INFO INSTITUTE OF ENGINEERING COIMBATORE

(Autonomous, Affiliated to Anna University, Chennai)

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

CURRICULUM AND SYLLABI R-2026

B.E./B.Tech.Programme (Full-Time)

Applicable to the students admitted from the Academic year 2026– 2027

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INFO INSTITUTE OF ENGINEERING, COIMBATORE-641107.

(An Autonomous Institution, Affiliated to Anna University, Chennai)

B.E – ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

R-2026, CHOICE BASED CREDIT SYSTEM

ABBREVIATIONS

HUM - Humanities (Languages, Management, Heritage, and others)	**L** -Laboratory Course
BS - Basic Science (Mathematics, Physics, Chemistry)	**T** -Theory
ES-Engineering Science (General (G), Programme Core (PC), Programme Elective (PE) & Emerging Technology (ET))	**LIT** - Laboratory Integrated Theory
	PW -Project Work
SD - Skill Development	**DIC** - Department Introductory Course
SL - Self Learning	**TCP** -Total Contact Period(s)
OE- Open Elective	

DEPARTMENT VISION

- To achieve outstanding standards in the field of artificial intelligence and data science by imparting high quality education through latest curriculum, industry connect, problem solving and research for good of humanity.

DEPARTMENT MISSION

- To facilitate a good environment with excellent facilities and industrial interaction in the field of artificial intelligence and data science.
- To enhance the cognitive skill of students to serve the global needs.
- To produce ethically responsible professionals for serving the societal requirements.

PROGRAM OUTCOMES (POs)

PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

PO3: Design/Development of Solutions: Design creative solutions for complex engineering problems and

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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. (WK5)

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. (WK8).

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. (WK2 and WK6)

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. (WK1, WK5, and WK7).

PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

PO8: Individual and Collaborative Team work: 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.

PROGRAM SPECIFIC OUTCOMES (PSOs)

The Students will be able to

1: Apply artificial intelligence, machine learning, and deep learning techniques to develop intelligent solutions for real-world problems.

2: Analyze, manage, and interpret large-scale data using data science, statistical methods, and computational tools to support data-driven decision making.

3: Design and implement AI-based systems using emerging technologies to address societal, industrial, and research challenges.

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PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

To enable graduates to:

1:Apply fundamental knowledge of mathematics, sciences, Artificial Intelligence, and Data Science to develop intelligent systems for data-driven applications.

2:Develop advanced technical skills and research capabilities to create innovative, sustainable AI and Data Science solutions for real-world problems.

3:Demonstrate professional ethics, lifelong learning, teamwork, and innovative thinking to contribute effectively to society and economic development.

Curriculum for I to VIII Semester

I Semester							
S.No	Course code	Course Name	Course Type	Periods /Week		Credits	Category
				L-T- P	TCP		
Theory Courses							
1	26TA101T	Heritage of Tamils / தமிழர் மரபு	T	1-0-0	1	1	HUM
2	26EN101T	Professional English – I	T	2-0-0	2	2	HUM
3	26MA101T	Matrices and Calculus	T	3-1-0	4	4	BS
4	26PH101T	Engineering Physics	T	3-0-0	3	3	BS
5	26CY101T	Engineering Chemistry	T	3-0-0	3	3	BS
6	26IT101T	Programming in C	T	3-0-0	3	3	ES (G)
Laboratory Courses							
7	26BS101L	Physics and Chemistry Laboratory	L	0-0-4	4	2	BS
8	26IT102L	Programming in C Laboratory	L	0-0-4	4	2	ES (G)
9	26GE101L	Engineering Practices Laboratory	L	0-0-4	4	2	ES (G)
Mandatory Credit Course							
10	26GN101M	Life skills for Engineers	T	1-0-0	1	1	HUM
Non Credit Courses							
11	26GN102M	Physical Education – I	–	0-0-2	2	–	HUM
12	26GN103M	Soft Skills for Engineers-I	–	2-0-0	2	–	HUM
13	26GN104M	Social values and Responsibility	–	1-0-0	1	–	HUM
Total Credits					**34**	**23**	

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II Semester							
S.No	Course code	Course Name	Course Type	Periods /Week		Credits	Category
				L-T- P	TCP		
Theory Courses							
1	26TA202T	Tamils and Technology / தமிழர்களும் தொழில்நுட்பமும்	T	1-0-0	1	1	HUM
2	26EN202T	Professional English – II	T	2-0-0	2	2	HUM
3	26MA202T	Linear Algebra	T	3-1-0	4	4	BS
4	26PH202T	Physics for Information Science	T	3-0-0	3	3	BS
5	26CY202T	Environmental Science and Sustainability	T	2-0-0	2	2	BS
6	26EE201T	Basic Electrical and Electronics Engineering	T	3-0-0	3	3	BS
7	26EC203T	Digital Principles and Computer Organization	T	3-1-0	4	4	ES (G)
8	26IT201T	Python Programming	T	3-0-0	3	3	ES (G)
Laboratory Courses							
9	26IT202L	Python Programming Laboratory	L	0-0-4	4	2	ES (G)
Credit Course							
10	26GN205M/ 26GN206M	Foreign Language- Deutsch / Foreign Language- Japanese	L	0 -0-2	2	1	HUM
Non-Credit Courses							
11	26GN207M	Physical Education – II	–	0-0-2	2	–	HUM
12	26GN208M	Soft Skills for Engineers-II	–	2-0-0	2	–	HUM
Total Credits					**32**	**25**	

Semester– III							
S. No.	Course Code	Course Name	Course Type	Periods/Week		Credits	Category
				L-T-P	TCP		
Theory Courses							
1.	26MA305T	Discrete Mathematics	T	3-1-0	4	4	BS
2.	26CS302T	Data Structures	T	3-0-0	3	3	ES(PC)
3.	26IT303T	Object oriented programming using Java	T	3-0-0	3	3	ES(PC)
4.	26AD301T	Artificial Intelligence Essentials	T	3-0-0	3	3	ES(PC)
5.	26AD302T	Exploratory Data Analysis	T	3-0-0	3	3	ES(PC)
Laboratory Integrated Theory Courses							
6.	26AD303I	Foundations of Data Science	LIT	3-0-2	5	4	ES(PC)
Laboratory Courses							
7.	26CS307L	Data Structures Laboratory	L	0-0-3	3	1.5	ES(PC)
8.	26IT308L	Object oriented programming using Java Laboratory	L	0-0-3	3	1.5	ES(PC)
9.	26EN301L	English Communication Skills Laboratory	L	0-0-2	2	1	HUM
Total Credits					**29**	**24**	

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Semester–IV							
S. No.	Course Code	Course Name	Course Type	Periods/Week		Credits	Category
				L-T-P	TCP		
Theory Courses							
1.	26MA409T	Probability and Statistics	T	2-1-0	3	3	BS
2.	26AD401T	Operating Systems	T	3-0-0	3	3	ES(PC)
3.	26AD402T	Neural networks	T	3-0-0	3	3	ES(PC)
4.	26AD403T	Machine Learning	T	3-0-0	3	3	ES(PC)
Laboratory Integrated Theory Courses							
5.	26AD404I	Database Management Systems	LIT	3-0-2	5	4	ES(PC)
6.	26AD405I	Design and Analysis of Algorithms	LIT	3-0-2	5	4	ES(PC)
Laboratory Courses							
7.	26AD406L	Operating Systems Laboratory	L	0-0-3	3	1.5	ES(PC)
8.	26AD407L	Machine Learning Laboratory	L	0-0-3	3	1.5	ES(PC)
9.	26EN402L	English Communication Skills Laboratory –II	L	0-0-2	2	1	HUM
10.	26AD408S	Skill Development Course- I	L	0-0-2	2	1	SD
				Total Credits	**32**	**25**	

Semester–V							
S. No.	Course Code	Course Name	Course Type	Periods/ Week		Credits	Category
				L-T-P	TCP		
Theory Courses							
1.	26AD501T	Computer Networks	T	3-0-0	3	3	ES(PC)
2.	26AD502T	Standards In Artificial Intelligence	T	1-0-0	1	1	ES(PC)
3.		Programme Elective – I	T	3-0-0	3	3	ES(PE)
Laboratory Integrated Theory Courses							
4.	26AD503I	Deep Learning	LIT	3-0-2	5	4	ES(PC)
5.	26AD504I	Data Engineering	LIT	3-0-2	5	4	ES(ET)
6.	26EC505I	Embedded Systems and IoT	LIT	3-0-2	5	4	ES(G)
Laboratory Courses							
7.	26AD506S	Skill Development Course- II	L	0-0-2	2	1	SD

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8.	26AD5N1L	Industry Oriented Course –I	L	0-0-2	2	1	SD
				Total Credits	**26**	**21**	
Semester–V							
For Honours Degree							
1.		Honours Elective–I	T	3-0-0	3	3	
2.		Honours Elective–II	T	3-0-0	3	3	
For Minor Degree							
1.		Minor Elective–I	T	3-0-0	3	3	
2.		Minor Elective– II	T	3-0-0	3	3	

Semester–VI							
S. No.	**Course Code**	**Course Name**	**Course Type**	**Periods/Week**		**Credits**	**Category**
				L-T-P	**TCP**		
Theory Courses							
1.		Programme Elective – II	T	3-0-0	3	3	ES(PE)
2.		Programme Elective – III	T	3-0-0	3	3	ES(PE)
3.		Open Elective-I	T	3-0-0	3	3	OE
Laboratory Integrated Theory Courses							
4.	26AD601I	AI integrated Full Stack Web Development	LIT	2-0-2	4	3	ES(PC)
5.	26AD602I	Programming for Data Science	LIT	3-0-2	5	4	ES(PC)
6.	26AD603I	UI/UX Design and Human Centered Design	LIT	3-0-2	5	4	ES(PC)
Laboratory Courses							
7.	26AD6N2L	Industry Oriented Course –II	L	0-0-2	2	1	SD
Non Credit Course							
8.		Self-Learning Course	---	1-0-0	1	--	SL
				Total Credits	**26**	**21**	
Semester–VI							
For Honours Degree							
1.		Honours Elective–III	T	3-0-0	3	3	
2.		Honours Elective–IV	T	3-0-0	3	3	

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For Minor Degree							
1.		Minor Elective– III	T	3-0-0	3	3	
2.		Minor Elective– IV	T	3-0-0	3	3	

Semester–VII							
S. No.	Course Code	Course Name	Course Type	Periods/ Week		Credits	Category
				L-T-P	TCP		
Theory Courses							
1.		Programme Elective–IV	T	3-0-0	3	3	ES(PE)
2.		Programme Elective–V	T	3-0-0	3	3	ES(PE)
3.		Open Elective – II	T	3-0-0	3	3	OE
4.	26AD701T	Human Values and Ethics	T	3-0-0	3	3	HUM
Laboratory Integrated Theory Courses							
5.	26AD702I	Ethics in Artificial Intelligence	LIT	2-0-2	4	3	ES(PC)
Non Credit Course							
6.	26AD703S	Summer Internship	---	1-0-0	1	1	SD
				Total Credits	**17**	**16**	

Semester–VII							
S. No.	Course Code	Course Name	Course Type	Periods/ Week		Credits	Category
				L-T-P	TCP		
For Honours Degree							
1.		Honours Elective–V	T	3-0-0	3	3	
2.		Honours Elective–VI	T	3-0-0	3	3	
For Minor Degree							
1.		Minor Elective–V	T	3-0-0	3	3	
2.		Minor Elective– VI	T	3-0-0	3	3	

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Semester–VIII							
S. No.	Course Code	Course Name	Course Type	Periods/Week		Credits	Category
				L-T-P	TCP		
1	26AD801P	Project Work	PW	0-0-16	16	8	SD
				Total Credits	16	8	

Total Credits of the programme–165 Credits



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PROGRAMME ELECTIVE COURSES–STREAMS

S. NO	A	B	C	D	E	F
	DATA SCIENCE & ANALYTICS	**PRODUCT DEVELOPMENT**	**CLOUD COMPUTING & DEVOPS**	**EMERGING TECHNOLOGIES**	**INTELLIGENT COMPUTING**	**CREATIVE MEDIA**
1	Data Mining and Warehousing	Software Testing Tools and Techniques	CloudComputing	Augmented Reality/ Virtual Reality	Responsible AI	Multimedia and Animation
2	Big Data Analytics	UI and UX Design	DevOps	Quantum Computing	Generative AI	Video Creation and Editing
3	Data Visualization Techniques	DevOps	Containerization and Orchestration (Docker/Kubernetes)	Prompt Engineering	Explainable AI	Image Processing
4	Predictive Analytics and Business Intelligence	Cloud Services Management	Serverless Architecture	Large Language Models	MLOps	Game Theory
5	Edge Analytics	Java Spring Boot	Agile Methodologies	Cryptocurrency and Block chain Technologies	Computational Neuroscience	3D Printing and Design
6	Data Analytics with LLM	Frontend Frameworks and API Design	Microservices Architecture	Edge Computing	Robotics and Intelligent Systems	Game Design and Interactive Media
7	Data Governance and Ethics	RESTful and GraphQL API Development	SOA and Services Design	Human-Computer Interaction	AI for Healthcare/Finance	Digital Video Production and Editing
8	Recommender Systems	Web Performance and Accessibility	Cloud Services Management	Metaverse and 3D Environments	Speech and Audio Processing	Animation and Motion Graphics



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Vertical 1 (DATA SCIENCE & ANALYTICS)

S. No.	Course Code	Course Name	Course Type	Periods/ Week		Credits	Category
				L-T-P	TCP		
1	26AD$A1T	Data Mining and Warehousing	T	3-0-0	3	3	ES (PE)
2	26AD$A2T	Big Data Analytics	T	3-0-0	3	3	ES (PE)
3	26AD$A3T	Data Visualization Techniques	T	3-0-0	3	3	ES (PE)
4	26AD$A4T	Predictive Analytics and Business Intelligence	T	3-0-0	3	3	ES (PE)
5	26AD$A5T	Edge Analytics	T	3-0-0	3	3	ES (PE)
6	26AD$A6T	Data Analytics with LLM	T	3-0-0	3	3	ES (PE)
7	26AD$A7T	Data Governance and Ethics	T	3-0-0	3	3	ES (PE)
8	26AD$A8T	Recommender Systems	T	3-0-0	3	3	ES (PE)

$ - Semester

Vertical 2 (PRODUCT DEVELOPMENT)

S. No.	Course Code	Course Name	Course Type	Periods/ Week		Credits	Category
				L-T-P	TCP		
1	26AD$B1T	Software Testing Tools and Techniques	T	3-0-0	3	3	ES (PE)
2	26AD$B2T	UI and UX Design	T	3-0-0	3	3	ES (PE)
3	26AD$B3T	DevOps	T	3-0-0	3	3	ES (PE)
4	26AD$B4T	Cloud Services Management	T	3-0-0	3	3	ES (PE)
5	26AD$B5T	Java Spring Boot	T	3-0-0	3	3	ES (PE)
6	26AD$B6T	Frontend Frameworks and API Design	T	3-0-0	3	3	ES (PE)
7	26AD$B7T	RESTful and GraphQL API Development	T	3-0-0	3	3	ES (PE)
8	26AD$B8T	Web Performance and Accessibility	T	3-0-0	3	3	ES (PE)

$ - Semester

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Vertical 3 (CLOUD COMPUTING & DEVOPS)

S. No.	Course Code	Course Name	Course Type	Periods/ Week		Credits	Category
				L-T-P	TCP		
1	26AD$C1T	Cloud Computing	T	3-0-0	3	3	ES (PE)
2	26AD$C2T	DevOps	T	3-0-0	3	3	ES (PE)
3	26AD$C3T	Containerization and Orchestration (Docker/Kubernetes)	T	3-0-0	3	3	ES (PE)
4	26AD$C4T	Serverless Architecture	T	3-0-0	3	3	ES (PE)
5	26AD$C5T	Agile Methodologies	T	3-0-0	3	3	ES (PE)
6	26AD$C6T	Microservices Architecture	T	3-0-0	3	3	ES (PE)
7	26AD$C7T	SOA and Services Design	T	3-0-0	3	3	ES (PE)
8	26AD$C8T	Cloud Services Management	T	3-0-0	3	3	ES (PE)

$ - Semester

Vertical 4 (EMERGING TECHNOLOGIES)

S. No.	Course Code	Course Name	Course Type	Periods/ Week		Credits	Category
				L-T-P	TCP		
1	26AD$D1T	Augmented Reality/ Virtual Reality	T	3-0-0	3	3	ES (PE)
2	26AD$D2T	Quantum Computing	T	3-0-0	3	3	ES (PE)
3	26AD$D3T	Prompt Engineering	T	3-0-0	3	3	ES (PE)
4	26AD$D4T	Large Language Models	T	3-0-0	3	3	ES (PE)
5	26AD$D5T	Cryptocurrency and Block chain Technologies	T	3-0-0	3	3	ES (PE)
6	26AD$D6T	Edge Computing	T	3-0-0	3	3	ES (PE)
7	26AD$D7T	Human-Computer Interaction	T	3-0-0	3	3	ES (PE)
8	26AD$D8T	Metaverse and 3D Environments	T	3-0-0	3	3	ES (PE)

$ - Semester

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Vertical 5 (INTELLIGENT COMPUTING)

S. No.	Course Code	Course Name	Course Type	Periods/ Week		Credits	Category
				L-T-P	TCP		
1	26AD$E1T	Responsible AI	T	3-0-0	3	3	ES (PE)
2	26AD$E2T	Generative AI	T	3-0-0	3	3	ES (PE)
3	26AD$E3T	Explainable AI	T	3-0-0	3	3	ES (PE)
4	26AD$E4T	MLOps	T	3-0-0	3	3	ES (PE)
5	26AD$E5T	Computational Neuroscience	T	3-0-0	3	3	ES (PE)
6	26AD$E6T	Robotics and Intelligent Systems	T	3-0-0	3	3	ES (PE)
7	26AD$E7T	AI for Healthcare/Finance	T	3-0-0	3	3	ES (PE)
8	26AD$E8T	Speech and Audio Processing	T	3-0-0	3	3	ES (PE)

$ - Semester

Vertical 6 (CREATIVE MEDIA)

S. No.	Course Code	Course Name	Course Type	Periods/ Week		Credits	Category
				L-T-P	TCP		
1	26AD$F1T	Multimedia and Animation	T	3-0-0	3	3	ES (PE)
2	26AD$F2T	Video Creation and Editing	T	3-0-0	3	3	ES (PE)
3	26AD$F3T	Image Processing	T	3-0-0	3	3	ES (PE)
4	26AD$F4T	Game Theory	T	3-0-0	3	3	ES (PE)
5	26AD$F5T	3D Printing and Design	T	3-0-0	3	3	ES (PE)
6	26AD$F6T	Game Design and Interactive Media	T	3-0-0	3	3	ES (PE)
7	26AD$F7T	Digital Video Production and Editing	T	3-0-0	3	3	ES (PE)
8	26AD$F8T	Animation and Motion Graphics	T	3-0-0	3	3	ES (PE)

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B.TECH- ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

OPEN ELECTIVES

List of open electives for other Department students

(Student shall choose the open elective course, such that the course content are not similar to any other course contents/title under any course categories)

S. No.	Course Code	Course Name	Course Type	Periods/ Week		Credits
				L-T-P	TCP	
1	26AD$01O	Introduction to Artificial Intelligence	T	3-0-0	3	3
2	26AD$02O	Introduction to Machine Learning	T	3-0-0	3	3
3	26AD$03O	Foundations of Data Science	T	3-0-0	3	3
4	26AD$04O	Recommender Systems	T	3-0-0	3	3
5	26AD$05O	Prompt Engineering	T	3-0-0	3	3
6	26AD$06O	Multimedia Systems and Applications	T	3-0-0	3	3
7	26AD$07O	Web Development	T	3-0-0	3	3

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B.TECH- ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

CREDITS SUMMARY										
CATEGORY	Credits per Semester								Total Credits	% of Category
	I	II	III	IV	V	VI	VII	VIII		
HUM	4	4	1	1	-	-	3	-	13	8
BS	12	12	4	3	-	-	-	-	31	19
ES(G)	7	9	-	-	4	-	-	-	20	12
ES(PC)	-	-	19	20	10	11	3	-	63	38
ES(PE)	-	-	-	-	3	6	6	-	15	9
ES(ET)	-	-	-	-	4	-	-	-	4	2
OE	-	-	-	-	-	3	3	-	6	4
SD	-	-	-	1	2	1	1	8	13	8
SL	-	-	-	-	-	0	-	-	0	0
TOTAL	23	25	24	25	23	21	16	8	165	100

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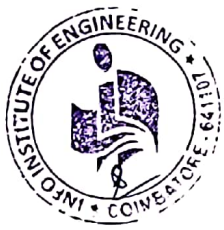
SEMESTER-I



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26TA101T	HERITAGE OF TAMILS	L	T	P	C
		1	0	0	1

Course Objectives:

To provide students with a comprehensive understanding of Tamil language, literature, heritage, arts, culture, history, and their contributions to Indian civilization and national development.

Unit I	LANGUAGE AND LITERATURE	3 Hours

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.

Unit II	HERITAGE – ROCK ART PAINTINGS TO MODERN ART – SCULPTURE	3 Hours

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.

Unit III	FOLK AND MARTIAL ARTS	3 Hours

Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance – Sports and Games of Tamil.

Unit IV	THINAI CONCEPT OF TAMILS	3 Hours

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 Chola.

Unit V	CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE	3 Hours

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.

Total Hours	15

26TA101T	தமிழர் மரபு	L	T	P	C
		1	0	0	1

Course Objectives:

தமிழ்மொழி, இலக்கியம், பாரம்பரியம், கலை, பண்பாடு, வரலாறு மற்றும் இந்திய நாகரிகம், தேசிய முன்னேற்றம் ஆகியவற்றில் தமிழர்களின் பங்களிப்பைப் பற்றிய முழுமையான புரிதலை மாணவர்கள் பெறச் செய்வது..

அலகு 1	மொழி மற்றும் இலக்கியம்	3 Hours

இந்தியாவில் உள்ள மொழிக் குடும்பங்கள், திராவிட மொழிகள், தமிழ் ஒரு செம்மொழி - தமிழ் செம்மொழி இலக்கியம் - சங்க இலக்கியத்தின் மதச்சார்பற்ற தன்மை, சங்க இலக்கியத்தில் பகிர்தல் அறம், திருக்குறளில் மேலாண்மைக் கருத்துகள், தமிழ் காப்பியங்கள். தமிழகத்தில் சமண மற்றும் பௌத்த சமயங்களின் தாக்கம். பக்தி இலக்கியம் ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலக்கியங்கள்- தமிழில் நவீன இலக்கிய வளர்ச்சி, பாரதியார் மற்றும் பாரதிதாசன் பங்களிப்பு.

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அலகு 2	மரபு - பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை - சிற்பகலை	3 Hours
நடுகல் முதல் நவீன சிற்பங்கள் வரை , ஐம்பொன் சின்னங்கள், பழங்குடியினர் மற்றும் அவர்களின் கைவினைப்பொருட்கள் - தேர் செய்யும் கலை, சுடுமண் சிற்பங்கள், நாட்டுப்புற தெய்வங்கள், குமரிமுனையில் திருவள்ளுவர் சிலை, இசைக்கருவிகள், மிருதங்கம், பறை, வீணை, யாழ், நாதஸ்வரம் இசைக்கருவிகள், தமிழர்களின் சமூக மற்றும் பொருளாதார வாழ்வில் கோயில்களின் பங்கு.		
அலகு 3	நாட்டுப்புற மற்றும் வீர விளையாட்டுகள்	3 Hours
தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியன் கூத்து, ஒயிலாட்டம், தோல் பொம்மலாட்டம், சிலம்பாட்டம், வளரி, புலியாட்டம்- தமிழர்களின் விளையாட்டுகள்.		
அலகு 4	தமிழர்களின் திணைக் கோட்பாடுகள்	3 Hours
தமிழகத்தின் தாவரங்கள் மற்றும் விலங்கினங்கள் மற்றும் தொல்காப்பியம் மற்றும் சங்க இலக்கியங்களிலிருந்து அகம் மற்றும் புறக்கோட்பாடுகள், தமிழர்களின் அறக் கோட்பாடுகள், சங்க காலத்தில் கல்வி மற்றும் எழுத்தறிவு - பண்டைய நகரங்கள் மற்றும் சங்க கால துறைமுகங்கள், சங்க காலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி - சோழர்களின் வெளிநாட்டு வெற்றி.		
அலகு 5	இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்கு தமிழர்களின் பங்களிப்பு	3 Hours
இந்திய சுதந்திரப் போராட்டத்திற்கு தமிழர்களின் பங்களிப்பு, இந்தியாவின் பிற பகுதிகளில் தமிழர்களின் கலாச்சார செல்வாக்கு, சுயமரியாதை இயக்கம், சுதேச மருத்துவ முறைகளில் சித்த மருத்துவத்தின் பங்கு, கல்வெட்டுகள் மற்றும் கையெழுத்துப் படிகள், தமிழ் புத்தகங்களின் அச்சு வரலாறு.		
	Total Hours	**15**

Weightage: Continuous Assessment: 35%, Attendance:5 % , End Semester Examinations: 60%

Continuous Assessment: Assessment – I (35%), Assessment – II (35%), Activities (30%).
Activities: Quiz (5%), Assignments (20%), Flipped Class (5%)

Course outcomes:

At the end of the course, students will be able to:

CO1: Explain the Dravidian language family, outline the features of Tamil classical literature, and explain the development of Tamil art, sculpture, and temple–related traditions in a historical context.

CO2: Apply the concepts of Sangam landscape classification and Tamil cultural heritage to interpret social and historical contexts.

Reference:

1. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
2. Social Life of the Tamils – The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
3. Historical Heritage of the Tamils (Dr.S.V.Subramanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
4. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)

Weightage: Continuous Assessment: 35%, Attendance:5 % , End Semester Examinations: 60%

Continuous Assessment: Assessment – I (35%), Assessment – II (35%), Activities (30%)
Activities: Quiz (5%), Assignments, Paper Presentation, Publication, Project (20%), Flipped Class (5%).

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	CO–PO Mapping											CO–PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	3	-	-	-	3	-	-	-
AVERAGE	-	-	-	-	-	-	3	-	-	-	3	-	-	-

1-Low, 2-Medium, 3-High

26EN101T	PROFESSIONAL ENGLISH – I	L	T	P	C
		2	0	0	2

Course Objectives:

To develop students' communication skills in English by improving their listening, speaking, reading, and writing abilities. It enhances grammar, vocabulary, and professional writing skills while enabling students to communicate effectively, present ideas confidently, and use English appropriately in academic, technical, and workplace contexts.

Unit I	FOUNDATION OF COMMUNICATION SKILLS	6 Hours

Listening – Listening to simple conversation **Speaking**– Self-Introduction **Reading** – Advertisements & Reading Comprehension. **Writing**– Complain Letter & Letter to the Editor. **Grammar**– Present Tense, Articles, Adjectives. **Vocabulary**– Synonyms & Antonyms.
Activities : Self Introduction

Unit II	UNDERSTANDING AND IMPLEMENTING	6 Hours

Listening– Short Speeches, **Speaking**– Conversation Practice in real life situations, **Reading** – Reading biographies, Newspaper Reports. **Writing**– Emails & Transferring information from non– verbal.
Grammar– Past Tense, Subject– Verb Agreement, Prepositions. **Vocabulary** – Phrasal verbs.
Activities : Transferring information from non-verbal (Chart, graph etc to verbal mode)

Unit III	DESCRIPTIVE TECHNIQUES	6 Hours

Listening– Ted Talk, **Speaking**– Group Discussion, **Reading**– Reading brochures. **Writing**–Instructions & Product / Process description. **Grammar**– Question types: Future Tense, Wh/Yes or No and Tags.
Vocabulary– One word substitution, Compound Nouns.
Activities : Process/product description

Unit IV	EXPRESSION OF OPINION	6 Hours

Listening – Reviews, Speaking– Role Play, Reading– Editorials, and Opinion Blogs, **Writing** – Report Writing & Essay Writing. **Grammar** – Direct & Indirect Speech, Punctuation; **Vocabulary:** Negation (Statements & Questions).
Activities : Short conversations

Unit V	CLASSIFICATION AND RECOMMENDATIONS	6 Hours

Listening– Movie Clippings, **Speaking**– Conversation skills with the sense of stress, Intonation, Pronunciation and Meaning.
Reading – Newspaper articles; Journal reports. **Writing**– Note– making/Note– taking, Writing recommendations. **Grammar** – Pronouns – Possessive & Relative pronouns. Degrees of comparison, **Vocabulary**– Abbreviation & Acronyms, Homophones & Homonyms.
Activities : Movie review

	Total Hours	30

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Weightage: Continuous Assessment: 35%, Attendance: 5 %, End Semester Examinations: 60%

Continuous Assessment: Assessment – I (35%), Assessment – II (35%), Activities (30%)
Activities: Quiz (10%), Assignments (20%), Speaking Task (10%), Reading Task (10%), Writing Task (10%)

Course outcomes:
At the end of the course, students will be able to:
CO1: Choose diverse vocabulary and grammar rules to express ideas with precision and accuracy.
CO2: Adapt speech delivery techniques to convey meaning effectively in various communication contexts.
CO3: Design letters and reports by synthesizing technical details and context– specific language.
CO4: Evaluate analytical or evaluative content to develop critical thinking and articulate well– reasoned arguments.

Reference:

1. Dr.Mahalakshmi S.N. English Essentials – I: VK Publication, India (2025)
2. Dr. R. Rajeswari, Dr. M. Dhilshath Banu, Dr. Malathi .P, English Essentials – I: Maruthi Publishers, India (2025) A course book on Technical English by Lakshminarayanan, Scitech Publications (India) Pvt. Ltd. 2012.

E- resources:
1. www.coursera.com
2. https://www.cambridgeenglish.org/
3. https://archive.nptel.ac.in/content/storage2/courses/109104030/references/references.pdf

	CO– PO Mapping											CO– PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	–	–	–	–	–	–	–	–	3	–	2	–	–	–
CO2	–	–	–	–	–	–	–	–	3	–	2	–	–	–
CO3	–	–	–	–	–	–	–	–	3	–	2	–	–	–
CO4	–	–	–	–	–	–	–	–	3	–	2	–	–	–
CO5	–	–	–	–	–	–	–	–	3	–	2	–	–	–
AVERAGE	–	–	–	–	–	–	–	–	3	–	2	–	–	–

1-Low, 2-Medium, 3-High

26MA101T	MATRICES AND CALCULUS	L	T	P	C
		3	1	0	4

Course Objectives:
The course aims to develop a strong foundation in matrices, differential and multivariable calculus, and integration techniques, and apply mathematical and analytical methods to solve problems involving eigenvalues, optimization, differential equations, and engineering applications.

UNIT I	MATRICES	12 Hours

Eigenvalues and Eigenvectors of a real matrix – Characteristic equation – Properties of Eigenvalues and Eigenvectors – Statement and applications of Cayley-Hamilton Theorem – Diagonalization of matrices by Orthogonal Transformation – Reduction of a quadratic form to canonical form by orthogonal transformation – Nature of quadratic forms.

Activities: Computation of eigenvalues and eigenvectors using open-source software.

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UNIT II	DIFFERENTIAL CALCULUS	12 Hours

Representation of functions – Limit of a function – Continuity – Derivatives – Differentiation rules: Polynomials, exponential functions, product and quotient rules, Trigonometric functions, chain rule, implicit functions, logarithmic functions – Maxima and Minima of functions of one variable.

Activities: Visualization of the functions, Maxima and Minima of a function using open-source software.

UNIT III	FUNCTIONS OF SEVERAL VARIABLES	12 Hours

Partial differentiation – Homogeneous functions and Euler's theorem - Total derivative – Jacobians – Taylor's series for functions of two variables – Maxima and minima of functions of two variables - Method of Lagrange's Multipliers.

Activities: Partial Derivatives with two or three variables, Maxima and Minima of a function using open-source software.

UNIT IV	INTEGRAL CALCULUS	12 Hours

Definite and Indefinite integrals – Substitution rule – Techniques of Integration: Integration by parts, Trigonometric substitutions – Integration of rational functions by partial fraction, Improper integrals (test the convergence).

Activities: Definite and Indefinite Integrals using open-source software.

UNIT V	ORDINARY DIFFERENTIAL EQUATIONS	12 Hours

Higher order linear differential equations with constant coefficients – Method of variation of parameters – Homogeneous equation of Euler's and Legendre's type – System of simultaneous linear differential equations with constant coefficients.

Activities: Solving of second and higher order ordinary differential equations using open-source software.

Total Hours	60

Weightage: Continuous Assessment: 35%, Attendance: 5 %, End Semester Examinations: 60%.

Continuous Assessment: Assessment – I (35%), Assessment – II (35%), Activities (30%).

Activities: Assignments (20%), Solution to application-oriented problems using software (20%), Solving of GATE questions (20%), Internal Examinations (40%).

Course Outcomes:

At the end of the course, students will be able to

CO1: Explain the fundamental concepts, definitions, theorems, and methods of linear algebra, differential calculus, multi-variable calculus, integral calculus, and higher-order differential equations.

CO2: Apply the principles and methods of linear algebra, differential calculus, multi-variable calculus, integral calculus, and differential equations to solve mathematical problems arising in engineering and scientific applications.

CO3: Analyze **the** behavior of matrices, single and multi-variable functions, integrals, and differential equations using appropriate mathematical concepts, theorems, and analytical techniques.

CO4: Examine mathematical problems by applying appropriate methods from linear algebra, differential calculus, multi-variable calculus, integral calculus, and differential equations, and validate the obtained solutions.

CO5: Create mathematical models using higher-order linear differential equations and systems of simultaneous linear differential equations for electrical circuits, mechanical vibration systems, control systems, population dynamics, and heat transfer.

Reference Books:

1. Kreyszig Erwin, "*Advanced Engineering Mathematics*", John Wiley and Sons (Asia) Limited, New Delhi, 10th Edition, 2016.
2. Jain R.K. and Iyengar S.R.K., "*Advanced Engineering Mathematics*", Narosa Publications, New Delhi, 5th Edition, 2017.
3. Kandasamy P, Thilagavathy K and Gunavathy K, "*Engineering Mathematics*", S Chand and Company Limited, New Delhi, 2017.

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E-resources:

1. Matrices:https://nptel.ac.in/courses/122104018
2. Differential Calculus:https://onlinecourses.nptel.ac.in/noc21_ma16/preview
3. Differential Calculus in Several Variables: https://nptel.ac.in/courses/111104092
4. Advanced Calculus for Engineers: https://onlinecourses.nptel.ac.in/e-learning/preview/noc22_ma75
5. Ordinary Differential Equations:https://nptel.ac.in/courses/111108081

	CO-PO Mapping											CO-PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	2	2	1	-	2	-	-	-	-	-	-	2	2	-
CO3	3	3	2	1	2	-	-	-	-	-	-	3	2	-
CO4	3	3	2	2	2	-	-	-	-	-	-	3	2	-
CO5	2	2	1	1	2	-	-	-	-	-	-	2	2	-
AVERAGE	2	2.5	1.5	1.3	2	-	-	-	-	-	-	2.5	2	-

1-Low, 2-Medium, 3-High

26PH101T	ENGINEERING PHYSICS	L	T	P	C
		3	0	0	3

Course Objectives:

To understand the fundamental concepts of oscillations, electromagnetic waves, ultrasonics, quantum physics, optics, lasers, and fiber optics, and their applications in modern science, communication, industry, and healthcare.

Unit I	OSCILLATIONS AND ELECTROMAGNETIC WAVES	9 Hours

Oscillations: Simple Harmonic Motion (SHM) – Resonance – Wave Motion (Qualitative) – Standing Waves. **Electromagnetic Waves:** Dielectric constant – Permittivity – Dielectric displacement– Gauss theorem. Maxwell's Equations in Integral and Differential Forms – Plane Electromagnetic Waves in Vacuum – properties of electromagnetic waves: speed, amplitude, phase, orientation and waves in matter– Reflection and transmission of electromagnetic waves from a non-conducting medium vacuum interface for normal incidence – Cell phone reception.

Activities: Virtual demonstration of propagation of EM waves.

Unit II	ULTRASONICS WAVES	9 Hours

Introduction – Production of Ultrasonic Waves (Piezoelectric and Magnetostriction Methods) – Properties of Ultrasonic Waves – Detection of ultrasonic waves properties– Acoustic Grating (Velocity measurement) – Industrial applications – Drilling, welding, soldering and cleaning – SONAR – Non Destructive Testing – Pulse echo system through transmission and reflection modes – A,B and C scan displays– Medical Applications (Sonogram).

Activities: Demonstrate object detection using echo principles.

Unit III	QUANTUM PHYSICS	9 Hours

Postulates of quantum mechanics – Black body radiation – Planck's theory (derivation) – Wave particle duality – Heisenberg's uncertainty principle– degenerate and non-degenerate states – Physical significance of wave function– Schrödinger's wave equation –Time independent and Time dependent wave equations – Particle in a one–dimensional box –Bloch's theorem (qualitative)– Kronig–Penney model (qualitative): E-k diagram – Effective mass of electron– Formation of energy bands– Origin of bandgap– Classification of solids– Concept of discrete energy levels– Quantum Tunnelling– Scanning tunnelling microscope.

Activities: Virtual demonstration of Scanning Transmission Electron Microscope.

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Unit IV	OPTICS AND LASER	9 Hours
Optics: Interference – Theory of Air wedge – Michelson's Interferometer. **Laser:** Properties of laser radiation and their significance – Wavelength, Power, Monochromaticity, Coherence. Spontaneous and stimulated emission –Einstein's co-efficient – Population inversion – Pumping method – Types of Lasers– Nd-YAG Laser– CO_2 laser – Semiconductor laser (Homojunction & Heterojunction) – Applications of laser cutting, drilling, and welding. **Activities:** Demonstration of applications of Lasers.		
Unit V	**FIBER OPTICS**	**9 Hours**
Introduction to fibre optics –Total internal reflection – Structure of optical fibre – Properties of optical fibre – Numerical aperture and acceptance angle – Types of optical fibers (Material Used, Number of Modes and Refractive Index Profile) – Losses in optical fibre (attenuation, dispersion, bending) – Fiber optical communication system (Block diagram) – Displacement and temperature sensor – Medical Endoscopy. **Activities:** Demonstration of an Optical Communication System.		
	Total Hours	**45**

Weightage: Continuous Assessment: 35%, Attendance: 5 % , End Semester Examinations: 60%

Continuous Assessment: Assessment – I (35%), Assessment – II (35%), Activities (30%)
Activities: Quiz (5%), Assignments, Paper Presentation, Publication, Project (20%), Flipped Class (5%).

Course outcomes:

At the end of the course, students will be able to:

CO1: Explain the fundamental concepts of oscillations, electromagnetic waves, ultrasonics, quantum physics, optics, lasers, and fiber optics.

CO2: Apply relevant concepts and equations to solve problems involving electromagnetic waves, ultrasonics, quantum phenomena, optics, lasers, and fiber optic systems.

CO3: Analyze quantum phenomena, energy band formation, and the performance of optical fiber communication systems.

CO4: Oral presentation on the applications of electromagnetic waves, ultrasonics, lasers, and fiber optics in engineering

CO5: Design an engineering solution based on the principles of ultrasonics, lasers, quantum devices, or fiber optic communication.

Reference:

1. Gaur, R. K., & Gupta, S. L. (2022). *Engineering physics*. Dhanpat Rai Publications.
2. Arumugam, *Engineering Physics*, Anuradha publications
3. David J. Griffiths and Darrell F. Schroeter, *Introduction to Quantum Mechanics*,3rd Edition, Cambridge University Press, 2018.
4. B.K. Pandey, S. Chaturvedi, *Engineering Physics*, Cengage Learning.

E–resources:

1. Electromagnetic Theory – https://onlinecourses.nptelac.in/noc25_ee149/preview?utm_source
2. Acoustics & Ultrasonic Waves – https://nptel.ac.in/courses/115/101/115101077/
3. Quantum Physics – https://ocw.mit.edu/courses/8–04–quantum–physics–i–fall–2016/
   https://ocw.mit.edu/courses/8–05–quantum–physics–ii–spring–2016/
4. Lasers and Their Applications – https://nptel.ac.in/courses/115/105/115105167/
5. Optical Fibers& Communication Systems – https://nptel.ac.in/courses/108/105/108105161

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	CO–PO Mapping											CO–PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	2	2	-
CO3	3	3	-	2	-	-	-	-	-	-	-	2	-	1
CO4	2	-	-	-	-	-	-	-	-	-	-	-	1	-
CO5	3	2	3		2	-	-	-	-	-	-	-	-	1
AVERAGE	3.6	2.5	3	2	2	-	-	-	-	-	-	2	1.5	1

1-Low, 2-Medium, 3-High

26CY101T	ENGINEERING CHEMISTRY	L	T	P	C
		3	0	0	3

Course Objectives:

To provide fundamental chemical principles with engineering applications by equipping students to understand, select, and process materials, while addressing practical challenges in water treatment, polymers, corrosion, energy storage, and nanotechnology.

Unit I	WATER TECHNOLOGY AND CHEMISTRY	9 Hours

Introduction–Water sources and impurities – Water quality parameters: colour, odour, pH, hardness, and alkalinity, TDS, COD and BOD – Boiler feed water – Requirement – Troubles (scale & sludge, caustic embrittlement, boiler corrosion and priming & foaming–Internal conditioning – Phosphate, calgon and carbonate treatment – External conditioning – ion exchange demineralization – Zeolite (permutit) – Municipal water treatment process – Primary (screening, sedimentation and coagulation), secondary (activated sludge process and trickling filter process) and tertiary (ozonolysis, UV treatment, chlorination, reverse osmosis).

Activities: Build Your Own Water Treatment System.

Unit II	POLYMER CHEMISTRY	9 Hours

Introduction – Functionality – Degree of polymerization – Classification of polymers – natural and synthetic, thermoplastic and thermosetting – Types and mechanism of polymerization – Addition (free radical, cationic, anionic and living); condensation and copolymerization – Properties of polymers – Tg, tacticity, molecular weight –weight average, number average and polydispersity index – Techniques of polymerization – Bulk, emulsion, solution and suspension. Structure, Properties and uses of – PE, PVC, PC, PTFE, PP, Nylon 6, Nylon 66, Bakelite, Epoxy – Conducting polymers – poly aniline and poly pyrrole.

Activities: Turn Milk into Plastic (Natural Polymer Extraction).

Unit III	ELECTROCHEMISTRY AND CORROSION	9 Hours

Introduction–Electrochemical cells – Redox reactions – Electrode potential – origin, oxidation and reduction potential – Measurement and applications – Nernst equation (derivation and problems) – Corrosion – causes, factors, and types(chemical and electro chemical corrosion, galvanic and differential aeration) – Corrosion control–material selection and design aspects – Electrochemical protection – Sacrificial anode method and impressed current cathodic protection.

Activities: The Saline Droplet Test (The Corrosion Cell).

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Unit IV	ENERGY CONVERSIONS AND STORAGE	9 Hours

Introduction – Nuclear fission – Controlled nuclear fission – Nuclear fusion – differences between nuclear fission and fusion – nuclear chain reactions – Nuclear energy – light water nuclear power plant – fast breeder reactor – Solar energy conversion – solar cells– Wind energy–Batteries – types of batteries – primary battery (dry cell), secondary battery (lead acid, nickel – cadmium and lithium–ion–battery)– Fuel cells – H_2–O_2 and microbial fuel cell– Explosives, classification, examples–TNT, RDX, Dynamite– Rocket fuels and propellants–definition and uses.

Activities: Comparing Different Types of Batteries.

Unit V	NANO CHEMISTRY	9 Hours

Introduction – Basics – Distinction between Molecules, Nanomaterials and Bulk Materials – Size Dependent Properties (Electrical, Mechanical, Optical & Magnetic) – Types –Nanoparticle, Nanocluster, Nanorod, Nanowire and Nanotube. Preparation of Nanomaterials – Sol-gel, Solvothermal & Electrochemical Deposition – Applications of Nanomaterials – Medicine, Agriculture, Electronics and Catalysis.

Activities: Surface Area Demonstration.

Total Hours	45

Weightage: Continuous Assessment: 35%, Attendance:5 %, End Semester Examinations: 60%

Continuous Assessment: Assessment – I(35%), Assessment – II(35%), Activities (30%)

Activities: Quiz (5%), Assignments, Paper Presentation, Publication, Project (20%), Flipped Class (5%).

Course outcomes:

At the end of the course, students will be able to:

CO1: Explain the principles of boiler water treatment, polymerization, molding processes, nanomaterial synthesis, electrochemistry, corrosion, and secondary battery construction and operation.

CO2: Apply chemistry concepts to compare water treatment methods, evaluate polymer properties, analyze corrosion factors, assess energy storage systems, and interpret nanomaterial properties.

CO3: Examine engineering chemistry problems involving water hardness calculations, polymer selection, corrosion control, electrochemical devices, and nanomaterial applications.

CO4: Critique the technical, economic, environmental, safety, and sustainability aspects of water treatment, polymers, corrosion protection, energy storage, and nanomaterials.

CO5: Design and develop sustainable engineering solutions using eco–friendly water systems, advanced polymers, corrosion prevention methods, next–generation batteries, and innovative nanomaterials.

Reference Books:

1. P. C. Jain and Monica Jain, "Engineering Chemistry", 17th Edition, Dhanpat Rai Publishing Company (P) Ltd, New Delhi, 2018.
2. Sivasankar B., "Engineering Chemistry", Tata McGraw–Hill Publishing Company Ltd, New Delhi,2008.
3. S.S. Dara, "A Text book of Engineering Chemistry", S. Chand Publishing, 12th Edition, 2018.

E–resources

1. Google Books S.S. Dara.
2. Google Books Jain & Jain.

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	CO–PO Mapping											CO–PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	2	1	1	-	-	-	-	-	-	-	-	-	-
CO2	2	2	1	1	-	-	-	-	-	-	-	-	-	-
CO3	2	2	2	2	1	-	-	-	-	-	-	-	-	-
CO4	2	1	2	1	1	-	-	-	-	-	-	-	-	-
CO5	2	1	2	1	2	-	-	-	-	-	-	-	-	-
AVERAGE	2	1.6	1.6	1.2	0.8	-	-	-	-	-	-	-	-	-

1-Low, 2-Medium, 3-High

26IT101T	PROGRAMMING IN C	L	T	P	C
		3	0	0	3

Course Objectives:

The course aims to provide students with the foundational knowledge and practical skills in 'C' programming to analyze and solve computational problems effectively. To foster problem-solving, critical thinking, and modular programming skills essential for engineering domains.

Unit I	BASICS OF C PROGRAMMING	9 Hours

Introduction to C programming - C Program Structure - Pre-processor Directives and Macros- Program Compilation & Execution,- C tokens: Character Set, Keywords, Identifiers, Data Types, Constants and Variables - Input/output statements - Operators & Expressions, Precedence and Associativity- Control Flow: Branching and Looping statements.

Activities: Conduct a Debugging Challenge where students identify and correct syntax, logical, and runtime errors in a given program.

Unit II	ARRAYS AND STRINGS	9 Hours

Arrays: One Dimensional Arrays and Two Dimensional Arrays – Declaration, initialization, accessing elements. Multidimensional Arrays. Strings: Defining a string - Initialization of Strings - Reading and Writing Strings - String operation: length, compare, concatenate, copy.

Activities: Students write and execute a simple C program (addition of two numbers, area calculation, etc.)

Unit III	FUNCTIONS AND POINTERS	9 Hours

Functions: Built-in functions - Defining a function - Accessing a function - Function prototypes-Parameter passing method - Passing Arrays to Function - Scope of variable - Recursion. Pointers: Pointer Declaration - Pointer Initialization–Dereferencing-Dynamic Memory Allocation.

Pointer Tracing Activity: Trace pointer values and memory address.

Unit IV	STRUCTURES AND UNIONS	9 Hours

Structures: Structure declaration-Nested structures-Pointer and Structures-Array of structures–Self-referential Structures-Singly Linked List-Union-Storage classes.

Group Discussion: Compare Structures and Unions with examples.

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Unit V	FILE PROCESSING	9 Hours
Files–Types of file processing–Sequential access file-Finding average of numbers stored in sequential access file-Random access file –Command line arguments. **Code Analysis:** Analyze a linked list program and identify its components.		
	Total Hours	45

Weightage: Continuous Assessment: 35%, Attendance: 5 % , End Semester Examinations: 60%

Continuous Assessment: Assessment – I (35%), Assessment – II (35%), Activities (30%)
Activities: Quiz (5%), Assignments, Paper Presentation, Publication, Project (20%), Flipped Class (5%)

Course outcomes:

At the end of the course, students will be able to:

CO1: Explain the C programming concepts including data types, operator, expression, control structure and file handling Techniques.

CO2: Apply core programming constructs, modular programming principles, advanced data structures, and file management techniques to develop efficient and reliable C programs.

CO3: Analyze and solve complex programming problems by effectively utilizing modular programming components such as functions, pointers, and dynamic memory management.

CO4: Design an optimal C-based software solution, Integrating complex data structures and file handling mechanism for scalable societal application

CO5: Develop C program that employ file handling operation for data storage, retrieval and processing real world application

Reference:

1. ReemaThareja,"ProgramminginC",OxfordUniversityPress,SecondEdition,(2021).
2. Balagurusamy, E. (2019). Programming in ANSI C. McGraw Hill Education.
3. Kalicharan, N. (2022). Learn to program with C: An introduction to programming using the C language.
4. Forouzan, B. A., &Afyouni, H. (2023). Computer science: A structured programming approach in C.

E–resources:

1. Learn-C.org - https://www.learn-c.org/
2. Geeks for Geeks - C Programming - https://www.geeksforgeeks.org/c-programminglanguage/
3. GNU C Library Documentation - https://www.gnu.org/software/libc/manual/
4. "Introduction to C Programming, Swayam MOOC Course- https://onlinecourses.swayam2.ac.in/imb25_mg71/
5. NPTELVideoLectureNoteson"IntroductiontoProgramminginC"byProf.SatyadevNandakumar-IIT Kanpur.

	CO–PO Mapping											CO–PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	1	2	1	-	1	-	-	-	-	-	-	2	1	-
CO3	1	2	3	1	1	-	-	-	-	-	1	2	2	-
CO4	2	2	2	1	1	1	-	-	-	-	1	2	2	1
CO5	2	2	1	1	1	-	-	-	-	-	2	2	2	1
AVERAGE	1.5	2	1.75	1	1	1	-	-	-	-	1.25	2	1.75	1

1-Low, 2-Medium, 3-High

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26BS101L	PHYSICS AND CHEMISTRY LABORATORY	L	T	P	C
		0	0	4	2

Course Objectives:

To introduce different experiments to test basic understanding of physics concepts applied in optics, properties of matter and liquids.

To develop experimental skills in water quality analysis and electroanalytical techniques for the determination of impurities in aqueous solutions.

PHYSICS LABORATORY (Any **SEVEN** Experiments)

1. Determination of rigidity modulus – Torsion pendulum.
2. Non-uniform bending - Determination of Young's modulus
3. Uniform bending – Determination of Young's modulus
4. Laser- Determination of the wave length of the laser using grating
5. Air wedge - Determination of thickness of a thin sheet/wire
6. a) Optical fibre -Determination of Numerical Aperture and acceptance angle
   b) Compact disc- Determination of width of the groove using laser.
7. Ultrasonic interferometer – determination of the velocity of sound and compressibility of Liquids
8. Determination of Band gap of a semiconductor.
9. Photoelectric effect
10. Melde's string experiment.

CHEMISTRY LABORATORY (Any **SEVEN** Experiments)

1. Preparation of Na2CO3 as a primary standard and estimation of acidity of a water sample using the primary standard
2. Determination of types and amount of alkalinity in a water sample. ◦ Split the first experiment into two
3. Determination of total, temporary & permanent hardness of water by EDTA method.
4. Determination of DO content of water sample by Winkler's method.
5. Determination of chloride content of water sample by Argentometric method.
6. Estimation of copper content of the given solution by Iodometry.
7. Estimation of TDS of a water sample by gravimetry.
8. Determination of strength of given hydrochloric acid using pH meter.
9. Determination of strength of acids in a mixture of acids using conductivity meter.
10. Conductometric titration of barium chloride against sodium sulphate (precipitation titration)
11. Estimation of iron content of the given solution using potentiometer.
12. Determination of molecular weight of polyvinyl alcohol using an Ostwald viscometer.

Practical Hours	**30**

Weightage: Continuous Assessment: 55%, Attendance: 5 % , End Semester Examinations: 40%

Continuous Assessment: Procedure, Observation, Record, Viva, Personal Protective Equipment, Model Exam (75%) and Activities (25%)

Course outcomes:

At the end of the course, students will be able to:

CO1: Explain the principles of mechanics, optics, ultrasonics, semiconductors, and modern physics experiments and the principles of volumetric, electroanalytical, and physicochemical experiments used in water quality analysis and material characterization in chemistry experiments.

CO2: Determine the physical properties of materials using appropriate experimental techniques and calculations in physics experiments and also determine the concentration, composition, and physicochemical properties of chemical samples using appropriate analytical methods in chemistry experiments.

CO3: Analyze experimental observations to interpret the physical properties and behaviour of engineering materials in physics experiments and also analyze analytical data obtained from volumetric, electroanalytical, and gravimetric methods in chemistry experiments.

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	CO-PO Mapping											CO-PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	3	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-		-	-	-	-	-	-	-	-	-	-
AVERAGE	3			3										

1-Low, 2-Medium, 3-High

26IT102L	PROGRAMMING IN C LABORATORY	L	T	P	C
		0	0	4	2

Course Objectives:

To learn fundamental C programming concepts, including data types, operators, expressions, input/ output, and control structures. It develops problem-solving -oriented mini projects using C programming.

PRACTICAL EXERCISES

1. Programs using I/O statements, operators, expressions.
2. Programs using Branching Statements: if, if-else, nested if, goto, switch-case, break, continue.
3. Programs using Looping Statements.
4. Programs using 1D and 2D Arrays.
5. Programs using String operations.
6. Programs using Functions: passing, returning values and arrays.
7. Programs using Recursion.
8. Programs using Pointers: Pointers to functions, Arrays, Strings, Pointers to Pointers, Array of Pointers.
9. Programs using File operations: reading and writing, file pointers, file operations, random access.
10. Create a C program for a given application (Like Library Management System, Ticket Reservation etc.,)
11. Develop mini-project applications(Simple Calculator with Menu, Electricity Bill Calculator, Student Record Management System Employee Payroll System, Student Grade Calculator, Telephone Directory Management)

Practical Hours	30

Weightage: Continuous Assessment: 55%, Attendance: 5 % , End Semester Examinations: 40%

Continuous Assessment: Procedure, Observation, Record, Viva, Personal Protective Equipment, Model Exam (75%) and Activities (25%)

Course outcomes:

At the end of the course, students will be able to:

CO1: Implement C programs using fundamental programming constructs and structured programming techniques.

CO2: Apply C programming concepts to develop programs using arrays, strings, functions, recursion, and pointers.

CO3: Analyze computational problems and implement efficient solutions using pointers, file handling, and appropriate programming techniques.

CO4: Design modular and reusable C applications by integrating functions, pointers, arrays, and file operations.

CO5: Evaluate application-oriented mini projects using C programming concepts, debugging, and testing techniques.

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	CO-PO Mapping											CO-PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	1	2	1	-	2	-	-	-	-	-	-	1	1	-
CO3	2	2	1	-	2	-	-	-	-	-	1	2	2	-
CO4	1	2	1	2	1	-	-	1	-	1	1	2	1	-
CO5	2	2	2	2	3	-	1	3	-	1	2	3	2	1
AVERAGE	1.2	1.6	1.0	0.8	1.6		0.2	0.8		0.4	0.8	1.6	1.2	0.2

1-Low, 2-Medium, 3-High

26GE101L	ENGINEERING PRACTICES LABORATORY	L	T	P	C
		0	0	4	2

Course Objectives:

The course introduces fundamental C programming concepts, including data types, operators, expressions, input/output, and control structures. It develops problem-solving -oriented mini projects using C programming

GROUP – A (MECHANICAL ENGINEERING)
MECHANICAL ENGINEERING PRACTICES

1. **PLUMBING WORK**
   a) Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, elbows and other components which are commonly used in household.
   b) Preparing plumbing line sketches.
2. **WOOD WORK**
   a) Making joints like T-Joint and Dovetail joint.
3. **WELDING WORK**
   a) Welding of Butt Joints and Lap Joints using arc welding.
   b) Practicing gas welding.
4. **DIS-ASSEMBLY & ASSEMBLY PRACTICES**
   a) Dis-assembly and assembly of table fan
   b) Dis-assembly and assembly of mixer grinder
   c) Dis-assembly and assembly of air conditioner system
   d) Dis-assembly and assembly of refrigerator
5. **BASIC MACHINING WORK**
   a) Drilling and Tapping.

Practical Hours	**30**

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GROUP – B (ELECTRICAL) ELECTRICAL ENGINEERING PRACTICES	
a) Introduction to switches, fuses, indicators and lamps - Basic switch board wiring withlamp, fan and three pin socket b) Staircase wiring c) Fluorescent Lamp wiring with introduction to CFL and LED types. d) Energy meter wiring and related calculations. e) Study of Iron Box wiring and assembly f) Study of Fan Regulator (Resistor type and Electronic type using Diac/Triac/quadrac) g) Study of emergency lamp wiring	
Practical Hours	**15**
GROUP – C (ELECTRONICS) ELECTRONIC ENGINEERING PRACTICES	
1. SOLDERING WORK a) Soldering simple electronic circuits. **2. ELECTRONIC ASSEMBLY AND TESTING WORK** a) Assembling and testing electronic components on a small PCB. **3. ELECTRONIC EQUIPMENT STUDY:** a) Study the elements of a smart phone. b) Assembly and dismantle of LED TV. c) Assembly and dismantle of computer/ laptop	
Practical Hours	**15**
Practical Hours	**60**
Weightage: Continuous Assessment: 55%, Attendance: 5 % , End Semester Examinations: 40%	
Continuous Assessment: Procedure, Observation, Record, Viva, Personal Protective Equipment, Model Exam (75%) and Activities (25%)	
Course outcomes: At the end of the course, students will be able to: **CO1:** Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common householdwood work. **CO2**. Wire various electrical joints in common household electrical wire work. **CO3**. Weld various joints in steel plates using arc welding work; **CO4**. Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.	

	CO-PO Mapping											CO-PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	-	-	1	1	1	-	-	-	2	2	1	1
CO2	3	2	-	-	1	1	1	-	-	-	2	2	1	1
CO3	3	2	-	-	1	1	1	-	-	-	2	2	1	1
CO4	3	2	-	-	1	1	1	-	-	-	2	2	1	1
AVERAGE	3	2			1	1	1				2	2	1	1

1-Low, 2-Medium, 3-High

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26GN101M	LIFE SKILLS FOR ENGINEERS	L	T	P	C
		1	0	0	1

Course Objectives:

To develop self-awareness, emotional intelligence and positive attitude for personal growth and to build life skills such as financial literacy, communication, teamwork and leadership.

Unit I	PERSONAL AND EMOTIONAL DEVELOPMENT	5 Hours

Personal and Emotional Development: Self-Awareness & Personality – Emotional Intelligence & Empathy – Positive thinking – Right attitude – Stress & Anger Management – Goal-Setting & Time Management – Growth Mindse Resilience.

Activities: Empathy circle, Vision board creation.

Unit II	MANAGEMENT SKILLS	5 Hours

Financial Literacy: Budgeting & Saving – Nutrition, Health, and Hygiene, Digital Literacy & Online Safety – Civic Responsibility & Ethics.

Activities: Create a monthly budget, physical wellness challenge.

Unit III	LEADERSHIP	5 Hours

Leadership Styles & Self-Assessment – Communication & Active Listening – Decision-Making & Responsibility, Teamwork & Delegation – Empathy, Integrity & Conflict Management, Vision, Motivation & Goal-Setting.

Activities: Leadership Dilemmas Role-Play.

Total Hours	15

Weightage: Continuous Assessment: 95%, Attendance: 5 %

Continuous Assessment: Assignments (20%), Flipped Class & Worksheets (10%), Practical (30%), Internal Examinations (40%)

Course Outcomes:

After completing the course, the students will be able to:

CO1: Understand personality traits and emotional intelligence, in interpersonal interactions.

CO2: To work and execute as a team through successful implementation of set goals.

CO3: Explain the importance of leadership and management skills in life.

References:

1. Mitra, *B. K. (2017).* Personality development & soft skills (3rd impression). Oxford University Press.
2. *ICT Academy of Kerala. (2016).* Life skills for engineers. McGraw Hill Education (India) Private Ltd.

E-resources:

1. Emotional Intelligence & Personal Development - https://www.mindtools.com/pages/article/newCDV_59.htm
2. Positive Thinking & Stress Management - https://www.helpguide.org/mental-health/stress
3. Goal Setting & Time Management - https://www.mindtools.com/a4wo118/smart-goals

	CO-PO Mapping											CO-PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	3	2	-	-	2	-	-	-
CO3	-	-	-	-	-	-	3	2	-	-	2	-	-	-
AVERAGE	-	-	-	-	-	-	3	2	-	-	2	-	-	-

1-Low, 2-Medium, 3-High

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26GN102M	PHYSICAL EDUCATION - I	L	T	P	C
		0	0	2	0

Course Objectives:

- To impart the fundamentals of physical education for development of students physical, mental and social well-being.

Introduction to physical Education: Exercise For Good Posture-conditioning and calisthenics for before start, jogging, Bending, Twisting, Standing, Sitting and Relaxation, Training on First Aid Practices.
Participation of athletic events: Rules and Regulations of Important athletic events, Sprint, Throws, Jumps, and Hurdles.
Skill development in any one of the following outdoor games: Volley ball, Cricket, kho-kho,
Skill Development in any one of the following indoor games : Table Tennis, Badminton, Chess.
Coordination Events: pyramids, March past.

Course Outcomes:

After completing the course, the students will be able to:
CO1: Explain the importance of physical activity for mental and physical health
CO2: Apply safety principles and method during sports activities.

References :

1. Singh, A.(2008).Essential of Physical Education. Kalyani Publishers.
2. Kamlesh, M.L.(2006) Psychology in Physical Education and port (3rd ed) Metropolitan Book Co.
3. Mangal, S.K. (2009) Psychology of Sports Performance. Sports Publication.
4. Kandappan, K. (2004). Foundations of Physical Education. Friends Publications.

E-resources:

1. https://www.who.int/health-topics/physical-activity

	CO-PO Mapping											CO-PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	3	-	-		-	-	-
CO4	-	-	-	-	-	-	-		-	-	2	-	-	-
AVERAGE	3							3			2			

1-Low,2-Medium, 3-High

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26GN103M	SOFT SKILLS FOR ENGINEERS – I	L	T	P	C
		2	0	0	0

Course Objectives:

To develop self–awareness, emotional intelligence and positive attitude for personal growth and to build life skills such as financial literacy, communication, teamwork and leadership.

Unit I	Introduction to Soft Skills	15 Hours

Introduction – Purpose of communication – Tools of communication – Verbal communication – Listening skills – Speaking skills – Verbal and Non-verbal communication – Dealing with conflict – Barriers to communication – Overcoming barriers.

Activities: Role-play conversations, mock presentations, listening exercises, speech delivery practice.

Unit II	Aptitude and Quantitative Ability	15 Hours

Ratio and Proportion – Average – Time – Speed and Distance – Coding – Decoding – Blood Relation –Syllogisms – Logical Sequences – Statement and Assumptions – Critical Reasoning.

Activities: Weekly aptitude tests and problem-solving sessions.

Total Hours	30

Course Outcomes:

After completing the course, the students will be able to:

CO1 : Explain personality traits and emotional intelligence, in interpersonal interactions.

CO2 : Apply quantitative aptitude and logical reasoning techniques to solve aptitude problems accurately and efficiently.

CO3: Analyze mathematical concepts related to ratio and proportion, averages, and time–speed–distance to solve aptitude problems.

References:

1. Sanjay Kumar and Pushp Lata, Communication Skills, 2nd Edition, Oxford University Press, 2018.
2. R.S. Aggarwal, Quantitative Aptitude for Competitive Examinations, Revised Edition, S. Chand Publishing. 2023.

E–resources:

1. Verbal & Non–Verbal Communication – https://www.skillsyouneed.com/?utm_source
2. Conflict Management & Workplace Communication – https://www.mindtools.com/?utm_source
3. Quantitative and Reasoning Courses – https://swayam.gov.in/?utm_source

	CO-PO Mapping											CO-PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	2	3	-	-	2	-	-	-
CO3	2	3	-	-	-	-	-	-	-	-	1	-	-	-
AVERAGE	2	3	-	-	-	-	2	3	-	-	1.5	-	-	-

1-Low,2-Medium, 3-High

Approved by 1st Academic Council Meeting held on 25th August 2026

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26GN104M	SOCIAL VALUES AND RESPONSIBILITY	L	T	P	C
		1	0	0	0

Course Objectives:

To understand life values, self-control, family values, social responsibility, civic responsibility and ethical behaviour for a peaceful personal and professional life.

Unit I	PHILOSOPHY OF LIFE	5 Hours

Human life on earth – Purpose and meaning of life – Philosophy of life – Law of nature – protection of nature/universe – Basic culture and thought analysis – Regulating desire and controlling anger – Removing anxiety – Importance of blessings – Friendship, love, and charity – Self-tranquillity and peace.

Unit II	SOCIAL VALUES	5 Hours

Family and peace in family life – Society and social harmony – Brotherhood and responsibility – Pride of womanhood – Five responsibilities of human: (Self, Family, Environment, Society and Universe) –Thrift and economic values – Health and education importance – World peace.

Unit II	CIVIC RESPONSIBILITY AND PROFESSIONAL ETHICS	5 Hours

The concept of good citizenship and civic duty – Constitutional values and human rights – Duties to oneself, family, community, and the environment– Volunteerism, community engagement, and social service.

Ethics in personal and professional environments – Workplace responsibilities (Punctuality, accountability and lawfulness) – Corporate Social Responsibility (CSR): Obligations of enterprises to society – Addressing ethical dilemmas in professional – decision-making.

Total Hours	15

Course Outcomes:

After completing the course, the students will be able to:

CO1: Explain the principles of philosophy of life, social values, and human responsibilities for personal well-being and societal harmony.

CO2 : Apply ethical values, civic responsibilities, and constitutional principles in personal, social, and professional life.

CO3 : Analyze ethical issues and professional responsibilities to make informed and responsible decisions in workplace and community contexts.

References:

1. R. R. Gaur, R. Asthana & G. P. Bagaria, "*Teachers' Manual for A Foundation Course in Human Values and Professional Ethics*",2nd Revised Edition, Excel Books, New Delhi, 2019.
2. D. R. Kiran, "Professional Ethics & Human Values", McGraw Hill Education, New Delhi, 2014.
3. S. B. Srivastava, "Professional Ethics & Human Values", SciTech Publications, New Delhi, 2011.

E-resources:

1. Human Values And Professional Ethics - https://onlinecourses.swayam2.ac.in/e–carning/preview/imb26_mg125
2. Peace - https://www.bsgforsdg.org/sdg–video/sdg–16–peace–justice–and–strong–institutions?utm_source
3. Civic Responsibility - https://glasp.co/youtube/A2pGLI_xLak

	CO-PO Mapping											CO-PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	3	2	-	-	2	-	-	-
CO3	-	-	-	-	-	-	3	2	-	-	2	-	-	-
AVERAGE	-	-	-	-	-	-	3	2	-	-	2	-	-	-

1-Low, 2-Medium, 3-High

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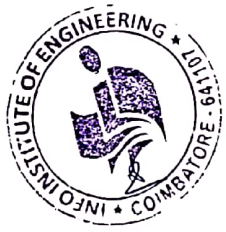
SEMESTER-II



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26TA202T	TAMILS AND TECHNOLOGY	L	T	P	C
		1	0	0	1

Course Objectives:

To understand the traditional technologies, scientific knowledge, and cultural heritage of Tamil civilization and their relevance to modern science, engineering, and digital applications.

Unit I	WEAVING AND CERAMIC TECHNOLOGY	3 Hours

Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries.

Unit II	DESIGN AND CONSTRUCTION TECHNOLOGY	3 Hours

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.

Unit III	MANUFACTURING TECHNOLOGY	3 Hours

Art of Ship Building – Metallurgical studies – Iron industry – Iron smelting, steel – Copper and gold – Coins as source of history – Minting of Coins – Beads making–industries Stone beads – Glass beads – Terracotta beads – Shell beads/ bone beats – Archeological evidences – Gem stone types described in Silappathikaram.

Unit IV	AGRICULTURE AND IRRIGATION TECHNOLOGY	3 Hours

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 – Conch diving – Ancient Knowledge of Ocean – Knowledge Specific Societ.

Unit V	SCIENTIFIC TAMIL & TAMIL COMPUTING	3 Hours

Development of Scientific Tamil – Tamil computing – Digitalization of Tamil Books – Development of Tamil Software – Tamil Virtual Academy – Tamil Digital Library – Online Tamil Dictionaries – Sorkuvai Project.

Total Hours	15

26TA202T	தமிழர்களும் தொழில்நுட்பமும்	L	T	P	C
		1	0	0	1

பாடத்தின் நோக்கங்கள் :

தமிழ் நாகரிகத்தின் பாரம்பரிய தொழில்நுட்பங்கள், அறிவியல் அறிவு மற்றும் கலாச்சார பாரம்பரியம் மற்றும் நவீன அறிவியல், பொறியியல் மற்றும் டிஜிட்டல் பயன்பாடுகளுக்கு அவற்றின் தொடர்பு ஆகியவற்றைப் புரிந்துகொள்வது.

அலகு 1	நெசவு மற்றும் பானைத்தொழில்நுட்பம்	3 Hours

சங்க காலத்தில் நெசவுத் தொழில் - பானைத் தொழில்நுட்பம் - கருப்பு , சிவப்பு பாண்டங்கள் (BRW) - மட்பாண்டங்களில் மீது கீறல்குறியீடுகள்

அலகு 2	வடிவமைப்பு மற்றும் கட்டிடத்தொழில்நுட்பம்	3 Hours

சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு- சங்க காலத்தில் கட்டுமானப் பொருட்களும் நடுகல்லும், சிலப்பதிகாரத்தில் மேடைஅமைப்பு பற்றிய விவரங்கள் - மாமல்லபுர சிற்பங்களும் கோவில்களும் - சோழர்காலத்துப் பெருங்கோவில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் - நாயக்கர் கால கோவில்கள் – மாதிரி கட்டமைப்பு பற்றி அறிதல், மதுரைமீனாட்சிஅம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் செட்டிநாடு வீடுகள் , - வகை ஆய்வு. பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ - சரசெனிக் கட்டிடக்கலை.

அலகு 3	உற்பத்தித் தொழில்நுட்பம்	3 Hours

கப்பல் கட்டும் கலை - உலோகவியல் ஆய்வுகள் - இரும்புத் தொழிற்சாலை - இரும்பை உருகுதல், எஃகு வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் அச்சடித்தல் - மணிகள் உருவாக்கும் தொழிற்சாலை - கல் மணிகள் - கண்ணாடி மணிகள் - சுடுமண் மணிகள் - சங்கு மணிகள் / எலும்புத் துண்டுகள் - தொல்லியல் சான்றுகள் , சிலப்பதிகாரத்தில் மணிகளின் வகைகள்

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அலகு 4	வேளாண்மை மற்றும் நீர்ப்பாசனத்தொழில்நுட்பம்	3 Hours

அணை, ஏரி, குளங்கள், மதகு, சோழர் காலக் குமிழித்தூம்பின் முக்கியத்துவம், கால்நடை பராமரிப்பு - கால்நடைகளுகாக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண் சார்ந்த செயல்பாடுகள் - கடல் அறிவு - மீன்வளம் - முத்து - முத்துக்குளித்தல்- பெருங்கடல் குறித்த பண்டைய அறிவு – அறிவுசார் சமூகம்.

அலகு 5	அறிவியல் தமிழ் & தமிழ் கம்ப்யூட்டிங்	3 Hours

அறிவியல் தமிழ் வளர்ச்சி – தமிழ் கணினி – தமிழ் நூல்களின் டிஜிட்டல் மயமாக்கல் – தமிழ் மென்பொருள் உருவாக்கம் – தமிழ் மெய்நிகர் அகாடமி – தமிழ் டிஜிட்டல் நூலகம் – இணைய தமிழ் அகராதிகள் – சொற்குவை திட்டம்.

Total Hours	**15**

Weightage: Continuous Assessment: 35%, Attendance: 5 % , End Semester Examinations: 60%,

Continuous Assessment: Assessment – I (35%), Assessment – II (35%), Activities (30%)
Activities: Quiz (5%), Assignments (20%), Flipped Class (5%)

பாடநெறி முடிவுகள்:

பாடநெறியின் முடிவில், மாணவர்கள் செய்ய முடியும்:

CO1: வெவ்வேறு வரலாற்று காலகட்டங்களில் நெசவு, மட்பாண்டம், உலோகம் மற்றும் கட்டிடக்கலை ஆகியவற்றில் பண்டைய தமிழ் தொழில்நுட்பங்களின் முக்கியத்துவத்தை புரிந்து கொள்ளுங்கள்.

CO2: விவசாயம், நீர்ப்பாசனம் மற்றும் கடல்சார் அறிவியல் ஆகியவற்றில் பாரம்பரிய தமிழ் அறிவின் கொள்கைகளை விளக்கவும், மேலும் தமிழ் மொழியின் வளர்ச்சியை டிஜிட்டல் தொழில்நுட்பங்கள் மற்றும் கணினியுடன் தொடர்புபடுத்தவும்.

References:

1. தமிழக வரலொறு – மக்களும் பண்பொடும் – மக.மக. பிள்மள (தவளியீடு: தமிழ்நொடு பொடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் – முமனவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி – மவமக நதிக்கமரயில் ெ ங்ககொல நகர நொகரிகம் (ததொல்லியல் துமற தவளியீடு)
4. தபொருமந – ஆற்றங்கமர நொகரிகம். (ததொல்லியல் துமற தவளியீடு)
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 Text Book and Educational Services Corporation, Tamil Nadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
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) – Reference Book.

	CO–PO Mapping											CO–PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	1	-	-	1	-	1	-	-	-
CO2	-	-	-	-	-	1	-	-	1	-	1	-	-	-
AVERAGE	-	-	-	-	-	1	-	-	1	-	1	-	-	-

1-Low, 2-Medium, 3-High

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26EN202T	PROFESSIONAL ENGLISH - II	L	T	P	C
		2	0	0	2

Course Objectives:

To focus on applying appropriate vocabulary in both written and spoken communication, composing professional documents with proper structure and clarity, and synthesizing information from verbal and non-verbal sources into well-organized notes and reports.

Unit I	LANGUAGE SKILLS DEVELOPMENT	6 Hours

Listening-Listening to general conversations, **Speaking-** Self-Introduction **Reading –** Reading Comprehension-Book review, Article review, **Writing** - Letter Writing – Complaint, Request, Permission (acceptance/declining). Grammar- Parts of Speech, Prefix & Suffix

Activities: Situational Role Plays.

Unit II	USAGE OF PROFESSIONAL LANGUAGE	6 Hours

Listening-Listening to telephonic conversation – (specific information, numbers, time, duration) **Speaking-** Narrating personal experiences / events, **Reading** – newspaper and digital articles, **Writing-**Minutes of the meeting, Paragraph Writing – Narrative, Descriptive, Argumentative Grammar- Sentence Patterns, Subject-Verb Agreement.

Activities:: Short Presentation

Unit III	GENERAL CORRESPONDENCE	6 Hours

Listening-Listening to group discussion and providing factual information **Speaking-**Argumentative speech about a public issue, **Reading –** Reading strategies (Skimming, Scanning, Intensive reading, and Extensive reading), **Writing-** Recommendations, Instructions, Grammar- Active and Passive voice, Tense.

Activities: Report on modern technologies.

Unit IV	CORPORATE CORRESPONDENCE	6 Hours

Listening-Listening to debates, **Speaking-**Describe an object or event, **Reading** – Reading brochures, instruction manual - **Writing-** Essay Writing Grammar- Gerunds, Articles

Activities: Graphical Summaries.

Unit V	ENGLISH FOR EMPLOYABILITY	6 Hours

Listening- Listening to daily news or briefing, **Speaking**- Interview skills, **Reading** – Sequencing the jumbled sentences **Writing-**Resume /CV, Cover Letter, E-mail Writing (Formal & Informal) Grammar-Degrees of Comparison, Linking words.

Activities:: Poster and Picture interpretation

Total Hours	30

Weightage: Continuous Assessment: 35%,Attendance: 5 %, End Semester Examinations: 60%

Continuous Assessment: Assessment – I (35%), Assessment – II (35%), Activities (30%)

Activities : Quiz (10%), Assignments (20%), Speaking Task (10%), Reading Task (10%), Writing Task (10%)

Course outcomes:

At the end of the course, students will be able to:

CO1: Interpret grammatical structures to ensure accurate and context-appropriate communication.

CO2: Apply reading strategies to improve comprehension in professional communication.

CO3: Analyse communication situations and select appropriate speaking strategies for academic and professional interactions.

CO4: Adapt life-long learning to new and emerging technologies, and critical thinking in the broadest context of technological change.

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Reference:

1. Dr. Mahalakshmi S.N (2025). English Essentials - II: VK Publication, India
2. Dr. R. Rajeswari, Dr. M. DhilshathBanu, Dr. Malathi.P, (2025) English Essentials - II: Maruthi Publishers, India

E-resources:

1. Communication for Business Success - https://open.umn.edu/opentextbooks/textbooks/8
2. Cambridge English – https://www.cambridgeenglish.org/learning

	CO-PO Mapping											CO-PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	2	-	1	-	-	-
CO2	-	-	-	-	-	-	-	2	2	-	1	-	-	-
CO3	-	-	-	-	-	-	-	-	2	-	2	-	-	-
CO4	-	-	-	-	-	-	-	-	3	-	3	-	-	-
CO5	-	-	-	-	-	-	-	2	2	-	2	-	-	-
AVERAGE	-	-	-	-	-	-	-	0.8	2.2	-	1.8	-	-	-

1-Low, 2-Medium, 3-High

26MA203T	LINEAR ALGEBRA (B.E - CSE & B.TECH - AIDS, IT)	L	T	P	C
		3	1	0	4

Course Objectives:

To impart foundational knowledge in linear algebra essential for analysing, solving problems in engineering applications and interpret key linear algebra concepts using software.

Unit I	SOLUTION OF A SYSTEM OF LINEAR EQUATION	12 Hours

Solution of linear system of equations: Gauss elimination method - Gauss Jordan method - Iterative methods of Gauss Jacobi and Gauss Seidel - Eigen Values of the matrix by Power method.

Activities: Solve a system of linear equations by Gauss Elimination method using Open-Source Software.

Unit II	VECTOR SPACES	12 Hours

Introduction to Vector Spaces, Examples, Subspaces, Linear Combinations, Span, Linear Dependence and Independence. Basis and Dimension - Dimension of Subspaces.

Activities: Recognize vector spaces and subspaces, and examine vectors through linear combinations and linear dependence tests and to find basis and dimension of vector spaces using Open-Source Software.

Unit III	LINEAR TRANSFORMATION	12 Hours

Linear transformation, Matrix representation of a linear transformation, Row space and Column space of a matrix, Null space, Range, Dimension Theorem (statement only), Eigen values and Eigen vectors.

Activities: Estimate a linear transformation's range and null space using Open-Source Software.

Unit IV	INNER PRODUCT SPACES	12 Hours

Inner product space, Norms, Cauchy-Schwarz inequality, Gram- Schmidt orthogonalization.

Activities: Determine vector norms and compute inner products in real-world examples using Open-Source Software.

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Unit V	MATRIX DECOMPOSITION	12 Hours
Orthogonal transformation of a symmetric matrix to diagonal form - Positive definite matrices, QR decomposition, Singular Value Decomposition (SVD), Least squares solutions - simple problems (up to 3 × 3 *matrices*). **Activities:** Examine a given matrix for PCA using SVD in Open-Source Software.		
	Total Hours	**60**

Weightage: Continuous Assessment: 35%, Attendance: 5 %, End Semester Examinations: 60%

Continuous Assessment: Assessment – I (35%), Assessment – II (35%), Activities (30%)
Activities: Assignments, Paper Presentation, Publication, Project (20%), Software activity (20%), Quiz (20%)

Course outcomes:

At the end of the course, students will be able to

CO1: Explain the fundamental concepts of vector spaces, subspaces, basis, dimension, linear transformation and inner product spaces.

CO2: Determine the matrix representation, rank, nullity, eigenvalues and eigenvectors of the matrix.

CO3: Apply inner product concepts to compute norms, verify orthogonality, and perform Gram-Schmidt orthogonalization.

CO4: Analyze matrix decomposition techniques to solve least squares problems.

CO5: Develop Open-source programs to implement and validate key linear algebra concepts

Reference:

1. Friedberg S. H. Insel A. J. Spence L.E. *"Linear Algebra"* Pearson, 2022.
2. Grewal, B.S. "Numerical Methods in Engineering and Science" Khanna Publishers, 2017.
3. Burden, R.L. & Faires, J.D. "Numerical Analysis" 9th Edition, Cengage Learning, 2016.
4. Kumaresan. S. "Linear Algebra – A Geometric Approach" Prentice – Hall of India, New Delhi, 2010.
5. Strang. G. "Linear Algebra and its applications" Thomson (Brooks/Cole), New Delhi,2016

E-resources:

1. Linear systems of solutions -https://tu-dresden.de/ing/informatik/ki/wr/ressourcen/dateien/vorlesung/bnm/script.pdf
2. Linear Algebra -https://home.iitm.ac.in/mtnair/linear.pdf
3. Linear Transformation -https://pdfroom.com/books/linear-transformations/Vo75XnmygaG
4. Inner Product Spaces -https://egyankosh.ac.in/bitstream/123456789/17824/1/Unit-12.pdf
5. Least square problems-https://tu-dresden.de/ing/informatik/ki/wr/ressourcen/dateien/vorlesung/bnm/script.pdf

	CO-PO Mapping											CO-PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	3	1	1	-	-	-	-	-	-	1	2	-	-
CO3	3	3	2	1	-	-	-	-	-	-	1	1	-	-
CO4	3	3	2	2	2	-	-	-	-	-	1	-	-	1
CO5	2	2	2	2	3	-	-	1	1	-	2	-	2	-
AVERAGE	2.75	2.75	1.75	1.75	2.5	-	-	1	1	-	1.25	0.2	0.4	0.2

1-Low, 2-Medium, 3-High

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26PH202T	PHYSICS FOR INFORMATION SCIENCE (B.E - CSE & B.TECH - AIDS, IT)	L	T	P	C
		3	0	0	3

Course Objectives:

To understand the basic concepts, working principles, and applications of magnetic, optical, digital, nano, and quantum technologies, along with advanced materials and devices relevant to modern computing and Information Technology.

Unit I	MAGNETIC MATERIALS	9 Hours

Basic definitions – Types of magnetic materials – Domain theory of ferromagnetism – Origin of domains – Antiferromagnetic materials – Ferrites – Structure, properties and applications – Hysteresis loop (M versus H behaviour) – Hard and soft magnetic materials – Magnetic principle in computer data storage – Magnetic hard disc – Giant Magnetoresistance sensor – Tunnel Magnetoresistance sensor – Dynamic Random Access Memory – Magnetoresistive – RAM

Activities: Virtual demonstration of magnetic behavior in dia, para, and ferromagnetic materials.

Unit II	OPTICAL MATERIALS	9 Hours

Classification of optical materials – Carrier generation and recombination processes– Absorption emission and scattering of light in metals, insulators and semiconductors – Photo current in a P-N diode – Solar cell – LED – Organic LED – Laser diodes – Optical Data Storage Technologies (CD, DVD, Blu-ray and Holographic Storage) – Silicon Photonics and Photonic Integrated Circuits (Basic concepts) – Optical Sensors and Imaging Devices (CMOS/CCD) for Smart Systems.

Activities: Virtual demonstration of solar cell operation under different light intensities.

Unit III	LOGIC GATES	9 Hours

Conversion of Binary to Decimal – Decimal to Binary – Binary to Octal and Hexadecimal – Binary coded decimal code – Binary Arithmetic: Addition and Subtraction –Signed Binary Numbers (1's and 2's Complement) – Logic gates (OR, AND, NOT, NAND and NOR) – Exclusive OR gate – Universal Gates and Their Applications – Simplification based on basic Boolean theorems (sum of products, product of sums expression) – Simplification by Karnaugh Map method (up to 4 variables, including Don't Care Conditions).

Activities: Virtual demonstration of basic logic gates.

Unit IV	NANODEVICES	9 Hours

Introduction to Nanotechnology – Quantum confinement – Quantum Structures: Quantum Wells, Quantum Wires and Quantum Dots – Band gap of nanomaterial – Barrier penetration and quantum tunnelling– Resonant tunnelling diode – Coulomb blockade – Single electron transistor – Nanomaterials for Electronic and Computing Applications – Carbon Nanotubes (CNTs) – Properties and Applications – Quantum Dots in Displays, Sensors and Computing.

Activities: Virtual demonstration of quantum tunnelling phenomenon.

Unit V	QUANTUM COMPUTING	9 Hours

Quantum system for information processing – Classical bits – Quantum bits or qubits – Quantum States and Superposition Principle – Bloch Sphere Representation of a qubit – Single qubit Systems and Multiple qubit Systems– Quantum Entanglement (Basic Concept) – Quantum gates (Pauli – X, Y and Z Gates, Hadamard Gate, Phase gate – T gate and CNOT Gate) – Advantage of quantum computing over classical computing.

Activities: Virtual demonstration of quantum confinement in nanostructures.

Total Hours	45

Weightage: Continuous Assessment: 35%, Attendance:5 % , End Semester Examinations: 60%

Continuous Assessment: Assessment – I (35%), Assessment – II (35%), Activities (30%)

Activities: Quiz (5%), Assignments, Paper Presentation, Publication, Project (20%), Flipped Class (5%).

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Course outcomes:

At the end of the course, students will be able to:

CO1: Explain the fundamental concepts of magnetic, optical, digital, nano, and quantum technologies used in modern computing systems.

CO2: Apply the principles of advanced materials, optoelectronic devices, logic circuits, and nanodevices for solving basic engineering problems.

CO3: Analyze the characteristics and performance of magnetic storage devices, optical technologies, digital systems, and quantum devices.

CO4: Evaluate the applications of advanced materials and emerging technologies in computer science and information technology domains.

CO5: Develop innovative ideas based on magnetic materials, photonics, nanotechnology, and quantum computing for modern technological applications.

Reference:

1. M. N. Avadhanulu, P. G. Kshirsagar and T. V. S. Arun Murthy, *A textbook of Engineering Physics*, Eleventh edition, S Chand and Company Ltd. New Delhi-110055.
2. ArthurBeiser, *Concepts of Modern Physics*, McGraw-Hill, 6th Edition, 2009.
3. Michael A. Nielsen & Isaac L. Chuang, *Quantum Computation and Quantum Information*, Cambridge Universities Press, 2010 Edition.
4. Gupta and Gour, *Engineering Physics*, Dhanpat Rai Publications, 2016.

E-resources:

1. Magnetic Materials & Electronic Materials - https://phet.colorado.edu/?utm_source
2. Optical Properties of Materials, LEDs, Lasers&Solar Cells -https://nptel.ac.in/courses/108106181?utm_source
3. Optoelectronic Devices and Optical Materials - https://nptel.ac.in/courses/113106788?utm_source
4. Logic Gates and Digital Electronics-https://onlinecourses-archive.nptel.ac.in/noc18_ee32/preview?utm_source
5. Nanodevices and Quantum Structures - https://nanohub.org/?utm_source
6. Quantum Physics and Quantum Information Science: https://ocw.mit.edu/?utm_source

	CO-PO Mapping											CO-PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	2	-	2	-	-	-	-	-	-	-	-	-	-
CO3	3	3	-	2	-	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	2	-	-	-	-	-	-	-	-	-
CO5	3	2	3	-	2	-	-	-	-	-	-	-	-	-
AVERAGE	3	2.2	3	2	2	-	-	-	-	-	-	-	-	-

1-Low, 2-Medium, 3-High

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26CY202T	ENVIRONMENTAL SCIENCE AND SUSTAINABILITY	L	T	P	C
		2	0	0	2

Course Objectives:

To understand the basics of environment, ecosystems, biodiversity, pollution, natural resources, sustainability, climate change, renewable energy, green materials, and environmental management for promoting sustainable practices and responsible resource utilization.

Unit I	ECOSYSTEMS AND BIODIVERSITY	6 Hours

Definition, concept, scope and importance of an environment and ecosystem. structure and function of an ecosystem - energy flow in the ecosystem – ecological succession processes –Introduction, types, characteristic features, structure and function of the (a) forest ecosystem(b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) –biodiversitytypes - values of biodiversity - India as a mega-diversity nation – hot-spots of biodiversity- conservation of biodiversity: In-situ and ex-situ conservation.

Activities: Waste Segregation

Unit II	ENVIRONMENTAL POLLUTION	6 Hours

Definition – causes, effects and control measures of: (a) Air pollution (b) Water (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards- pollution case studies – Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

Activities: Water Conservation Audit

Unit III	NATURAL RESOURCES	6 Hours

Renewable and non-renewable energy sources, Energy management and conservation - New Energy Sources: Need of new sources, Different types new energy sources - Applications of- Hydrogen energy, Ocean energy resources, Tidal energy conversion - Concept, origin and power plants of geothermal energy– Equitable use of resources for sustainable lifestyles.

Activities: Mini Compost Preparation

Unit IV	SUSTAINABILITY AND MANAGEMENT	6 Hours

Introduction to Sustainability- Development, GDP, Sustainability- concept, needs and challenges-economic, social and aspects of sustainability - from unsustainability to sustainability-millennium development goals and protocols-Sustainable Development Goals-targets, indicators and intervention areas- Climate change- Global, Regional and local environmental issues and possible solutions-case studies- Concept of Carbon Credit, Carbon Footprint-water conservation method-Rain water harvesting, Environmental management in industry-A case study.

Activities: Carbon Footprint Estimation

Unit V	SUSTAINABILITY PRACTICES	6 Hours

Waste Reduction -Zero waste and R concept - Circular economy- ISO 14000 Series- Material Life cycle assessment-Environmental Impact Assessment- Sustainable habitat: Green buildings, Green materials, Energy efficiency, Sustainable transports - Sustainable energy: Non-conventional Sources, Energy Cycles - carbon cycle, emission and sequestration - Green Engineering: Sustainable urbanization- Socio-economic and technological challenge.

Activities: Tree Identification and Biodiversity Survey

	Total Hours	30

Weightage: Continuous Assessment: 35%, Attendance:5 %, End Semester Examinations: 60%

Continuous Assessment: Assessment – I (35%), Assessment – II (35%), Activities (30%)

Activities: Quiz (5%), Assignments, Paper Presentation, Publication, Project (20%), Flipped Class (5%).

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Course outcomes:

At the end of the course, students will be able to:

CO1: Identify fundamental concepts, definitions, and components of ecosystems, biodiversity, environmental pollution, natural resources, sustainability, and sustainable practices.

CO2: Explain the structure and functions of ecosystems, importance of biodiversity, causes and effects of pollution, utilization of natural resources, and principles of sustainability and environmental management.

CO3: Implement ecological principles, pollution control methods, resource conservation strategies, and sustainability practices to address real-world environmental issues.

CO4: Inspect the interrelationships among ecosystems, biodiversity loss, pollution impacts, resource depletion, and human activities affecting environmental balance

CO5: Design innovative solutions, management plans, and sustainable practices for ecosystem conservation, Biodiversity protection, pollution reduction, and efficient resource utilization.

Reference:

1. W.P. Cunningham & M.A. Cunningham,*Principles of Environmental Science*, 9th Edition, McGraw Hill Education, 2022.
2. R. Rajagopalan,*Environmental Studies: From Crisis to Cure,* 4th Edition, Oxford University Press, 2021.
3. Daniel A. Vallero,*Environmental Engineering: A Design Approach,* 2nd Edition, Academic Press, 2022.
4. AnubhaKaushik& C.P. Kaushik, Perspectives in Environmental Studies, 7th Edition, New Age International Publishers, 2021.

E-resources:

1. Environmental Science (IIT Madras) - https://nptel.ac.in/courses/120106002
2. Climate Change and Sustainable Development (IIT Madras) - https://nptel.ac.in/courses/120106013
3. University of Minnesota Open Textbooks or the University of West Florida Press books.
4. www.setju.ac.in/Environmental_Studies/
5. www.britannica.com

	CO-PO Mapping											CO-PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	2	1	1	-	-	2	1	1	1	1	-	-	-
CO2	2	1	2	2	-	-	2	1	1	1	1	-	-	-
CO3	3	2	2	2	-	-	2	1	1	1	1	-	-	-
CO4	2	2	3	3	-	-	2	1	1	1	1	-	-	-
CO5	2	2	1	2	-	-	2	1	1	1	1	-	-	-
AVERAGE	2.2	1.8	1.6	2	-	-	2	1	1	1	1	-	-	-

1-Low, 2-Medium, 3-High

26EE201T	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING (B.E – CSE, MECH & B.TECH - AIDS, IT)	L	T	P	C
		3	0	0	3

Course Objectives:

To provide knowledge of Electrical Circuits, Rotating Machines, Measurement Instruments, Analog–Digital electronics, Microprocessor and Microcontroller.

Unit I	ELECTRICAL CIRCUITS	9 Hours

DC Circuits: Circuit Components: Conductor, Resistor, Inductor, Capacitor – Ohm's Law – Kirchhoff's Laws – Nodal Analysis, Mesh analysis.

AC Circuits: Introduction to AC Circuits, Waveforms, Average value, RMS Value, Instantaneous power, real power, reactive power and apparent power, power factor – RLC circuits.

Activities: Virtual demonstration of DC and AC Circuits, Solving GATE questions.

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Unit II	ELECTRICAL MACHINES	9 Hours
Construction and Working principle of DC Generators, EMF equation, Types and Applications. Working Principle of DC motors, Types and Applications. Transformer – Construction, Working principle and Applications, Three phase Alternator, Synchronous motor and Three Phase Induction Motor. **Activities:** Virtual demonstration of step-up and step-down transformers, Virtual working models of Universal and BLDC motors, Solving GATE questions.		
Unit III	**ANALOG AND DIGITAL ELECTRONICS**	**9 Hours**
PN Junction Diodes, Zener Diode –Characteristics Applications – Bipolar Junction Transistor, JFET, SCR, MOSFET,IGBT – Types, I-V Characteristics and Applications. Number systems, binary codes, error detection and correction codes, Combinational logic – representation of logic functions – SOP and POS forms, K–map representations – minimization using K maps **Activities:** Simulate the V-I characteristics of PN junction, Zener diodes, inverting/non-inverting amplifiers, logic gates using virtual online tools, Solving GATE questions.		
Unit IV	**MEASUREMENTS AND INSTRUMENTATION**	**9 Hours**
Functional elements of an instrument, Standards and calibration, Operating Principle, types – Moving Coil and Moving Iron meters, Measurement of three phase power, Energy Meter, Instrument Transformers – CT and PT, DSO – Block diagram – Data acquisition. **Activities:** Virtual demonstration of calibration standards of moving coil, moving iron, energy meters, instrument transformers, and DSO data acquisition, Solving GATE questions.		
Unit V	**MICROPROCESSOR AND MICROCONTROLLER**	**9 Hours**
8086 Microprocessor Architecture – 8051 Microcontroller Architecture – I/O Interfacing – Applications. **Activities:** Physical demonstration of a microcontroller and online simulation of microcontroller.		
	Total Hours	**45**
Weightage: Continuous Assessment: 35%, Attendance:5 %, End Semester Examinations: 60%		
Continuous Assessment: Assessment – I (35%), Assessment – II (35%), Activities (30%) **Activities:** Quiz (5%), Assignments, Paper Presentation, Publication, Project (20%), Flipped Class (5%).		

Course outcomes:

At the end of the course, students will be able to:

CO1: Define the principles governing electrical circuits, electrical machines, electronic devices, digital systems, Measurement techniques and embedded systems.

CO2: Apply circuit analysis methods, measurement techniques, and microprocessor/microcontroller interfacing concepts to analyze and solve basic electrical and electronics engineering problems.

CO3: Analyze the behavior of electrical circuits, machine performance, electronic circuits, and digital logic using appropriate analytical techniques.

CO4: Evaluate performance and application suitability of circuits, rotating machines, transformers, semiconductor logic, Measuring instruments, Microprocessor and Microcontroller

CO5: Create simple electrical and electronics system solutions by integrating electrical circuits, machines, electronic devices, digital logic, measurement, and embedded system concepts for real–world applications.

Reference:

1. Kothari DP and I.J Nagrath, "Basic Electrical and Electronics Engineering", Second Edition, McGraw Hill Education, 2020
2. S.K.Bhattacharya "Basic Electrical and Electronics Engineering", Pearson Education, Second Edition, 2017.
3. Douglas V. Hall, "Micro–processors & Interfacing", Tata McGraw Hill 3rd Edition, 2017.
4. Thomas L. Floyd, 'Digital Fundamentals', 11th Edition, Pearson Education, 2017.
5. MahmoodNahvi and Joseph A. Edminister, "Electric Circuits", Schaum' Outline Series, McGraw Hill, 2002.

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E–resources:

1. Electrical Circuits – https://nptel.ac.in/courses/108104139
2. Electrical Machines – https://nptel.ac.in/courses/108105155
3. Analog And Digital Electronics – https://nptel.ac.in/courses/108105146
4. Measurements And Instrumentation – https://nptel.ac.in/courses/112106295
5. Microprocessor And Microcontroller – https://nptel.ac.in/courses/106108100

	CO–PO Mapping											CO–PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CO2	3	1	–	–	–	–	–	–	–	–	1	1	–	–
CO3	2	3	–	–	–	–	–	–	–	–	1	1	–	–
CO4	1	2	1	–	–	1	1	–	–	–	2	2	1	1
CO5	3	2	3	–	–	2	2	–	–	–	3	1	2	2
AVERAGE	1.8	1.6	0.8	–	–	0.6	0.6	–	–	–	1.4	1	0.6	0.6

1-Low, 2-Medium, 3-High

26EC203T	DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION (B.E - CSE & B.TECH - AIDS)	L	T	P	C
		3	1	0	4

Course Objectives:

To understand the fundamental concepts of combinational and sequential circuits, the basic structure and operation of a digital computer, the design of data path and control units for processors, pipeline hazards, and the concepts of memory organization and I/O interfacing.

Unit I	DIGITAL LOGIC	12 Hours

Digital Systems – Number Systems – Signed Binary Numbers and Binary Arithmetic – Boolean Algebra – Basic Theorems and Properties – Boolean Functions – Truth Tables – Canonical and Standard Forms – Simplification of Boolean Functions using Karnaugh Maps – Don't Care Conditions – Digital Logic Gates – Universal Gates.

Activities: Assignment on Karnaugh Map, Build logic circuits, Virtual demonstration of logical gates

Unit II	DIGITAL BUILDING BLOCKS	12 Hours

Combinational Circuits: Adders, Subtractors, Multiplexers and Decoders – Sequential Circuits: Latches, Flip-Flops, Shift Registers, Counters.

Activities: MIPS, MFLOPS, and CPI calculations, Preparations of report on comparison of two CPU from different manufacturing.

Unit III	COMPUTER ORGANIZATION	12 Hours

Basic Structure of a Computer – Classes of Computers – Functional Units and Interconnection of Components – Von Neumann and Modified Harvard Architectures – Instruction Formats – Addressing Modes – Instruction Execution Cycle – Hardwired and Microprogrammed Control – Performance Metrics: MIPS, MFLOPS, CPI and Throughput.

Activities: Comparison of RISC-V and x86 ISAs; present findings on their relevance to AI accelerators, • Spot and resolve different types of pipeline hazards in given scenarios.

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Unit IV	PROCESSING AND PIPELINING	12 Hours
Fixed Point Arithmetic: Addition, Subtraction, Multiplication and Division – Booth's Algorithm for Signed Multiplication – Floating Point Representation and Operations – Pipelining – Pipeline Stages – Pipeline Hazards and Hazard Handling Techniques – Instruction Level Parallelism – RISC vs CISC. **Activities:** Construct a 4-bit asynchronous ripple counter using toggle-configured flip-flops. Attach a multi-channel virtual oscilloscope to visualize the cumulative delay stack-up across higher-order bits.		
Unit V	**MEMORY AND I/O SYSTEMS**	**12 Hours**
Memory Hierarchy – Main Memory – Cache Memory – Associative Memory – Cache Mapping Techniques – Input / Output Organization – Interrupts and Priority Handling – Modes of Data Transfer: Programmed I/O, Interrupt Driven I/O and DMA–Buses and Bus Arbitration – I/O Interface Standards. **Activities:** Virtual demonstration of DMA, • I/O in Real AI Systems.		
	Total Hours	**60**
Weightage: Continuous Assessment: 40%, End Semester Examinations: 60%		
Continuous Assessment: Assessment – I (35%), Assessment – II (35%), Activities (30%) **Activities:** Quiz (5%), Assignments, Paper Presentation, Publication, Project (20%), Flipped Class (5%).		

Course outcomes:

At the end of the course, students will be able to:

CO1: Explain digital number systems, Boolean algebra, logic gates, and logic simplification techniques.

CO2: Analyze and design combinational and sequential digital circuits.

CO3: Describe computer organization, instruction execution, control unit design, and performance evaluation metrics.

CO4: Apply arithmetic processing techniques and analyze pipelined processor architectures.

CO5: Analyze memory organization, cache mechanisms, input/output systems, and data transfertechniques.

Reference:

1. M. Morris Mano. *'Digital Logic and Computer Design'*. Pearson Education, 2017.
2. William Stallings, *'Computer Organization and Architecture'*. 11th edition, Pearson Education/Prentice Hall of India, New Delhi, 2022.
3. Patterson, D. A., & Hennessy, J. L. *'Computer organization and design: The hardware/software interface'*, Sixth Edition, Morgan Kaufmann/Elsevier, 2020.

E-resources:

1. Computer Architecture and Organization - https://onlinecourses.nptel.ac.in/e-learning/preview/noc26_cs166
2. Digital Electronics - https://onlinecourses.swayam2.ac.in/e-learning/preview/ntr26_ed81
3. Digital System Design- https://nptel.ac.in/courses/11710508
4. Digital Computer Organization - https://nptel.ac.in/courses/117105078

	CO-PO Mapping											CO-PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	3	3	2	3	-	-	-	-	-	2	3	3	2
CO3	3	2	2	2	2	-	-	-	-	-	2	2	2	2
CO4	3	3	2	2	3	-	-	-	-	-	2	2	3	2
CO5	3	3	1	2	2	-	-	-	-	-	2	2	3	2
AVERAGE	2.4	2.2	1.6	1.6	2	0	0	0	0	0	1.6	1.8	2.2	1.6

1-Low, 2-Medium, 3-High

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26IT201T	PYTHON PROGRAMMING	L	T	P	C
		3	0	0	3

Course Objectives:

To develop problem-solving and Python programming skills by enabling students to apply Python fundamentals, control structures, functions, data structures, file handling, exception handling, and libraries to build efficient real-world applications.

UNIT I	STRUCTURED PROGRAMMING	9 Hours

Problem-Solving Strategies. Basic Problem-Solving Tools: Flowcharts, Pseudo code. Introduction to Programming Languages and Development Environments. Programming. Basic Concepts and Syntax: Variables, Identifiers, and Data Types: Primitive Types and Strings, Statements, Operators, Expressions and its evaluation, Operator Precedence, Basic Arithmetic Operations, Built-in Functions, Importing from Packages.

Activities: write pseudo code for problems such as ATM withdrawal, shopping bill calculation, and employee salary calculation.

UNIT II	CONTROL STRUCTURES AND FUNCTIONS	9 Hours

Control Structures: if, if-else, nested if, multi-way if-elif statements, while loop, for-loop, nested loops, pass statements. Functions: Hiding redundancy, complexity; Parameters, arguments and return values; formal vs actual arguments, named arguments, Recursive & Lambda Functions

Activities: solve problems using for and while loops, such as prime number generation, factorial calculation, Fibonacci series, and number reversal.

UNIT III	STRINGS & COLLECTIONS	9 Hours

Strings & Collections: String Comparison, Formatting, Slicing, Splitting, Stripping, Lists, tuples, and dictionaries, basic list operators, searching and sorting lists; dictionary literals, adding and removing keys, accessing and replacing values.

Activities: Develop programs for string reversal, palindrome checking, character counting, word counting, and substring searching.

UNIT IV	FILE OPERATIONS AND EXCEPTION HANDLING	9 Hours

File Operations: Create, Open, Read, Write, Append and Close files. Manipulating directories, OS and Sys modules, reading/writing text and numbers, from/to a file; Creating and reading a formatted file (csv, tab-separated, etc.) , Exceptions: Syntax errors, Exceptions, Exception types, Handling exceptions, Raising exceptions.

Activities: Develop a small application such as a Library Management System, Expense Tracker.

UNIT V	MODULES AND PACKAGES	9 Hours

Modules: Creating Modules, import and from statements, Executing modules as scripts, Standard modules. Packages: Built-in modules, User-Defined modules, Numpy, SciPy, Pandas, Scikit-learn.

Activities: Create NumPy arrays and perform indexing, slicing, reshaping, aggregation, and mathematical operations.

	Total Hours	45

Weightage: Continuous Assessment: 35%, Attendance: 5 % , End Semester Examinations: 60%

Continuous Assessment: Assessment – I (35%), Assessment – II (35%), Activities (30%)

Activities: Quiz (5%), Assignments, Paper Presentation, Publication, Project (20%), Flipped Class (5%).

Course outcomes:

At the end of the course, students will be able to:

CO1: Explain the fundamentals of Problem solving, python syntax, data types, operators, control structures expressions and built in functions.

CO2: Apply arrays, Strings, functions and recursion to create modular and efficient Python Programs.

CO3: Analyze and select appropriate string operations and collection data structures (lists, tuples, and dictionaries) to

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organize, manipulate, and solve data-processing problems efficiently.

CO4: Evaluate, implement, test, and document real world applications using Python Programming by integrating multiple concepts

CO5: Design and develop Python applications by integrating modules, packages, and scientific libraries to solve real-world computational and data analysis problems.

References:

1. Allen B. Downey, *Think Python: How to Think Like a Computer Scientist*, O'Reilly Media, Second Edition, 2016.
2. Kenneth A. Lambert, *Fundamentals of Python: First Programs*, Cengage Learning, Third Edition, 2021.
   Paul Deitel and Harvey Deitel, *Python for Programmers*, Pearson Education, 2020.

E–resources:

1. Python Official Documentation- https://docs.python.org/3/
2. W3Schools – Python Tutorial- https://www.w3schools.com/python/
3. Programiz – Learn Python Programming - https://www.programiz.com/python-programming
4. Geeks for Geeks – Python Programming Language - https://www.geeksforgeeks.org/python-programming-language/

	CO-PO Mapping											CO-PSO Mapping		
CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1		-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	2	-	-	-	-	-	-	-	-	-	1	1	-
CO3	-	2	2	-	-	-	-	-	-	-	-	2	1	-
CO4	-	1	-	2	1	-	-	-	1	-	-	1	1	1
CO5	-	-	1	-	2	-	-	-	-	-	-	1	1	2
AVERAGE	-	2.3	1.5	2	1.5	-	-	-	1	-	-	1.5	1	1.5

1-Low, 2-Medium, 3-High

26IT202L	PYTHON PROGRAMMING LABORATORY	L	T	P	C
		0	0	4	2

Course Objectives:

The course enables students to develop logical thinking and problem-solving skills using Python programming. It provides hands-on experience in designing, implementing, testing, and debugging Python programs using appropriate programming construct. Students also learn to build simple real-world applications by applying modular programming techniques and standard Python libraries.

PRACTICAL EXERCISES

1. Write a Python program to calculate the Simple Interest and Compound Interest.
2. Develop an algorithm and flowchart to find the area of a circle and implement the corresponding Python program.
3. Write a Python program to find the greatest of three numbers using conditional statements

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4. Write a Python program to check whether a given year is a leap year.
5. Write a Python program to find the GCD of two numbers using a function and the factorial of a number using recursion.
6. Write a Python program to generate the Fibonacci series using loops.
7. Write a Python program to count the number of vowels, consonants, digits, and spaces in a given string.
8. Write a Python program to find the second largest element in a list of numbers.
9. Write a Python program to create a file and perform read, write, and append operations.
10. Write a Python program to perform division and handle division-by-zero exceptions.
11. Mini Project: Develop a simple Python application such as a Student Mark Analysis System, Library Management System, or Electricity Bill Calculator.

Weightage: Continuous Assessment: 55%, Attendance: 5 % , End Semester Examinations: 40%

Continuous Assessment: Procedure, Observation, Record, Viva, Personal Protective Equipment, Model Exam (75%) and Activities (25%)

Course outcomes:

At the end of the course, students will be able to:

CO1: Implement Python programs using fundamental programming constructs and structured programming techniques.

CO2: Apply Python programming concepts to develop programs using strings, lists, tuples, dictionaries, functions, and recursion.

CO3: Analyze computational problems and implement efficient solutions using Python data structures, file handling, and exception handling techniques.

CO4: Design modular and reusable Python applications by integrating functions, modules, packages, and file operations.

CO5: Evaluate application-oriented mini projects using Python programming concepts, debugging, testing, and standard Python libraries.

	CO-PO Mapping											CO-PSO Mapping		
CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	1	2	1	-	2	-	-	-	-	-	-	1	1	-
CO3	2	2	1	-	2	-	-	-	-	-	1	2	2	-
CO4	1	2	1	2	1	-	-	1	-	1	1	2	1	-
CO5	2	2	2	2	3	-	1	3	-	1	2	3	2	1
AVERAGE	1.2	1.6	1.0	0.8	1.6	0.0	0.2	0.8	0.0	0.4	0.8	1.6	1.2	0.2

1-Low, 2-Medium, 3-High

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26GN205M	FOREIGN LANGUAGE - DEUTSCH	L	T	P	C
		0	0	2	1

Course Objectives:

To impart fundamentals of the Deutsch language, including reading, writing systems, pronunciation, and speaking.

Unit I	BASICS AND INTRODUCTION	5 Hours

German alphabet and pronunciation, Basic greetings and farewells, Introducing yourself and others (Ichheiße..., Werbist du?), Numbers 1– 100 and days of the week, Personal pronouns (ich, du, er, sie...), Sentence structure (SVO word order). Activities: Alphabet spelling game, short skits, Use color-coded cards for SVO sentences.

Unit II	GRAMMAR ESSENTIALS AND EVERYDAY VOCABULARY	5 Hours

Present tense of regular verbs (spielen, arbeiten, machen...), Common irregular verbs: sein (to be), haben (to have), gehen, kommen, Articles and gender (der, die, das; ein, eine), Simple questions and negation (nicht, kein), Describing people and things: adjectives and colors, Family, school, food, and common objects vocabulary. Activities: Conjugate regular and irregular verbs, "Question Chain" game, Create a simple family tree.

Unit III	EVERYDAY COMMUNICATION IN GERMAN	5 Hours

Asking for and giving directions, Telling the time and talking about schedules, Ordering food and drinks at a café or restaurant, Talking about hobbies, weather, and daily routines, Listening to short conversations and responding appropriately, Introduction to German culture and formal/informal language use (du vsSie). Activities: Ordering food and drinks, Give directions, Formal / Informal greetings, Do's and Don'ts.

Total Hours	15

Weightage: Continuous Assessment: 100%

Continuous Assessment: Assignments (30%), Quiz (10%) and Internal Examinations 60%

Course outcomes:

At the end of the course, students will be able to:

CO1: Understand simple spoken Deutsch in everyday contexts.
CO2: Communicate with widely used Deutsch words effectively.
CO3: Develop the skills necessary for self-directed learning and continuous improvement in Deutsch language.

Reference Books:

1. Menschen – Communicative course with exercises, audio, and workbooks
2. Schritte International Neu – Popular for self-study and classroom learning.
3. Hammers German Grammar and usage by Martin Durrell,Routledge Publication.
4. English Grammar for students of German by Cecile Zorach & Charlotte Melin, Olivia & Hill Press.
5. A Practical Review of German Grammar by H.C.O Mittwede, Oxford University press India publication.

E-resources:

1. Goethe-Institute - https://learngerman.dw.com/en/learn-german/s-9528?utm_source
2. Easy German - https://www.youtube.com/@EasyGerman

	CO-PO Mapping											CO-PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	2	-	-	-	-	2
CO3	-	-	-	-	-	-	-	-	-	-	1	-	-	2
AVERAGE	-	-	-	-	-	-	-	-	2	-	1	-	-	2

1-Low, 2-Medium, 3-High

Approved by 1st Academic Council Meeting held on 25th August 2026

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26GN206M	FOREIGN LANGUAGE - JAPANESE	L	T	P	C
		0	0	2	1

Course Objectives:

To impart fundamentals of the Japanese language, including reading, writing systems, pronunciation, and speaking.

Unit I	WRITING SYSTEMS AND BASIC COMMUNICATION	5 Hours

Introduction to Hiragana: vowels, basic characters, reading & writing, Introduction to Katakana: basic characters and usage, Basic greetings and farewells (こんにちは, おはようございます, さようなら), Introducing yourself (名前、出身、年齢), Basic sentence structure: Subject–Object– Verb, Numbers 1–100, days of the week, classroom expressions. Activities: Flashcard games and writing drills, Self-introduction, Numbers &datematching, Greeting expressions, Listening to audio.

Unit II	GRAMMAR AND EVERYDAY VOCABULARY	5 Hours

Particles: は (wa), を (wo), の (no), へ (e), に (ni), Present tense verbs: です, ます-form conjugation (たべます、のみます), Negative forms: ではありません, ません, Describing people and objects using adjectives (い and な), Question formation: なに、どこ、だれ、いつ, Vocabulary for family, food, colors, and basic actions. Activities: Verb conjugation drills, Guessing game, Picture description, "Shopping" with food vocab and counters.

Unit III	CONVERSATION AND CULTURAL ETIQUETTE	5 Hours

Talking about routines and schedules (daily verbs, time expressions), Asking and giving simple directions (〜はどこですか？), Ordering food and making polite requests (〜をください、〜をおねがいします), Expressing likes and dislikes (すき・きらい), Listening to short conversations and identifying key phrases, Introduction to formal/informal speech and Japanese etiquette. Activities: Skits and role-plays, daily schedule, beginner-level dialogue, Group discussion on etiquette.

Activities: Practice worksheets and flashcards for hiragana, Writing drills and reading simple katakana words, Dialogue practice for greetings and self-introduction, Sentence construction exercises with basic SOV structure, Particle usage exercises and short dialogues, Role-play scheduling, shopping, and telling time, Verb conjugation drills for common verbs, Descriptive sentence exercises using adjectives, Practice Q&A dialogues forming questions and negations, Kanji writing practice and quizzes for basic characters, Vocabulary tests and conversational practice on daily topics, Oral presentations and listening comprehension quizzes.

Total Hours	15

Weightage: Continuous Assessment: 100%

Continuous Assessment: Assignments (30%), Quiz (10%) and Internal Examinations 60%

Course outcomes:

At the end of the course, students will be able to:

CO1: Understand simple spoken Japanese in everyday contexts.

CO2: Communicate with widely used Japanese words effectively.

CO3: Develop the skills necessary for self-directed learning and continuous improvement in Japanese language.

Reference Books:

1. A Dictionary of Basic Japanese GrammarbySeiichi Makino &MichioTsutsui,The Japan Times Publishing
2. Schritte International Neu – Popular for self-study and classroom learning.
3. Banno, E., Ikeda, Y., Ohno, Y., Shinagawa, C., &Tokashiki, K. (2011). Genki I: An integrated course in elementary Japanese. The Japan Times.
4. The Japan Foundation. (2017). Marugoto Japanese language and culture starter (A1) course book for communicative language activities. Goyal Publishers.

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E-resources:
1. Japan Foundation –https://www.irodori.jpf.go.jp/en/?utm_source
2. NHK WORLD-JAPAN Easy Japanese – https://www.tofugu.com/japanese/learn-hiragana/?utm_source

PO & PSO / CO	CO-PO Mapping											CO-PSO Mapping		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	2	-	-	-	-	2
CO3	-	-	-	-	-	-	-	-	-	-	1	-	-	2
AVERAGE	-	-	-	-	-	-	-	-	2	-	1	-	-	2

1-Low, 2-Medium, 3-High

26GN207M	PHYSICAL EDUCATION -II	L	T	P	C
		0	0	2	0

Course Objectives:

To Important Knowledge on yoga asanas and pressing needs for up skilling in a particular games.

Basic Yoga Exercise : Suitable warm up, Pranayama, Surya Namaskar, Badmasana, Vajarasana, Pakchimotasana, Bhujangasana, Dhanurasana, Salabasana, Trikonasana, Vriksasana, Virabhatrasana, Shavasana, Mudras, Postures,Oom Kara Meditations, Kriyas.

Upskilling in any one of the athletics : Long Jump, Triple Jump, Shot Put, Discus Throw, Relay 4*100, 4*400, Shot & Long Distance Running.

Total Hours	2

Course Outcomes:

After completing the course, the students will be able to:

CO1: Explain the importance of physical activity for mental and physical health.

CO2: Apply safety principles and methods during sports activities.

CO3: Develop teamwork, discipline, and leadership through sports and group activities and collaborate effectively.

References:

1. Singh, A. (2008). Essential of Physical Education. Kalyani Publishers.
2. Kamlesh, M.L. (2006) Psychology in Physical Education and Sport (3rd ed) Metropolitan Book Co.
3. Mangal, S.K. (2009) Psychology of Sports Performance. Sports Publication.

E-resources:

https://www.who.int/health-topics/physical-activit

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	CO-PO Mapping											CO-PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	3	-	-	-	-	-	-
AVERAGE	3	-	-	-	-	-	-	3	-	-	-	-	-	-

1-Low, 2-Medium, 3-High

26GN208M	SOFT SKILLS FOR ENGINEERS – II	L	T	P	C
		2	0	0	0

Course Objectives:

To develop self-awareness, emotional intelligence and positive attitude for personal growth and to build life skills such as financial literacy, communication, teamwork and leadership.

Unit I	CAREER SKILLS & EMPLOYABILITY	15 Hours

Resume Writing – Cover Letter – Interview Skills – Group Discussion Techniques – Problem-Solving Skills – Decision-Making Skills – Critical Thinking – Workplace Etiquette and Professionalism – Communication Skills – Time Management – Teamwork and Collaboration –Career Planning and Goal Setting – Professional Networking – Adaptability and Lifelong Learning.

Activities: Resume preparation, mock interviews, aptitude/problem-solving tests, group discussion practice, work place scenario role-play.

Unit II	DATA INTERPRETATION	15 Hours

Graphs: bar graphs, pie charts, line graphs. – Tables and case lets, making decisions based on data insights – Probability and Statistics – Basic concepts of probability – Combinatory: permutations and combinations – Descriptive statistics: mean, median, mode, standard deviation – Ordering and ranking – Time based puzzles.

Activities: Weekly aptitude tests and problem-solving sessions.

Total Hours	30

Course Outcomes:

After completing the course, the students will be able to:

CO1: Explain the concepts of data interpretation, probability, statistics, and time-based reasoning used in aptitude problem-solving.

CO2: Apply employability skills such as resume writing, communication, teamwork, problem-solving, and professional etiquette in career-related situations.

CO3:Analyze and interpret data using graphs, statistics, probability, and logical reasoning techniques to make informed decisions. skills in life.

References:

1. R.S. Aggarwal, Quantitative Aptitude for Competitive Examinations, Revised Edition, S. Chand Publishing, 2023.
2. Sanjay Kumar and PushpLata, Communication Skills, 2nd Edition, Oxford University Press, 2018.

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E-resources:

1. Aptitude, Logical Reasoning & Puzzles - https://www.indiabix.com/?utm_source
2. Interview Skills & Group Discussion - https://nptel.ac.in/courses?utm_source

	CO-PO Mapping											CO-PSO Mapping		
PO & PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	2	3	-	-	2	-	-	-
CO3	2	3	-	-	-	-	-	-	-	-	1	-	-	-
AVERAGE	2	3	-	-	-	-	2	3	-	-	1.5	-	-	-

1-Low, 2-Medium, 3-High

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