutherland, Jeff., The Scrum Guide – The Definitive Guide to Scrum, 2020 Edition (Latest), Scrum.org. [Free Download: https://scrumguides.org]	
Online Resources	
1. https://scrumguides.org – Official Scrum Guide 2020 (Free PDF) 2. https://agilemanifesto.org – The Agile Manifesto and 12 Principles 3. https://nptel.ac.in/courses/106105085 – NPTEL: Software Engineering (IIT Bombay) 4. https://www.atlassian.com/agile – Atlassian Agile Coach: Scrum, Kanban, XP Guides 5. https://docs.github.com/en/actions – GitHub Actions CI/CD Documentation 6. https://www.coursera.org/learn/software-processes-and-agile-practices – Coursera: Software Processes & Agile Practices (University of Alberta)	

Assessment (Embedded Course)
SA I, SA II Activity and Learning Task(s), MCQ, End Semester Examination (ESE) Lab Workbook, Experimental Cycle tests, viva-voce

Course Curated by
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Expert(s) from Industry	Expert(s) from Higher Education Institution		Internal Expert
-	-		Dr. Sathyavathi, AP/IT
Recommended by BoS on	06.06.2026		
Academic Council Approval	No: 30	Date	19.06.2026


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24CSI011	COMPUTER NETWORKS AND SECURITY (Common to AD, CS, IT)	L	T	P	J	C
		3	0	2	0	4
PC		SDG 4,9				

Pre-requisite courses	Nil	Data Book / Codes / Standards (If any)	Nil
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Course Objectives:	
The purpose of taking this course is to:	
6.	Illustrate the basic concepts, architecture, and protocols of computer networks, including the OSI and TCP/IP models.
7.	Familiarize students with networking hardware (routers, switches, firewalls) and basic configuration principles.
8.	Explore the functionalities, differences, and use-cases of major transport protocols such as TCP (Transmission Control Protocol) and UDP (User Datagram Protocol).
9.	Explain the basic security principles such as confidentiality, integrity, availability and explore common threats, vulnerabilities and encryption techniques.

Course Outcomes		
After successful completion of this course, the students shall be able to		Bloom's Taxonomy Level (BTL)
CO 1	Understand the principles of data communication and functionalities of standard network reference models.	U
CO 2	Apply error detection methods and flow control techniques to ensure reliable data transmission in network communications.	Ap
CO 3	Implement routing algorithms to recommend optimal paths for efficient packet switching and internetworking.	Ap
CO 4	Apply congestion control mechanisms to assess their effectiveness and identify the functionalities of application layer protocols	Ap
CO 5	Construct a secure data communication model using standard cryptographic algorithms for cyber defense.	Ap

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2
1	3	3									2	2	
2	3	3		3									2



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3	3		3	3									2
4	3		3			3							2
5	3	2	3									2	

Course Content	
DATA COMMUNICATIONS Basics of Data Communication, Network Models: The OSI Model, TCP/IP Protocol Suite, Addressing, Transmission Media, Networking Devices, Network Topologies. Practical Component Demonstrate the use of network Diagnostic tools such as PING, TRACEROUTE, IPCONFIG, NSLOOKUP AND NETSTAT	8 Hours 6 Hours
DATA LINK LAYER Encoding, Error Detection, Reliable Transmission, MAC Protocols, Multiple Access Protocols: Random Access, Controlled Access and Channelization. Practical Component Design a network topology in Cisco Packet Tracer with multiple devices, configure IP addresses and network protocols, and verify connectivity and proper communication between all devices.	9 Hours 6 Hours
Network Layer Circuit Switching, Packet Switching, Bridges and LAN Switches, Spanning Tree Algorithm, Internetworking, IPv4, Subnetting, IPv6, Routing Techniques (RIP, OSPF, BGP).	9 Hours
TRANSPORT LAYER AND APPLICATION LAYER UDP, TCP, Congestion Control, Resource Allocation, TCP Congestion Control, Congestion Avoidance Mechanisms, Quality of Service (Integrated Services, Differentiated Services), Network Traffic Analysis. Application Layer -DNS, Email, WWW, HTTP. Practical Component Capture and analyze network traffic using Wireshark to identify and examine packets, perform traffic analysis to assess network performance, and conduct vulnerability analysis to detect any security issues or anomalies -Implement TCP and UDP client-server applications using UNIX socket programming functions.	10 Hours 10 Hours
NETWORKS SECURITY CONCEPTS Introduction to network security concepts, Network Security Model, Classical Encryption Techniques-Symmetric cipher model, Substitution techniques, Transposition techniques, Block cipher concepts and Data Encryption Standard. Practical Component Implementation of substitution and transposition technique.	9 Hours 8 Hours

Theory	Tutorial	Practical	Project	Total
Hours: 45	Hours: 0	Hours: 30	Hours: 0	Hours: 75

Learning Resources
Textbooks
1. Behrouz A. Forouzan, "Data Communications and Networking with TCP/IP Protocol Suite", 6th Edition, Tata McGraw-Hill, New Delhi, (2022). 2. Andrew S. Tanenbaum and David J. Wetherall, "Computer Networks", Fifth Edition, Prentice Hall Publisher, (2010).


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Reference books/ Web Links	
1.	Larry L. Peterson, Bruce S. Davie, "Computer Networks: A Systems Approach," Fifth Edition, Morgan Kaufmann Publishers Inc., (2011).
2.	William Stallings, "Data and Computer Communications," Tenth Edition, Pearson Education, (2013).
3.	James F. Kurose, Keith W. Ross, "Computer Networking: A Top-Down Approach Featuring the Internet," Sixth Edition, Pearson Education, (2012).
4.	William Stallings, "Network Security Essentials: Applications and Standards," Fifth Edition, Pearson Education, (2013).
Online Resources	
1.	https://www.classcentral.com/course/udacity-computer-networking-2336 .
2.	https://www.classcentral.com/course/fundamentals-network-communications-9267 .
3.	https://www.classcentral.com/course/computer-communications-18777 .
4.	https://www.mygreatlearning.com/academy/learn-for-free/courses/network-security .
Assessment (Embedded Course)	
SA - I, SA - II, Activity and Learning Task(s), MCQ, End Semester Examination (ESE), Lab Workbook, Experimental Cycle tests, viva-voce	

Course Curated by			
Expert from Industry	Expert(s) from Higher Education Institution		Internal Expert(s)
			Dr. A. Roshini, Department of Computer Science and Engineering
Recommended by BoS on	09.05.2025		
Academic Council Approval	No:28	Date	26.06.2025


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24HSP007	Building Professional Readiness	L	T	P	J	C
		0	0	2	0	1
Practical		SDG		4&8		

Pre-requisite courses	Nil	Data Book / Codes / Standards (If any)	
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Course Objectives**:	The purpose of taking this course is to:
1	To familiarize students with various interview formats and equip them with essential techniques for effectively handling personal, behavioural, stress, and panel interviews.
2	To develop self-awareness and career readiness by guiding students in analysing job roles, articulating career goals, and confidently presenting their skills and experiences.
3	To enhance students' adaptability in diverse career pathways by exploring alternative job opportunities, entrepreneurial ventures, and global career options beyond traditional engineering roles.

Course Outcomes:	After successful completion of this course, the students shall be able to	Bloom's Taxonomy Level (BTL)
CO 1	Effectively navigate various interview formats by applying appropriate techniques for personal, behavioural, stress, and panel interviews, demonstrating confidence and professionalism in different interview scenarios.	Ap
CO 2	Exhibit career readiness and self-awareness by analysing job roles, articulating career aspirations, and presenting skills and experiences in alignment with employer expectations.	An
CO 3	Evaluate and explore diverse career pathways beyond traditional engineering roles, demonstrating adaptability in pursuing opportunities in entrepreneurship, global careers, public sector roles, and other emerging industries.	E

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)		
	1	2	3	4	5	6	7	8	9	10	11			
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2	PSO-3
1						2	2	3	3		3			


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2						2	2	3	3		3			
3						2	2	3	3		3			

Course Content

Career Awareness and Goal Setting • Exploring Varied Career Options Beyond Engineering • Industry Roles • Startups and Entrepreneurial Ventures • Research Opportunities and Higher Education • Public Sector and Non-Profit Careers • Self-Assessment and Personal Reflection • Identifying Strengths, Weaknesses, Skills, and Career Aspirations • Setting Short-Term and Long-Term Career Goals	6 Hours
Fundamentals of Interview Preparation • Analysing Company Background and Understanding Job Roles • Aligning Career Goals with Job Opportunities • Professional Etiquette and Appearance • Interview Dress Code, Grooming, and First Impression • Resume and Digital Profile Readiness • Types of interviews: personal, behavioural, stress, virtual, and panel	6 Hours
Behavioural Interviews – Responding with Purpose • Introduction to behavioural interviews: What and Why? • Common behavioural interview questions • The STAR technique (Situation – Task – Action – Result) • Identifying and reflecting on past experiences • Mapping soft skills to behavioural questions • Practicing concise storytelling • Active listening and adapting responses	6 Hours
Stress Interviews – Performing Under Challenging Situations • Understanding stress interviews: Purpose and setting • Types of stress tactics (rapid-fire questions, silence, disagreement, interruptions) • Strategies to stay composed and confident • Emotional regulation and response control • Maintaining clarity, tone, and respect under pressure • Practicing assertive and professional body language • Turning pressure moments into strengths	6 Hours



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Panel Interviews • What is a panel interview? Structure and expectations • Understanding panel roles (HR, technical, managerial) • Techniques for engaging with a diverse panel • Managing eye contact, addressing questions, and body posture • Preparing multi-perspective answers • Handling follow-up or cross-questions • Strategies for closing the interview with impact	6 Hours
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Theory Hours:	-	Tutorial Hours:	-	Practical Hours:	2	Project Hours:	-	Total Hours:	30
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Learning Resources*									
Reference books/ Web Links									
1. Amos, J. (2004). Handling Tough Job Interviews: Be Prepared, Perform Well, Get the Job. United Kingdom: How To Books. 2. Clark, A. (2019). Cracking the Behavioral Interview Code!!! How to Answer Behavioral Interview Questions and Answer with a Preparation Guide + 20 Most Popular Behavioral									


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Interview Questions and Answers.. (n.p.): Amazon Digital Services LLC - KDP Print US.

3. Collins, A. (2015). HR Interview Secrets: How to Ace Your Next Human Resources Interview, Dazzle Your Interviewers and LAND the JOB YOU WANT!. United States: Success in HR Publishing.
4. Downes, C. (2008). Cambridge English for Job-hunting Student's Book with Audio CDs (2). Germany: Cambridge University Press.
5. Hatcher, S. (2015). Group Interview Preparation: Learn How to Use Group Discussion to Your Advantage and Be Comfortable, Confident, and Likeable While Standing Out in a Group Interview. (n.p.): CreateSpace Independent Publishing Platform.
6. McKay, D. R. (2013). The Everything Job Interview Question Book: The Best Answers to the Toughest Interview Questions. United States: Adams Media.
7. Ryan, R. (2016). 60 Seconds and You're Hired!: Revised Edition. United States: Penguin Publishing Group.
8. Winter, S. (2020). Job Interview Preparation and Conversation Skills 2-in-1 Book: Learn How to Crush Your Next Job Interview and Develop A Magnetic Charisma to Enhance Your Communication Skills. United States: Native Publish

Online Resources

1. <https://www.coursera.org/projects/preparation-for-job-interviews>
2. <https://www.coursera.org/projects/accomplishment-star-techniques-for-job-interviews>
3. <https://www.coursera.org/specializations/english-interview-resume>

Assessment

Formative	Summative
-----	1. Participation in Mock interviews (80%) 2. Career Readiness Portfolio Submission (20%)

Course Curated By

Expert(s) from Industry	Expert(s) from Higher Education Institutions	Internal Expert(s)
Mr. Bhuvana Sundar Soorappaiah Program Manager Bosch, Coimbatore	Dr Kishore Selva Babu Head and Associate Professor Department of English and Cultural Studies Christ University Bangalore-560029	Dr. J Srikala- AP III Dr. C Tissaa Tony - AP III Dr. S G Mohanraj – AP III Dr. S Sreejan – AP III Dr. R Hema – AP II Dr. A S Mythili - AP II



Signature of BOS Chairman, IT

Approved by: BoS Chairman	With Signature and date
BoS Approval date:	 25.04.2025


Signature of BOS Chairman, IT

24INP202	Innovation Practicum – IV (Common to All Branches)	L	T	P	J	C
		0	0	0	2	1
ES		SDG		4, 9, 11, 12		
Pre-requisite courses		-		Data Book / Code book (If any)		
				-		

Course Objectives:	
The purpose of taking this course is to:	
1	Learn and apply the Forge Innovation Handbook (FIH) to problem-solving.
2	Develop a minimum usable prototype (MUP) through iterative design, development, and testing.
3	Effectively demonstrate the developed MUP.

Course Outcomes		
After successful completion of this course, the students shall be able to		Revised Bloom's Taxonomy Levels (RBT)
CO 1	Proficiency in using the FIH to identify and solve problems.	An
CO 2	Experience in designing, building, and demonstrating a MUP.	C
CO 3	Improved ability to communicate and present project outcomes effectively.	E

	Program Outcomes (PO) (Strong-3, Medium – 2, Weak-1)											Program Specific Outcomes (PSO)	
	1	2	3	4	5	6	7	8	9	10	11		
Course Outcomes (CO)	Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Conduct Investigations of Complex Problems	Engineering Tool Usage	The Engineer and The World	Ethics	Individual and Collaborative Team work	Communication	Project Management and Finance	Life-Long Learning	PSO-1	PSO-2
1	3	2	2	2	2								
2			3	2			2		2				
3									2	3			

Course Content


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Innovation Fundamentals Master Class #1: Explore the core concepts of product design and development. Master Class #2: Introduction to the Forge Innovation Handbook (FIH) and its applications. Workshop #1: Utilize the FIH Canvas to identify challenges, validate problems, understand user needs, and define pain points, gains, and value propositions.	3 Hours
Advanced Prototyping Techniques Master Class #3: Rapid Prototyping Techniques - 1. Master Class #4: Rapid Prototyping Techniques - 2. Hack Time #1: Engage in hands-on experimentation to test core assumptions, refine the Proof of Concept (PoC). Incorporate rapid prototyping techniques and iterate on the design to enhance functionality.	6 Hours
Intellectual Property and Proof of Concept Master Class #5: Gain insights into intellectual property (IP) and prior art search. Hack Time #2: Develop and refine a working prototype. Build a Minimum Usable Prototype (MUP) based on feedback and iteration.	6 Hours
Build the Minimum Usable Prototype (MUP) Hack Time #3: Enhance the prototype through iterative improvements. Utilise feedback from mentoring sessions to make targeted adjustments and refinements, optimising the prototype's functionality and design based on practical insights. Hack Time #4: Develop the Minimum Usable Prototype (MUP). Build the final version of the MUP incorporating all iterative refinements. Ensure that it meets the defined criteria and is ready for comprehensive testing and presentation.	7 Hours
Perfect Pitch and Product Showcase Hack Time #5: Conduct a final demonstration and technical testing of the prototype. Create a compelling pitch to articulate the value proposition and potential impact of the innovation, aimed at securing support or funding. Pitch Presentation and MUP Demonstration: Students showcase their completed prototype through a comprehensive demonstration, highlighting its key features and functionalities to Industry experts, incubators and investors. They deliver a compelling pitch that clearly communicates the innovation's impact, market potential, and benefits. This presentation aims to effectively convey the value of the prototype, engage potential stakeholders, and secure support or funding opportunities.	8 Hours

Theory	Tutorial	Practical	Project	Total
Hours: 0	Hours: 0	Hours: 0	Hours: 30	Hours: 30

Learning Resources
Textbooks:


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1. Rapid Prototyping And Engineering Applications: A Toolbox For Prototype Development - Frank W.Liou, 2007
2. Rapid Prototyping Technology: Selection And Application - COOPER K. G, 2001

References:

1. Jazz Factory - All about Presentations and <http://blog.jazzfactory.in/>
2. Pretotyping Methodology - <https://www.pretotyping.org/methodology.html>
3. How to give a killer presentation - <https://hbr.org/2013/06/how-to-give-a-killer-presentation>
4. Evaluating Product Innovations — proof, potential, & progress:<https://blog.forgeforward.in/evaluating-product-innovations-e8178e58b86e>

Assessment (Project)

Project Review, Hackathons, Project Report, viva-voce, etc...

Course Curated by

Expert(s) from Industry	Expert(s) from Higher Education Institution	Internal Expert(s)
Dr. Mahesh Veezhinathan Director - Innovation Practicum		Dr. Samuel Ratna Kumar P S Assistant Professor – III Department Mechanical Engineering



Signature of BOS Chairman, IT