NPR
College of Engineering and Technology
(AN AUTONOMOUS INSTITUTION)
NBA Accredited (B.E. - CSE, ECE, EEE & Mechanical Engg.) | Accredited by NAAC with 'A' Grade
Recognized by UGC under s (f) | ISO 9001:2015 Certified | Approved by All India Council for Technical Education, New Delhi
Affiliated to Anna University, Chennai
Natham, Dindigul (Dist.) - 624 401, Tamil Nadu.

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B.E -ELECTRONICS AND COMMUNICATION ENGINEERING

REGULATIONS 2025
CHOICE BASED CREDIT SYSTEM (CBCS)
CURRICULUM AND SYLLABUS

Chairperson - Board of Studies,
Department of Electronics and Communication Engineering,
NPR College of Engineering & Technology
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Natham, Dindigul - 624401

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I - Department Vision

To impart quality technical education and nurture excellence to meet the impending challenges in emerging technologies

II - Department Mission

M1: To instill the thirst for advancement in Electronics and Communication technologies to address the social needs.

M2: To increase industrial interaction to ascertain prevailing technologies.

M3: To inculcate ethics and transform lives through value-based education.

M4: To enhance analytical and practical skills to solve real time problems in the society.

III - Programme Name: B.E – Electronics and Communication Engineering

IV - Programme Educational Objectives

Graduates of Electronics and Communication Engineering Programme will be able

1. To have a successful career in academia or industries associated with Electronics and Communication Engineering, or as entrepreneurs.
2. To build solutions or systems of varying complexity with strong fundamental concepts and advanced techniques.
3. To analyze existing literature in an area of specialization and ethically develop innovative and research-oriented methodologies to solve the real time problems.

V - Programme Outcomes

Engineering Graduates will be able to:

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 solutions to 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 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 and 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)

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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 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. (WK8)

VI - Programme Specific Outcomes

At the end of the programme,

1. Our students will be highly proficient in Electronic circuits, Embedded and communication systems and able to find solutions for real time complexities.
2. Our students will be able to utilize MATLAB, Xilinx tools and techniques to develop innovative research ideas for new applications.

VII - Mapping of PEOs, POs, and PSOs - Tabular Format

PEOs vs POs/PSOs	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
I						✓	✓	✓	✓	✓	✓	✓	✓
II	✓	✓	✓	✓	✓							✓	✓
III	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓

VIII - Programme Scope

- Graduates can pursue careers in electronics, telecommunications, signal processing, control systems, embedded systems, and research and development.
- They can work in industries such as telecommunications, consumer electronics, manufacturing, aerospace, defense, and research organizations.
- The programme equips students with the necessary technical skills and knowledge to design and develop electronic systems, analyze and process signals, and contribute to advancements in communication technology.

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IX - Programme Specific Criteria

Core Technical Knowledge: The curriculum should cover fundamental areas of electronics and communication engineering, including analog and digital electronics, electronic devices and circuits, signals and systems, communication systems, microprocessors, electromagnetic fields, and microwave engineering.

Mathematics and Science Foundation: The programme should provide a strong foundation in mathematics, including calculus, differential equations, linear algebra, and probability theory. Relevant scientific principles such as physics and basic principles of chemistry may also be included.

Electronic Devices and Circuits: The curriculum should include courses that focus on electronic devices, semiconductor physics, transistor circuits, integrated circuits, and electronic circuit design. Students should gain an Understand of device characteristics, circuit analysis, and design methodologies.

Communication Systems: The programme should cover topics related to analog and digital communication systems, modulation techniques, signal processing, wireless communication, optical communication, and networking. Students should acquire knowledge of system design, modulation/demodulation techniques, and communication protocols.

Signal Processing and Control Systems: The curriculum should include courses on digital signal processing, control systems, and system modeling. Students should learn about signal analysis, filtering, transform techniques, feedback control systems, and system stability.

Microelectronics and VLSI Design: The **programme** may include courses on microelectronics and Very Large Scale Integration (VLSI) design. Students should gain knowledge of semiconductor technology. transistor-level design, integrated circuit fabrication, and VLSI design methodologies.

Professional Skills and Ethics: ECE **programmes** should emphasize the development of professional skills, including communication, teamwork, problem-solving, critical thinking, and ethical considerations. Students should understand the ethical responsibilities of engineers and the social impact of their work.

Continuous Improvement and Assessment: ECE **programmes** should have mechanisms in place for continuous improvement and assessment of student learning outcomes. This involves regular evaluation of the curriculum, feedback from industry professionals, alumni, and students, and incorporation of emerging technologies and industry trends.

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X - Curriculum I Semester to VIII Semester

SEMESTER - I

S/N	Course Code	Course Title	Curricular Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1.	25IP100	Induction Programme	-	-	-	-	-	0
THEORY								
2.	25HS101	Technical Communication	HSMC	2	0	0	2	2
3.	25MA101	Engineering Mathematics	BSC	3	1	0	4	4
4.	25PH101	Engineering Physics	BSC	3	0	0	3	3
5.	25CH101	Engineering Chemistry	BSC	3	0	0	3	3
6.	25BE101	Fundamentals of Computing	ESC	3	0	0	3	3
7.	25BEC01	Basics of Electrical Engineering	ESC	2	0	2	4	3
8.	25HS102	தமிழர்மரபு /Heritage of Tamils	HSMC	1	0	0	1	1
PRACTICALS								
9.	25BS111	Physics and Chemistry Laboratory	BSC	0	0	4	4	2
10.	25HS111	English Laboratory -I	EEC	0	0	2	2	1
11.	25BE111	Basic Computing and Problem-Solving Laboratory	ESC	0	0	2	2	1
TOTAL				**17**	**1**	**10**	**28**	**23**

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SEMESTER – II

S/N	Course Code	Course Title	Curricular Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1.	25HS201	Communicative English	HSMC	2	0	0	2	2
2.	25MA203	Partial Differential Equations and Transforms	BSC	3	1	0	4	4
3.	25BS201	Environmental Sciences and Sustainability	BSC	2	0	0	2	2
4.	25BE202	Python Programming (IC)	ESC	3	0	2	5	4
5.	25EC201	Electronic Devices	PCC	3	0	0	3	3
6.	25EC202	Circuits Analysis (IC)	PCC	3	0	2	5	4
7.	25HS203	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	HSMC	1	0	0	1	1
PRACTICALS								
8.	25EC211	Electronic Devices Laboratory	PCC	0	0	2	2	1
9.	25HS211	English Laboratory –II	EEC	0	0	2	2	1
TOTAL				**17**	**1**	**8**	**26**	**22**

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SEMESTER – III

S/N	Course Code	Course Title	Curricular Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1.	25MA304	Probability, Statistics and Random Processes	BSC	3	1	0	4	4
2.	25AI301	Data Structures using Python	ESC	3	0	0	3	3
3.	25EC301	Electromagnetic Fields	PCC	3	0	0	3	3
4.	25EC302	Digital System Design (IC)	PCC	3	0	2	5	4
5.	25EC303	Signals and Systems	PCC	3	1	0	4	4
6.	25HSC01	Human Values and Ethics	HSMC	2	0	0	2	2
PRACTICALS								
7.	25AI311	Data Structures using Python Laboratory	ESC	0	0	2	2	1
8.		Industry Oriented Course – I	EEC	0	0	2	2	1
TOTAL				**17**	**2**	**6**	**25**	**22**

SEMESTER – IV

S/N	Course Code	Course Title	Curricular Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1.	25CS401	Artificial Intelligence and Machine Learning (IC)	ESC	3	0	2	5	4
2.	25EC401	Analog Electronics and Integrated Circuits	PCC	3	0	0	3	3
3.	25EC402	Transmission Lines and Wave Guides	PCC	3	0	0	3	3
4.	25EC403	Networks and Security (IC)	PCC	3	0	2	5	4
5.	25EC404	Digital Signal Processing	PCC	3	0	0	3	3
6.	25EC405	Control Systems	PCC	3	0	0	3	3
PRACTICALS								
7.	25EC411	Circuits Design and Simulation Laboratory	PCC	0	0	2	2	1
8.	25EC412	Digital Signal Processing Laboratory	PCC	0	0	2	2	1
9.		Industry Oriented Course – II	EEC	0	0	2	2	1
TOTAL				**18**	**0**	**10**	**28**	**23**

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SEMESTER – V

S/N	Course Code	Course Title	Curricular Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1.	25EC501	Analog and Digital Communication	PCC	3	0	0	3	3
2.	25EC502	Microcontroller and Embedded Systems (IC)	PCC	3	0	2	5	4
3.	25EC503	Antenna and Wave Propagation	PCC	3	0	0	3	3
4.	25EC504	VLSI Design	PCC	3	0	0	3	3
5.		Professional Elective-I	PEC	3	0	0	3	3
6.		Open Elective-I	OEC	3	0	0	3	3
PRACTICALS								
7.	25EC511	Analog and Digital Communication Laboratory	PCC	0	0	2	2	1
8.	25EC512	VLSI Design Lab	PCC	0	0	2	2	1
9.	25SD511	Skill Development Course	EEC	0	0	2	2	1
TOTAL				**18**	**0**	**8**	**26**	**22**

SEMESTER – VI

S/N	Course Code	Course Title	Curricular Category	Period Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1.	25EC601	Internet of Things and Architecture	PCC	3	0	0	3	3
2.	25EC602	Wireless Communication (IC)	PCC	3	0	2	5	4
3.	25EC603	Microwave Engineering	PCC	3	0	0	3	3
4.	25EC604	Millimeter Wave and Optical Communication	PCC	3	0	0	3	3
5.		Professional Elective-II	PEC	2/3	0	2/0	4/3	3
6.		Professional Elective-III	PEC	2/3	0	2/0	4/3	3
7.		Open Elective-II	OEC	3	0	0	3	3
PRACTICALS								
8.	25EC611	IoT Laboratory	PCC	0	0	2	2	1
9.	25EC612	Advanced Communication Laboratory	PCC	0	0	2	2	1
10.	25SD611	Self-Learning Course	EEC	0	0	0	0	1
TOTAL								**25**

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SEMESTER – VII

S/N	Course Code	Course Title	Curricular Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1.	25HS701	Project Management	HSMC	2	0	0	2	2
2.	25EC701	Image Processing	PCC	3	0	2	5	4
3.		Professional Elective-IV	PEC	2/3	0	2/0	4/3	3
4.		Professional Elective-V	PEC	2	0	2	4	3
5.		Professional Elective-VI	PEC	2	0	2	4	3
6.		Open Elective-III	OEC	3	0	0	3	3
PRACTICALS								
7.	25EC711	Internship	EEC	0	0	0	0	2
TOTAL								**20**

SEMESTER – VIII

S/N	Course Code	Course Title	Curricular Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
PRACTICALS								
1.	25EC811	Project Work	EEC	0	0	16	16	8
TOTAL				**0**	**0**	**16**	**16**	**8**

CREDIT DISTRIBUTION

S/N	Course Components	Credits Per Semester								Total Credits
		I	II	III	IV	V	VI	VII	VIII	
1	HSMC	3	3	2				2		10
2	BSC	12	6	4						22
3	ESC	7	8	4	4					23
4	PCC		4	11	18	15	15	4		67
5	PEC					3	6	9		18
6	OEC					3	3	3		9
7	EEC	1	1	1	1	1	1	2	8	16
TOTAL		**23**	**22**	**22**	**23**	**22**	**25**	**20**	**8**	**165**

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SYLLABUS

SEMESTER I

I - Course Name: 25HS101 Technical Communication

Prerequisite	Programme Name	Sem	Category	L	T	P	C
Nil	B.E./B.TECH. Common to all	I	HSMC	2	0	0	2

II - Course Objectives

1	To Enhance consciousness regarding grammar in both spoken and written communication
2	To Augment verbal capabilities in both formal and casual settings
3	To Elevate reading fluency and expand vocabulary.

III - Course Content

Preamble:

The Technical communication course aims to establish a solid groundwork in the English language for students ranging from beginner to intermediate levels. This course emphasizes the critical skills of reading, writing, listening, and speaking, allowing participants to express themselves clearly and with confidence in both every day and professional contexts.

Unit – I	**English for Communication**	**6 Periods**
Introduction to communication- Parts of speech- Questions & its types-Tenses- Be Verbs-Subject Verb Agreement-Reading Comprehension.		
Unit – II	**Vocabulary Building**	**6 Periods**
Vocabulary-Formation of words- Articles- Sentence Completion-Types of Sentences-Jumbled Sentences/Paragraph- Paragraph writing.		
Unit – III	**Formal Correspondence**	**6 Periods**
Active & Passive Voice-Conjunction-Punctuation-Formal letters/emails: Business Letters – One-word Substitution.		
Unit – IV	**Descriptive Writing**	**6 Periods**
Prepositions-Adjectives-Idioms and Phrases- Homophones/Homonyms-Picture/Process Description.		
Unit – V	**Effective Writing**	**6 Periods**
Modal verbs-Simple, Compound & Complex- Sentence Pattern- Note Making/Note Taking- Spot the Error-Writing Instructions.		
		TOTAL: 30 Periods

Reference Books:	1. Murphy, Raymond. English Grammar in Use: A Self-Study Reference and Practice Book for Intermediate Students: with Answers. Cambridge: Cambridge University Press, 1985. 2. Prasad, Hari Mohan, A Handbook of Spotting Errors, McGraw Hill Education,

	2010. 3. Reynolds, John. Cambridge IGCSE, First Language English. 2018th ed., Hodder Education, 2018.
MOOC/Web Platforms:	https://swayam.gov.in https://www.edx.org https://learnenglish.britishcouncil.org

IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Demonstrate proficiency in basic language skills.	Apply (K3)
CO2	Apply grammatical structures correctly.	Apply (K3)
CO3	Improve vocabulary and word usage.	Analyze (K4)
CO4	Develop reading comprehension skills.	Understand (K2)
CO5	Write coherent and structured texts.	Apply (K3)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	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	-	-	-	-	-	-	-	-	2	3	2	-	-
CO2	-	-	-	-	-	-	-	-	2	3	2	-	-
CO3	-	-	-	-	-	-	-	-	2	3	2	-	-
CO4	-	-	-	-	-	-	-	-	2	3	2	-	-
CO5	-	-	-	-	-	-	-	-	2	3	2	-	-

Mapping: 1-Low, 2-Medium, 3-

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I - Course Name: 25MA101 Engineering Mathematics

Prerequisite	Programme Name	Sem	Category	L	T	P	C
Nil	B. E / B. TECH. Common to all Branches	I	BSC	3	1	0	4

II - Course Objectives

1	To impart mathematical modeling to describe and explore real-world phenomena and data.
2	To provide basic understanding on Linear, quadratic, power and polynomial, exponential, and multi variable models.
3	Summarize and apply the methodologies involved in framing the real world problems related to fundamental principles of polynomial equations.

III - Course Content

Preamble:
This course covers mathematical modeling with linear, quadratic, polynomial, power, exponential, and multivariable functions. It blends theoretical foundations such as vector spaces, eigenvalues, orthogonality, and series convergence—with practical methods like least squares, regression, and optimization. The focus is on applying these models to solve real-world problems in engineering, science, and related fields.

Unit – I	Mathematical Modeling of Linear Functions	12 Periods

The geometry of linear equations - Formation of linear equations for the given data (x_i,y_i):Method of least squares and method of regression - Vector spaces: Basic concepts with examples - Linear Transformation- Eigen values and vectors.

Unit – II	Mathematical Modeling of Quadratic Functions	12 Periods

General form of a quadratic function - Basic relationships between the equation and graph of a quadratic function - Sum of squares error and the quadratic function of best fit - Quadratic forms: Matrix form - Orthogonality - Canonical form and its nature.

Unit – III	Mathematical Modeling of Power and Polynomial Functions	12 Periods

Characteristics of the graphs of power and polynomial functions - Fitting of power and polynomial functions using the method of least squares - Local maxima and local minima of power and polynomial functions - Tests of convergence for series of positive terms - comparison test, ratio test - Power series of functions with real variables, Taylors series, radius and interval of convergence

Unit – IV	Mathematical Modeling of Exponential Functions	12 Periods

Concept of exponential growth - Graphs of exponential functions - Relationship between the growth factor and exponential growth or decline - Exponential equations have a variable as an exponent and take the form $y = ab^x$ through least square approximation - Calculus of exponential functions - Exponential series.

Unit – V	Mathematical Modeling of Multivariable Functions	12 Periods

Graphing of functions of two variables - Partial derivatives - Total derivatives - Jacobians - Optimization of multivariable functions without constraints- Optimization of multivariable functions with constraints – Lagrangian multipliers method.

TOTAL: 60 Periods

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Reference Books:	1.ErwinKreyszig, Advanced Engineering Mathematics, Tenth Edition, Wiley India Private Limited, New Delhi 2016 2. B. S. Grewal, Numerical Methods in Engineering & Science: With Programs in C, C++ & MATLAB, Khanna, 2014 3.S.C. Gupta, V.K. Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand & Sons2020 4. Thomas and Finney, Calculus and analytic Geometry, Fourteenth Edition, by Pearson Paperback, 2018 5. S.S. Sastry, Introductory Methods of Numerical Analysis, 5th edition, 2012, PHI Publication.
MOOC/Web Platforms:	https://youtu.be/h5urBuE4Xhg?si=i9bDuZp0O1OnOdzA https://youtu.be/2DX8Vp1Q2-0?si=2mD7I_QewwqIOoBK https://youtu.be/h23P5lrlrYU?si=nu59KGFxuA-bGB91 https://youtu.be/O9okvkNlB1Y?si=XGnIl_SB3MoZScWn https://youtu.be/6aRiifsZGns?si=Fnsp5aMk68Mo3mWl

IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Implement the concepts of mathematical modeling based on linear functions in Engineering.	Apply (K3)
CO2	Formulate the real-world problems as a quadratic function model.	Apply (K3)
CO3	Apply integral calculus and multiple integral tools in solving various application Problems.	Apply (K3)
CO4	Apply the concept of mathematical modeling of exponential functions in Engineering.	Apply (K3)
CO5	Develop the identification of multivariable functions in the physical dynamical problems.	Analyse (K4)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	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	2	3	-	-	-	-	-	-	-	-	2	-	-
CO2	2	3	-	-	-	-	-	-	-	-	2	-	-
CO3	2	3	-	-	-	-	-	-	-	-	2	-	-
CO4	2	3	-	-	-	-	-	-	-	-	2	-	-
CO5	2	3	-	-	-	-	-	-	-	-	2	-	-

Mapping: 1-Low, 2-Medium, 3-High

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I - Course Name: 25PH101 Engineering Physics

Prerequisite	Programme Name	Sem	Category	L	T	P	C
Nil	B.E./B.TECH. Common to all	I	BSC	3	0	0	3

II - Course Objectives

1	To understand the concept and principle of energy possessed by mechanical system.
2	To exemplify the propagation and exchange of energy.
3	To identify the properties of materials based on the energy possession.

III - Course Content

Preamble:
The aim of the Engineering Physics course is to offer students a solid background in the fundamentals of Physics and to impart that knowledge in engineering disciplines. The program is designed to develop scientific attitudes and enable the students to correlate the concepts of Physics with the core programmes.

Unit – I	Mechanics and Energy Conservation	9 Periods

Concept of energy - types of energy-conservation of energy - mechanical energy: - translation - rotation - vibration – kinetic energy and potential energy - conservation of linear momentum, angular momentum and energy -Newton's laws of motion - minimization of potential energy - equilibrium - dissipative systems – friction- static and kinetic.

Unit – II	Oscillatory Motion and Resonant Systems	9 Periods

Periodic Motion - simple Harmonic Motion - energy of the Simple Harmonic Motion - pendulum types- simple Pendulum- compound Pendulum -torsional Pendulum – damped and forced oscillations Non-linear Oscillations and Chaos Theory -natural frequency-tuning fork – resonance.

Unit – III	Propagation of Energy	9 Periods

Transfer of energy - material medium - transverse wave - longitudinal wave - standing wave – interference - Doppler effect - sound waves and its characteristics-infrasonic sound-audible sound-ultrasonic sound– piezo electric oscillator-SONAR - human voice - reflection - refraction-beats.

Unit – IV	Phase Transformation of Themodynamic System	9 Periods

Energy in transit - heat - temperature - measurement - specific heat capacity of solid and water - thermal expansion –heat transfer processes-thermodynamics: thermodynamic systems and processes - laws of thermodynamics –isothermal and adiabatic change- entropy - entropy on a microscopic scale -maximization of entropy- thermodynamic properties of Gases and Liquids.

Unit – V	Material Strength and Elastic Deformation	9 Periods

Elastic energy - structure and bonding - stress - strain –types of modulus – elasticity in wire-Tension-bending moment of beam-expansion and compression - elastic limit - stress - strain diagram –factors affecting elasticity - ductility – brittleness-plasticity - rubber elasticity and entropy.

TOTAL: 45 Periods

Reference Books:

1. CJ Fischer, The energy of Physics PartI: Classical Mechanics and Thermodynamics, Cognella Academic Publishing, 2019.

2. PG Hewitt, Conceptual Physics, Pearson education, 2017.

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	3. RA Serway and JWJewitt, Physics for Scientists and Engineers, Thomson Brooks/Cole, 2019. 4. JWalker, DHalliday and RResnick, Principles of Physics, John Wiley and Sons, Inc, 2018. 5. HC Verma, Concepts of Physics (VolI&II), Bharathi Bhawan Publishers & Distributors, New Delhi, 2017.
MOOC/ Web Platforms:	https://onlinecourses.nptel.ac.in/noc25_me167/preview https://onlinecourses.nptel.ac.in/noc25_ch79/preview https://onlinecourses.nptel.ac.in/noc20_mm13/preview https://archive.nptel.ac.in/courses/115/104/115104109/

IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Apply the work-energy theorem to analyse and optimize mechanical system performance.	Apply (K3)
CO2	Analyze free and forced mechanical oscillations in vibrational energy systems.	Understand (K2)
CO3	Analyze the propagation of energy in mechanical systems through transverse and longitudinal waves.	Understand (K2)
CO4	Analyze the exchange of energy and work between the system using thermodynamic principles.	Apply (K3)
CO5	Apply the concept of Elasticity and entropy to understand the mechanical properties of materials.	Understand (K2)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	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	1	1	-	-	-	2	-	-	3	-	-
CO2	3	2	1	2	-	-	-	2	-	-	3	-	-
CO3	3	2	2	1	-	-	-	2	-	-	3	-	-
CO4	3	2	2	1	-	-	-	2	-	-	2	-	-
CO5	3	2	2	1	-	-	-	2	-	-	1	-	-

Mapping: 1-Low, 2-Medium, 3-High

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I - Course Name: 25CH101 Engineering Chemistry

Prerequisite	Programme Name	Sem	Category	L	T	P	C
Nil	B.E./B.TECH. Common to all	I	BSC	3	0	0	3

II - Course Objectives

1	To understand the origin of elements from the universe.
2	To understand the electrochemical cell and its reactions.
3	To understand the origin of elements in the universe.
4	To understand the types, properties and applications of polymers.
5	To learn the different States of Matter and it's applications.

III - Course Content

Preamble:

The aim of the Engineering Chemistry course is to offer students a solid background in the fundamentals of Chemistry and to impart that knowledge in engineering disciplines. The program is designed to develop scientific attitudes and enable the students to correlate the concepts of Chemistry with the core programmes.

Unit – I	Water and its Treatment	9 Periods

Water: sources and impurities, water quality parameters: colour, odour, turbidity, pH, hardness, alkalinity, TDS, COD and BOD, flouride and arsenic. Desalination of brackish water: reverse osmosis. Boiler troubles: scale and sludge, boiler corrosion, caustic embrittlement, priming & foaming. Treatment of boiler feed water: internal treatment (phosphate, colloidal, and calgon conditioning) and external treatment: ion exchange demineralisation and zeolite process.

Unit – II	Electrochemistry	9 Periods

Electrochemical cell - redox reaction, electrode potential- origin of electrode potential- oxidation potential- reduction potential, measurement and applications – standard hydrogen gas electrode - electrochemical series and its significance - Nernst equation derivation.

Unit – III	Evolution of Elements	9 Periods

Hydrogen- Isotopes – Properties and Applications – Hydrogen Bonding-The sun and its Elements – fusion – hypernova vs. supernova – A cosmic comparison –Stellar Evolution: The Death Phase – man – made elements – Heavy Water, Hydrogen Peroxide Preparation and Properties- H_2 Fuel Cell - Hydrogen: Fuel of the Future.

Unit – IV	Polymers	9 Periods

Introduction: Classification of polymers – Natural and synthetic; Thermoplastic and Thermosetting. Functionality – Degree of polymerization. Condensation and copolymerization. Properties of polymers: Tg, Tacticity, Molecular weight – weight average, number average. Techniques of polymerization: Bulk, emulsion, solution and suspension. Preparation, properties and uses of Nylon 6/6, and Epoxy resin, Teflon, PVC.

Unit – V	Phases of matter	9 Periods

Solid – liquid – gas – plasma – Quantum dots –Atomic and Molecular arrangement in different states of matter - Applications of Plasma in Industry - Applications of Quantum Dots in Electronics and Medicine- Liquification of Gases- Critical Temperature-Viscosity

TOTAL: 45 Periods

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Reference Books:	1. Rose Marie Gallagher and Author PaulIngram, Complete Chemistry Cambridge IGCSE, 2nd Edition, Oxford university press, 2020. 2. P. C. Jain and Monica Jain, "Engineering Chemistry",Dhanpat Rai Publishing Company (P) Ltd, New Delhi, 17th Edition, 2018. 3. Peter Atkins, Julio D Paula and James Keeler, Atkins' Physical Chemistry, 12thEdition, Oxford University press, 2019. 4. Gowariker V.R., Viswanathan N.V. and Jayadev Sreedhar, "Polymer Science", New Age International P (Ltd.,) Chennai, 4thEdition, 2021. 5.D Tabor, Gases, liquids and solids and other states of matter, 3rd Edition, Oxford University press, 2018. 6. PL Soni, Text book of inorganic chemistry, Chand publishers, NewDelhi, 2017. 7. J.D. Lee, Concise inorganic chemistry, 5th edition (Reprint), Blackman Science Ltd, France, Wiley-India, 2016.
MOOC/Web Platforms:	https://www.cambridge.org/ https://www.arpansa.gov.au/understanding-radiation/what-is-radiation/ionising-radiation/atomic-structure https://ncert.nic.in/textbook/pdf/kech104.pdf https://www.sciencedirect.com/journal/the-journal-of-chemical-thermodynamics https://www.grc.nasa.gov/www/k-12/airplane/state.html

IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Summarize the water related problems in boilers and their treatment techniques.	Apply (K3)
CO2	Apply the concept Electrochemical Reactions and applications.	Apply (K3)
CO3	Apply the principles of nuclear fusion and stellar evolution to explain the process of hydrogen fusion in stars and the creation of elements.	Apply (K3)
CO4	Discuss the types, properties and applications of polymers.	Analyze (K4)
CO5	Analyze whether the given matter is a solid, liquid, gas, or plasma and interpret the arrangement of atoms.	Analyze (K4)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	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	2	1	1	-	-	-	-	-	-	-	2	-	-
CO2	2	1	1	-	-	-	-	-	-	-	2	-	-
CO3	2	1	1	-	-	-	-	-	-	-	2	-	-
CO4	2	1	1	-	-	-	-	-	-	-	2	-	-
CO5	3	2	2	-	-	-	-	-	-	-	3	-	-

Mapping: 1-Low, 2-Medium, 3-High

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I - Course Name: 25BE101 Fundamentals of Computing

Prerequisite	Programme Name	Sem	Category	L	T	P	C
Nil	B.E/B. Tech. – Common to all	I	ESC	3	0	0	3

II - Course Objectives

1.	To understand the foundational concepts of computer systems, binary codes, and data representation.
2.	To learn how computers perform computations and communicate through input and output devices.
3.	To develop the ability to write and analyze simple programs using assembly language.
4.	To understand the functioning of operating systems, system software components, and application generation.
5.	To apply software development methodologies and basic web technologies for solving real-world problems.

III - Course Content

Preamble: This course enables the student to learn the fundamental principles of computing and the way computers process, store, and represent information. Students will be able to understand binary codes, computational operations, and the interaction between hardware and software components. Concepts of assembly language, operating systems, and software development equip them to design simple programs and apply basic computing methods to real-world problem solving.

Unit – I	**Codes and Combinations**	**8 Periods**
Communication using Mores and Braille binary codes - Digitizing letters, numbers and objects using binary codes - Performing simple operations: addition through binary codes		
Unit – II	**Computation using Computer**	**9 Periods**
Communication to computing devices through various input sources - Computational operation - flow, functions and controls - Communication to output devices - Basic communication protocol.		
Unit – III	**Assembly Language Programming**	**11 Periods**
Little Man Computing (LMC) Model - Instruction Set - Labels - Calculation -Branching - Input - Output - Loops - Simple programs		
Unit – IV	**Operating System and Application Generation BIOS**	**9 Periods**
Device Drivers - Resources - Scheduler - Applications Generation and Creation - Stages of Compilation - Linkers, Loaders and Libraries - Case Study		
Unit – V	**Software Development**	**8 Periods**
Phases of application life cycle management - Software Development Methodologies - Web Page development – Case Study		

TOTAL: 45 Periods

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Text Books:	1. Charles Petzold, "Code: The Hidden Language of Computer Hardware and Software", Microsoft Press, 2009. 2. Peter Norton, "Introduction to Computers", McGraw-Hill, 7th Edition.
Reference Books:	1. David D. Riley & Kenny A. Hunt, "Computational Thinking for the Modern Problem Solver", CRC Press, 2014.
MOOC/Web Platforms:	https://www.khanacademy.org/computing

IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Understand how computers use codes and combinations to represent information.	Understand (K2)
CO2	Learn how computers handle data transfer and communicate with input/output devices	Understand (K2)
CO3	Solve simple problems by writing and using assembly language programs.	Understand (K2)
CO4	Understand the basic working of operating systems and system software.	Understand (K2)
CO5	Apply software development methods to real-world problems.	Apply (K3)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	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	-	-	-	-	2
CO2	3	3	2	1	-	-	-	2	-	-	-	-	2
CO3	2	3	3	2	-	-	-	2	-	-	-	-	2
CO4	3	2	2	1	-	-	-	2	-	-	-	-	2
CO5	2	2	3	2	-	-	-	3	-	-	-	-	2

Mapping: 1-Low, 2-Medium, 3-High

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I - Course Name: 25BEC01 Basics of Electrical Engineering

Prerequisite	Programme Name	Sem	Category	L	T	P	C
Nil	B.E./B.TECH. – Common to all except EEE	I	ESC	2	0	2	3

II - Course Objectives

1	To introduce the basic concepts of DC and AC circuits.
2	To impart knowledge on working principles and applications of electrical machines.
3	To provide understanding of measurements and instrumentation.
4	To introduce the fundamentals of sensors and transducers.
5	To expose students to applications of basic electronics in electrical systems

III - Course Content

Preamble:

This course provides the fundamental knowledge of electrical engineering essential for all branches of engineering. It introduces the principles of DC and AC circuits, working of electrical machines, measurement techniques, sensors, transducers, and the role of basic electronics in electrical and instrumentation systems. The course aims to build a strong foundation for students to understand, analyze, and apply electrical engineering concepts in real-life engineering applications.

Unit – I	DC Circuits	6 Periods

Circuit Components: Conductor, Resistor, Inductor, Capacitor – Ohm's Law – Kirchhoff's Laws – Independent and Dependent Sources – Simple problems – Mesh Analysis with Independent sources only (DC Analysis only)

Unit – II	AC Circuits	6 Periods

Introduction to AC Circuits and Parameters: Waveforms, Average value, RMS Value, Instantaneous power, real power, reactive power and apparent power, power factor .-RLC Circuits (Simple Problems)

Unit – III	Electrical Machines	6 Periods

Construction and Working principle – DC Separately and Self-excited Generators, EMF equation, Types and Applications. Working Principle of DC Motors – Torque Equation, Types and Applications. Construction, Working principle and Applications of Transformer, Three-phase Induction Motor.

Unit – IV	Measurements and Instrumentation	6 Periods

Functional elements of an instrument – Standards and calibration – Operating Principle, types: Moving Coil and Moving Iron meters – Measurement of three-phase power – Energy Meter –DSO (Block diagram) – Data acquisition.

Unit – V	Sensors and Transducers	6 Periods

Transducers -Sensors, solenoids, pneumatic controls with electrical actuator,– Types of valves and applications – Electro-pneumatic systems – Proximity sensors, Limit switches, Piezoelectric, Hall effect, Photo sensors, Strain gauge, LVDT, Optical and Digital transducers, Smart sensors, Thermal Imagers.

TOTAL:30 Periods

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Lab Experiments: **(30 Periods)**

1.Staircase Wiring
2.Single lamp controlled by single switch
3. Verification of ohms and Kirchhoff's Laws.
4.Load test on DC shunt motor
5.Load Test on Induction Motor
6.Energy meter wiring and related calculations
7.Mini project on sensors

Total: 60 Periods

Reference Books:	1. Kothari D.P. and I.J. Nagrath, Basic Electrical and Electronics Engineering, 2nd Edition, McGraw Hill, 2020. 2. S.K. Bhattacharya, Basic Electrical and Electronics Engineering, Pearson Education, 2019. 3. Sedha R.S., A Textbook of Applied Electronics, S. Chand & Co., 2008. 4. Sawhney A.K. and Puneet Sawhney, A Course in Electrical & Electronic Measurements & Instrumentation, Dhanpat Rai, 2015. 5. Albert Malvino, David Bates, Electronic Principles, 7th Edition, McGraw Hill, 2017. 6. Thomas L. Floyd, Digital Fundamentals, 11th Edition, Pearson Education, 2017. 7. James A. Svoboda & Richard C. Dorf, Introduction to Electric Circuits, Wiley, 2018. 8. Muhammad H. Rashid, Power Electronics – Circuits, Devices and Applications, Pearson, 2017. 9. H.S. Kalsi, Electronic Instrumentation, Tata McGraw-Hill, 2010.
MOOC/ Web Platforms:	https://nptel.ac.in/courses/108/105/108105159 https://ocw.mit.edu

IV - Course Outcomes

On completion of the course, the students will be able to		**Bloom's Level Mapped**
CO1	Compute and analyze electrical circuit parameters for simple DC/AC problems.	Analyze (K4)
CO2	Explain the working principles and applications of electrical machines.	Understand (K2)
CO3	Demonstrate understanding of measurement systems and instrumentation.	Understand (K2)
CO4	Apply the concepts of sensors and transducers to engineering systems.	Apply (K3)
CO5	Relate basic electronics to electrical and instrumentation applications.	Understand (K2)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	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	2	-	-	-	-	-	-	1	-
CO2	3	2	2	2	2	-	-	-	-	-	-	1	-
CO3	2	2	-	3	2	1	-	-	-	-	-	1	-
CO4	3	2	2	2	3	-	-	-	-	-	1	1	-
CO5	3	2	2	-	3	-	-	-	1	-	2	1	-

Mapping: 1-Low, 2-Medium, 3-High

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I - Course Name: 25HS102 Heritage of Tamils - தமிழர்மரபு

Prerequisites	Programme Name	Sem	Category	L	T	P	C
Nil	B.E./B.TECH. Common to all	I	HSMC	1	0	0	1

II - Course Objectives

1	Appreciate Tamil art, culture and literature Learn the history and culture of Tamil language.
2	Relate to various art forms and their relevance to development.
3	Acknowledge the rich heritage and significant achievements of the Tamils.
4	Tamils Appreciate the contribution of Tamils to nation building.
5	Summarize the contribution of Tamil in Indian culture.

III - Course Content

Preamble:

This course provides an overview of the rich cultural, literary, artistic, and historical heritage of the Tamil people. It introduces the evolution of the Tamil language within the Dravidian family, the ethical foundations in Sangam literature, and the management principles found in the Thirukkural. It explores Tamil epics, the influence of Jain and Buddhist traditions, the rise of Bhakti literature, and the contributions of poets like Bharathi and Bharathidasan to modern Tamil writing. The course further examines traditional and modern art forms, sculpture, folk arts, heroic games, and the socio-economic role of temples. It also highlights ancient landscapes (thinai) and their cultural significance. trade, education, and maritime achievements of the Sangam age.

Unit – I	மொழி மற்றும் இலக்கியம்: Language and Literature	3 Periods

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.

இந்திய மொழிக் குடும்பம்-திரவிடமொழி-சங்க இலக்கியம்-அறம்-சமயச் சார்பற்ற நதன்மை-திருக்குறலளில் மேலாண்மைக் கருத்துக்கள்-தமிழ் காப்பியங்கள்-சமண பௌத்த சமயங்களின் தாக்கம்-பக்தி இலக்கியம்-ஆழ்வார்கள் நாயன்மார்கள்-சிற்றிலக்கியங்கள்-நவீன இலக்கியத்தின் வளர்ச்சி-தமிழ் இலகியவளர்ச்சியில் பாரதியார் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

Unit – II	மரபு-பாறை ஓவியங்கள் முதல் நவீனஓவியங்கள் வரை:சிற்பக்கலை: Rock Art Paintings to Modern Art – Sculpture	3 Periods

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.

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திடுகல் முதல் நவீன சிற்பங்கள் வரை-ஐம்பொன்சிலைகள்-பழங்குடியினர் தயாரிக்கும்கைவினைப் பொருட்கள்-பொம்மைகள்-தேர் செய்யும் கலை-சுடுமண் சிற்பங்கள்-நாட்டுப்புறத் தெய்வங்கள்-திருவள்ளுவர் சிலை-இசைக்கருவிகள்-தமிழர்களின் சமூக பொருளாதர வாழ்வில் கோயில்களின் பங்கு.		
Unit – III	**நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள்: Folk and Martial Arts**	**3 Periods**
Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leatherpuppetry, Silambattam, Valari, Tiger dance – Sports and Games of Tamils. தெருக்கூத்து-கரகாட்டம்-வில்லுப்பாட்டு-கணியன் கூத்து-ஒயிலாட்டம்-தோல்பாவைக்கூத்து-சிலம்பாட்டம்-வளரி-புலியாட்டம்-தமிழர்களின் விளையாட்டு.		
Unit – IV	**தமிழர்களின் திணைக் கோட்பாடுகள்: Thinai Concept of Tamils**	**3 Periods**
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. தமிழகத்தின் தாவரங்களும் விளங்குகளும்-தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள்-தமிழர்கள் பொற்றிய அறக்கோட்பாடுகள்-சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவும்,கல்வியும்-சங்ககால நகரங்களும் துறைமுகங்களும் சங்க இலக்கியத்தில் ஏற்றுமதி மற்றும் இறக்குமதி-கடல் கடந்த நாடுகளின் சோழர்களின் வெற்றி.		
Unit – V	**இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்க்குத் தமிழர்களின் பங்களிப்பு: Contribution of Tamils to Indian National Movement and Indian Culture**	**3 Periods**
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. இந்திய விடுதலைப் போரில் தமிழர்களின் பங்கு-இந்தியாவின்பிற்பகுதிகளில் தமிழ் பண்பாட்டின் தாக்கம்-சுயமரியாதை இயக்கம்.-இந்திய மருத்துவத்தில் சித்த மருத்துவத்தின் பங்கு-கல்வெட்டுகள்-கையெழுத்துப்படிகள்-தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.		
		Total: 15 Periods
Text Books:	1. தமிழர்மரபு / Heritage of Tamils- Poobalan - VRB Publishers Pvt. Ltd. 2. பொருநை- ஆற்றங்கரை நாகரிகம்.(தொல்லியல் துறை வெளியீடு.) 3. கீழடி-வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம்(தொல்லியல் துறை வெளியீடு.) 4. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by:RMRL)	
Reference Books:	1. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print) 2. 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 Tamils Studies). 4. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)	
MOOC/Web Platforms:	https://www.tnarch.gov.in/ta/epigraphy/ https://www.tamildigitallibrary.in/admin/assets/book	

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	https://www.tamilhistory.co.in/2020/05/heroic-games-ancient-tamils-jallikattu-silambam.html https://www.tamilvu.org/ta/courses-degree-a061-a0611-html-a0611313-10334 https://tamil.samayam.com/others-news/independence-day-2016/news/freedom-fighters-of-india/articleshow/53666058.cms https://www.tamildigitallibrary.in/admin/assets/book https://www.scribd.com/document/646362880/Text-book

IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Understand the significance of Tamil as a classical language	Understand (K2)
CO2	Relate the art and culture in Tamil language	Understand (K2)
CO3	Explain the importance of music, dance and martial arts that were derived from Tamil Culture	Understand (K2)
CO4	Understand the poetic mode or theme of classical language	Understand (K2)
CO5	Relate the contribution of Tamils to Nation building	Understand (K2)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	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	-	-	-	-	-	1	1	-	-	-	1	-	-
CO2	-	-	-	-	-	1	1	-	-	-	1	-	-
CO3	-	-	-	-	-	1	1	-	-	-	1	-	-
CO4	-	-	-	-	-	1	1	-	-	-	1	-	-
CO5	-	-	-	-	-	1	1	-	-	-	1	-	-

Mapping: 1-Low, 2-Medium, 3-High

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I - Course Name: 25BS111 Physics and Chemistry Laboratory

Prerequisites	Programme Name	Sem	Category	L	T	P	C
Nil	B.E./B.TECH. Common to all	I	BSC	0	0	4	2

II - Course Objectives (Physics Laboratory)

1	To learn the correct usage of several types of physics lab equipment.
2	To learn, how to gather, present, and understand facts in a simple and succinct manner.
3	To learn Physics-related problem-solving abilities and experimental data interpretation.
4	To identify experimental measurement error and the methods used to reduce it
5	To encourage active participation from the learner in all aspects of the lab exercises.

III - Course Content

Preamble:

This course aims to provide practical training in the estimation of physical parameters like band gap, ultrasound velocity, liquid compressibility, thin wire thickness, Young's modulus, and knowledge of the operation of the photoelectric effect, Michelson interferometer, laser, and fibre optics as well as to provide project-based skills development.

PHYSICS LABORATORY:

1. Non-uniform Bending– Determination of young's modulus.
2. Simple harmonic oscillations of cantilever.
3. Torsional pendulum – Determination of rigidity modulus of wire and moment of inertia of disc.
4. Air wedge – Determination of thickness of a thin sheet/wire.
5. Laser- Determination of the wave length of the laser using grating.
6. Ultrasonic Interferometer – determination of the velocity of sound and compressibility of liquids.
7. Particle size determination using LASER.

TOTAL: 30 Periods

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IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Apprehend the concepts of interference, diffraction of light and recognize the resonance concept of waves.	Understand (K2)
CO2	Apply the principles of operations of optical fibers, semiconductor using simple circuits and interaction of electromagnetic waves and crystalline solids.	Apply (K3)
CO3	Measure the elastic moduli and moment of inertia of given materials with the help of suggested procedures.	Apply (K3)
CO4	Experiment the relationship between the light and matter & properties of liquids.	Analyze (K4)
CO5	Estimate the velocity of sound and compressibility of liquid.	Understand (K2)

II - Course Objectives (Chemistry Laboratory)

1	To inculcate experimental skills to test basic understanding of water quality parameters, such as, acidity, alkalinity, hardness, DO, chloride and copper.
2	To induce the students to familiarize with electroanalytical techniques such as, pH metry and potentiometry.
3	To make the student to acquire practical skills conductometry in the determination of impurities in aqueous solutions.
4	To demonstrate the analysis of metals and alloys.
5	To demonstrate the synthesis of nanoparticles.

III - Course Content

Preamble:
This course aims to provide the students, a basic practical knowledge in chemistry. The objective of this course is to develop intellectual and psychomotor skills of the students by providing hands on experience in quantitative, electrochemical and photo-chemical analysis.

CHEMISTRY LABORATORY:

1. Estimation of HCl using Na2CO3 as primary standard and Determination of alkalinity in water sample.
2. Determination of total, temporary & permanent hardness of water by EDTA method.
3. Determination of DO content of water sample by Winkler's method.
4. Determination of chloride content of water sample by argentometric method.
5. Estimation of copper content of the given solution by EDTA method.
6. Determination of strength of acids in a mixture of acids using conductivity meter.
7. Conductometric titration of strong acid vs strong base.

TOTAL: 30 Periods

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Reference Books:	1. Vogel's Text book of Quantitative Chemical Analysis(8th edition,2014).
MOOC/Web Platforms:	https://www.youtube.com/watch?v=5b2LNdsfQdQ https://www.youtube.com/watch?v=k8GDv-uhlyU

IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO.	Analyze (K4)
CO2	Determine the amount of metal ions through volumetric and spectroscopic techniques.	Apply (K3)
CO3	Analyse and determine the composition of alloys.	Analyze (K4)
CO4	Learn simple method of synthesis of nanoparticles	Understand (K2)
CO5	Quantitatively analyse the impurities in solution by electro analytical methods.	Analyze (K4)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	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	1	-	-	-	-	1	3	2	-	-	-	-
CO2	3	1	-	-	-	-	1	2	1	-	-	-	-
CO3	3	3	-	-	-	-	2	2	1	-	-	-	-
CO4	3	2	-	-	-	-	1	3	2	-	-	-	-
CO5	3	2	-	-	-	-	2	1	2	-	-	-	-

Mapping: 1-Low, 2-Medium, 3-High

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Prerequisite	Programme Name	Sem	Category	L	T	P	C
Nil	B.E./B.TECH. Common to all	I	EEC	0	0	2	1

I - Course Name: 25HS111 English Laboratory - I

II – Course Objectives

1	To implement English Vocabulary at command and ensure language proficiency.
2	To achieve better technical writing and Presentation skills.
3	Identify the common errors in speaking and writing English.

III – Course Content

List of Experiments:

1. Listening for data, for specific information, for opinion.
2. Listening to Ted Talks-Listening for specific information.
3. Self-Introduction - Recreating interview scenarios -Haptics - Gestures -Proxemics- Facial expressions- Paralinguistic / Vocalic- Body Language- Appearance-Eye Contact-Artefacts.
4. Short Speeches - Making short formal and informal speeches
5. Speaking: Tendering verbal apologies, and explanations, persuading a listener/ audience-Hierarchy in Business correspondence.
6. Active reading- Newspaper, short paragraphs, excerpts, articles, magazines and editorials
7. Identifying the central themes/ crux-Interpreting tone - formal/informal/semi-formal-Note-taking
8. Narrative Expression- Travelogue and Story Telling Technique
9. Summary writing, selective summary, paraphrasing, opinion pieces-Finding synonyms in the context Paraphrasing
10. Descriptive Expression-Process Description and Blog Writing

TOTAL: 30 Periods

Text Books:	1. Sasikumar, V, et.al. A Course in Listening & Speaking Foundation Books, 2005. 2. Murphy, Raymond. English Grammar in Use: A Self-Study Reference and Practice Book for Intermediate Students: with Answers. Cambridge: Cambridge University Press, 1985. 3. Prasad, Hari Mohan. A Handbook of Spotting Errors. Mcgraw Hill Education, 2010.
Reference Books:	1. Reynolds, John. Cambridge IGCSEA, First Language English. 2018th ed., Hodder Education, 2018. 2. Wiggins, Grant P., and Jay McTighe. Understanding by Design. Association for Supervision and Curriculum Development, 2008

Web Sources	www.studyladder.com www.fluentu.com www.esl-lab.com www.wordsworthelp.com

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IV – Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Demonstrate improved listening comprehension skills.	Apply (K3)
CO2	Practice correct pronunciation, stress, rhythm and intonation.	Analyze (K4)
CO3	Engage in oral communication tasks.	Apply (K3)
CO4	Deliver short Oral Presentation.	Create (K6)
CO5	Use Language lab tools, software and digital resources.	Apply (K3)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	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	1	-	-	-	-	-	3	2	-	3	-	-
CO2	3	1	-	-	-	-	-	3	2	-	3	-	-
CO3	3	3	-	-	-	-	-	3	2	-	3	-	-
CO4	3	2	-	-	-	-	-	3	2	-	3	-	-
CO5	3	2	-	-	-	-	-	3	2	-	3	-	-

Mapping: 1-Low, 2-Medium, 3-High

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I - Course Name: 25BE111 - Basic Computing and Problem-Solving Laboratory

Prerequisite	Programme Name	Sem	Category	L	T	P	C
Nil	All B.E /B. Tech Programmes	I	ESC	0	0	2	1

II - Course Objectives

1.	To enable students to understand the basics of programming constructs such as input/output operations, expressions, and decision-making.
2.	To develop logical thinking through hands-on implementation of iterative structures and pattern-generation problems.
3.	To provide the ability to handle arrays and strings for real-time data processing applications.
4.	To Introduce modular programming concepts using functions to design structured programs.
5.	To familiarize students with dynamic data handling and memory management using pointers.

III - List of Experiments

Note: The lab instructor is expected to design problems based on the topics listed. The Examination shall not be restricted to the sample experiments designed.

1. Basic Calculator Using Input/Output and Expressions
2. Simple Voting System Using Decision Making Constructs
3. Number Pattern Generator Using Loops
4. Student Marks Management Using Arrays
5. Text Processing Tool Using String Handling
6. Library Management System Using Functions
7. Contact Management System Using Pointers

LIST OF EQUIPMENTS:

Tools: Turbo C/Turbo C++/GCC

TOTAL: 30 Periods

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IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Demonstrate knowledge on C programming concepts using input and output expressions.	Understand (K2)
CO2	Develop programs in C using basic constructs	Apply (K3)
CO3	Develop programs in C using loops	Apply (K3)
CO4	Develop applications in C using arrays	Apply (K3)
CO5	Develop applications in C using string handling and pointers	Apply (K3)

V- Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	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	1	1	-	-	-	1	1	-	1
CO2	3	2	2	1	1	1	-	-	-	1	1	-	1
CO3	3	2	2	1	1	1	-	-	-	-	1	-	1
CO4	3	2	3	1	2	1	-	-	1	-	1	-	1
CO5	3	2	3	2	2	1	-	-	1	1	1	-	1

Mapping: 1-Low, 2-Medium, 3-High

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I - Course Name: 25BEC02 Basics of Electronics Engineering

Prerequisite	Programme Name	Sem	Category	L	T	P	C
Nil	All Programmes except Civil, EEE, ECE and Mechanical Engineering	I	ESC	2	0	2	3

II - Course Objectives

1	To understand the concept of energy transmission through mechanical, electrical and electromagnetic means.
2	To understand the use of PN Junction Diode and BJT for signal conditioning.
3	To familiarize with the working principle of PN Junction Diode and BJT for the design of basic Digital Logic.
4	To learn the working and characteristics of Special Purpose Semiconductor Electronic Devices.

III - Course Content

Preamble:
This course provides an introduction to signal transmission and conditioning using mechanical, electrical, and electromagnetic means. It emphasizes the role of diodes, transistors, and special-purpose devices in amplification, switching, energy conversion, and digital logic, forming a foundation for advanced studies in electronics and communication.

Unit-I	Energy Transfer and Signals	6 Periods

Energy Transmission through Mechanical, Electrical and Electromagnetic means - Signal as Energy Transmission - Complexity in signal transmission (Volume of Information - Distance and Time taken) - Limitations of Mechanical Energy Transmission, Electrical and Electromagnetic Signal Transmission - Need for Conversion between Electrical and Mechanical Signals.

Unit-II	Signal Conditioning using Diode	6 Periods

Semiconductor Materials - Flow of electrical energy through PN Junction Diode - Signal Clipping - Signal Clamping and Rectification using PN Junction Diode - Limitations of PN Junction Diode – Zener Diode - Voltage Regulation using Zener Diode

Unit-III	Signal Conditioning using Transistor	6 Periods

Need for controlling electrical signals - Principle of Bipolar Junction Transistor operation - Signal Switching and Amplification using BJT - Limitations of BJT - Principle of Field Effect Transistor operation.

Unit-IV	Logic Synthesis using Diode and Transistors	6 Periods

Logic Gates - PN Junction and BJT as electronic switches - Digital Logic Synthesis using Diode and Transistor: Diode Logic - Resistor Transistor Logic - Diode Transistor Logic - Transistor Logic.

Unit-V	Special Purpose Semiconductor Devices	6 Periods

Variable Capacitance using Varactor Diode – Voltage triggered switch using Uni-Junction Transistor – Current-controlled Swich using Silicon Controlled Rectifier - Electrical Energy to Light Energy conversion using Light Emitting Diode - Light Energy to Electrical Energy conversion using Solar Cell.

TOTAL: 30 Periods

List of Experiments (30 Periods)

EXPERIMENT 1 - Design a voltage multiplier to convert the low voltage from the mains power supply to the high voltage to operate the microwave oven.

EXPERIMENT 2 - Design and construct regulated DC power supply for Mobile phone charger.

EXPERIMENT 3 - Design and construct an audio amplifier circuit to play the mobile music in a huge speaker.

EXPERIMENT 4 - Design and construct Switching circuit for the Pump to control over flow and drain condition for overhead tank using PN junction diode.

EXPERIMENT 5 - Design and construct BJT based circuit to implement two-way connection for stair case light application.

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TOTAL: 60 Periods

Text Books:	1.David A. Bell, Electronic Devices and Circuits, Oxford Higher Education press, 5th Edition, 2010. 2.Robert L. Boylestad and Louis Nasheresky, "Electronic Devices and Circuit Theory", 10th, Edition, Pearson Education / PHI, 2008. 3.Adel .S. Sedra, Kenneth C. Smith, Micro Electronic Circuits, Oxford University Press, 7th, Edition, 2014.
Reference Books:	1.Thomas L. Floyd, Electronic Devices: Electron Flow Version, Nineth Edition, Prentice Hall, 2012. 2.J Millman, C. Halkias & Satyabrata JIT, Electronic Devices and Circuits, Tata McGraw-Hill, 2007. 3.L Robert Boylestead, Louis Nashelsky, Electronic Devices and Circuit Theory, Pearson Education 2006. 4.Behzad Razavi, Microelectronics, Wiley India Pvt. Ltd.; 2nd edition (2018)
MOOC/WEB Platforms:	https://onlinecourses.nptel.ac.in/noc24_ee17/preview https://iipseries.org/assets/docupload/rsl20248EE30140CB96C2A.pdf https://en.wikipedia.org/wiki/Light-emitting_diode

IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Understand the need for electrical and electromagnetic signal transmission.	Understand (K2)
CO2	Analyze the working principle and characteristics of PN junction diode and Zener diode.	Analyze (K4)
CO3	Analyze the working principle and characteristics of Bipolar Junction Transistor.	Analyze (K4)
CO4	Apply the working principle of PN Junction diode and BJT for designing basic Digital Logic functions	Apply (K3)
CO5	Analyze the energy conversion needs and working principle of special purpose electronic devices.	Analyze (K4)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/PSOs	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	3	3	1	-	-	-	-	-	-	-	2	-
CO2	3	3	3	2	-	-	-	-	-	-	-	3	-
CO3	3	3	3	2	-	-	-	-	-	-	-	2	-
CO4	3	3	3	2	-	-	-	-	-	-	-	2	-
CO5	3	3	3	1	-	-	-	-	-	-	-	2	-

Mapping: 1-Low, 2-Medium, 3-High

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SEMESTER II

I - Course Name: 25HS201 Professional Communication

Prerequisite	Programme Name	Sem	Category	L	T	P	C
Nil	B.E./B.TECH. Common to all	II	HSMC	2	0	0	2

II - Course Objectives

1.	Develop advanced reading skills that enable students to comprehend, infer and critically analyze academic, technical and professional texts.
2.	Strengthen grammar proficiency and vocabulary range through systematic practice in word-building, collocations, sentence structures, conditional clauses and discourse markers.
3.	Enhance students' ability to write clear, concise and well-structured professional documents such as emails, memos, minutes, agendas, business letters, brochures and manuals.
4.	Equip learners with the skills to interpret data, identify trends and accurately express information using graph-specific and technical vocabulary.
5.	Cultivate academic writing competencies, including summarizing, proofreading, reviewing research papers and composing argumentative, cause-effect and persuasive writing.

III - Course Content

Preamble:
This course equips engineering students with essential communication skills through advanced reading, writing, grammar and vocabulary training. It prepares learners to handle academic, technical and workplace communication with clarity, accuracy and confidence.

Unit – I	READING & PROFESSIONAL COMMUNICATION	6 Periods

Reading- Importance of Good Communication- Inference and Reading for facts vs opinions - **Grammar and Vocabulary-** Conditional clauses- Hypothetical questions and Answers Synonyms and Antonyms, Selecting Words, **Writing**-Email Etiquette- Email Writing- Responding to Emails.

Unit – II	VOCABULARY EXPANSION & ACADEMIC WRITING	6 Periods

Prefixes and Suffixes- Numerical Adjectives, Collocations, Compound Nouns, **Writing** – Recommendations- Suggestions- Writing- Cause and Effect, Argumentative, Persuasive. Checklist.

Unit – III	READING SKILLS & WORKPLACE DOCUMENTATION	6 Periods

Reading – Skimming – Reading to Summarize- Abbreviations, Acronyms and Short-forms- Phrasal Verbs- Cloze test using verbs-**Writing** -Memorandum - Minutes of Meeting- Agenda- Transcoding – Identifying Trends and Patterns in Graphs and Expressing with Graph Specific Vocabulary.

Unit – IV	APPLIED READING & BUSINESS CORRESPONDENCE	6 Periods

Reading - Case Studies- Winning Strategies excerpts from *You Can Win*-Determiners-**Writing**- Business letters- Call for Quotation- creating brochures-catalogues-manuals.

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Unit - V	ACADEMIC & CAREER COMMUNICATION	6 Periods
Reading Newspaper Articles- Interpreting and Analyzing a Research Paper- Approaches to Review paper-Discourse Markers- Job Application letters-Resume building.		
		TOTAL: 30 Periods

Reference Books:	1. Raman, Meenakshi and Sangeeta Sharma. *Technical Communication: Principles and Practice*. Oxford University Press, 2015. 2. Rizvi, M. Ashraf. *Effective Technical Communication*. Tata McGraw Hill Education, 2017. 3. Murphy, Raymond. *English Grammar in Use: A Self-Study Reference and Practice Book for Intermediate Students with Answers*. Cambridge University Press, 2019. 4. Lewis, Norman. *Word Power Made Easy*. Goyal Publishers / Penguin Random House, 2014. 5. Khera, Shiv. *You Can Win: A Step-by-Step Tool for Top Achievers*. Bloomsbury India, 2014.
MOOC/Web Platforms:	https://swayam.gov.in https://www.edx.org https://learnenglish.britishcouncil.org https://www.futurelearn.com

IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Interpret and analyze academic, technical and professional texts using suitable reading strategies.	Analyze (K4)
CO2	Apply appropriate grammatical structures and discourse markers for accurate and coherent communication.	Apply (K3)
CO3	Prepare professional documents such as emails, memos, minutes, agendas, business letters, brochures and manuals.	Understand (K2)
CO4	Use an enhanced range of vocabulary, collocations and word-formation techniques in professional contexts.	Apply (K3)
CO5	Compose structured essays, summaries, reviews, job applications and resumes using effective writing techniques.	Apply (K3)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO1	PSO2
CO1	-	-	-	-	-	-	-	2	3	-	2	-	-
CO2	-	-	-	-	-	-	-	2	3	-	2	-	-
CO3	-	-	-	-	-	-	-	2	3	-	2	-	-
CO4	-	-	-	-	-	-	-	2	3	-	2	-	-
CO5	-	-	-	-	-	-	-	3	3	-	3	-	-

Mapping: 1-Low, 2-Medium, 3-High

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I - Course Name: 25MA203 Partial Differential Equations and Transforms

Prerequisites	Programme Name	Sem	Category	L	T	P	C
Nil	B.E. - ECE	II	BSC	3	1	0	4

II - Course Objectives

1.	To study the formation and solve the Partial Differential Equations.
2.	To understand the concepts of Dirichlet's conditions and Fourier series.
3.	To Study the application of transform techniques using Fourier Transforms.
4.	To understand the concept of Laplace transforms can be used for efficiently solving the problems that occur in various branches of engineering disciplines.
5.	To provide the basic concepts of Z-Transform and solve the difference equations.

III - Course Content

Preamble:
Fourier analysis allows modelling periodic phenomena which appears frequently in engineering, alternating electric currents or the motion of planets. The idea of Fourier analysis is to represent complicated functions in terms of simple periodic functions, namely cosines and sines.

Unit – I	**PARTIAL DIFFERENTIAL EQUATIONS**	**12 Periods**
Introduction to ODE – Standard types – Formation of partial differential equations - Solutions of standard types of first order partial differential equations - Lagrange's linear equation - Homogenous type of Second order Linear differential equations with constant coefficients.		
Unit – II	**FOURIER SERIES**	**12 Periods**
Fourier series – Euler's formulae –Dirichlet's conditions – Change of interval – Half range series – RMS Value – Parseval's identity – Harmonic analysis.		
Unit – III	**FOURIER TRANSFORMS**	**12 Periods**
Fourier transform pair – Properties – Fourier sine and cosine transforms – Parseval's identity– Convolution theorem (excluding Proof) .		
Unit – IV	**LAPLACE TRANSFORMS**	**12 Periods**
Laplace Transforms of standard functions – Laplace transform of periodic functions – Initial and final value theorems – Inverse Laplace transform – Partial fractions method – Convolution theorem (excluding Proof) – Application to ordinary differential equations with constant coefficients.		
Unit – V	**Z – TRANSFORMS AND DIFFERENCE EQUATIONS**	**12 Periods**
Z-transform - Standard functions – Inverse Z-transform - partial fractions and convolution theorem - Formation of difference equation – Solution of difference equations using Z - transform.		
		TOTAL: 60 Periods

Text Books:	[1] Veerarajan T., "Transforms and Partial Differential Equations", Tata McGraw Hill Education Pvt. Ltd., New Delhi, Third Edition, 2016. [2] Grewal B.S., "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, Delhi, 2012.

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Reference Books:	[1] Bali. N.P and Manish Goyal, "A Textbook of Engineering Mathematics", 9th Edition, Laxmi Publications Pvt Ltd, 2014. [2] Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Edition, Wiley India, 2015. [3] Ray Wylie C and Barrett L.C, "Advanced Engineering Mathematics" Tata McGraw Hill Education Pvt Ltd, Sixth Edition, New Delhi, 2012.
MOOC/Web Platforms:	https://archive.nptel.ac.in/courses/111/103/111103021/ https://archive.nptel.ac.in/courses/111/106/111106139/

IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Apply Partial Differential Equation in real time Engineering problems.	Apply (K3)
CO2	Understand general periodic functions and apply in problems of Fourier series, which are sums of sines and cosines.	Understand (K2)
CO3	Use the Fourier transform as the tool to connect the time domain and frequency domain in signal processing.	Apply (K3)
CO4	Apply Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.	Apply (K3)
CO5	Understand the concepts of Z - Transform techniques for discrete time systems.	Understand (K2)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO1	PSO2
CO1	3	3	1	1	-	-	-	-	2	-	-	2	-
CO2	3	3	1	1	-	-	-	-	2	-	-	2	-
CO3	3	3	1	1	-	-	-	-	2	-	-	2	-
CO4	3	3	1	1	-	-	-	-	2	-	-	2	-
CO5	3	3	1	1	-	-	-	-	2	-	-	2	-

Mapping: 1-Low, 2-Medium, 3-High

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I - Course Name: 25BS201 Environmental Sciences and Sustainability

Prerequisites	Programme Name	Sem	Category	L	T	P	C
Nil	B.E. /B.TECH. Common to all	II	BSC	2	0	0	2

II - Course Objectives

1.	To introduce the basic concepts of environment, ecosystems and biodiversity and emphasize on the biodiversity of India and its conservation.
2.	To impart knowledge on the causes, effects and control or prevention measures of environmental pollution and waste management.
3.	To study the dynamic processes and understand the features of the earth's interior and surface.
4.	To facilitate the understanding of global and Indian scenario of renewable and nonrenewable resources, causes of their degradation and measures to preserve them.
5.	To inculcate and embrace sustainability practices and develop a broader understanding on green materials, energy cycles and analyzes the role of sustainable urbanization.

III - Course Content

Preamble:
The objective of this course is intended to make the students to understand the basic concepts of environment, ecology and pollution of the current environmental issues and to participate in various activities on conserving and protecting the environment.

Unit – I	ENVIRONMENT AND BIODIVERSITY	6 Periods

Definition, scope and importance of environment – need for public awareness. Eco-system and energy flow – Ecological Pyramids - ecological succession - Types of biodiversity: genetic, species and ecosystem diversity – values of biodiversity - India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss- poaching of wildlife- man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: in-situ and ex-situ.

Unit – II	ENVIRONMENTAL POLLUTION AND WASTE MANAGEMENT	6 Periods

Causes, effects and preventive measures of water pollution, soil pollution, air pollution and noise pollution - Solid waste: Industrial- hazardous- Biomedical and e-waste management- Case studies on occupational health and safety management system (OHASMS) - Environmental protection - environmental protection acts.

Unit – III	SOCIAL ISSUES AND THE ENVIRONMENT	6 Periods

Water conservation, rain water harvesting, watershed management- Issues and possible solutions – climate change, global warming, acid rain, ozone layer depletion-nuclear accidents and holocaust- case studies.

Unit – IV	RENEWABLE SOURCES OF ENERGY	6 Periods

Solar – Wind – Hydro - Geothermal, Biomass, and Ocean: Tidal -Wave energy - Hydrogen Fuel Cells - principles, applications (electricity, heating, transport) - advantages (clean, sustainable) - challenges (storage, cost) - clean alternatives to fossil fuels - modern energy transition.

Unit – V	SUSTAINABILITY PRACTICES	6 Periods

Sustainable Development Goals- targets -Zero waste and 3R and 5R concepts – linear economy - circular economy - ISO 14000 series - material life cycle assessment, environmental impact assessment- Sustainable habitat: green buildings - green materials - energy efficiency -

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Sustainable transports. Sustainable energy: non-conventional sources- energy cycles carbon cycle - emission and sequestration - green engineering: sustainable urbanization - socio economical and technological change.
TOTAL: 30 Periods

Text Books:	1. Anubha Kaushik and C. P. Kaushik's 'Perspectives in Environmental Studies', 6th Edition, New Age International Publishers, 2018. 2. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, 2017. 3. Gilbert M. Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education, 2004. 4. Allen, D. T. and Shonnard, D. R., 'Sustainability Engineering: Concepts, Design and Case Studies', Prentice Hall. 1st Edition, 2011. 5. Bradley. A.S; Adebayo, A.O., Maria, P. 'Engineering applications in sustainable design and development', Cengage learning. 1st Edition, 2015. 6. Environment Impact Assessment Guidelines, Notification of Government of India, 2006.
Reference Books:	1. R.K. Trivedi, 'Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards', Vol. I and II, Enviro Media, 2010. 2. Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, Third Edition, 2015. 3. Erach Bharucha 'Textbook of Environmental Studies for Under graduate Courses' Orient Blackswan Pvt. Ltd. 2021.
MOOC/Web Platforms:	https://onlinecourses.nptel.ac.in/

IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.	Understand (K2)
CO2	Identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures and waste management in the society.	Understand (K2)
CO3	Identify the causes, effects of natural disasters and contribute to the preventive measures in the society.	Apply (K3)
CO4	Identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.	Understand (K2)
CO5	Demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.	Apply (K3)

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V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO1	PSO2
CO1	2	1	-	-	-	2	3	-	1	-	2	-	-
CO2	3	2	-	-	-	3	3	-	1	-	2	-	-
CO3	3	1	1	-	-	2	2	-	-	-	2	-	-
CO4	3	1	1	1	-	2	2	-	1	-	2	-	-
CO5	3	2	1	-	-	2	2	-	1	-	1	-	-

Mapping: 1-Low, 2-Medium, 3-High

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I - Course Name: 25BE202 Python Programming

Prerequisite	Program Name	Sem	Category	L	T	P	C
25BE101-Fundamentals of Computing	B.E/B.Tech. – Common to CSE, IT, AI&DS, CSE (AI&ML), CSE (CYBER SECURITY), ECE and EEE	II	ESC	3	0	2	4

II - Course Objectives

1.	To learn the basic concepts of Python such as data types, expressions, operators, and writing simple programs.
2.	To understand how to use conditions, loops, functions, recursion, and strings to build programs.
3.	To use lists, tuples, dictionaries, and list comprehension to store and work with data.
4.	To learn how to read and write files and use Python libraries like NumPy, Pandas, and Matplotlib for data processing and graphs.
5.	To know how to handle errors and exceptions to make programs work correctly and without interruption.

III - Course Content

Preamble: Python is a high-level, easy-to-learn programming language used for applications such as web development, data analysis, automation, and AI. This course introduces students to basic programming concepts, including variables, control statements, functions, data structures, and file handling. Through practical exercises, students develop problem-solving skills and learn to write clear and efficient Python programs.

Unit – I	DATATYPES, EXPRESSIONS, STATEMENTS	9 Periods

Python Interpreter and Interactive Mode; Values and Types: Int, Float, Boolean, String and List; Variables, Expressions, Statements, Operators -Precedence of Operators, Comments. Illustrative Programs: Exchange the values of two Variables, Circulate the values of n variables, distance between two points

Unit – II	CONTROL FLOW, FUNCTIONS, STRINGS	9 Periods

Control Flow Statements- Conditional Statements- Looping Statements- Fruitful Functions: Return Values- Parameters- Local and Global Scope-Modules and Functions-Recursion; Strings: String Slices, Immutability, String Functions and Methods, String Module; Lists as Arrays. Sets -Set Operations, Classes.
Illustrative Programs: Sum an array of numbers.

Unit – III	LISTS, TUPLES, DICTIONARIES	9 Periods

Lists: List Operations, List Slices, List Methods, List Loop, Mutability, Aliasing, Cloning Lists, List Parameters; Tuples: Tuple Assignment, Tuple as Return Value; Dictionaries: Operations and Methods; Advanced List Processing - List Comprehension

Unit – IV	FILES, MODULES, PACKAGES	9 Periods

Files and exceptions: text files, reading and writing files, format operator; command line arguments, modules, packages: Numpy and Numpy Operations, Pandas and Pandas operations, Matplotlib: types of plots. Illustrative programs: word count, copy file. Case study: Analyze the academic performance of students and plot a graph.

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Unit – V	EXCEPTIONS	9 Periods
Introduction to Errors and Exceptions-Types of Errors – Syntax Errors and Runtime Errors - Need for Exception Handling - Creating User-defined Exceptions, Built-in Exceptions - Python Standard Libraries, File and Data Handling Libraries. Case Study: Validating marks range and voter's age, Reading student data from a CSV file		

TOTAL: 45+30=75 Periods

List of Experiments:

1. Compute the GCD of two numbers.
2. Find square root of a number (the Newton's method).
3. Exponentiation (power of a number).
4. Find the maximum of a list of numbers.
5. Linear search and Binary search.
6. Selection sort, Insertion sort.
7. First n prime numbers.
8. Multiply matrices.
9. Programs that take command line arguments (word count).
10. File handling and plotting.
11. Mini Project

Text Books:	1. Eric Matthes, "Python Crash Course A Hands-On, Project - Based Introduction to Programming", No Starch Press, Inc. 2nd Edition,2019 2. Mark Summerfield, "Programming in Python 3: A Complete Introduction to the Python Language", Pearson Education, 2nd Edition, 2018
Reference Books:	1. Mark Lutz, "Python Pocket Reference", O Reilly, Fifth Edition, 2014 2. Zed Shaw, "Learn Python the Hard Way" Addison-Wesley, 2013. 3. Martin C. Brown, "Python: The Complete Reference ", Mc Graw Hill, 2018.
MOOC/Web Platforms:	1. Python for Everybody Specialization (by University of Michigan) https://www.coursera.org/specializations/python 2. SWAYAM – Programming in Python (Indian MOOC) https://onlinecourses.swayam2.ac.in/cec22_cs20/preview 3. Codecademy – https://www.codecademy.com/learn/learn-python 3Codecademy+1

IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Understand Python data types, expressions, statements, and operators to describe the structure and execution of basic programs.	Understand (K2)
CO2	Explain and use conditional statements, loops, functions, recursion, and string operations to build modular Python programs.	Understand (K2)
CO3	Understand Python data structures such as lists, tuples, and dictionaries to organize and manage data.	Understand (K2)
CO4	Apply file handling operations and Python libraries such as NumPy, Pandas, and Matplotlib to analyze and visualize data.	Apply (K3)
CO5	Apply exception-handling techniques using built-in and user-defined exceptions to develop reliable Python applications.	Apply (K3)

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V - Mapping Table Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO1	PSO2
CO1	3	2	2	-	2	-	-	-	-	2	-	2	2
CO2	3	3	3	2	2	-	-	-	-	2	3	3	2
CO3	3	3	3	2	2	-	-	-	-	2	3	3	2
CO4	3	2	2	-	3	-	-	-	-	2	-	2	2
CO5	3	3	3	2	3	-	-	-	-	2	3	3	2

Mapping: 1-Low, 2-Medium, 3-High

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I - Course Name: 25EC201 Electronic Devices

Prerequisite	Programme Name	Sem	Category	L	T	P	C
Nil	B.E. ECE	II	PCC	3	0	0	3

II - Course Objectives

1.	To understand the basic concepts of semiconductor devices.
2.	To learn the characteristics of bipolar junctions.
3.	To inculcate the construction, characteristics of FET and MOSFET.
4.	To understand the special purpose semiconductor devices.
5.	To introduce the concepts of power devices and display devices.

III - Course Content

Preamble:

Electronics industry plays a vital role in all aspects of our day life with the evolution in automation industry, IoT, Robotics and Artificial Intelligence. Every industry, in order to work with this growing technology, one should know the working principle, operation and characteristics, diodes, transistors, FET, MOSFET, Special purpose semiconductor diodes, display devices and power devices.

Unit – I	**SEMICONDUCTOR DIODE**	**9 Periods**
Types of Materials, PN junction diode, Current equations, Diffusion and drift current densities, forward and reverse bias characteristics, Transition and Diffusion Capacitances, rectifier circuits, Zener Diode and its characteristics, regulators		
Unit – II	**BIPOLAR JUNCTION TRANSISTORS**	**9 Periods**
NPN -PNP -Junctions-Early Effect-Current equations – Input and Output characteristics of CE, CB CC-Hybrid π model, h-parameter model, Ebers Moll Model, Multi Emitter Transistor.		
Unit – III	**FIELD EFFECT TRANSISTORS**	**9 Periods**
JFETs – Drain and Transfer characteristics, -Current Equations-Pinch off voltage and its significance, MOSFET- Characteristics- Channel length modulation, D-MOSFET, E-MOSFET		
Unit – IV	**SPECIAL PURPOSE SEMICONDUCTOR DEVICES**	**9 Periods**
Metal-Semiconductor Junction- MESFET, Schottky barrier diode--Varactor diode –Tunnel diode- Gallium Arsenide device, LASER diode, LDR, Photo diode, Photo transistor, Opto Coupler, Solar cell		
Unit – V	**POWER DEVICES AND DISPLAY DEVICES**	**9 Periods**
Uni Junction Transistor, Silicon Controlled Rectifier, Diac, Triac, Power BJT, Light Emitting Diode, Liquid Crystal Display, Charge Coupled Devices		
		TOTAL: 45 Periods

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Text Books:	1. Robert Boylestad and Louis Nashelsky, "Electron Devices and Circuit Theory": Printice Hall Publications, 11th Edition, 2015 2. Donald A Neaman, "Semiconductor Physics and Devices", Fourth Edition, Tata Mc Graw Hill Inc. 2012 3. David A. Bell, Electronic Devices & Circuits, 5th Edition, Oxford University Press, 2008.
Reference Books:	1. Millman and Halkias, "Electronic devices and circuits", 2nd Edition, McGraw Hill Publication, 2007 2. Salivahanan. S, Suresh Kumar. N, Vallavaraj. A, —Electronic Devices and circuit, Third Edition, Tata McGraw- Hill, 2008. 3. Yang, "Fundamentals of Semiconductor devices", McGraw Hill International Edition, 1978.

IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Design simple rectifiers and voltage regulators using diodes.	Apply (K3)
CO2	Apply suitable biasing conditions to study the input and output characteristics of BJT.	Apply (K3)
CO3	Explore the characteristics and operation of JFET and MOSFET.	Understand (K2)
CO4	Compare the characteristics of special Semiconductor diodes.	Understand (K2)
CO5	Articulate the applications of Power and Display devices.	Understand (K2)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	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	1	-	-	-	-	-	-	-	-	1	-
CO2	3	2	1	-	-	-	-	-	-	-	-	1	-
CO3	3	2	1	-	-	-	-	-	-	-	-	1	-
CO4	3	2	1	-	-	-	-	-	-	-	-	1	-
CO5	3	2	1	-	-	-	-	-	-	-	-	1	-

Mapping: 1-Low, 2-Medium, 3-High

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I - Course Name: 25EC202 Circuits Analysis

Prerequisite	Programme Name	Sem	Category	L	T	P	C
Nil	B.E. ECE	II	PCC	3	0	2	4

II - Course Objectives

1.	To learn the basic concepts and behaviour of DC and AC circuits.
2.	To understand various methods of circuit/ network analysis using network theorems.
3.	To learn the concept of Resonance and coupled circuits.
4.	To understand the transient response of the circuits subjected to DC and AC excitations.
5.	To understand the methods to analyze the Two port networks.

III - Course Content

Preamble:

This course introduces the fundamental concepts and principles that are essential for comprehending circuit behavior, design, and troubleshooting. They are the building blocks of countless electronic systems, from simple flashlight circuits to complex integrated circuits powering computers and smart phones.

Unit – I	**BASIC CIRCUITS ANALYSIS OF DC AND AC CIRCUITS**	**9 Periods**

Ohm's Law – Kirchhoff's laws – The single Node – Pair Circuit, series and Parallel Connected Independent Sources, Resistors in Series and Parallel, voltage and current division, source transformation - Mesh current and node voltage method of analysis for D.C and A.C. circuits - Duality and dual networks.

Unit – II	**NETWORK THEOREMS FOR DC AND AC CIRCUITS**	**9 Periods**

Superposition theorem, Thevenin's theorem, Norton's theorem, Reciprocity theorem, Millman's theorem, and Maximum power transfer theorem, application of Network theorems- – star delta conversion.

Unit – III	**RESONANCE AND COUPLED CIRCUITS**	**9 Periods**

Resonance - Series resonance - Parallel resonance - Variation of impedance with frequency, Variation in current through and voltage across L and C with frequency, Bandwidth, Quality factor, Selectivity, Self-inductance- Mutual inductance - Dot rule -Coefficient of coupling - Series, Parallel connection of coupled inductors

Unit – IV	**TRANSIENT ANALYSIS**	**9 Periods**

Natural response-Forced response - Transient response of RC, RL and RLC circuits to excitation by Step Signal, Impulse Signal and exponential sources - Complete response of RC, RL and RLC Circuits to sinusoidal excitation.

Unit – V	**TWO PORT NETWORKS**	**9 Periods**

Two port networks, Z parameters, Y parameters, Transmission (ABCD) parameters, Hybrid (H) Parameters, Interconnection of two port networks, Symmetrical properties of T and π networks.

TOTAL: 45 Periods

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List of Experiments:	30 Periods
1. Verifications of KVL & KCL. 2. Verifications of Thevenin & Norton theorem. 3. Verification of Superposition Theorem. 4. Verification of maximum power transfer Theorem. 5. Implementation of Star-Delta Conversion. 6. Determination of Resonance Frequency of Series and Parallel RLC Circuits. 7. Transient analysis of RL and RC circuits to step signal excitation. 8. Transient analysis of RL and RC circuits to sinusoidal excitation. 9. Measurement of currents and voltages of a two-port network to calculate Z and Y parameters.	
	TOTAL: 75 Periods

Text Books:	1. Hayt Jack Kemmerly, Steven Durbin, "Engineering Circuit Analysis", Mc Graw Hill education, 9th Edition, 2018. 2. Joseph Edminister and Mahmood Nahvi, —Electric Circuits, Schaum's Outline Series, Tata McGraw Hill Publishing Company, New Delhi, Fifth Edition Reprint 2016. 3. Charles K. Alexander & Mathew N.O.Sadiku, "Fundamentals of Electric Circuits", Mc Graw Hill, 2nd Edition, 2003.
Reference Books:	1. Robert.L. Boylestead, "Introductory Circuit Analysis", Pearson Education India, 12th Edition, 2014. 2.Allan H.Robbins, Wilhelm C.Miller, "Circuit Analysis Theory and Practice", Cengage Learning, Fifth Edition, 1st Indian Reprint 2013 3. John O Mallay, Schaum's Outlines "Basic Circuit Analysis", The Mc Graw Hill companies, 2nd Edition, 2011
MOOC/Web Platforms:	https://youtu.be/7Nh7lSeqn6E https://youtu.be/zF12z_R6xZA https://www.youtube.com/live/X2y1LI9Tq3w?feature=share

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IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Apply the basic concepts of Kirchoff's laws, mesh current and node voltage method for analysis of DC and AC circuits.	Apply (K3)
CO2	Apply suitable network theorems to analyze electric circuits.	Analyze (K4)
CO3	Analyze series, parallel resonance and coupled circuits.	Analyze (K4)
CO4	Analyze the transient response for any RC, RL and RLC circuits.	Analyze (K4)
CO5	Analyze the two port network parameters and properties.	Analyze (K4)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	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	-	-	-	-	1	1	-	2	-
CO2	3	3	2	1	-	-	-	-	1	1	-	2	-
CO3	3	3	3	2	-	-	-	-	1	1	-	2	-
CO4	3	3	3	2	-	-	-	-	1	1	-	2	-
CO5	3	3	3	2	-	-	-	-	1	1	-	2	-

Mapping: 1-Low, 2-Medium, 3-High

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I - Course Name: 25HS202 Tamils and Technology

Prerequisites	Programme Name	Sem	Category	L	T	P	C
Nil	B.E./B.TECH. Common to all	II	HSMC	1	0	0	1

II - Course Objectives

1	To understand the technological knowledge of ancient Tamils in weaving, pottery, manufacturing, agriculture, irrigation, and maritime activities from the Sangam period onwards.
2	To study the evolution of Tamil architectural and design technologies, including temples, palaces, domestic structures, and Indo-Saracenic buildings across different historical periods.
3	To analyze the production technologies of the Tamils such as shipbuilding, metallurgy, coin minting, bead-making industries, and their archaeological and literary evidences.
4	To examine the agricultural, irrigation, and water-management technologies of the Tamils, along with their knowledge of animal husbandry, fisheries, pearl diving, and ocean science.
5	To explore the growth of Scientific Tamil and Computational Tamil, focusing on digital publishing, Tamil software development, online learning platforms, and electronic Tamil resources.

III - Course Content

Preamble:

The Tamil civilization has demonstrated a profound harmony between knowledge, innovation, and human progress. Rooted in a rich legacy of language, science, mathematics, medicine, architecture, and maritime trade, Tamils have long embraced technology as a means to enhance life while upholding ethical values and social responsibility. The spirit of inquiry found in classical Tamil literature reflects a culture that values learning, adaptation, and forward thinking.

Unit – I	நெசவு மற்றும் பானைத் தொழில் நுட்பம்	3 Periods
சங்ககாலத்தில் நெசவுத் தொழில்-பானைத் தொழில் நுட்பம்- கருப்பு சிவப்பு பாண்டங்கள்-பாண்டங்களில் கீறல் குறியீடுகள்		
Unit – II	**வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்**	**3 Periods**
சங்ககாலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்ககாலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு - சங்ககாலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் -சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள்- மாமல்லபுரச் சிற்பங்களும், கோவில்களும்- சோழர்கால பெருங்கோயில்களும் மற்றும் பிற வழிபாட்டுத் தலங்கள்-நாயக்கர் காலக் கோயில்கள்-மாதிரி கட்டமைப்புகள் பற்றி அறிதல்,மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றம் திருமலை நாயக்கர் மஹால்-செட்டிநாட்டு வீடுகள்-பிரிட்டிஸ் காலத்தில் சென்னையில் இந்தோ-சாரோசெனிக் கட்டிடக் கலை.		
Unit – III	**உற்பத்தித் தொழில் நுட்பம்**	**3 Periods**

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கப்பல் கட்டும் கலை-உலோகவியல்-இரும்புத் தொழிற்சாலை-இரும்பை உருக்குதல்,எஃகு-வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் அச்சடித்தல்- மணி உருவாக்கும் தொழிற்சாலைகள்-கல்மணிகல்,கண்ணாடி மணிகள்-சுடுமணிகள்-சங்கு மணிகள்-எழும்பு துண்டுகள்-தொல்லியல் சான்றுகள்-சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.		
Unit – IV	**வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில்நுட்பம்**	**3 Periods**
அணை,ஏரி,குளங்கள்,மதகு-சோழர்காலக் குமுழித் தூம்பின் முக்கியத்துவம்-கால்நடை பராமரிப்பு-கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள்-வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்தசெயல்பாடுகள்-கடல்சார் அறிவு-மீனவளம் – முத்து மற்றும் முத்துக்குளித்தல்-பெருங்கடல் குறித்த பண்டைய அறிவு-அறிவுசார் சமூகம்.		
Unit – V	**அறிவியல் தமிழ் மற்றும் கணித்தமிழ்**	**3 Periods**
அறிவியல் தமிழின் வளர்ச்சி-கணித்தமிழ் வளர்ச்சி-தமிழ் நூல்களை மின்பதிப்பு செய்தல்-தமிழ் மென்பொருட்கள் உருவாக்கம்-தமிழ் இணையக் கல்விக்கழகம்-தமிழ் மின் நூலகம்-இணையத்தில் தமிழ் அகராதிகள்-சொற்குவைத் திட்டம்		
		TOTAL: 15 Periods

Reference Books:	1.தமிழக வரலாறு-மக்களும் பண்பாடும்-கே.கே..பிள்ளை (வெளியீடு:தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்) 2. கீழடி-வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம்(தொல்லியல் துறை வெளியீடு.) 3. பொருநை- ஆற்றங்கரை நாகரிகம்.(தொல்லியல் துறை வெளியீடு.)
MOOC/Web Platforms:	https://www.tnarch.gov.in/ta/epigraphy/ https://www.tamildigitallibrary.in/admin/assets/book https://www.tamilhistory.co.in/2020/05/heroic-games-ancient-tamils-jallikattu-silambam.html https://www.tamilvu.org/ta/courses-degree-a061-a0611-html-a0611313-10334 https://tamil.samayam.com/others-news/independence-day-2016/news/freedom-fighters-of-india/articleshow/53666058.cms https://www.tamildigitallibrary.in/admin/assets/book https://www.scribd.com/document/646362880/Text-book

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IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Understand the significance of Tamil as a classical language.	Understand (K2)
CO2	Relate the art and culture in Tamil language.	Understand (K2)
CO3	Explain the importance of music, dance and martial arts that were derived from Tamil Culture.	Understand (K2)
CO4	Understand the poetic mode or theme of classical language.	Understand (K2)
CO5	Relate the contribution of Tamils to Nation building.	Understand (K2)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO2
CO1	-	-	-	-	-	1	1	-	-	-	1	-	-
CO2	-	-	-	-	-	1	1	-	-	-	1	-	-
CO3	-	-	-	-	-	1	1	-	-	-	1	-	-
CO4	-	-	-	-	-	1	1	-	-	-	1	-	-
CO5	-	-	-	-	-	1	1	-	-	-	1	-	-

Mapping: 1-Low, 2-Medium, 3-High

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I - Course Name: 25EC211 Electronic Devices Laboratory

Prerequisite	Programme Name	Sem	Category	L	T	P	C
Nil	B.E. ECE	II	PCC	0	0	2	1

II - Course Objectives

1.	To learn the characteristics of basic electronic devices such as Diode, BJT, FET
2.	To learn the characteristics of power electronic devices such as UJT, SCR

III - Course Content

List of Experiments:

PART – A

1. Study of passive components– Resistor, Capacitor and Inductor

2.Characteristics of PN Junction Diode and Zener diode

3. Full Wave Rectifier

4. Series Regulator

5. Common Collector input-output characteristics

6. UJT Characteristics

7. SCR Characteristics

8. Characteristics of LDR

9. Study of CRO, DSO, MSO

10.Study of elements of smart phone

11. Assembly and dismantle of LED TV

12. Assembly and dismantle of computer/ laptop

PART - B: Simulation

(TINA, LTSpice, MultiSim, Proteus, Circuit Lab or any equivalent tool)

13. Input and Output characteristics of BJT Common emitter configuration and evaluation of parameters

14. Transfer and drain characteristics of a JFET and MOSFET

TOTAL: 30 Periods

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IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Analyze the characteristics of basic electronic devices.	Analyze (K4)
CO2	Analyze the characteristics of power electronic devices.	Analyze (K4)
CO3	Analyze the characteristics of electronic devices using simulation software.	Analyze (K4)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	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	3	2	1	-	-	-	-	1	1	-	2	-
CO2	3	3	2	1	-	-	-	-	1	1	-	2	-
CO3	3	3	2	2	2	-	-	-	1	1	1	2	2

Mapping: 1-Low, 2-Medium, 3-High

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I - Course Name: 25HS211 English Laboratory - II

Prerequisites	Programme Name	Sem	Category	L	T	P	C
25HS112-English Laboratory-I	B.E./B.TECH. Common to all	II	HSMC	0	0	2	1

II - Course Objectives

1.	Develop students' ability to communicate confidently through structured speaking tasks such as self-introduction, discussions, role plays, and presentations.
2.	Strengthen oral interaction skills required in professional contexts including interviews, group discussions, telephonic conversations, and small talk.
3.	Enhance listening comprehension skills through note-taking from discussions and spoken observations.

III - Course Content

List of Experiments:

1. Speaking: Introducing Oneself- Discussion on Social Media
2. Speaking: Role Play
3. Speaking: Narrating an Incident, Discussing tourist Destinations
4. Writing: Job Application
5. Writing: Report Writing
6. Making an oral presentation
7. Listening: Taking notes From a Discussion
8. Speaking: Small Talk and Telephonic Conversation
9. Mock Interview
10. Group Discussion

TOTAL: 30 Periods

Reference Books:	1. Sasikumar, V, et.al. A Course in Listening & Speaking Foundation Books, 2005. 2. Murphy, Raymond. English Grammar in Use: A Self-Study Reference and Practice Book for Intermediate Students: with Answers. Cambridge: Cambridge University Press, 1985. 3. Prasad, Hari Mohan. A Handbook of Spotting Errors. Mcgraw Hill Education, 2010 4. Reynolds, John. Cambridge IGCSEA, First Language English. 2018th ed., Hodder Education, 2018. 5. Wiggins, Grant P., and Jay McTighe. Understanding by Design. Association for Supervision and Curriculum Development, 2008.
Web Sources:	• www.studyladder.com • www.fluentu.com • www.esl-lab.com

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IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Introduce themselves clearly and participate in discussions on familiar topics such as social media and tourist destinations.	Understand (K2)
CO2	Perform effective role plays, telephonic conversations, and small-talk interactions using appropriate language and tone.	Apply (K3)
CO3	Retell incidents and make structured oral presentations with clarity and coherence.	Apply (K3)
CO4	Write job applications and reports relevant to workplace needs.	Apply (K3)
CO5	Demonstrate listening skills by taking accurate notes from discussions.	Analyze (K4)

V - Mapping Table - Mapping of COs with POs and PSOs

COs Vs POs/ PSOs	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	3	2	3	-	-
CO2	-	-	-	-	-	-	-	3	3	2	3	-	-
CO3	-	-	-	-	-	-	-	3	3	2	3	-	-
CO4	-	-	-	-	-	-	-	3	3	2	3	-	-
CO5	-	-	-	-	3	-	-	3	3	2	3	-	-

Mapping: 1-Low, 2-Medium, 3-High

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