



BHARATHIYAR

INSTITUTE OF ENGINEERING FOR WOMEN

(An Autonomous Institution)

Approved by AICTE, Affiliated to Anna University, Accredited by NAAC with B+ Grade
Deviyakurichi, Thalaivasal Tk, Salem Dt – 636112, Tamil Nadu, India.

REGULATIONS-2026

CHOICE BASED CREDIT SYSTEM

B.E- COMPUTER SCIENCE AND ENGINEERING (CYBER SECURITY)

CURRICULUM AND SYLLABI

(For the Students Admitted from the Academic Year 2026 – 27 Onwards)

Vision of the Institute

To achieve the dream of Tamil Poet **Mahakavi Bharathiyar** “**Kanavu Meipada Vendum**”, we committed to serve the State and the Nation by grooming Professionally Educated, broadly talented Women Engineering Graduates, developing innovative technologies through high quality Research and empowering Women Students to meet the challenges in the Society.

Mission of the Institute

1. To Prepare our Students by Imparting Knowledge with Focuses on Academic Competence, Social Skills and Moral Values.
2. To Empower our Students as Capable Engineers with Inventiveness and Truthfulness to Meet the Technological Challenges in their Career.
3. To Create our students having Strong Bond Between the Institute and Industry for Technology updating.
4. To Develop our Students as Intellectual Leaders to Emerge in their Professions.

Vision of the Department

To be a trusted leader in safeguarding digital assets, ensuring resilient, secure and innovative environments that enable the organization to thrive in an ever-evolving cyber landscape.

Mission of the Department:

- To provide a standard education in the computer science discipline with an emphasis on software development.
- To empower the students with the required skills to solve the technological problems of modern society and also provide them with a framework for and promoting collaborative multidisciplinary activities.
- To proactively protect the organization's information systems and data by implementing robust security measures.

- Fostering a culture of cyber awareness, ensuring compliance with regulatory standards and responding swiftly to emerging threats to support the organization's goals with integrity and resilience.”

Program Educational Objectives (PEOs):

- **PE01:** Graduates will apply core knowledge of computer science and cyber security to design, analyze, and implement secure computing systems and solutions in industry and research.
- **PE02:** Graduates will work effectively as individuals and as members or leaders of multidisciplinary teams in developing, deploying and managing secure systems.
- **PE03:** Graduates will pursue higher studies, research, entrepreneurship and lifelong learning to contribute to advancements in cyber security and emerging technologies.

Program Outcomes (POs)

1. **PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering Fundamentals and an engineering specialization to the solution of complex engineering problems.
2. **PO2: Problem analysis:** Identify, formulate, review research literature, and analyze complex Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **PO3: Design / development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal and environmental considerations.
4. **PO4: Conduct investigations of complex problems:** Use research – based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **PO5: Modern tool usage:** Create, select, and apply appropriate techniques,

resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

- 6. PO6: The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7. PO7: Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.
- 8. PO8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. PO9: Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10. PO10: Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- 11. PO11: Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- 12. PO12: Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes(PSOs):

1. **PSO1:** Able to identify, analyze, and mitigate cyber threats using modern

security tools, techniques, and frameworks.

2. **PSO2:** Able to design and develop secure software, networks, and systems by applying principles of cryptography, network security, and secure coding practices.
3. **PSO3:** Able to investigate security breaches, perform digital forensics, and implement effective incident response and recovery strategies.



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REGULATIONS -2026

CHOICE BASED CREDIT SYSTEM

**B.E- COMPUTER SCIENCE AND ENGINEERING
(CYBER SECURITY)**

CURRICULUM FOR I TO VIII SEMESTERS

(For the students admitted 2026-2027 onwards)

SEMESTER- I									
S.No	Course Code	CourseTitle	Course Type	PeriodsPerWeek				Credits	Category
				L	T	P	TCP		
1.	U26IPL101	Induction Program	-	-	-	-	-	0	-
2.	U26ENT102	Technical English-I	T	2	1	0	3	3	HUM
3.	U26MAT103	Calculus	T	3	1	0	4	4	BS
4.	U26PHT104	Engineering Physics-I	T	3	0	0	3	3	BS
5.	U26TAT105	தமிழர் மரபு / Heritage of Tamils	T	1	0	0	1	1	HUM
6.	U26CST106	Programming in C	T	3	0	0	3	3	ES(G)
7.	U26CYT107	Engineering Chemistry	T	3	0	0	3	3	BS
8.	U26CSI108	Computing Fundamentals	LIT	3	0	2	5	4	ES(G)
9.	U26CSL109	Programming in C Laboratory	L	0	0	4	4	2	ES(G)
10.	U26PCL110	Physics and Chemistry Laboratory	L	0	0	4	4	2	BS
TOTAL				18	2	10	30	25	

SEMESTER-II									
S.No	Course Code	Course Title	Course Type	Periods Per Week				Credits	Category
				L	T	P	TCP		
1	U26ENT201	Technical English–II	T	2	1	0	3	3	HUM
2	U26MAT202	Linear Algebra	T	3	1	0	4	4	BS
3	U26PHT203	Engineering Physics-II	T	3	0	0	3	3	BS
4	U26TAT204	Tamils and Technology	T	1	0	0	1	1	HUM
5	U26CST205	Object Oriented Programming	T	3	0	0	3	3	ES(G)
6	U26CSI206	Digital Principles and System Design	LIT	3	0	2	5	4	ES(PC)
7	U26SDT207	Aptitude Skills-I	T	1	0	0	1	1	SD
8	U26CSL208	Object Oriented Programming Laboratory	L	0	0	4	4	2	ES(G)
TOTAL				16	3	4	24	21	

SEMESTER-III									
S.No	Course Code	Course Title	Course Type	Periods Per Week				Credits	Category
				L	T	P	TCP		
1	U26MAT301	Discrete Mathematics	T	3	1	0	4	4	BS
2	U26CBT302	Operating Systems & Security	LIT	3	0	2	5	4	ES(PC)
3	U26CST303	Computer Organization and Architecture	T	3	0	0	3	3	ES(PC)
4	U26ITT304	Data Structures & Algorithms	T	3	0	0	3	3	ES(PC)
5	U26ITT305	Web Technology	T	3	0	0	3	3	ES(PC)
6	U26SDT301	Aptitude Skills-II	T	1	0	0	1	1	SD
7	U26ITL306	Data Structures & Algorithms Laboratory	L	0	0	4	4	2	ES(PC)
8	U26ITL307	Web Technology Laboratory	L	0	0	4	4	2	ES(PC)
9	U26SDL302	Communication Skills-I	L	0	0	2	2	1	SD
TOTAL				16	1	10	29	23	

SEMESTER- IV									
S.No	Course Code	Course Title	Course Type	Periods Per Week				Credits	Category
				L	T	P	TCP		
1	U26GET401	Climate Change and Sustainability	T	2	0	0	2	2	HUM
2	U26CST402	Theory of Computation	T	3	0	0	3	3	ES(PC)
3	U26CBT403	Database Management Systems & Security	T	3	0	0	3	3	ES(PC)
4	U26ITT404	Python for Data Science	T	3	0	0	3	3	ES(PC)
5	U26CST405	Computer Networks	LIT	3	0	2	5	4	ES(PC)
6	U26CBT406	Object Oriented Software Engineering	T	3	0	0	3	3	ES(PC)
7	U26CBL407	Database Management Systems & Security Laboratory	L	0	0	4	4	2	ES(PC)
8	U26ITL408	Python for Data Science Laboratory	L	0	0	4	4	2	ES(PC)
9	U26SDL401	Coding Skills-I	L	0	0	2	2	1	SD
TOTAL				17	0	12	29	23	

SEMESTER-V									
S.No	Course Code	Course Title	Course Type	Periods Per Week				Credits	Category
				L	T	P	TCP		
1	U26CST501	Compiler Design	T	3	0	0	3	3	ES(PC)
2	U26ITT502	Java Programming	T	3	0	0	3	3	ES(PC)
3	U26ITT503	Artificial Intelligence and Machine Learning	T	3	0	0	3	3	ES(PC)
4	U26CBT504	Cryptography and Cyber Security	T	3	0	0	3	3	ES(PC)
5	U26CBT505	Cyber Laws and Ethics	T	3	0	0	3	3	ES(PC)
6	U26XXE5XX	Programme Elective-I	T	3	0	0	3	3	ES(PE)
7	U26MCT5XX	Mandatory Course-I	T	3	0	0	3	-	NCC
8	U26ITL506	Java Programming Laboratoty	L	0	0	4	4	2	ES(PC)
9	U26ITL507	Artificial Intelligence and Machine Learning Laboratory	L	0	0	4	4	2	ES(PC)
10.	U26SDL501	Coding Skills-II	L	0	0	2	2	1	SD
TOTAL				21	0	10	31	23	

SEMESTER- VI									
S.No	Course Code	Course Title	Course Type	Periods Per Week				Credits	Category
				L	T	P	TCP		
1	U26CBT601	Network Security	T	3	0	0	3	3	ES(PC)
2	U26CBT602	Malware Analysis	T	3	0	0	3	3	ES(PC)
3	U26ITT603	Full Stack Development	T	3	0	0	3	3	ES(PC)
4	U26CBT604	Cyber Threat Intelligence	T	3	0	0	3	3	ES(PE)
5	U26XXE6XX	Programme Elective–II	T	3	0	0	3	3	ES(PE)
6	U26MCT6XX	Mandatory Course-II	T	3	0	0	3	-	NCC
7	U26OET6XX	Open Elective–I	T	3	0	0	3	3	-
8	U26CBL605	Network Security Laboratory	L	0	0	4	4	2	ES(PC)
9	U26ITL606	Full Stack Development Laboratory	L	0	0	4	4	2	ES(PC)
10.	U26SDL601	Industry Oriented Course	-	0	0	2	2	1	SD
TOTAL				21	0	10	31	23	

SEMESTER- VII									
S.No	Course Code	Course Title	Course Type	Periods Per Week				Credits	Category
				L	T	P	TCP		
1	U26GET701	Human Values and Ethics	T	2	0	0	2	2	HUM
2	U26CBT702	Ethical Hacking and Vulnerability Assessment	LIT	3	0	2	5	4	ES(PC)
3	U26XXE7XX	Programme Elective–III	T	3	0	0	3	3	ES(PE)
4	U26XXE7XX	Programme Elective–IV	T	3	0	0	3	3	ES(PE)
5	U26OET7XX	Open Elective–II	T	3	0	0	3	3	-
6	U26OET7XX	Open Elective–III	T	3	0	0	3	3	-
7	U26SDL701	Technical Comprehension & Mock Interview	L	0	0	2	2	1	SD
8	U26SDL702	Summer Internship	L	-	-	-	-	1	SD
TOTAL				17	0	4	21	20	

SEMESTER–VIII									
S. No.	Course Code	Course Title	Course Type	Period Per Week				Credits	Category
				L	T	P	TCP		
1.	U26PWL801	Project Work/Internship cum Project Work	L	0	0	16	16	8	SD
TOTAL				0	0	16	16	8	

TOTAL CREDITS : 166

U26ENT102	TECHNICAL ENGLISH-I	L	T	P	C
		3	0	0	3
Course Objectives:					
• To build fundamental skills in listening, speaking, reading, and writing for effective communication. • To develop a basic understanding of grammar and vocabulary for accurate and appropriate usage. • To enhance communication and comprehension skills for everyday and academic contexts, enabling clear expression of ideas in both speaking and writing.					
UNIT-I	LISTENING SKILLS	9			
Listening and understanding the main idea (Parts of Speech)-Listening to a conversation between two people (Opinions and emotions) – Listening to public announcements (Word formation)- Listening to formal talks and presentations (Note Taking and Note Making) , Listening: Exposure to diverse accents in listening.					
UNIT-II	SPEAKING SKILLS	9			
Introducing oneself and others (“Wh” type questions) – Just a minute (JAM)-Hobbies, Hometown, School life, Daily Routine–Describing people and places (Yes/No type questions) – Asking and answering simple questions (Lexical equivalents/opposites and contextual vocabulary) - Describing events/experiences (Interpreting and developing hints).					
UNIT-III	READING SKILLS	9			
Reading and its types (Skimming, Scanning, Intensive and Extensive) – Reading and interpreting conversation (Tenses)-Reading and comprehending short passages (Describing words) – Read and Making Inference (Guessing from context), Idioms and Phrasal verbs					
UNIT-IV	WRITING SKILLS	9			
Writing Short answers (Sentence Structure), Definition and Extended definition –Letter writing (Formal/informal) – E-mail writing (Professional/Academic), Creative Writing (Dialogue), Write a paragraph (Descriptive/Narrative/Expository).					
UNIT-V	LEXICAL AND GRAMMATICAL SKILLS	9			
Instructions (User Manual), Recommendations and Checklist, Subject verb agreement, British and American Vocabulary, Common Errors in English.					
TOTAL : 45 PERIODS					
Weightage: Continuous Assessment: 40%, End Semester Examinations: 60%					
Text Books:					
1. Murphy, Raymond. English Grammar in Use: A Self-Study Reference and Practice Book for Intermediate Learners, with Answers and Interactive e-Book. 5th ed., Cambridge University Press & Assessment, 2019. 2. Veena Selvametal. English for Science and Technology. Cambridge University Press, 2021.					

References:

1. Department of English, Anna University. English for Engineers and Technologists. Orient Blackswan, 2020.
2. Oshima, Alice, and Ann Hogue. Writing Academic English. Oxford University Press.
3. Rizvi, M. Ashraf. *Effective Technical Communication*. 2nd ed., McGraw Hill Education, 2017.
4. Raman, Meenakshi, and Sangeeta Sharma. Technical Communication: Principles and Practice. 4th ed., Oxford University Press, 2022.

E-RESOURCES:

1. [https://math.libretexts.org/Bookshelves/Calculus/Map%3ACalculusEarlyTranscendentals\(Stewart\)/](https://math.libretexts.org/Bookshelves/Calculus/Map%3ACalculusEarlyTranscendentals(Stewart)/)
2. <https://openstax.org/books/calculus-volume/>
3. <https://tutorial.math.lamar.edu/Classes/CalcII/CalcII.aspxSCILAB>, <https://www.scilab.org/>

CO's - PO's & PSO's MAPPING :

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	2	2	-	-	-	-	-
CO2	-	-	-	-	-	-	-	2	3	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	2	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	2	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Avg	-	-	-	-	-	-	-	2	2	-	-	-	-	-

1-low, 2 - medium, 3 - high, '-' – no correlation

U26MAT103	CALCULUS	L	T	P	C
		3	1	0	4
Course Objectives: • To familiarize the students with concepts of differential and integral calculus. • To familiarize the students with functions of several variables. • To acquaint the students with mathematical tools in evaluating multiple integrals and their applications in vector calculus.					
UNIT- I	DIFFERENTIAL CALCULUS	9 + 3			
Functions, Graph representation of functions, Limit, Continuity, Derivatives, Maxima and Minima functions of single variable, Mean value theorem.					
UNIT-II	INTEGRAL CALCULUS	9 + 3			
Fundamental theorem of Calculus, Indefinite integrals and Net Change Theorem, Techniques of integration: Integration by parts, Trigonometric integrals, Trigonometric substitutions, Integration of rational functions by partial fraction, Integration of irrational functions.					
UNIT-III	FUNCTIONS OF SEVERAL VARIABLES	9 + 3			
Partial derivatives, Chain rule, Jacobians, Maxima and Minima functions of two variables, Method of Lagrange's Multipliers, Taylor's series, Expansion of two variables, Applications problems in Engineering.					
UNIT- IV	MULTIPLE INTEGRALS	9 + 3			
Iterated integrals and Fubini's theorem, Evaluation of double integrals, Change of order of integration, Change of variables between Cartesian and polar co-ordinates, Evaluation of triple integrals- Area enclosed by plane curves, Volume of solids, Cylindrical and Spherical co-ordinates.					
UNIT- V	VECTOR CALCULUS	9 + 3			
Vector introduction, Gradient and directional derivative, Irrotational and Solenoidal vectors- Green's theorem (Excluding proof) - Problems, Gauss divergence theorem (Excluding proof)- Problems and Stokes' theorem (Excluding proof) - Problems, Engineering Applications.					
TOTAL: 60 PERIODS					
Weightage: Continuous Assessment:40%, End Semester Examinations:60%.					
TEXT BOOK:					
1. Thomas GB, Jr., Weir, M.D., Hass, J., & Heil, C.(2018). Thomas' calculus: Early transcendental Pearson.					
2. B. S. Grewal, Higher Engineering Mathematics, 2020, 44 th Edition, Khanna Publishers.					
REFERENCES:					
1. T. Veerarajan, Engineering Mathematics-I © 2014, by McGraw Hill Education (India) Private Limited					
2. Singh K.(2019). Engineering mathematics through applications, Bloomsbury Publishing.					
3. Dr. G. Balaji, Applied Calculus, First Edition (August 2025).					

E-RESOURCES:

1. [https://math.libretexts.org/Bookshelves/Calculus/Map%3ACalculusEarlyTranscendentals\(Stewart\)/](https://math.libretexts.org/Bookshelves/Calculus/Map%3ACalculusEarlyTranscendentals(Stewart)/)
2. <https://openstax.org/books/calculus-volume-1/>
3. <https://tutorial.math.lamar.edu/Classes/CalcII/CalcII.aspxSCILAB>, <https://www.scilab.org/>

CO's - PO's & PSO's MAPPING

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	-	-	-	-	-	-	-	-	-	-	-	-
Avg	3	2	-	-	-	-	-	-	-	-	-	-	-	-

1-low, 2 - medium, 3 - high, '-' – no correlation



U26PHT104	ENGINEERING PHYSICS - I	L	T	P	C
		3	0	0	3
Course Objectives:					
- Understand the basic concepts of properties of matter, acoustics, ultrasonics, and crystal structures. - Learn the fundamentals of lasers, fiber optics, and quantum mechanics and their practical applications.					
UNIT - I	PROPERTIES OF MATTER				9
Elasticity – Hooke’s law – Relationship between three moduli of elasticity – Poisson’s ratio – Factors affecting elastic modulus and tensile strength; Torsional stress and deformations – Twisting couple – Torsional pendulum – Double pendulum; Bending of beams – Bending moment – Cantilever – Uniform and non-uniform bending – I-shaped girders; Viscosity – Stokes method; Surface tension – Drop weight method.					
UNIT - II	LASER AND FIBER OPTICS				9
Lasers – Spontaneous and stimulated emission – Population inversion – Pumping methods – Einstein’s coefficients – Types of lasers – Nd-YAG laser, CO ₂ laser, Semiconductor lasers – Applications of lasers in industry and medical; Fiber optics – Propagation of light in optical fibres – Numerical aperture and acceptance angle – Types of optical fibres (material, refractive index, mode) – Fiber optic communication system – Fiber optic sensors (pressure and displacement) – Applications of fiber optics.					
UNIT – III	ACOUSTICS AND ULTRASONICS				9
Acoustics – Classification – Weber–Fechner law – Sabine’s formula – Absorption coefficient – Factors affecting acoustics of buildings and their remedies; Ultrasonics – Properties – Generation of ultrasonics – Magnetostriction method – Piezoelectric method – Velocity measurement – Ultrasonic flaw detector – Non-destructive testing – Medical applications – Sonogram.					
UNIT - IV	QUANTUM MECHANICS				9
Black body radiation – Planck’s theory (derivation) – Deduction of Wien’s displacement law – Rayleigh–Jeans law from Planck’s theory; Photoelectric effect – Compton effect (theory and experimental verification) – Wave particle duality; Schrödinger’s wave equation – Time independent and time dependent equations – Physical significance of wave function – Particle in a one-dimensional box – Barrier penetration – Quantum tunneling; Microscope – Scanning tunneling microscope.					
UNIT - V	CRYSTAL PHYSICS				9
Lattice and Basis – Unit cell – Crystal Systems – Bravais lattice – Miller indices – ‘d’ spacing in cubic lattice – Atomic radius – Coordination number – Atomic Packing factor for SC, BCC, FCC, and HCP structures – Diamond and graphite structures – Crystal imperfections: Point, Line, Surface and Volume defect – Burger vectors, Stacking faults – Role of imperfections in plastic deformation.					
TOTAL : 45 PERIODS					

Weightage: Continuous Assessment: 40%, End Semester Examinations: 60%

TEXT BOOK:

1. Thyagarajan K and Ajoy Ghatak, “Lasers – Fundamentals and Applications”, 2nd edition, Laxmi Publications Pvt Limited, New Delhi, 2019.
2. Bhattacharya D K and Poonam Tandon, “Engineering Physics”, 2nd Edition, Oxford University Press, Chennai, 2017.
3. William D Callister Jr "Materials Science and Engineering-An Introduction", John Wiley and Sons Inc., New York, 2018, Tenth edition.
4. Arumugam M. Engineering Physics. Anuradha publishers, 2010.
5. Marikani A, “Engineering Physics”, 3rd Edition, PHI publishers, Chennai, 2021.

REFERENCES:

1. Shatendra Sharma and Jyotsna Sharma, “Engineering Physics”, 2nd edition, Pearson India Education Services Private Limited, Chennai.2018.
2. Avadhanulu M N, Kshirsagar P G and Arun Murthy TVS, “A Text book Engineering Physics”, 2nd edition, S Chand Publishing, New delhi, 2018.

CO's - PO's & PSO's MAPPING :

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	2	2	-	-	-	-	-	-	-	-	-	-	-
CO4	3	3	-	-	-	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-	-	-	-	-
Avg	3	2.5	2	-	-	-	-	-	-	-	-	-	-	-

1- low, 2 - medium, 3 - high, '-' – no correlation

U26TAT105	தமிழர் மரபு	L	T	P	C
		1	0	0	1
இயல்-1	மொழி மற்றும் இலக்கியம்				3
இந்திய மொழிக் குடும்பங்கள், திராவிட மொழிகள், தமிழ் ஒரு செம்மொழி, தமிழ் செவ்விலக்கியங்கள், சங்க இலக்கியத்தின் சமயச் சார்பற்ற தன்மை, சங்க இலக்கியத்தில் பகிர்தல் அறம், திருக்குறளில் மேலாண்மைக் கருத்துக்கள், தமிழ்க் காப்பியங்கள், தமிழகத்தில் சமண பௌத்த சமயங்களின் தாக்கம், பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள், சிற்றிலக்கியங்கள், தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி, தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.					
இயல்-2	மரபு – பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை – சிற்பக்கலை				3
நடுகல் முதல் நவீன சிற்பங்கள் வரை, ஐம்பொன் சிலைகள், பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள், தேர் செய்யும் கலை, சுடுமண் சிற்பங்கள், நாட்டுப்புறத் தெய்வங்கள், குமரிமுனையில் திருவள்ளூர் சிலை, இசைக் கருவிகள், மிருதங்கம், பறை, வீணை, யாழ், நாதஸ்வரம், தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு.					
இயல்-3	நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள்				3
தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஓயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.					
இயல்-4	தமிழர்களின் திணைக் கோட்பாடுகள்				3
தமிழகத்தின் தாவரங்களும், விலங்குகளும், தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள், தமிழர்கள் போற்றிய அறக்கோட்பாடு, சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும், சங்ககால நகரங்களும் துறை முகங்களும், சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி, கடல்கடந்த நாடுகளில் சோழர்களின் வெற்றி.					
இயல்-5	இந்திய தேசிய இயக்கம் மற்றும் பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு				3
இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு, இந்தியாவின் பிறப்பகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம், சுயமரியாதை இயக்கம் இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு, கல்வெட்டுகள், கையெழுத்துப்படிகள், தமிழ்ப் புத்தகங்களின் அச்ச வரலாறு.					
TOTAL : 15 PERIODS					
References:					
1. தமிழக வரலாறு, மக்களும் பண்பாடும், கே.கே.பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்). 2. கணினித் தமிழ், முனைவர் இல.சுந்தரம் (விகடன் பிரசுரம்). 3. கீழடி, சைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு) 4. பொருறை, ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு) 5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print) 6. Social Life of the Tamils – The Classical Period (Dr. S. Singaravelu) (Published by: International Institute of Tamil Studies). 7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D.Thirunavukkarasu) (Published by: International Institute of Tamil Studies). 8. The Contributions of the 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 Archeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu) 12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by:RMRL) – Reference Book.					

U26TAT104	Heritage of Tamils	L	T	P	C
		1	0	0	1
UNIT-I	Language and Literature				3
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
Hero stone to modern sculpture, Bronze icons, Tribes and their handicrafts – Art of temple car making, Massive Terracotta sculptures, Village deities, Thriuvalluvar 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 Marital Arts				3
Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyilattam, Leather puppetry, Silambattam, Valari, Tiger dance – sports and Games of Tamils.					
UNIT-IV	Thinai Concept of Tamils				3
Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature, Aram Concept of Tamils, Education and Literacy during Sangam Age – Ancient cities and Ports of Sangam Age, Export and Import during Sangam Age – Overseas Conquest of Cholas.					
UNIT-V	Contribution of Tamils to Indian National Movement and Indian Culture				3
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.					
References:					
1. தமிழக வரலாறு, மக்களும் பண்பாடும், கே.கே.பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்). 2. கணினித் தமிழ், முனைவர் இல.சுந்தரம் (விகடன் பிரசுரம்). 3. கீழடி, சைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு) 4. பொருதை, ஆற்றங்கரை நாகரிகம் (தொல்லியல் துறை வெளியீடு) 5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print) 6. Social Life of the Tamils – The Classical Period (Dr. S. Singaravelu) (Published by: International Institute of Tamil Studies). 7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D.Thirunavukkarasu) (Published by: International Institute of Tamil Studies). 8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies). 9. Keeladi – ‘Sangam City Civilization on the banks of river Vaigai’ (Jointly Published by: Department of Archaeology & Tamil Nadu 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 Archeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu) 12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Publsihed by:RMRL) – Reference Book.					

U26CST106	PROGRAMMING IN C	L	T	P	C
		3	0	0	3
COURSE OBJECTIVES: • To understand the fundamental concepts of C programming. • To Develop problem solving skills using C. • To apply arrays, pointers, structures and file handling in programs. • To understand the concepts of Structures and Unions. • To Develop Applications in C using File Processing.					
UNIT-I	INTRODUCTION TO C				9
Introduction – Structure of C Program – C Programming: Data Types, Constants, Variables, Tokens, Character set, Keywords- Operators, Expressions-Input / Output statements-Assignment statements-Decision making statements –Looping statements-Preprocessor directives.					
UNIT-II	ARRAYS AND STRINGS				9
Introduction to arrays: Declaration, Initialization- One- dimensional and Multi-dimensional Arrays, Array operations and traversal - String Handling functions.					
UNIT-III	FUNCTIONS AND POINTERS				9
Functions: Definition and Declaration, Types of functions, Parameter Passing: Call by Value, Call by Reference, Recursion. Pointers– Pointer operators –Pointer arithmetic– Pointers and Arrays– Pointers and Functions-Pointers to Pointers – Parameter passing: Pass by value, Pass by reference.					
UNIT-IV	STRUCTURES, UNIONS AND DATA REPRESENTATION				9
Structures: Defining and using structures- Nested Structures-Pointers and Structures-Array of structures- Unions, Enumerations. Bit Fields: Definition and syntax – packing of data into bits – advantages and limitations. Memory Optimization: Efficient memory usage using unions and bit fields – structure padding and alignment – techniques to reduce memory wastage. Self-Referential Structures: Concept and implementation – structures containing pointers to same type – applications in linked lists, trees and other dynamic data structures.					
UNIT-V	FILE PROCESSING				9
Files– File Operations: Open, read, write, close file operations, File pointers, Error handling –Types of file processing: Sequential access, Random access – Sequential access file – Random access file – Command line arguments.					
TOTAL: 45 PERIODS					
Weightage : Continuous Assessment : 40%, End Semester Examinations: 60%					
Text Books: 1. Reema Thareja,(2021). Programming in C. Oxford University Press. 2. Balagurusamy, E. (2024). Programming in ANSIC, 9th Edition. Mc Graw Hill Education. References: 1. Yashvanth Kanetkar,(2020). Let us C, 16th Edition. BPB Publications. 2. Kalicharan,N.(2022). Learn to program with C: An introduction to programming using the C language. A press. 3. Forouzan, B.A., & Afyouni, H.(2023). Computer science: A structured programming approach in C. Cengage. 4. Paul Deitel and Harvey Deitel, C: How to Program, 8thedition, Pearson Education.					

E-Resources

1. Learn- C.org - <https://www.learn-c.org/>
2. Geeks for Geeks- C Programming-<https://www.geeksforgeeks.org/c-programming-language/>
3. GNUC Library Documentation -<https://www.gnu.org/software/libc/manual/>

COURSE OUT COMES:

CO1: Understand the basic structure of C programs, data types, operators and expressions

CO2: Apply control structures (decision making, looping) to solve computational problems.

CO3: Implement modular programming using functions and recursion

CO4: Use arrays, strings, and pointers effectively in problem solving.

C05: And file handling for data management.

CO, PO & PSO Mapping:

[illegible]

U26CYT107	ENGINEERING CHEMISTRY	L	T	P	C
		3	0	0	3
Course Objectives:					
• To inculcate sound understanding of water quality parameters, water treatment, electrochemistry, corrosion, and engineering materials for industrial applications. • To develop knowledge of energy sources, renewable technologies, and modern energy storage devices. • To gain insight into polymers, composites, and engineering materials, including their properties, processing techniques, and industrial applications.					
UNIT - I	WATER AND IT'S TREATMENT	9			
Water: Sources and impurities, Water quality parameters: Definition and significance of- colour, odour, turbidity, pH, hardness, alkalinity, TDS, COD and BOD, flouride and arsenic. Municipal watertreatment: primary treatment and disinfection (UV, Ozonation, break-point chlorination). Desalinationof brackish water: Reverse Osmosis. Boiler troubles: Scale and sludge, Boiler corrosion, Caustic embrittlement, Priming & foaming. Treatment of boiler feed water: Internal treatment (phosphate, colloidal, sodium aluminate and calgon conditioning) and External treatment – Ion exchange demineralisation and zeolite process.					
UNIT -II	ELECTROCHEMISTRY AND CORROSION	9			
Electrochemical cell - redox reaction, electrode potential- origin of electrode potential- oxidation potential- reduction potential, measurement and applications - electrochemical series and its significance - Nernst equation (derivation and problems). Corrosion- causes- factors- types- chemical, electrochemical corrosion (galvanic, differential aeration), corrosion control - material selection and design aspects - electrochemical protection – sacrificial anode method and impressed current cathodic method. Paints- constituents and function. Electroplating of Copper and electroless plating of nickel.					
UNIT- III	ENERGY AND STORAGE DEVICES	9			
Stability of nucleus: mass defect (problems), binding energy; Nuclear energy: light water nuclear power plant, breeder reactor. Solar energy conversion: Principle, working and applications of solar cells; Recent developments in solar cell materials. Wind energy; Geothermal energy; Batteries: Types of batteries, Primary battery - dry cell, Secondary battery - lead acid battery and lithium-ion battery; Electric vehicles-working principles; Fuel cells: H ₂ -O ₂ fuel cell, microbial fuel cell; Super capacitors: Storage principle, types and examples.					
UNIT -IV	POLYMERS AND COMPOSITES	9			
Polymers-definition – polymerization – types – addition and condensation polymerization – free radical polymerization mechanism – Plastics, classification – preparation, properties and uses of PVC, Teflon, polycarbonate, polyurethane, nylon-6,6, PET Rubber -vulcanization of rubber, synthetic rubbers – butyl rubber, SBR, Composites – definition, types polymer matrix composites – FRP only. Moulding of plastics compression, Injection and Transfer moulding.					
UNIT - V	ENGINEERING MATERIALS	9			
Abrasives: definition, classification or types, grinding wheel, abrasive paper and cloth. Refractories: definition, characteristics, classification, properties – refractoriness and RUL, dimensional stability,					

thermal spalling, thermal expansion, porosity; Manufacture of alumina, magnesite and silicon carbide, Portland cement- manufacture and properties - setting and hardening of cement, special cement waterproof and white cement-properties and uses. Glass - manufacture, types, properties and uses.

TOTAL : 45 PERIODS

Weightage: Continuous Assessment: 50%, End Semester Examinations: 50%

Text Books:

1. Gowariker V.R. , Viswanathan N.V. and Jayadev Sreedhar, “Polymer Science”, New Age International P (Ltd.), Chennai, 2006.
2. S.S. Dara, “A Text book of Engineering Chemistry”, S. Chand Publishing, 12th Edition, 2018.
3. R. Sivakumar, M.Sivakumar, ‘Engineering Chemistry’, McGraw-Hill Education (India) Pvt Limited, 2009.

References:

1. P. C. Jain and Monica Jain, “Engineering Chemistry”, 17th Edition, DhanpatRai Publishing Company (P) Ltd, New Delhi, 2018.
2. Sivasankar B., “Engineering Chemistry”, Tata McGraw-Hill Publishing Company Ltd, New Delhi, 2008.
3. O.G. Palanna, “Engineering Chemistry” McGraw Hill Education (India) Private Limited, 2nd Edition, 2017.
4. Shikha Agarwal, “Engineering Chemistry-Fundamentals and Applications”, Cambridge University Press, Delhi, Second Edition, 2019.

CO's - PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	2	1	-	-	-	-	-	-	-	-	-	-	-
CO3	2	3	-	-	-	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO5	2	1	1	-	-	-	-	-	-	-	-	-	-	-
Avg	2.6	2	1	-	-	-	-	-	-	-	-	-	-	-

1-low, 2 - medium, 3 - high, '-' – no correlation

U26CSI108	COMPUTING FUNDAMENTALS	L	T	P	C
		3	0	2	4
COURSE OBJECTIVES: - To understand fundamentals of computing systems and digital representation - To develop computational thinking and problem-solving skills - To learn programming concepts and language fundamentals - To apply digital tools for engineering applications - To understand networking, internet usage, and cyber security fundamentals					
UNIT - I	INTRODUCTION TO COMPUTER SYSTEM				9
Computer: Generation-Classification-Applications- Building blocks of Computer Systems: Computer System Hardware-CPU-Memory Unit: RAM- ROM - External Devices: I/O Devices, External Storage Devices - Software: System software and Application software- Operating systems: Functions and types (Batch, Time-sharing, Real-time).					
UNIT – II	COMPUTATIONAL THINKING AND PROBLEM SOLVING				9
Computational Thinking: Decomposition-Abstraction- Real World Information to Computable Data Data Representation: Number Systems- Conversions among Number systems - Logic: Boolean Logic-Applications of Propositional Logic.					
UNIT – III	PROGRAMMING CONCEPTS AND WORD PROCESSING				9
Program Development Life Cycle - Program Design Tools: Algorithms, Flow Chart-Pseudo code. Types of programming languages: low-level, high-level, scripting and paradigms. Language translators: assembler, compiler, interpreter,					
UNIT – IV	DATA HANDLING AND OFFICE AUTOMATION TOOLS				9
Data and information concepts. Data organization: Files, records, and fields. Basics of data handling and storage -Basics: Creating Document- Editing Document- Fonts & Styles - Changing Layout of Document - Inserting Elements to Word Document - Working with Tables - Working with Columned Layouts and Section Breaks- Working with Spread Sheets - Editing Worksheet - Formatting Cells and Sheets - Working with Charts - Advanced Operations. Creating Presentation: Designing Professional Slides - Using Master slides - Working with Tables - Adding Animations - Incorporating Multimedia Elements.					
UNIT – V	INTERNET AND NETWORKING				9
Internet fundamentals: World Wide Web (WWW), browsers, URL, search engines. Basics of computer networks: LAN, WAN, Wi-Fi. Network devices: Router and modem. Web usage: Search techniques. Digital communication: E-mail. Cyber security: Common threats, malware, and safe practices. Introduction to web applications.					

PRACTICAL EXERCISES

1. Identify hardware components (CPU, memory, I/O devices)
2. Demonstrate basic system operations
3. Write algorithms for
 - i. Largest of three numbers
 - ii. Simple interest calculation
 - iii. Factorial of a number
4. Draw flowcharts for:
 - i. Even/Odd number
 - ii. Sum of first N numbers
 - iii. Prime number checking
 - iv. Sorting numbers
 - v. Searching an element
 - vi. Swapping two numbers
5. Word Processing – Basics
 - i. Create and format a document
 - ii. Apply fonts, styles, and page layout
6. Word Processing – Advanced
 - i. Insert tables, images, shapes
 - ii. Use mail merge for letters
 - iii. Apply headers, footers, and page numbering
7. Spreadsheet – Basic Operations
 - i. Create worksheet and enter data
 - ii. Perform basic calculations using formulas
8. Spreadsheet – Advanced
 - i. Use functions: SUM, AVERAGE, IF
 - ii. Create charts (bar, pie, line)
 - iii. Perform sorting and filtering
9. Data Analysis using Spreadsheets
 - i. Apply conditional formatting
 - ii. Create Pivot Tables (basic)
10. Presentation Tools
 - i. Create slides with themes and layouts
 - ii. Add animations and transitions
 - iii. Insert multimedia elements
11. Internet and E-mail
 - i. Create and send emails with attachments
 - ii. Use search engines effectively
 - iii. Demonstrate cloud tools (Google Drive, Docs)

TOTAL: 60 Periods**Weightage: Continuous Assessment: 40%, End Semester Examinations :60%****TEXT BOOKS:**

1. Pradeep K. Sinha, Priti Sinha Computer Fundamental, BPB Publication 8th Edition 2021.

2. Peter Norton Introduction to Computer, McGraw-Hill Education, 8th Edition, 2021.

REFERENCES:

1. V. Rajaraman, Fundamentals of Computers, PHI Learning (Prentice Hall of India) 6th Edition, 2021.
2. Goel, Anita (2014) Computer Fundamentals. Pearson Education. Edition
3. Joan Lambert, Microsoft Office 365 Step by Step, Microsoft Press, 2022.

E – RESOURCES:

1. <https://www.w3schools.com/excel/index.php>
2. <https://www.geeksforgeeks.org/websites-apps/ms-word-tutorial>
3. <https://www.geeksforgeeks.org/websites-apps/ms-powerpoint-tutorial-basic-to-advanced>

COURSE OUTCOMES:

After completion of the course, students will be able to:

CO1: Explain computer system components and emerging technologies

CO2: Apply computational thinking and data representation techniques

CO3: Develop basic algorithms and create structured documents

CO4: Perform data analysis using spreadsheets and create presentations

CO5: Understand networking concepts and practice safe internet usage

CO,PO & PSO Mapping:

(CO)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO 1	PSO 2
CO1	3	2	1	1	2	1	-	-	-	-	-	3	2
CO2	1	-	-	-	3	-	-	1	2	3	1	1	3
CO3	2	3	2	2	3	-	-	-	1	2	2	2	3
CO4	1	-	-	-	3	-	-	-	2	3	1	1	3
CO5	2	1	-	-	3	2	1	2	1	2	-	2	3
Average Mapping	1.8	2	1.5	1.5	2.8	1.5	1	1.5	1.5	2.5	1.3	1.8	2

Note: Correlation levels are 3 (High), 2 (Medium), 1 (Low) and - (None).

U26CSL109	PROGRAMMING IN C LABORATORY	L	T	P	C
		0	0	4	2
COURSE OBJECTIVES:					
• To familiarize with C programming constructs. • To develop programs using arrays, strings, pointers and functions. • To apply structures, unions and file handling concepts. • To design and implement algorithms, flow charts and pseudo code for problem solving. • To enhanced e bugging skills through practical exercises.					
LIST OF EXPERIMENTS					
1. Create Algorithms, Flow charts and Pseudo code for simple C programs. 2. I/O statements, operators, expressions 3. Decision-making constructs: if-else, go to, switch-case, break-continue 4. Loops: for, while, do-while 5. Arrays: 1D and 2D, Multi-dimensional arrays, traversal 6. Strings: operations 7. Functions: call, return, passing parameters by (value, reference), passing arrays to function. 8. Recursion 9. Pointers: Pointers to functions, Arrays, Strings, Pointers to Pointers, Array of Pointers 10. Structures: Nested Structures, Pointers to Structures, Arrays of Structures and Unions. 11. Files: reading and writing, File pointers, file operations, random access, processor directives.					
TOTAL: 60 PERIODS					
Weightage:ContinuousAssessment:60%,EndSemesterExaminations:40%					

CO, PO & PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	-	2	-	-	-	-	-	-	1	2	1
CO2	3	3	2	-	2	-	-	-	-	-	-	1	3	2
CO3	3	3	3	1	2	-	-	-	-	-	-	1	2	2
CO4	2	3	2	2	1	-	-	-	-	1	-	1	2	1
CO5	2	2	2	2	2	-	-	-	2	1	-	2	3	2

1- low, 2 - medium, 3 - high, '-' – no correlation

U26PCL109	PHYSICS AND CHEMISTRY LABORATORY	L 0	T 0	P 4	C 2
PHYSICS LABORATORY: (Any Six Experiments to be conducted)					
COURSE OBJECTIVES: To introduce different experiments to test basic understanding of physics concepts applied in optics, properties of matter and liquids.					
LIST OF EXPERIMENTS: - Determination of rigidity modulus of wire and moment of inertia of the disc - Torsion pendulum. - Determine the Young's modulus of the material of the given cantilever by observing its simple harmonic oscillations. - Determination of Young's modulus of the material by Non-uniform bending method. - Determination of Young's modulus of the material by Uniform bending method. - Determination of the wavelength of the laser using Grating. - Determination of thickness of a thin wire – Air wedge method. - Determination of Ruling width of the compact disc using laser. - Determination of velocity of sound and compressibility of the liquid – Ultrasonic interferometer.					
TEXT BOOKS: Dr. B.Narasimha Rao, Dr.N.Ramaiah, Engineering Physics: Lab Manual, Publisher-Ink of Knowledge, Himmatnagar, 2024.					

CO's - PO's & PSO's MAPPING :

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	3	-	3	-	-	-	-	-	-	-	-	-	-
CO4	-	3	2	-	-	-	-	-	-	-	-	-	-	-
CO5	-	3	2	-	-	-	-	-	-	-	-	-	-	-
Avg	2.5	2.6	2	3	-	-	-	-	-	-	-	-	-	-

1- low, 2 - medium, 3 - high, '-' – no correlation

CHEMISTRY LABORATORY: (Any Five Experiments to be conducted)

Course Objectives:

- To develop skills to analyze water parameters such as hardness, alkalinity, and dissolved oxygen for evaluating suitability and pollution levels.
- Acquire practical knowledge to determine molecular weights and properties of polymers using viscometric techniques.

LIST OF EXPERIMENTS

1. Determination of Total, Permanent and Temporary Hardness of water sample by EDTA method.
2. Determination of Alkalinity in water sample.
3. Determination of Dissolved Oxygen in water.
4. Determination of molecular weights of polymer samples using Ostwald's Viscometer.
5. Determination of strength of acids in a mixture of acids using conductivity meter.
6. Determination of strength of given hydrochloric acid using pH meter.

Text Books:

1. J. Mendham, R. C. Denney, J.D. Barnes, M. Thomas and B. Sivasankar, Vogel's Text book of Quantitative Chemical Analysis (2009).

CO's - PO's & PSO's MAPPING :

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	2	-	3	-	-	-	-	-	-	-	-	-	-	-
CO3	2	-	3	-	-	-	-	-	-	-	-	-	-	-
CO4	3	-	3	-	-	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-	-	-	-	-
Avg	2.6	2	3	-	-	-	-	-	-	-	-	-	-	-

1- low, 2 - medium, 3 - high, '-' – no correlation

U26ENT201	TECHNICAL ENGLISH-II	L	T	P	C
		3	0	0	3
Course objectives: • To develop effective listening and speaking skills for clear, confident academic and professional communication. • To build reading proficiency for comprehension, inference, and contextual understanding. • To enhance writing skills by improving grammar and vocabulary for clear, accurate and effective communication.					
UNIT-I	LISTENING SKILLS AND INFORMATION PROCESSING	9			
Listening-Active and Passive, Listening to news channels (Homophones and Homonyms), Listening to a short story and answering questions, Listening to group discussion sessions, Listening to telephonic conversation, Listening to motivational talks (Impersonal passive voice),Listening business meeting and writing minutes.					
UNIT-II	SPEAKING SKILLS AND ORAL COMMUNICATION	9			
Verbal and non- communication, Narrating a story, Situational Role enactment (Direct and Indirect speech), Practicing spoken communication through dialogues (One word substitution), Extempore speech, Discussions (Process/Product description) and Debates.					
UNIT-III	READING SKILLS AND INTERPRETATION	9			
Reading articles/essays from newspaper (If Conditionals), Reading short stories (Compound words), Predicting content (Contextual guessing), and Critical reading to analyse and interpret visual data (Graphical forms/bar charts /flowcharts),Speed reading-reading passages with time limit- I mproving reading speed.					
UNIT-IV	ACADEMIC AND PROFESSIONAL WRITING	9			
Job application (Cover letter and resume Digital resume technique) Compare and contrast writing (Degrees of Comparison), Understanding text structure and use of reference words (Discourse Markers), Modal Verbs and Word soften confused.					
UNIT-V	PROFESSIONAL WRITING AND LANGUAGE USE	9			
Writing reports (Accident and Survey),Cause and effect & Purpose and function, One word substitution, Collocations (Fixed and semi-fixed expressions), Proof reading.					
TOTAL : 45 PERIODS					
Weightage: Continuous Assessment:40%, End Semester Examinations:60%					
Text Books: 1. Tiwari, Anjana. <i>Communication Skills in English</i>. Khanna Book Publishing, 2022. 2. Murphy, Raymond. <i>English Grammar in Use</i>. 5th ed., Cambridge University Press, 2019.					

References:

1. Sudharshana,N.P., and C.Savitha. Communication Skills for Engineers. Cambridge University Press.
2. Rizvi, M.Ashraf. Effective Technical Communication. McGraw Hill Education.
3. Raman,Meenakshi, and Sangeeta Sharma. Technical Communication: Principles and Practice. Oxford University Press.
4. Board of Editors. Fluent English: A Course Book for Engineering Students. Orient Black Swan.

CO's - PO's & PSO's MAPPING :

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	2	3	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	1	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	1	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Avg	-	-	-	-	-	-	-	2	2	-	-	-	-	-

1-low, 2 - medium, 3 - high, '-' – no correlation

U26MAT202	LINEAR ALGEBRA	L	T	P	C
		3	1	0	4
Course Objectives:					
- To impart foundational knowledge in linear algebra for analyzing and solving Engineering problems. - To enable students to apply matrix decomposition techniques and least-squares methods to real engineering problems. - To strengthen problem-solving and analytical skills by connecting theoretical concepts to real-world applications and computational software.					
UNIT-I	MATRICES	9 + 3			
Matrices - Elementary transformation – Rank of matrix, Eigenvalues and Eigenvectors of a real matrix – Properties, Cayley–Hamilton theorem: Statement and its application, Diagonalization of matrices, Reduction of a quadratic form to canonical form by orthogonal transformation, Nature of quadratic forms, Applications: Stretching of an elastic membrane.					
UNIT- II	VECTOR SPACES	9 + 3			
Introduction to Vector Spaces, Polynomial space, Examples, Sub-spaces, Matrix subspace, Linear Combinations, Span, Generating Sets, Linear Dependence and Independence, Subset, Finite set, Basis and Dimension, Finite dimensional vector space, Dimension of Subspaces, Row space, Column space.					
UNIT-III	LINEAR TRANSFORMATIONS	9 + 3			
T-linear, One-to-one, Onto, Null space, Range, Basis for $N(T)$ and $R(T)$, Dimensions, Dimension Theorem (statement only), Matrix representation of a linear transformation.					
UNIT-IV	INNER PRODUCT SPACES	9 + 3			
Inner product, Norms, Matrix vector, Cauchy-Schwarz inequality, Gram-Schmidt orthogonalization, Inner product spaces-Orthogonal R^2, R^3, R^4 , $P(R)$, Orthogonal Complement, Inner product spaces-Orthogonal projection, Simple problems (upto R^3).					
UNIT-V	MATRIX DECOMPOSITION	9 + 3			
QR decomposition, Eigen values by QR decomposition, Householder, Singular Value Decomposition (SVD), Least squares solutions- Simple problems (up to 3×3 matrices).					
TOTAL : 60 PERIODS					
Weightage: Continuous Assessment: 40%, End Semester Examinations: 60%					
TEXT BOOK:					
1.Lipschitz, S., & Lipson, M. (2009). Schaum's outlines of linear algebra. McGraw-Hill.					
REFERENCES:					
1. Friedberg, S.H., Insel, A.J., & Spence, L.E. (2022). Linear algebra. Pearson.					
2. Bronson, R. (2011). Schaum's outline of matrix operations. McGraw-Hill Education.					

3. Strang,G.,& Thomson,R.(2005).Linear algebra and its applications. Brooks/Cole.
4. KreyzigE.,“Advanced Engineering Mathematics”, Tenth Edition,
5. JohnWileyandsons,2011.
6. Dr. G. Balaji, Linear Algebra, First Edition (January 2026).

E-RESOURCES:

- 1.<https://tutorial.math.lamar.edu/Classes/LinAlg/LinAlg.aspx>
- 2.<https://tutorial.math.lamar.edu/Classes/CalcIII/CalcIII.aspx>
- 3.https://www.math.ucdavis.edu/~linear/?utm_source=chatgpt.com

CO's - PO's & PSO's MAPPING

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	-	-	-	-	-	-	-	-	-	-	-	-
Avg	3	2	-	-	-	-	-	-	-	-	-	-	-	-

1-low, 2 - medium, 3 - high, '-' – no correlation

U26PHT203	ENGINEERING PHYSICS - II	L	T	P	C
		3	0	0	3
Course Objective(s): - Understand the electrical magnetic properties, semiconductor behavior, and optical properties of materials. - Learn the fundamentals of nano devices, quantum phenomena, and quantum computing with their applications.					
UNIT - I	ELECTRICAL AND MAGNETIC PROPERTIES OF MATERIALS	9			
Classical free electron theory – Expression for electrical and thermal conductivity – Wiedemann-Franz law – Fermi distribution function – Density of energy states – Carrier concentration in metals. Magnetic moment – Bohr magneton – Magnetic permeability – Magnetic susceptibility – Classification: Dia, Para, Ferro, Anti ferro and Ferrimagnetism – Domain theory – Hysteresis – Soft and hard magnetic materials – Ferrites structure; Magnetic principles in computer data storage – Magnetic hard disk – GMR sensor.					
UNIT - II	SEMICONDUCTING PROPERTIES OF MATERIALS	9			
Intrinsic Semiconductors – Energy band diagram – Direct and indirect band gap semiconductors – Carrier concentration in intrinsic semiconductors – Extrinsic semiconductors – Carrier concentration in N-type & P-type semiconductors – Variation of carrier concentration with temperature – Carrier transport in Semiconductors – Hall effect and devices.					
UNIT – III	OPTICAL PROPERTIES OF MATERIALS	9			
Classification – Carrier generation and Recombination processes – Absorption emission and scattering of light in metals, insulators and semiconductors (concepts only) – Photo current in P-N diode – Photo Detector – Solar cell – LED – Organic LED – Laser diodes – Optical data storage techniques – Optical modulators – Photonic integrated circuits.					
UNIT - IV	NANO DEVICES	9			
Electron density in bulk material – Size dependence of Fermi energy – Quantum confinement – Quantum structures: Quantum wells, wires and dots – Band gap of nanomaterials. Tunneling – Coulomb blockade - single electron transistor - resonant-tunneling diode- Carbon nanotubes: Properties and applications. – Ballistic transport – Quantum resistance and conductance – Carbon nanotubes: Properties and applications – Spintronic devices and applications – Optics in quantum structures – quantum well laser.					
UNIT - V	QUANTUM COMPUTING	9			
Introduction – Quantum system for information processing – Quantum states – Classical bits –					

Quantum bits (Qubits) – CNOT gate – Bloch sphere – Single and multiple qubits – Quantum gates (Pauli X, Y, Z, Hadamard, Phase, T gate) – Quantum entanglement – Quantum measurement – Quantum circuits – Universal gates – Basic quantum algorithms (Shor's and Grover's) – Quantum error correction – Decoherence – Physical realization of qubits – Quantum communication and cryptography – Applications and challenges of quantum computing.

TOTAL : 45 PERIODS

Weightage: Continuous Assessment: 40%, End Semester Examinations: 60%

TEXT BOOK:

1. William D Callister Jr "Materials Science and Engineering-An Introduction", John Wiley and Sons Inc., New York, 2018 , Tenth edition.
2. Jasprit Singh, "Semiconductor Devices: Basic Principles", Wiley (Indian Edition), 2007.
3. S.O. Kasap. Principles of Electronic Materials and Devices, McGraw-Hill Education (Indian Edition), 2020.
4. G.W.Hanson. Fundamentals of Nanoelectronics. Pearson Education (Indian Edition), 2009.
5. Bernhardt, C. (2019). Quantum computing for everyone. MIT Press.

REFERENCES:

1. Marikani A, "Materials Science", 1st edition, PHI publishers, Chennai, 2017.
2. Jasprit Singh, Semiconductor Optoelectronics: Physics and Technology, McGraw-Hill Education (Indian Edition), 2019.

CO's - PO's & PSO's MAPPING :

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	3	2	-	-	-	-	-	-	-	-	-	-	-
CO3	3	2	-	2	-	-	-	-	-	-	-	-	-	-
CO4	3	2	2	-	-	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	2	-	-	-	-	-	-	-	-	-
Avg	3	2.2	2	2	2	-	-	-	-	-	-	-	-	-

1- low, 2 - medium, 3 - high, '-' – no correlation

U26TAT204	தமிழர்களும் தொழில்நுட்பமும்	L	T	P	C
		1	0	0	1
இயல்-1	நெசவு மற்றும் பாணைத் தொழில்நுட்பம்				
சங்க காலத்தில் நெசவுத் தொழில், பாணைத் தொழில்நுட்பம், கருப்பு சிவப்பு பாண்டங்கள், பாண்டங்களில் கீறல் குறியீடுகள்.					
இயல்-2	வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்				3
சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு – சங்க காலத்தில் கட்டுமான பொருட்களும் நடுகல்லும், சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள், மாமல்லபுரச் சிற்பங்களும், கோவில்களும், சோழர் காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள், நாயக்கர் காலக் கோயில்கள், மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால், செட்டிநாட்டு வீடுகள், பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ-சாரோசெனிக் கட்டிடக் கலை.					
இயல்-3	உற்பத்தித் தொழில் நுட்பம்				3
கப்பல் கட்டும் கலை, உலோகவியல், இரும்புத் தொழிற்சாலை, இரும்பை உருக்குதல், எஃகு, வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள், நாணயங்கள் அச்சடித்தல், மணி உருவாக்கும் தொழிற்சாலைகள், கல்மணிகள், கண்ணாடி மணிகள், சுடுமண் மணிகள், சங்கு மணிகள், எலும்புத்துண்டுகள், தொல்லியல் சான்றுகள், சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.					
இயல்-4	வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நுட்பம்				3
அணை, ஏரி, குளங்கள், மதகு, சோழர்காலக் குழுமித் தூம்பின் முக்கியத்துவம், கால்நடை பராமரிப்பு, கால்நடைபளுக்காக வடிவமைக்கப்பட்ட கிணறுகள், வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள், கடல்சார் அறிவு, மின்வளம், முத்து மற்றும் முத்துக்குளித்தல், பெருங்கடல் குறித்த பண்டைய அறிவு, அறிவுசார் சமூகம்.					
இயல்-5	அறிவியல் தமிழ் மற்றும் கணித்தமிழ்				3
அறிவியல் மதிழின் வணர்ச்சி, கணித்தமிழ் வளர்ச்சி, தமிழ் நூல்களை மின்பதிப்பு செய்தல், தமிழ் மென்பொருட்கள் உருவாக்கம், தமிழ் இணையக் கல்விக்கழகம் - தமிழ் மின் நூலகம், இணையத்தில் தமிழ் அகராதிகள், சொற்குவைத் திட்டம்.					
TOTAL – 15 PERIODS					
Weightage: Continuous Assessment: 40%, End Semester Examinations:60%					
Assessment Methodology: Quiz (20%), Assignments (30%), Internal examinations (50%)					
References:					
1. தமிழக வரலாறு – மக்களும் பண்பாடும் - கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியில் பணிகள் கழகம்). 2. கணிதித் தமிழ் - முனைவர் இல.சுந்தரம் (விகடன் பிரசுரம்). 3. கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு) 4. பொருதை – ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு) 5. Social Life of Tamils (Dr. K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print) 6. Social Life of the Tamils – The Classical Period (Dr. S.Singaravelu) (Published by: International Institute of Tamil Studies). 7. Historical Heritage of the Tamils (Dr. S.V.Subatamanian, Dr.K.D.Thirunavukkarasu) (Published by: International Institute of Tamil Studies). 8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil studies.) 9. Keeladi – ‘Sangam City Civilization on the banks of river Vaigai’ (Jointly Published by: department of Archeology & 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.					

U26TAT204	Tamils and Technology	L	T	P	C
		1	0	0	1
UNIT-I	Weaving and Ceramic Technology:				3
Weaving Industry during Sangam Age, ceramic technology, Black and Red Ware Potteries (BRW), Graffiti on Potteries.					
UNIT-II	Design and Construction Technology:				3
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
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 Stonebeads, Glass beads, Terracotta beads – Shell beads/bone beads, Archeological evidences – Gem stone types described in Silappathikaram.					
UNIT-IV	Agriculture and Irrigation Technology:				3
Dam, Tank, Ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandary – Wells designed for cattle use – Agriculture and Agro Processing – Knowledge of sea, Fisheries, Pearl, Conche diving – Ancient Knowledge of Ocean – Knowledge Specific Society.					
UNIT-V	Scientific Tamil & Tamil Computing:				3
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 : 15 PERIODS					
Weightage: Continuous Assessment: 40%, End Semester Examinations:60%					
Assessment Methodology: Quiz (20%), Assignments (30%), Internal examinations (50%)					
References:					
1. தமிழக வரலாறு – மக்களும் பண்பாடும் - கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியில் பணிகள் கழகம்). 2. கணினித் தமிழ் - முனைவர் இல.சுந்தரம் (விகடன் பிரசுரம்). 3. கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு) 4. பொருளை – ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு) 5. Social Life of Tamils (Dr. K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print) 6. Social Life of the Tamils – The Classical Period (Dr. S.Singaravelu) (Published by: International Institute of Tamil Studies. 7. Historical Heritage of the Tamils (Dr. S.V.Subatamanian, Dr.K.D.Thirunavukkarasu) (Published by: International Institute of Tamil Studies). 8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil studies.) 9. Keeladi – ‘Sangam City Civilization on the banks of river Vaigai’ (Jointly Published by: department of Archeology & 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.					

U26CST205	OBJECT ORIENTED PROGRAMMIN G	L	T	P	C
		3	0	0	3
COURSE OBJECTIVES: • To understand how C++ improves C with object - oriented features. • To learn how to write in line functions for efficiency and performance. • To learn how to implement constructors, overload functions and operators in C++. • To learn how inheritance and virtual function simplement dynamic binding with polymorphism. • To learn how to use exception and file handling in C++programs.					
UNIT– I	PRINCIPLESOF OBJECT-ORIENTEDPROGRAMMING				9
OOPS Concepts - Procedure Oriented Programming vs. Object Oriented Programming - C++ constructs and syntax: Tokens, Variables, Data types, Type compatibility, Variable declaration, Dynamic initialization of variable, Reference variable, Type casting - Structure of C++ program - Class: Specifying a class, Access specifiers - Defining member functions: Inside class and Outside class – Object: Creating objects, Memory allocations for objects - Operators - Expressions -Flow ControlandDecisionmakingstatements-SpecialOperatorsinC++:Scoperesolutionoperator, Memory management operators, Manipulators.					
UNIT– II	FUNCTIONSANDCONSTRUCTORS				9
Functions: Inline function, Static data members, Static member function, Friend function: Using two different classes, Using non-member function - Array of objects - Object as function arguments - Constructors: Types of Constructors, Constructor Overloading– Constructors with default arguments- Destructors.					
UNIT– III	INHERITANCEAND POINTERS				9
Inheritance: Derived class, Visibility modes and effects, Types: Single, Multilevel, Multiple, Hierarchical, Hybrid- Virtual base class, Abstract class, Constructor in derived class- Pointers: Pointer operator, Address Operator, Pointers with Arithmetic operations, this pointer, Pointer to derived class and base class.					
UNIT– IV	TEMPLATES&POLYMORPHISM				9
Class Templates – Function Templates –Overloading of Template Functions –STL: Containers, Iterators - Compile time Polymorphism: Function over loading, Operator over loading: unary and binary Operator Overloading, Operator Overloading with Friend functions- Runtime polymorphism: Virtual function, Late Binding - Pure Virtual Function - Compile time Vs. Runtime Polymorphism.					
UNIT– V	EXCEPTIONHANDLINGANDFILE I/O				9
Exception Handling - C++ Streams- Formatted and Unformatted I/O – Filestream classes - File modes - File operations - Types of file: Random access, Sequential access - Binary and ASC II Files - Error handling in File I/O with member function.					
TOTAL : 45 Periods					
Weightage:ContinuousAssessment:40%,EndSemesterExaminations:60%					
REFERENCES: 1. Deitel,P.,&Deitel,H.(2024).C++howtoprogram:Anobjects-naturalapproach. PearsonEducation. 2. Balagurusamy,E.(2020).ObjectorientedprogrammingwithC++.McGrawHillEducation. 3. Bronson,G. (2011). Afirst bookof C++. Course Technology Inc. 4. K.R.Venugopal(2017) MasteringC++.McGraw HillEducation					

E – RESOURCES:

1. <https://en.cppreference.com/w/cpp>
2. <https://www.w3schools.com/cpp>

COURSEOUTCOMES:

CO1: Develop applications for arrange of problems using object- oriented programming techniques.

CO2: Apply Object Oriented Paradigms to solve problems using C++

CO3: Design and Analyze solutions involving codere usability and complexity management

CO4: Develop programs for handling files and exceptions in programming.

CO5: Demonstrate life-long learning skills through application development.

CO, PO & PSO Mapping:

PO,PSO (CO)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 10	PO1 11	PSO 1	PSO 2
CO1	3	3	2	1	2	0	0	0	1	1	0	2	3
CO2	3	3	3	2	3	0	0	0	1	1	0	2	3
CO3	3	3	3	2	2	0	0	0	2	1	0	2	3
CO4	3	2	3	3	3	0	0	0	1	1	0	2	3
CO5	2	2	2	2	3	0	0	0	3	3	2	3	2
Average Mapping	3	3	2	1	2	0	0	0	1	1	0	2	3

Note: Correlation levels are 3(High), 2 (Medium), 1(Low) and -(None).

U26CST206	Digital Principles and System Design	L	T	P	C
		3	0	2	4
COURSE OBJECTIVES:					
• To understand the basics of number systems and Boolean algebra. • To enable analysis and design of combinational logic circuits. • To use hardware description languages (HDL) for implementing digital systems. • To impart understanding of sequential circuits and their design. • To familiarize students with memory and programmable logic devices.					
UNIT-I	Boolean Algebra				9
Number Systems, Binary, Octal, Hexadecimal, Representation of negative numbers, 1's and 2's Complements, Arithmetic Operations, Binary Codes. Boolean Algebra, Theorems and Postulates, Functions, Truth Table, Logic Gates, Universal gates.					
UNIT-II	Canonical Functions and Combinational Logic				9
Canonical and Standard Forms, Minterms and Maxterms, Sum of Products and Product of Sums, Conversions and Expansion. Simplification of Boolean Functions, Karnaugh Map, 2,3,4 variables, NAND / NOR Implementations, Combinational Circuits, Arithmetic Circuits, Half and Full Adders, Subtractors. Introduction to HDL					
UNIT-III	Combinational Logic Design				9
Binary Parallel adder, Carry Look-ahead Adder, BCD Adder, Binary multiplier, Magnitude Comparator, Code Converters, Decoder, Encoder, Priority Encoder, Mux/Demux, Applications, Introduction to HDL and HDL for these circuits					
UNIT-IV	Sequential Logic Design				9
Sequential Logic Design: R – S Latch, D Latch, Flip flops, SR, JK, T, D, Master /Slave Flip Flop, Flip flop excitation tables, Analysis of clocked sequential circuits, Moore/Mealy models, Registers, Shift Registers, Universal Shift Register. Counters, Asynchronous Ripple Counters, Synchronous Counters- Ring Counter, Johnson Counter					
UNIT-V	System Design				9
Memory Systems, RAM, ROM, Memory Decoding, error detection and correction, Digital System Design using PROM, PLA, PAL, FPGA					
Practical Exercises:					
1. Simple functions using gates. 2. Implementation of Boolean functions. 3. Implementation of combinational circuits using gates for arbitrary functions. 4. Implementation of Arithmetic circuits and extended operations. 5. Implementation of Combinational circuits using code converters. 6. Implementation of BCD adder, encoder and decoder circuits. 7. Project demonstration and presentation. 8. Mini project on the design of a digital circuit for solving practical problems.					
TOTAL: 60 PERIODS					
Weightage: Continuous Assessment:40%, End Semester Examinations:60%					
References:					
1. Mano, M.M., & Ciletti, M.D.(2018). Digital design. Pearson Education. 2. Roth, C.H., Jr.(2003). Fundamentals of logic design. Jaico Publishing House. 3. Wakerly, J.F.(2007). Digital design principles and practices. Pearson Education. 4. Givone, D.D.(2003). Digital principles and design. Tata McGraw-Hill. 5. Kharate, G.K.(2010). Digital electronics. Oxford University Press.					
E-Resources:					
1. NPTEL Course Digital System Design By Prof. Neeraj Goel, IIT Ropar					

2. NPTEL Course Digital System Design By Prof. D. Roychoudhury, IIT Kharagpur
3. NPTEL Course Digital System Design Coordinated by IIT Roopar

Course Outcomes:

CO1: Identify number systems and basic logic gates.

CO2: Apply Boolean algebra and Karnaugh maps to simplify and implement combination allogic circuits.

CO3: Design and analyze digital systems with Combinational circuits using HDL and hardware tools.

CO4: Design synchronous sequential circuits using flip-flops.

CO5: Understand memory organization and programmable logic devices.

CO, PO & PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	-	-	-	-	-	-	-	-	-	1	-
CO2	3	3	2	-	-	-	-	-	-	-	-	-	-
CO3	3	3	3	-	-	-	-	-	-	-	-	-	-
CO4	2	3	3	2	3	-	-	-	-	-	-	-	-
CO5	3	2	2	-	2								
Average	2.8	2.6	2.5	2	2.5	-	-	-	-	-	-	1	-

Note: Correlation levels are 3 (High), 2 (Medium), 1 (Low) and - (None).



U26SDT207	APTITUDE SKILLS – I	L	T	P	C
		1	0	0	1
Course objectives: - To enhance problem-solving skills in quantitative aptitude topics. - To build speed and accuracy in calculations for competitive exams and placements. - To develop fundamental knowledge in number systems and basic arithmetic concepts.					
UNIT - I	NUMBER SYSTEM	3			
Classification of Numbers (Natural, Integers, Rational, Real), Divisibility Rules and Applications, Factors & Multiples (Prime factorization, Number of factors), HCF & LCM (Problem-Solving applications).					
UNIT - II	QUANTITATIVE ABILITY	3			
Permutation and Combinations, Percentage, Profit and Loss, Simple and Compound interest, Time, Speed and distance, Time and Work, Ratio and Proportion, Area.					
UNIT - III	DEDUCTIVE REASONING	3			
Number and letter series, Calendars, Clocks, Venn Diagrams, Mathematical Operations, Directions, Problem Solving & Decision Making.					
UNIT - IV	LOGICAL REASONING	3			
Alphabet and Number Series,Odd Man Out Series,Puzzles, Blood Relations, Seating Arrangements and Ordering, Direction Sense Test.					
UNIT - V	SPEED MATHS	3			
Squaring and Multiplying numbers faster than ConventionalMethods,Finding square roots of numbers,Finding cube roots faster, Solving simultaneous equations faster.					
TOTAL : 15 PERIODS					
Weightage: Continuous Assessment:100%.					
REFERENCES:					
1. Aggarwal R.S., Quantitative Aptitude for Competitive Examinations, S.Chand PublishingCompany Ltd., 2022 .					
2. Arun Sharma, How to Prepare for Quantitative Aptitude for the CAT, Tata McGraw-Hill Publishing Co., 2022.					
3. Analytical and Logical reasoning for CAT and other management entrance test By Sijwali B S.					
4. Quantitative Aptitude by Competitive Examinations by Abhijit Guha 4th edition.					

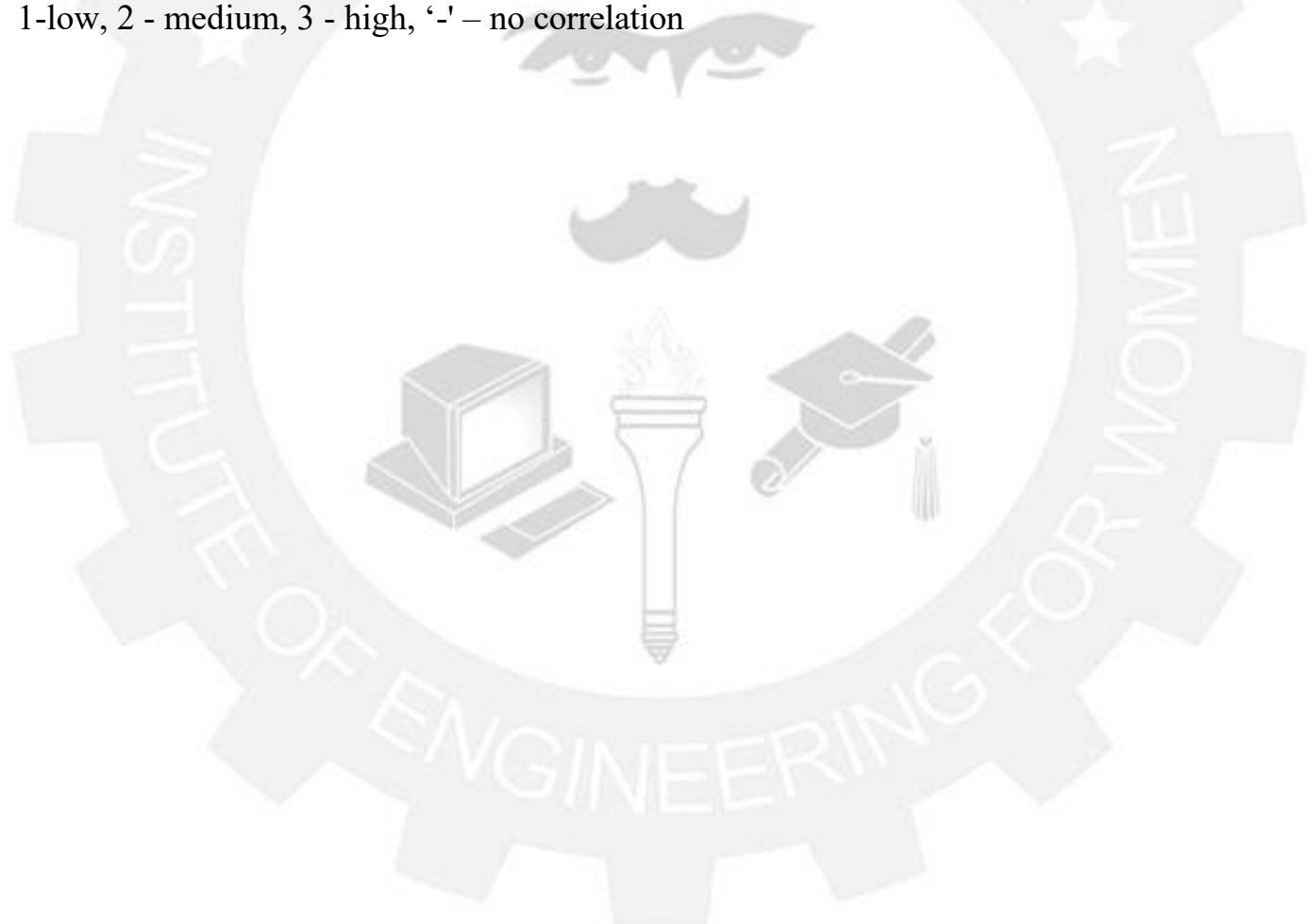
E-RESOURCES:

- <https://www.indiabix.com/online-test/aptitude-test/>
- <https://www.placementpreparation.io/quantitative-aptitude/>
- <https://www.geeksforgeeks.org/aptitude-for-placements/>

CO's - PO's & PSO's MAPPING

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	-	-	-	-	-	-	-	-	-	-	-	-
Avg	3	2	-	-	-	-	-	-	-	-	-	-	-	-

1-low, 2 - medium, 3 - high, '-' – no correlation



U26CSL208	OBJECT ORIENTED PROGRAMMING LABORATORY	L	T	P	C
		0	0	4	2
COURSE OBJECTIVES:					
• To understand and apply Object Oriented Programming Concepts. • To impart the principles of Object Oriented Programming and their advantages over procedural programming. • To develop programming skills by creating real-world applications using OOP features. • To enhance problem- solving abilities through different OOP concepts.					
LIST OF EXPERIMENTS					
1. Write a program that uses a class where the member functions are defined inside a class. 2. Write a program that uses a class where the member functions are defined outside a class. 3. Write a program to demonstrate the use of static data members and member function. 4. Write a program to demonstrate the use of const data members. 5. Write a program to implement virtual base class in a program. 6. Write a program to demonstrate the use of zero argument and parameterized constructors. 7. Write a program to demonstrate the use of dynamic constructor 8. Write a program to demonstrate the use of explicit constructor and destructor. 9. Write a program to implement friend function using different classes and external function. 10. Write a program to demonstrate the overloading of increment and decrement to operators. 11. Write a program to demonstrate the multilevel inheritance. 12. Write a program to implement pointer and ‘this’ pointer in a program. 13. Write a program to demonstrate the exception handling. 14. Write a program to demonstrate the use of function template. 15. Write a program to implement input/output operations on binary file.					
TOTAL: 45 PERIODS					
Weightage: Continuous Assessment: 60%, End Semester Examinations: 40%					

COURSE OUTCOMES:

- CO1: Apply the basic concepts of object – oriented programming to solve problems in C++.
- CO2: Implement classes, objects, constructors, destructors, and operator overloading.
- CO3: Develop programs using inheritance, polymorphism, and function overloading.
- CO4: Apply file handling and exception handling in C++ programs.
- CO5: Design and implement real-world applications using OOP principles.

CO, PO & PSO Mapping:

PO, PSO (CO)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2
CO1	3	2	2	1	2	0	0	1	1	0	2	3	2
CO2	3	2	3	1	2	0	0	1	1	0	2	3	2
CO3	3	3	3	2	2	0	0	1	1	0	2	3	2
CO4	3	2	3	2	3	0	0	1	1	0	2	3	3
CO5	3	3	3	2	3	1	1	2	2	1	3	3	3
Average Mapping	3	2	2	1	2	0	0	1	1	0	2	3	2

Note : Correlation levels are 3(High), 2(Medium), 1(Low) and - (None).