NEHRU INSTITUTE OF TECHNOLOGY

AN AUTONOMOUS INSTITUTION

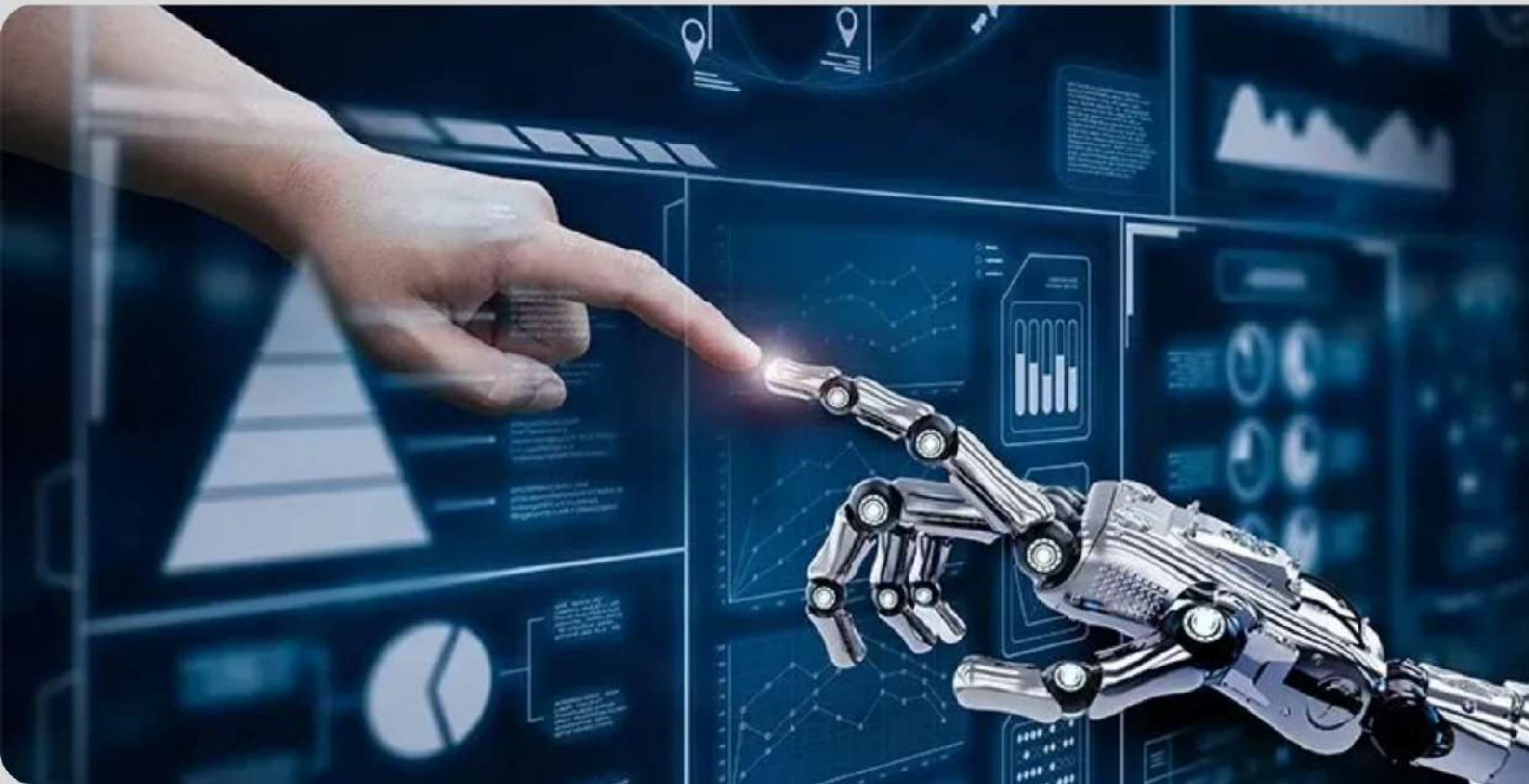
COIMBATORE | TAMILNADU

Curriculum and Syllabi

Regulation 2023

B.E Computer Science and Engineering

Applicable for 2024 Admitted students



Vision and Mission of the Institution

Vision

- To be leading Institution in Academic excellence, Multidisciplinary Research, Innovation, Entrepreneurship and Industry relation in order to mould true citizens of the country

Mission

- To create innovative and vibrant young leaders in Engineering and Technology field for building India as a knowledge power by improving the teaching-learning process
- To enhance employability, entrepreneurship and to improve the research competence to address Societal needs.
- To generate engineering graduates who use knowledge as a powerful tool to drive societal transformation and inculcate in them ethical and moral values.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Vision

- To become a School of Computing excellence in research and innovation by imparting industry driven Teaching Learning Process.

Mission

- To inculcate an innovator by adopting student-centric, activity and outcome-based teaching learning process in diversified areas of Computer Science and Engineering.
- To achieve global standards with technical transformations in education and value based living through a social and scientific approach.
- To groom graduates with all-round leadership qualities, team spirit to meet the requirements of industry, business and society.

Program Educational Objectives (PEOs)

The Computer Science and Engineering graduate can

PEO 1: Apply their technical competence in computer science to solve real world problems, with technical and people leadership.

PEO 2: Conduct cutting edge research and develop solutions on problems of social relevance.

PEO 3: Work in a business environment, exhibiting team skills, work ethics, adaptability and lifelong learning.

Program Outcomes

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

PO2 : Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 : Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 : Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 :Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6 : The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7 : Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8 : Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one‘s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes (PSOs)

PSO 1: Exhibit design and programming skills to build and automate business solutions using cutting edge technologies.

PSO 2: Strong theoretical foundation leading to excellence and excitement towards research, to provide elegant solutions to complex problems.

PSO 3. Ability to work effectively with various engineering fields as a team to design, build and develop system applications.

SEMESTER-I								
S.No.	**COURSE CODE**	**COURSE TITLE**	**CATEGORY**	**PERIODS PER WEEK**			**TOTAL CONTACT PERIODS**	**CREDITS**
				L	**T**	**P**		
	U23IP101	Induction Program	MC	-	-	-	-	0
THEORY								
1	U23EN101	English for Engineers	HSMC	3	0	0	3	3
2	U23MA101	Calculus And Differential Equations	BSC	3	1	0	4	4
3	U23PH101	Engineering Physics	BSC	3	0	0	3	3
4	U23CY101	Engineering Chemistry	BSC	3	0	0	3	3
5	U23CS101	C- Programming	ESC	3	0	0	3	3
6	U23HS101	Heritage of Tamil	HSMC	1	0	0	1	1
7	U23EE101	Career Enhancement Training I	EEC	3	0	0	3	1
PRACTICAL								
8	U23BS111	Basic Science Laboratory	BSC	0	0	4	4	2
9	U23EN111	Communicative English Laboratory	HSMC	0	0	2	2	1
10	U23CS111	C- Programming Laboratory	ESC	0	0	4	4	2
11		Vocational Enhancement Training-I	VEC	0	0	2	2	1*
Total				**19**	**1**	**12**	**32**	**23**

SEMESTER-II								
S.No.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1	U23PH203	Physics for Information Science	BSC	3	0	0	3	3
2	U23HS202	Tamil & Technology	HSMC	1	0	0	1	1
3	U23CS201	Python Programming and Practices	ESC	3	0	0	3	3
4	U23EN103	Technical English	HSMC	2	0	0	2	2
THEORY WITH LAB COMPONENT								
5	U23CS202	Basic Electrical and Electronics Engineering	ESC	3	0	0	3	3
6	U23MA202	Advanced calculus and Statistics	BSC	3	0	2	5	4
PRACTICAL								
7	U23CS211	Python Programming Lab	ESC	0	0	2	2	1
8	U23GE212	Engineering Practices Lab	ESC	0	0	2	2	1
9	U23GE213	Engineering Graphics Lab	ESC	0	0	2	2	1
10	U23EE202	Career Enhancement Training II	EEC	0	0	2	2	1
11		Vocational Enhancement Training-II	VEC	0	0	2	2	1*
Total				**15**	**0**	**12**	**27**	**20**

SEMESTER I

U23EN101 SDG: 4	ENGLISH FOR ENGINEERS (Common to all Branches)	Category : HSMC L T P C 3 0 0 3

COURSE OBJECTIVE:

1. To enable learners of engineering and technology to develop their basic communication skills in English.
2. To acquire, command in both the respective skills (listening and reading) and the productive skills (writing and speaking) of the English language.
3. To understand the key concepts of values, life skills and business communication and motivate students to look within and create a better version of themselves.
4. To focus on the development of basic fluency in English, usage of vocabulary in the technical field, and strengthening reading and official written communication skills.
5. To use language efficiently in expressing their opinions via various media.

UNIT 1 INTRODUCTION TO FUNDAMENTALS OF COMMUNICATION 9

Listening– listening to Audio/video(formal & informal);Telephonic conversation (Activity) Speaking-Self Introduction; Introducing a friend (Activity);Conversation-politeness strategies; Reading - Reading brochures (technical context), telephone messages / social media messages relevant to technical contexts-Writing-Writing on self, Writing Definition; Jumbled sentence Grammar – Simple present tense, Present continuous, Present perfect, Present perfect continuous; Question types: Wh/ Yes or No/ and Tags; Word formation, One-word substitution.

UNIT 2 NARRATION AND SUMMATION 9

Listening- Listening to the podcast, anecdotes/stories/event narration; documentaries and interviews with celebrities (Activity). Speaking-Narrating personal experiences/events; interviewing a celebrity (Activity). Reading- Reading biographies, travelogues, newspaper reports, Writing- Guided Writing-Paragraph writing, Short Report on an event (field trip etc.) - Grammar– Simple past tense, Past continuous, Past perfect, Past perfect continuous; Subject- Verb Agreement; Prepositions, Word forms (prefixes & suffixes); Error Correction.

UNIT 3 DESCRIPTION OF PROCESS/PRODUCT 9

Listening – Listening to specific audio tracks (Activity) Speaking – Picture description; giving instruction to use the product; presenting a product; Role play (Activity) -Reading – Reading advertisements, gadget reviews; finding key information from a given text- Writing - Instructions; Process description; Grammar - Simple future tense, Future continuous, Future perfect, Future perfect continuous; Imperatives; Adjectives; Degrees of comparison; Compound Words.

UNIT 4 CLASSIFICATION AND RECOMMENDATIONS 9

Listening – watching videos/ documentaries and responding to the questions based on them, Scientific lectures; and educational videos. Speaking – Small Talk; Mini presentations (Activity) - Reading – Journal reports, predicting content of reading habits, Reading articles (Activity)- Writing –Memos to colleagues or friends; Opinion Blogs; Grammar – Articles; Pronouns - Possessive & Relative pronouns, Cause and Effect.

UNIT 5 EXPRESSION 9

Listening – Listening to different accent, Listening to speeches or presentation- Speaking – Debates and Expressing opinions through Simulations, exchanging personal information - (Activity)- Reading – Reading editorials; Poster making (Activity)- Writing – Creative Writing, Checklist- Grammar – Punctuation; Compound Nouns, Homonyms; and Homophones, Simple, Compound & Complex Sentences.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Listen and comprehend complex academic texts.

CO2: Understand the denotative and connotative meanings of technical texts.

CO3: Identify definitions, descriptions, narrations and essays on various topics.

CO4: Apply different methods of integration in solving practical problems.

CO5: Express their opinions effectively in both oral and written medium of communication.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. English for Engineers & Technologists Orient Blackswan Private Ltd. Department of English, Anna University (2020 edition).

2. English for Science & Technology Cambridge University Press, 2021. Authored by Dr.VeenaSelvam, Dr.Sujatha Priyadarshini, Dr.Deepa Mary Francis, Dr.KN.Shoba and Dr.Lourdes Joevani, Department of English, Anna University.

REFERENCES:

1. Technical Communication – Principles and Practices By Meenakshi Raman & Sangeeta Sharma, Oxford Univ. Press, 2016, New Delhi.

2. A Course Book on Technical English by Lakshmi Narayanan, Scitech Publications (India) Pvt.Ltd.

3.English for Technical Communication (with CD) by Aysha Viswamohan, Mc-graw Hill Education, ISBN:0070264244

4. Effective Communication Skill, KulbhusanKumar, RS Salaria, Khanna Publishing House.

5. Learning to Communicate–Dr.V.Chellammal, Allied Publishing House, NewDelhi, 2003.

CO's-PO's & PSO's MAPPING															
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO3**
CO1	-	-	-	-	-	1	1	-	3	1	-	2	-	-	-
CO2	-	-	-	-	-	1	1	-	3	-	-	2	-	-	-
CO3	-	-	-	-	-	1	1	-	3	2	-	3	-	-	-
CO4	-	-	-	-	-	1	2	-	3	1	-	2	-	-	-
CO5	-	-	-	-	-	1	2	-	3	2	-	3	-	-	-
Correlation levels:			**1 – low**			**2 – medium**			**3 – high**			**"-"- no correlation**			

COURSE DESIGNED BY	**APPROVED BY**
Dr.T.Saranaya- AP/ English & Prof. J.Brindha Devi- AP/ English	Dr.M.Kumaresan – Professor & Head/ S&H
Name and Department	**Name and Department of BoS Chairman**

U23MA101 CALCULUS AND DIFFERENTIAL EQUATIONS **Category : BSC**

SDG: 4 **(Common to all Branches)**

L	**T**	**P**	**C**
3	**1**	**0**	**4**

COURSE OBJECTIVE:

1. To develop the use of matrix algebra techniques that is needed by engineers for practical applications.
2. To familiarize the students with differential calculus.
3. To enlighten the students with functions of several variables. This is needed in many branches of engineering.
4. To make the students acquire sound knowledge of techniques in solving ordinary differential equations that model engineering problems.
5. To acquaint the students with mathematical tools needed in evaluating multiple integrals and their applications.

UNIT 1 MATRICES 9+3

Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values and Eigen vectors (without proof) – Cayley – Hamilton theorem (Statement and applications

only) - Orthogonal matrices – Orthogonal transformation of a symmetric matrix to diagonal form – Quadratic form – Nature of Quadratic forms - Reduction of quadratic form to canonical form by orthogonal transformation.

UNIT 2 DIFFERENTIAL CALCULUS 9 + 3

Representation of functions - Limit of a function - Continuity - Derivatives -Differentiation rules (sum, product, quotient, chain rules) - Implicit differentiation - Logarithmic differentiation - Applications: Maxima and Minima of functions of one variable.

UNIT 3 MULTIVARIABLE CALCULUS 9 + 3

Functions of two variables – Partial derivatives – Total differential – Taylor's series for functions of two variables – Jacobian's – Constrained maxima and minima – Lagrange's multiplier and its applications

UNIT 4 ORDINARY DIFFERENTIAL EQUATIONS OF SECOND ORDER 9 + 3

Linear differential equations of second order with constant coefficients. Linear differential Equations of second order with variable coefficients: Cauchy's linear differential equation - Method of variation of parameters for second order differential equations

UNIT 5 MULTIPLE INTEGRALS 9 + 3

Double integration with constant and variable limits - Region of integration - Area as double integral in Cartesian coordinates. Triple integral in Cartesian coordinates. Application of integration – Volume of Solids

COURSE OUTCOMES:

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

CO1: Comprehend the concepts of Eigen values, Eigen vectors, limits, continuity, functions of several variables, double integration and region of integration for solving complex problems.

CO2: Use rules of differentiation to solve maxima and minima problems.

CO3: Apply various techniques in solving ordinary and partial differential equations for practical applications.

CO4: Apply differential and integral calculus tools in modeling problems.

CO5: Evaluate integrals to compute area, volume and other practical problems.

TOTAL: 60 PERIODS

TEXT BOOKS:

1. Grewal.B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition 2018.

2. James Stewart, "Calculus : Early Transcendentals", Cengage Learning, 8th Edition, New Delhi,2015.

3. Kreyszig.E, "Advanced Engineering Mathematics", John Wiley and Sons, 10th Edition, New delhi,2016.

REFERENCES:

1. Bali. N., Goyal. M. and Watkins. C., “Advanced Engineering Mathematics”, Firewall Media (An imprint of Lakshmi Publications Pvt., Ltd.,), New Delhi, 7th Edition, 2009
2. Ramana. B.V., "Higher Engineering Mathematics", McGraw Hill Education Pvt. Ltd, New delhi,2016
3. Anton. H, Bivens. I and Davis. S, " Calculus ", Wiley, 10th Edition, 2016
4. Narayanan. S. and Manicavachagom Pillai. T. K., “Calculus" Volume I and II, S.Viswanathan Publishers Pvt. Ltd., Chennai, 2009.
5. Jain. R.K. and Iyengar. S.R.K., “Advanced Engineering Mathematics”, Narosa Publications, New Delhi, 5th Edition, 2016.
6. Srimantha Pal and Bhunia. S.C, " Engineering Mathematics " Oxford University Press, 2015

CO’s-PO’s & PSO’s MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	3	1	1	3	-	-	-	-	-	-	-	-	-
CO2	3	3	1	-	-	3	-	-	-	-	-	-	-	-	-
CO3	3	3	2	-	1	3	-	-	-	-	-	-	-	-	-
CO4	3	3	3	-	-	3	-	-	-	-	-	-	-	-	-
CO5	3	3	2	1	-	3	-	-	-	-	-	-	-	-	-

Correlation levels: 1 – low 2 – medium 3 – high “-“- no correlation

COURSE DESIGNED BY	APPROVED BY
Dr. N. Vithya- ASP/ Mathematics	Dr.M.Kumaresan – Professor & Head/ S&H
Name and Department	**Name and Department of BoS Chairman**

U23PH101	ENGINEERING PHYSICS	Category : BSC			
SDG: 4	(Common to CSE & IT)	L	T	P	C
		3	0	0	3

COURSE OBJECTIVE:

1. Understand the basics of Properties of Matter and apply them to Engineering.
2. Explore the applications of Lasers and Fiber optics in engineering contexts.
3. Apply principles of Ultrasonics and Thermal Physics to Engineering challenges.
4. Grasp foundational Quantum Physics concepts and their modern applications.
5. Analyze Crystal systems and their structures in Engineering and Technology.

UNIT 1 PROPERTIES OF MATTER 9

Elasticity – Stress-strain diagram and its uses - Factors affecting elastic modulus – Torsional stress and deformations –Torsion pendulum: theory and experiment - Bending of beams - Bending moment – Cantilever: theory and experiment – Uniform and non-uniform bending: theory and experiment - I-shaped girders - Applications. – Basic Solved Problems.

UNIT 2 LASER AND FIBER OPTICS 9

Introduction – Principle of Spontaneous emission and stimulated emission. Population inversion, pumping- Einstein's A and B coefficients: derivation. Types of lasers – Nd-YAG, CO_2- Industrial Applications of Lasers –Fiber Optics: Principle and propagation of light – Numerical aperture and Acceptance angle - Types of optical fibres (material, refractive index, mode) – Temperature and displacement sensors.

UNIT 3 ULTRASONICS AND THERMAL PHYSICS 9

Introduction – Piezoelectric effect - piezoelectric generator - Velocity measurement – Acoustic grating – Ultrasonic Medical applications - Introduction to heat - Transfer of heat energy :Thermal conduction, convection and radiation –Thermal conductivity - Forbe's and Lee's disc method: theory and experiment – Applications: heat exchangers, refrigerators, ovens and solar water heaters.

UNIT 4 QUANTUM PHYSICS 9

Black body radiation – Planck's theory (derivation) – Deduction of Wien's displacement law and Rayleigh-Jeans' Law from Planck's theory – Compton effect :Theory and experimental verification – Matter waves – Schrödinger's wave equation: Time independent and time dependent equations – Physical significance of wave function – Particle in a one-dimensional box - Microscope: Scanning Tunnelling microscope.

UNIT 5 CRYSTAL PHYSICS 9

Lattice – Unit cell – Bravais lattice – Lattice planes – Miller indices – 'd' spacing in cubic lattice – Calculation of number of atoms per unit cell – Atomic radius – Coordination number – Packing factor for SC, BCC, FCC and HCP structures – Diamond and graphite structures – Polymorphism and allotropy - Crystal defects – Point, line and surface defects- Burger vector.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Realize the fundamental engineering ideas of matter, optics, heat, sound, and quantum theory.

CO2: Demonstrate a solid understanding of fundamental matter properties, Laser and Fiber optics classification, Quantum concepts and apply them successfully to solve practical engineering problems.

CO3: Apply the elastic modulus theory, Fiber Optic Sensors, Ultrasonics and thermal applications to integrate knowledge and problem solve at an advanced level.

CO4: Categorize the Elastic moduli concepts, Fiber optic lasers and Crystal structures to implement in Engineer problems in Material Science and electronics.

CO5: Analyze the foundational Quantum and Crystal Physics concepts to implement solutions for modern engineering problems.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Bhattacharya, D.K. & Poonam, T. "Engineering Physics". Oxford University Press, 2015.
2. Gaur, R.K. & Gupta, S.L. "Engineering Physics". Dhanpat Rai Publishers, 2012.
3. Pandey, B.K. &Chaturvedi, S. "Engineering Physics". Cengage Learning India, 2012

REFERENCES:

1. Halliday, D., Resnick, R. & Walker, J. "Principles of Physics". Wiley, 2015.
2. Serway, R.A. & Jewett, J.W. "Physics for Scientists and Engineers". Cengage Learning, 2010.
3. Palanisamy P.K. Engineering Physics. SCITECH Publications, 2011.
4. Kittle,C,: Introduction to solid state Physics:, Wiley, 2005.
5. Mani P. Engineering Physics I. Dhanam Publications, 2011.
6. Senthilkumar G. Engineering Physics I. VRB Publishers, 2011.

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

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO3
CO1	3	3	1	-	1	-	1	-	-	1	-	1	-	-	-
CO2	3	3	1	-	1	-	1	-	1	-	-	1	-	-	-
CO3	3	3	1	-	1	-	1	-	1	-	-	1	-	-	-
CO4	3	2	1	-	1	-	-	-	-	1	-	1	-	-	-

CO5	3	3	1	-	-	-	1	-	1	-	-	1	-	-	-

Correlation levels: 1 – low 2 – medium 3 – high "-"- no correlation

COURSE DESIGNED BY	APPROVED BY
Dr. T.Jayaprakash- Professor / Physics	Dr.M.Kumaresan – Professor & Head/ S&H
Name and Department	**Name and Department of BoS Chairman**

U23CY101 ENGINEERING CHEMISTRY Category : BSC

SDG: 9 (Common to all Branches)

L	T	P	C
3	0	0	3

COURSE OBJECTIVE:

1. Learn boiler feed water requirements, and water treatment techniques.
2. To acquire knowledge about the preparation, properties and applications of polymers.
3. Understand the basic concepts of electrochemistry and its applications.
4. Learn corrosion control and protective techniques.
5. Acquire the knowledge about the fuels and properties of energy storage devices.

UNIT 1 WATER TECHNOLOGY 9

Introduction - Sources of water - Impurities in water - Types of water –Hardness of water - Expression of hardness - Units of hardness - Estimation of hardness of water by EDTA method - Disadvantages of using hard water - Boiler troubles - Scale and sludge - Softening of water - External treatment method - Demineralization process - Internal treatment process – Carbonate, Phosphate and Calgon conditioning - Desalination by reverse osmosis method.

UNIT 2 POLYMERS 9

Introduction: Classification of polymers – Natural and synthetic; Thermoplastic and Thermosetting. Functionality – Degree of polymerization. Types: Addition, condensation and copolymerization and mechanism of Addition polymerization (Free Radical); Techniques of polymerization: Bulk, emulsion, solution and suspension. Preparation, properties and uses of Nylon (6,6 and 11) and Epoxy resin. Engineering application of plastics- PVC, PTFE and Bakelite. Types of compounding of plastics- Moulding, injection moulding.

UNIT 3 ELECTRO CHEMISTRY 9

Electrochemistry**:** Introduction - Cells - Representation of a galvanic cell - Reversible and irreversible cells - Electrode potential - Nernst equation - Reference electrode (Calomel electrode) - Standard hydrogen electrode - Glass electrode - Electrochemical series and its applications – Battery: Introduction, Types of batteries- alkaline battery- lead storage battery - H_2 -O_2 fuel cell-

applications. Construction of solar cells and E-Vehicle.

UNIT 4 CORROSION AND ITS CONTROL 9

Introduction - Chemical corrosion and Wet corrosion - Galvanic and differential aeration (Pitting, Crevice and Pipeline) - Factors influencing rate of corrosion - Corrosion- causes- factors- corrosion control - material selection and design aspects - electrochemical protection – sacrificial anode method and impressed current cathodic method- Cathodic protection method.

UNIT 5 FUELS AND COMBUSTION 9

Introduction - Classification of fuels - Requirements of a good fuel – Combustion: Principle of combustion - Calorific value - Gross and net calorific values - Explosive range - Spontaneous ignition temperature. Fuels: Solid fuels - Coal and its varieties - Proximate analysis - Significance - Metallurgical coke - Otto-Hoffman byproduct method - Liquid fuel: Manufacture of synthetic petrol - Bergius method - Knocking - Octane number - Cetane number - Gaseous fuel: Liquefied petroleum gas (LPG), Compressed natural gas (CNG).

COURSE OUTCOMES:

At the end of the course, students would

CO1: Recall the concept about water technology, engineering polymers, electrodes, corrosion and combustion of fuels.

CO2: Understand the boiler problems and categorize the polymers.

CO3: Classify plastics, batteries, corrosion, and the calorific value of fuels.

CO4: Apply enough knowledge of contemporary water softening, polymerization, fuel cell, electrochemical protection, and fuel manufacturing procedures.

CO5: Analyze the hardness of water using the EDTA technique and characterization of coal.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Jain P C and Monica Jain, “Engineering Chemistry”, 17th Edition, Dhanpat Rai Publishing Co., 2018.

2. Sivasankar B., “Engineering Chemistry”, Tata McGraw-Hill Publishing Company Ltd, New Delhi, 2017.

REFERENCES:

1. B. S. Murty, P. Shankar, Baldev Raj, B. B. Rath and James Murday, “Textbook of nanoscience and nanotechnology”, Universities Press-IIM Series in Metallurgy and Materials Science, 2018.

2. O.G. Palanna, “Engineering Chemistry” McGraw Hill Education (India) Private Limited, 2nd Edition, 2017.

3. Friedrich Emich, “Engineering Chemistry”, Scientific International Pvt, Ltd, New Delhi, 2017.

4. Shikha Agarwal, “Engineering Chemistry-Fundamentals and Applications”, Cambridge University Press, Delhi, Second Edition, 2019.

5. R.D. Madan, “Modern Inorganic Chemistry”, S. Chand, New Delhi, 2012

6. S.S. Dara, “A Textbook of Engineering Chemistry”, S. Chand Publishing, 12th Edition, 2018.

CO's-PO's & PSO's MAPPING														
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	-	-	2	-	-	2	-	-	-	-	1	-	-	-
CO2	3	-	-	2	2	-	2	-	-	-	-	2	-	-	-
CO3	3	-	-	2	2	-	2	-	-	-	-	2	-	-	-
CO4	3	-	-	2	3	-	2	-	-	-	-	3	-	-	-
CO5	3	-	-	2	3	-	2	-	-	-	-	3	-	-	-
Correlation levels:				**1 – low**			**2 – medium**			**3 – high**			**"-"- no correlation**		

COURSE DESIGNED BY	**APPROVED BY**
Dr.M.Kumaresan – Professor & Head/ S&H	Dr.M.Kumaresan – Professor & Head/ S&H
Name and Department	**Name and Department of BoS Chairman**

U23CS101 **C-PROGRAMMING** **Category : ESC**

SDG : 8 **(Common to CSE & IT)**

L	**T**	**P**	**C**
3	**0**	**0**	**3**

COURSE OBJECTIVE:

1. To acquire knowledge about the concept of C programming, keywords and operators.
2. To classify the data types, structure of C program, looping statements, arrays and strings.
3. To identify the basics of functions, structures, nested structure and Union.
4. To the concept of searching, recursion and array of structure with dynamic memory allocation
5. To defund the pointers, file fundamentals of sequential, random access file and command line arguments.

UNIT 1 **BASICS OF C PROGRAMMING** **9**

Introduction to Computer and programming paradigms – Applications of C Language - Structure of C program - C programming: Data Types - Constants – Enumeration Constants - Keywords –

Operators: Precedence and Associativity - Expressions - Input/Output statements, Assignment statements –Decision making statements - Switch statement - Looping statements – Preprocessor directives -Compilation process.

UNIT 2 ARRAYS AND STRINGS 9

Introduction to Arrays: Declaration, Initialization – One dimensional array –Two dimensional arrays - String operations: length, compare, concatenate, copy – Selection sort, linear and binary search.

UNIT 3 FUNCTIONS AND POINTERS 9

Modular programming - Function prototype, function definition, function call, Built-in functions (string functions, math functions) – Recursion, Binary Search using recursive functions –Pointers – Pointer operators – Pointer arithmetic – Arrays and pointers – Array of pointers – Parameter passing: Pass by value, Pass by reference.

UNIT 4 STRUCTURES AND UNION 9

Structure - Nested structures – Pointer and Structures – Array of structures – Self-referential structures – Dynamic memory allocation - Union - Storage classes and Visibility.

UNIT 5 FILE PROCESSING 9

Files – Types of file processing: Sequential access, Random access – Sequential access file - Random access file - Command line arguments.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Remember the concept of C programming to understand the functional knowledge about operators and the keywords used.

CO2: Demonstrate C program for data types, looping & array.

CO3: Illustrate the basics for functions, structures, pointers and union.

CO4: Make use of the concept to perform the operations dynamic memory allocation, searching and recursion.

CO5: Examine the file processing for sequential, random access and command line arguments.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. ReemaThareja, “Programming in C”, Oxford University Press, Second Edition, 2016.
2. Kernighan, B.W and Ritchie,D.M, “The C Programming language”, Second Edition, Pearson Education, 2015.

REFERENCES:

1. Paul Deitel and Harvey Deitel, “C How to Program with an Introduction to C++”, Eighth edition, Pearson Education, 2018.
2. Yashwant Kanetkar, Let us C, 17th Edition, BPB Publications, 2020.
3. Byron S. Gottfried, “Schaum’s Outline of Theory and Problems of Programming with C”, McGraw-Hill Education, 1996.
4. Pradip Dey, Manas Ghosh, “Computer Fundamentals and Programming in C”, Second Edition, Oxford University Press, 2013.
5. Anita Goel and Ajay Mittal, “Computer Fundamentals and Programming in C”, 1st Edition, Pearson Education, 2013

CO's-PO's & PSO's MAPPING															
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO3**
CO1	1	2	2	-	2	-	-	-	2	-	-	2	1	2	-
CO2	2	2	2	-	2	-	-	-	2	-	-	3	2	2	-
CO3	3	3	2	-	2	-	-	-	2	-	-	2	2	2	-
CO4	2	2	2	-	3	-	-	-	2	-	-	3	2	2	-
CO5	2	3	3	-	2	-	-	-	2	-	-	2	2	3	-
Correlation levels: 1 – low 2 – medium 3 – high "-"- no correlation															

COURSE DESIGNED BY	**APPROVED BY**
Dr.S.Pathur Nisha, Professor & Head/ CSE & Prof. Evance Leethail , AP/CSE	Dr.S.Pathur Nisha, Professor & Head/ CSE
Name and Department	**Name and Department of BoS Chairman**

U23HS101 **HERITAGE OF TAMIL (Common to all Branches)** **Category : HSMC**

L	**T**	**P**	**C**
1	**0**	**0**	**1**

COURSE OBJECTIVE:

1.To learn the extensive literature of classical tamil
2.To review the fine arts heritage of tamil culture
3.To realize the contribution in Indian freedom struggle

UNIT 1 LANGUAGE AND LITERATURE 3

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

UNIT 2 HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE **3**

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

UNIT 3 FOLK AND MARTIAL ARTS **3**

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

UNIT 4 THINAI CONCEPT OF TAMILS **3**

Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.

UNIT 5 CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE **3**

Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts – Print History of Tamil Books.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Remember the extensive literature of tamil and its classical nature, musical instruments, Folk, thinai concept, Indian Freedom Struggle& Aham, Puram and Aram Concept.

CO2: Remember the principles in Thirukural, Bakthi Literature Azhwars and Nayanmars , heritage of sculpture, painting and musical instruments of ancient people, victory of chozha dynasty.

CO3: Understand on folk and martial arts of tamil people, Justice in Sangam Literature, Development of Modern literature in Tamil, Making of musical instruments.

CO4: Understand the role of Temples in Social and Economic Life of Tamils, Ancient Cities and Ports of Sangam Age, Conquest of Cholas.

CO5: Understand the Cultural Influence of Tamils over the other parts of India, contribution of tamils self-esteem movement and siddha medicine, Print History of Tamil Books.

TOTAL: 15 PERIODS

TEXT BOOKS:

1.தமிழக வரலாறு – மக்களும் பண்பாடும் – .கக. கக பிள்ளை (வவியீடு): தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள்கழகம்

2.கணினித்தமிழ் – முளனவர் இல. சுந்தரம் . (விகடன்பிரசுரம்).

3.கீழடி – ளவளக நதிக்களரயில் சங்ககால நகர நாகரிகம் (வதால்லியல் துளை (வவிியீடு)

REFERENCES:

1.Social Life of Tamils (Dr. K. K. Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
2.Historical Heritage of the Tamils (Dr .S. V. Subaramanian, Dr .K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
3.The Contributions of the Tamils to Indian Culture (Dr. M. Valarmathi) (Published by: International Institute of Tamil Studies)
4. Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
5.Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

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

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO2	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO3	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO4	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO5	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-

Correlation levels: 1 – low 2 – medium 3 – high "-"- no correlation

COURSE DESIGNED BY	APPROVED BY
Prof. A.Prabhakaran – AP/ Tamil	Dr.M.Kumaresan - Professor & Head / S&H
Name and Department	**Name and Department of BoS Chairman**

Category : EEC

U23EE101 SDG: 17	CAREER ENHANCEMENT TRAINING I (Common to all Branches)	L	T	P	C
		3	0	0	1

COURSE OBJECTIVE:

1. To improve mathematical and analytical abilities of students, particularly in the context of comprehending engineering concepts and making data-driven decision.
2. To develop critical thinking skills including problem solving, logic, patterns, and reasoning.
3. To Comprehend and appreciate mathematical terminologies and concepts in order to understand, interpret, and represent science and technology.

UNIT 1 FUNDAMENTALS 6

Divisibility Test - Square root and Cube roots – HCF & LCM - problems on Numbers

UNIT 2 ALGEBRA 5

Simplification – Surds & Indices – Linear & Quadratic Equations

UNIT 3 BANKING ESSENTIALS 8

Average – Percentage – Profit & Loss – Simple Interest – Compound Interest

UNIT 4 TIME AND EFFICIENCY 8

Time Speed Distance – Problems on Trains – Boats & Streams – Time & Work – Pipes & Cisterns

UNIT 5 LOGICAL REASONING 3

Number & letter series – Analogy– Pattern classification – Coding & Decoding

COURSE OUTCOMES:

At the end of the course, students would

CO1: Exhibit a clear understanding of fundamental concepts of aptitude for engineering.

CO2: Demonstrate problem-solving skills and critical thinking abilities in the context of recruitment aptitude tests.

CO3: To use appropriate strategies and shortcuts to improve speed and accuracy in solving aptitude problems during recruitment processes.

CO4: Evaluate and interpret aptitude test results to identify areas of improvement and develop a personalized study plan for further enhancement.

TOTAL: 30 PERIODS

TEXT BOOKS:

1. The Pearson Guide to Quantitative Aptitude For Competitive Examinations, Dinesh Khattar. Pearson

2. Quantitative Aptitude Dr. R.S. Aggarwal S. Chand Publication.
3. A modern Approach to Verbal and Non-Verbal Reasoning R.s. Aggarwal.

REFERENCES:

1. Quantitative Aptitude for CAT, Arun Sharma.
2. Fast Track Objective Arithmetic, Rajesh Verma, Arihant Publication.
3. Quantitative Aptitude Quantum CAT Common Admission Tests for Admission into IIMs, Sarvesh K. Verma.
4. Effective Communication Skill,Kulbhusan Kumar,R S Salaria,Khanna Publishing House.
5.Wiley's Exam Expert Quantitative Ability for CAT, 2ed, Ashu Jain.

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

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO3
CO1	3	3	3	3	-	-	-	-	-	-	-	-			
CO2	3	2	1	3	-	-	-	-	-	-	-	-			
CO3	3	1	1	2	-	-	-	-	-	-	-	-			
CO4	1	1	1	1	-	-	-	-	-	-	-	-			
CO5	-	-	-	-	-	-	-	-	-	-	-	-			

Correlation levels: 1 – low 2 – medium 3 – high "-"- no correlation

COURSE DESIGNED BY	APPROVED BY
Prof. Ramesh Raja – Head/ NCPIR	Dr.M.Kumaresan – Professor & Head/ S&H
Name and Department	**Name and Department of BoS Chairman**

U23CS111 **C -PROGRAMMING LABORATORY** **Category : ESC**

SDG: 4 **(Common to CSE & IT)**

L	T	P	C
0	0	4	2

COURSE OBJECTIVE:

1. To familiarize with C programming constructs.
2. To develop programs in C using basic constructs.
3. To develop programs in C using arrays.
4. To develop applications in C using strings, pointers, functions.
5. To develop applications in C using structures.
6. To develop applications in C using file processing.

LIST OF EXPERIMENTS

1. Writing algorithms, flow charts and pseudo codes for simple problems.
2. Programs on expressions and conversions.
3. Programs using if, if-else, switch and nested if statements.
4. Programs using while, do-while, for loops.
5. Programs on one dimensional array, passing arrays to functions and array operations.
6. Programs using two dimensional arrays, passing 2D arrays to functions.
7. Programs using String functions.
8. Programs using function calls, recursion, call by value.
9. Programs on pointer operators, call by reference, pointers with arrays
10. Programs using structures and unions.
11. Programs on file operations and modes.
12. Working with text files, random files and binary files.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Demonstrate knowledge on C programming constructs.
CO2: Develop programs in C using arrays.
CO3: Develop applications in C using strings, pointers, functions.
CO4: Develop applications in C using structures.
CO5: Develop applications in C using file processing.

TOTAL: 60 PERIODS

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

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	3	1	1	1	-	-	2	-	2	2	2	2	-

CO2	3	2	2	2	1	1	-	-	2	-	2	2	3	3	-
CO3	3	2	3	2	1	2	-	-	2	-	2	2	2	2	-
CO4	3	2	2	2	1	2	-	-	3	-	2	3	3	3	-
CO5	3	2	3	1	1	2	-	-	3	-	2	3	2	3	-
Correlation levels: 1 – low 2 – medium 3 – high "-"- no correlation															

COURSE DESIGNED BY	APPROVED BY
Dr.S.Pathur Nisha, Professor & Head/ CSE & Prof. Evance Leethail , AP/CSE	Dr.S.Pathur Nisha, Professor & Head/ CSE
Name and Department	**Name and Department of BoS Chairman**

U23BS111 **BASIC SCIENCE LABORATORY** **Category : BSC**

SDG:4

L	T	P	C
0	0	2	2

COURSE OBJECTIVE:

1. Realize the fundamental engineering ideas of matter, optics, heat, sound, and quantumtheory.
2. Demonstrate a solid understanding of fundamental matter properties, Laser and Fiber optics classification, Quantum concepts and apply them successfully to solve practical engineering problems.
3. Apply the elastic modulus theory, Fiber Optic Sensors, Ultrasonics and thermal applications to integrate knowledge and problem solve at an advanced level.
4. Categorize the Elastic moduli concepts, Fiber optic lasers and Crystal structures to implement in Engineer problems in Material Science and electronics.
5. Analyse the foundational Quantum and Crystal Physics concepts to implement solutions for modern engineering problems.

PHYSICS - LIST OF EXPERIMENTS (Any 5 Experiments)

1. Determination of rigidity modulus – Torsion pendulum
2. Determination of Young's modulus - Non uniform bending method.
3. Determination of Young's modulus - Uniform bending method.
4. Determination of thickness of a thin wire – Air wedge method.
5. Determination of the wavelength of the laser using grating .
6. Determination of Numerical Aperture and acceptance angle using Optical fibre.
7. Determination of velocity of sound and compressibility of liquid – Ultrasonic interferometer.

8. Determination of thermal conductivity of a bad conductor – Lee's Disc method.
9. Melde's string experiment.
10. Determination of Band gap of a semiconductor.

CHEMISTRY- LIST OF EXPERIMENTS (Any 5 Experiments)

1. Estimation of total, temporary and permanent hardness of water by EDTA method.
2. Estimation of alkalinity of the given water sample.
3. Determination of chloride content of water sample by Argentometric method.
4. Determination of strength of given hydrochloride acid using pH meter
5. Determination of DO content of water sample by Winkler's method.
6. Conduct metric titration strong acid Vs Strong Base.
7. Estimation of BOD of the given water sample.
8. Estimation of iron content of the given solution using potentiometer.
9. Estimation of Iron content by spectrophotometer.
10. Estimation of sodium present in water using flame photometer.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Apply Physics principles of elasticity to evaluate engineering properties of materials.

CO2: Analyze the physical principle involved in various instruments in acoustics, optics andthermal physics.

CO3: Characterize the quality of water samples with respect to their acidity, alkalinity and hardness.

CO4: Apply chemistry principles to evaluate DO, BOD, Iron content of the given samples.

CO5: Analyze the strength and amount of acids using pH, potentiometer, conductivity meter and the amount of chloride, sodium iron using Argentometric method and flame photometer for thegiven solution.

TOTAL: 60 PERIODS

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

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	l O 3
CO1	3	2	1	1	-	-	1	-	1	-	-	-			
CO2	3	2	1	1	-	-	1	-	1	-	-	1			
CO3	3	2	1	1	-	-	1	-	1	-	-	-			
CO4	3	2	1	1	-	-	1	-	1	-	-	1			
CO5	3	2	-	1	-	-	1	-	1	-	-	1			
Correlation levels: 1 – low 2 – medium 3 – high "-"- no correlation															

COURSE DESIGNED BY	APPROVED BY
Dr.M.Kumaresan – Professor & Head/ S&H & Dr.T.Jayaprakash - Professor / Physics	Dr.M.Kumaresan – Professor & Head / S&H
Name and Department	**Name and Department of BoS Chairman**

U23EN111 COMMUNICATIVE ENGLISH LABORATORY **Category : HSMC**

SDG : 4 **(Common to all Branches)**

L	T	P	C
0	0	2	1

COURSE OBJECTIVE:

1. To enable learners of engineering and technology to develop their basic communication skills in English.
2. To acquire, command in both the respective skills (listening and reading) and the productive skills (writing and speaking) of the English language.
3. To understand the key concepts of values, life skills and business communication and motivate students to look within and create a better version of themselves.
4. To focus on the development of basic fluency in English, usage of vocabulary in the technical field, and strengthening reading and official written communication skills.
5. To use language efficiently in expressing their opinions via various media.

LIST OF EXPERIMENTS

1. Conversation: Introduction to Classmates-Audio/Video (formal & informal)
2. Self-Introduction
3. Telephone Conversation
4. Listening to voicemail & messages
5. Listening and filling a form
6. Debate
7. Group Discussion
8. Exchanging personal Information
9. Introducing a friend politeness strategy
10. Essay Writing

COURSE OUTCOMES:

At the end of the course, students would

CO1 : To improve the communicative competence of learners

CO2 :To help learners use language effectively in academic /work contexts

CO3 : To develop various listening strategies to comprehend various types of audio materials like lectures, discussions, videos etc.

CO4 : To build on students' English language skills by engaging them in listening, speaking and grammar learning activities that are relevant to authentic contexts.

CO5 : To use language efficiently in expressing their opinions via various media.

30 Periods

CO's-PO's & PSO's MAPPING															
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**	**PSO 3**
CO1	3	2	3	1	1	1	-	-	2	-	2	2	2	2	-
CO2	3	2	2	2	1	1	-	-	2	-	2	2	3	3	-
CO3	3	2	3	2	1	2	-	-	2	-	2	2	2	2	-
CO4	3	2	2	2	1	2	-	-	3	-	2	3	3	3	-
CO5	3	2	3	1	1	2	-	-	3	-	2	3	2	3	-
Correlation levels:			**1 – low**			**2 – medium**				**3 – high**			**"-"- no correlation**		

COURSE DESIGNED BY	**APPROVED BY**
Dr.T.Saranaya- AP/ English & Prof. J.Brindha Devi- AP/ English	Dr.M.Kumaresan – Professor & Head/ S&H
Name and Department	**Name and Department of BoS Chairman**

SEMESTER II

		Category : HSMC			
U23EN203	**TECHNICAL ENGLISH**	**L**	**T**	**P**	**C**
SDG: 4		**2**	**0**	**0**	**2**

COURSE OBJECTIVE:

1. To improve the communicative competence of learners.
2. To help learners use language effectively in academic /work contexts.
3. To develop various listening strategies to comprehend various types of audio materials like lectures, discussions, videos, etc.
4. To build on students' English language skills by engaging them in listening, speaking, and grammar learning activities that are relevant to authentic contexts.
5. To use language efficiently in expressing their opinions via various media.

UNIT 1 INTRODUCTION TO FUNDAMENTALS OF COMMUNICATION 6

Listening -conversation: Introduction to classmates - Audio / video (formal & informal), Speaking - making telephone calls-Self Introduction; Introducing a friend; - politeness strategies.

UNIT 2 NARRATION AND SUMMATION 6

Listening - Listening to podcasts, anecdotes / stories / event narration; documentaries and interviews with celebrities. Speaking - Narrating personal experiences describing experiences and feelings- engaging in small talk- describing requirements and abilities.

UNIT 3 DESCRIPTION OF A PROCESS / PRODUCT 6

Listening - Listen to product and process descriptions; a classroom lecture; and advertisements about products. Speaking – Picture description- describing locations in workplaces- Giving instruction to use the product- explaining uses and purposes- Presenting a product.

UNIT 4 CLASSIFICATION AND RECOMMENDATIONS 6

Listening –Listening to lectures - and educational videos. Speaking – Small Talk; discussing and making plans-talking about tasks-talking about progress talking about travel preparations.

UNIT 5 EXPRESSION 6

Listening – Listening to debates/ discussions; panel discussions. Speaking –making predictions- talking about a given topic-giving opinions.

COURSE OUTCOMES:

At the end of the course, students would

CO1: To listen and comprehend general as well as complex academic information

CO2: To listen to and understand different points of view in a discussion.

CO3: To speak fluently and accurately in formal and informal communicative contexts.

CO4: To describe products and processes and explain their uses and purposes clearly and accurately.

CO5: To express their opinions effectively in both formal and informal discussions.

TOTAL: 30 PERIODS

TEXT BOOKS:

1. English for Engineers & Technologists, Orient Blackswan Private Ltd. Department of English, Anna University, 2020.

2. English for Science & Technology Cambridge University Press, 2021. Authored by Dr. VeenaSelvam, Dr. Sujatha Priyadarshini, Dr. Deepa Mary Francis, Dr. KN. Shoba, and Dr. Lourdes Joevani, Department of English, Anna University.

3. A Handbook for English Language Laboratories, E. Suresh Kumar, Department of English, College of Engineering, Osmania University, P. Sreehari, Department of English, College of Engineering, Osmania University. 2011.

REFERENCES:

1. Technical Communication – Principles And Practices By Meenakshi Raman & Sangeeta Sharma, Oxford Univ. Press, 2016, New Delhi.

2. A Course Book on Technical English By Lakshmi Narayanan, Scitech Publications (India) Pvt. Ltd.

3. English For Technical Communication (With CD) By Aysha Viswamohan Mcgraw Hill Education, ISBN : 0070264244.

4. Effective Communication Skill, Kulbhusan Kumar, R S Salaria, Khanna Publishing House.

5. Learning to Communicate – Dr. V. Chellammal, Allied Publishing House, New Delhi, 2003.

6. A Manual For English Language Laboratory, D. Sudha Rani, Pearson Education India, 2009.

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

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	-	-	-	-	-	-	1	2	2	2	-	3	-	-	-

CO2	-	-	-	-	-	-	-	3	3	1	-	2	-	-	-
CO3	-	-	-	-	-	-	-	2	-	2	-	3	-	-	-
CO4	-	-	-	-	-	-	2	3	3	1	-	3	-	-	-
CO5	-	-	-	-	-	-	1	3	2	1	-	3	-	-	-
Correlation levels:			**1 – low**			**2 – medium**			**3 – high**				**"-"- no correlation**		

COURSE DESIGNED BY	**APPROVED BY**
Dr. Alice Evangalin Jebaselvi - Professor / English	Dr.M.Kumaresan – Professor & Head/ S&H
Name and Department	**Name and Department of BoS Chairman**

U23MA202 **ADVANCED CALCULUS AND STATISTICS** **Category : BSC**

SDG:4 **(Embedded Theory and Lab)**

L	**T**	**P**	**C**
3	**0**	**2**	**4**

COURSE OBJECTIVE:

1. Familiarize the student with vector calculus ideas in order to find line, surface and volume integrals in basic coordinate systems.
2. Understand and demonstrate basic conclusions by using Gauss, Stokes and Greens theorems.
3. Provide the required skill to apply the statistical tools in engineering problems.
4. Learn the theory of hypothesis testing for both small as well as large samples, which is an essential skill for solving real life problems
5. Introduce the basic concepts of classifications of design of experiments which plays very important roles in the field of statistical quality control.

UNIT 1 **VECTOR DIFFERENTIAL CALCULUS**

Differentiation of Vectors– Scalar and Vector Point Functions–Gradient, divergence and curl– Directional derivative–Irrotational and Solenoidal vector fields– Application: Decision Review System in Cricket and Hit Distance Using Differentiation of Vectors. **9**

UNIT 2 **VECTOR INTEGRAL CALCULUS**

Vector integration – Green's theorem in a plane, Gauss divergence theorem and Stokes' theorem (excluding proofs). Simple applications involving cubes and rectangular parallelepipeds. **9**

UNIT 3 CORRELATION AND LINEAR REGRESSION

Correlation–Karl Pearson's correlation coefficients–Spearman's Rank Correlation– Regression–Estimation of Regression line–Application: Measuring the influences between factors- Estimation of association among the variables. **9**

UNIT 4 HYPOTHESIS TESTING

Small sample tests: Student t-test - Single mean and difference of two means – F Test for Variance - Chi square test for goodness of fit –Independence of attributes. Application: Performance analysis- Comparative analysis–Quality testing. **9**

UNIT 5 DESIGN OF EXPERIMENTS

Analysis of Variance: One way and two –way Classifications-Completely randomized design–Randomized block design– Latin square design. Application:Response Surface Methodology. **9**

COURSE OUTCOMES:

At the end of the course, students would

CO1: Determine the identities that link grad, div and curl in Cartesian and other basic coordinate systems

CO2: Apply the Gauss, Stokes and Greens theorems to stream line integral computations and demonstrate basic outcomes.

CO3: Compute correlation between variables and use regression to predict unknown values using R-studio.

CO4 Apply the idea of hypothesis testing for both small and large samples in practical problems utilizing R- studio.

CO5: Construct the design of experiments modeling and analysis of variance using R- studio.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Erwin Kreyszig," Advanced Engineering Mathematics ", John Wiley and Sons, 10th Edition, New Delhi, 2016.

2.Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 41st Edition,2011.

3.Veerarajan T., Probability, Statistics and Random Processes, Tata McGraw Hill, 3rd edition, 2008.

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

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO3
CO1	3	3	3	-	2	-	-	-	1	-	-	1	-	-	-

CO2	3	3	3	-	2	-	-	-	1	-	-	1	-	-	-
CO3	3	3	3	-	2	-	-	-	1	-	-	2	-	-	-
CO4	3	3	3	-	2	-	-	-	1	-	-	2	-	-	-
CO5	3	3	3	-	2	-	-	-	1	-	-	2	-	-	-
Correlation levels: 1 – low 2 – medium 3 – high "-"- no correlation															

COURSE DESIGNED BY	APPROVED BY
Dr. N.Vithya – Associate Professor / Mathematics	Dr.M.Kumaresan – Professor & Head/ S&H
Name and Department	**Name and Department of BoS Chairman**

U23PH203 **PHYSICS FOR INFORMATION SCIENCE** **Category : BSC**

SDG : 4 **(Common to CSE & IT)**

L	T	P	C
3	0	0	3

COURSE OBJECTIVE:

1. Make the students understand the importance in studying electrical properties of materials.
2. Enable the students to gain knowledge in semiconductor physics.
3. Make the students to learn the origin of magnetism in magnetic materials and their classifications; to learn the physics of superconductivity and various properties exhibited by superconductors.
4. Make the students to learn the mechanisms of polarization in dielectric materials, and about classification and properties of dielectric materials; familiarize with the optical properties of materials.
5. Inculcate an idea of significance of Nano structures, quantum confinement, ensuing Nano materials preparation and applications.

UNIT 1 ELECTRICAL PROPERTIES OF MATERIALS 9

Introduction - Classical free electron theory - Expressions for Electrical and Thermal conductivity - Wiedemann-Franz law – Lorentz Number - Quantum free electron theory – Fermi distribution function – Effect of temperature on fermi function-Density of energy states – Carrier concentration in metals - Electron effective mass- concept of hole.

UNIT 2 SEMICONDUCTOR PHYSICS 9

Elemental and compound semiconductors - Intrinsic semiconductor – carrier concentration derivation

– Fermi level – Variation of Fermi level with temperature – electrical conductivity – band gap determination – Extrinsic semiconductor - Derivation of carrier concentration in n-type and p-type semiconductor – variation of Fermi level with temperature and impurity concentration — Hall effect –Determination of Hall coefficient – Applications.

UNIT 3 MAGNETISM AND SUPERCONDUCTIVITY 9

Origin of magnetic moment – Bohr magneton – Comparison of Dia, Para and Ferro magnetism – Domain theory – Hysteresis – soft and hard magnetic materials – anti-ferromagnetic materials – Ferrites and its applications. Superconductivity: properties – Type I and Type II superconductors – High Tc superconductors – Applications of superconductors – SQUID, cryotron, magnetic levitation.

UNIT 4 DIELECTRIC AND OPTICAL PROPERTIES OF MATERIALS 9

Electrical susceptibility – Dielectric constant – Electronic, ionic, orientational and space charge polarization – Frequency and temperature dependence of polarisation – Internal field – Claussius – Mosotti relation (derivation) – Dielectric loss - Light absorption - Luminescence, Phosphors and white LEDs -Birefringence, Dichroism - Electro-optic effect and amplitude modulators.

UNIT 5 NANO DEVICES 9

Introduction - Quantum confinement – Quantum structures: quantum wells, wires and dots — Band gap of nano-materials - Classification of nanomaterials - Thin Film Growth, Ball Milling, Sol-Gel – Properties and applications – Carbon nanotubes: types and applications.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Grasp the fundamental principles of classical and quantum mechanics, semiconductor physics, magnetic properties of materials, dielectric materials, superconducting materials, optical and nano materials and acquire insights into the essentials of emerging engineering materials.

CO2: Demonstrate a comprehensive understanding of classical and quantum mechanics, semiconductor physics, magnetic properties of materials, dielectric materials, and superconducting materials optical and nano materials, enabling the adept resolution of practical engineering challenges.

CO3: Apply the foundational theories of classical and quantum mechanics, semiconductor physics, and the properties of magnetic, dielectric, superconducting materials, optical and nano materials to seamlessly integrate knowledge into diverse engineering applications.

CO4: Classify the semiconductor, magnetic, dielectric, and superconducting properties of materials, utilizing this systematic categorization to effectively address engineering problems in Material Science.

CO5: Analyze the foundational knowledge of conductors, semiconductors, magnetic, dielectric, superconducting materials, optical and nano materials to formulate and implement solutions for contemporary engineering issues.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Arumugam M., Materials Science. Anuradha publishers, 2010.
2. S.O. Kasap. Principles of Electronic Materials and Devices, McGraw Hill Education (Indian Edition), 2020.
3. The Physics and Chemistry of NanoSolids by Frank J. Owens and Charles P. Poole Jr, Wiley-Interscience, 2008.

REFERENCES:

1. Palanisamy P.K. Materials Science. SCITECH Publishers, 2011.
2. Senthilkumar G. Engineering Physics II. VRB Publishers, 2011
3. Handbook of nanoscience, Eng. & Technology by W. Gaddand, D. Bernner, S.L. Solnki& G.J. Infrate (Eds) , CRC press 2002.
4. Charles Kittel, Introduction to Solid State Physics, Wiley India Edition, 2019.
5. Amnon Yariv and P.Yeh, Photonics: Optical Electronics in Modern Communications, Oxford Univ.Press, 2007
6. Nanostructure and Nanomaterials: Synthesis , Properties and Application by G. Cao, Imperial College Press, 2004.

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

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	1	-	-	-	1	-	-	-	-	1	-	-	-
CO2	3	2	-	-	1	-	1	-	-	-	-	-	-	-	-
CO3	3	2	1	-	1	-	1	-	-	1	-	1	-	-	-
CO4	3	2	1	-	1	-	1	-	-	1	-	1	-	-	-
CO5	3	2	1	-	1	-	1	-	-	1	-	1	-	-	-

Correlation levels: 1 – low 2 – medium 3 – high "-"- no correlation

COURSE DESIGNED BY	APPROVED BY
Dr. T.Jayaprakash- Professor / Physics	Dr.M.Kumaresan – Professor & Head/ S&H
Name and Department	**Name and Department of BoS Chairman**

U23CS201 SDG:4	PYTHON PROGRAMMING AND PRACTICES	Category : ESC			
		L	T	P	C
		3	0	0	3

COURSE OBJECTIVE:

1. To understand and develop programs using Python.
2. To use the concepts of strings, control flow, data types in python programs.
3. To create programs using list, tuples, dictionaries, and files concept in Python.
4. To analyze image processing, networking and object-oriented programming in Python.
5. To create new ideas for problems in real world application using python.

UNIT 1 INTRODUCTION TO PYTHON PROGRAMMING 6

Introduction to Python Programming- Python Interpreter and Interactive Mode -Variables- Numerical types- Arithmetic operators and Expressions- Psuedo Code - Values and types: int, float, Boolean - Variables, Expressions, Statements -Illustrative Problems.

UNIT 2 DATA TYPES, CONTROL FLOW, STRINGS 8

Control Flow -conditional (if), Alternative (if-else), Chained conditional (if-else if-else)- Iteration: state, while, for, break, continue, pass - Strings: string slices, immutability, string functions and methods, string module, Regular expression, Pattern matching. - Illustrative Problems.

UNIT 3 LISTS, TUPLES DICTIONARIES AND FUNCTIONS 10

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. Functions and User Defined Functions: Simple and Mathematical Built–in Functions, Recursion -Illustrative Problems.

UNIT 4 FILES AND OOPS CONCEPT IN PYTHON 10

Files, Text files, reading and writing files-format operator; Files and exception handling - Introduction to Object Oriented Programming – Basic principles of Object Oriented Programming in Python – Class Definition-Object Creation - Inheritance, Composition, Operator Overloading.

UNIT 5 IMAGE PROCESSING & NETWORKING WITH PYTHON AND APPLICATIONS 11

Basics of Image processing- Image File Formats – Introduction to Classic Image Processing Algorithm- Image Processing Tools-Fundamentals of Networking- Introduction to Python Sockets- Simple Client/Server Programming-Python Applications.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Explain the concepts of Python.

CO2: Use appropriate constructs to represent data.

CO3: Write programs using different constructs in Python.

CO4: Develop real world applications in image processing and networking.
CO5: Develop various simple programs for real world application using python.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Python Programming for Beginners: Skyrocket Your Code and Master Python in Less than a Week. Discover the Foolproof, Practical Route to Uncover Insider Hacks, Unlock New Opportunities, and Revolution Kindle Edition by Kit Jackson (Author), 31 May 2023
2.Introducing Python, 2nd Edition, by Bill Lubanovic, O'Reilly Media, Inc., 2019.

REFERENCES:

1.Python Programming for Beginners,ISBN-13-979-8870875248, Narry Prince, 2023.

2.Python Programming, West McKinney,ISBN-13-979-8870534817,2023.

3. Python Quick Start Guide: The Simplified Beginner's Guide to Python Programming Using Hands-On Projects and Real-World Applications, by Robert Oliver,ISBN-13-978-163610037, 2023.

4. Mastering Python Networking: Utilize Python packages and frameworks for network automation, monitoring, cloud, and management by Eric Chou,2023.

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

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO 12	PSO 1	PSO 2	PSO3
CO1	2	-	1	-	-	-	-	-	1	1	-	3	1	1	-
CO2	2	-	1	-	-	-	-	-	1	1	-	3	1	1	-
CO3	2	-	1	-	-	-	-	-	1	1	-	3	1	1	-
CO4	2	3	1	-	3	-	-	1	1	1	3	3	1	1	-
CO5	2	3	1	1	3	-	-	1	3	1	3	3	1	1	-

Correlation levels: 1 – low 2 – medium 3 – high "-"- no correlation

COURSE DESIGNED BY	APPROVED BY
Dr.S.Pathur Nisha – Professor & Head/ CSE & Prof. Evance Leethail – AP/CSE	Dr.S.Pathur Nisha – Professor & Head/ CSE
Name and Department	**Name and Department of BoS Chairman**

U23CS203 **BASIC ELECTRICAL AND ELECTRONICS ENGINEERING** **Category : ESC**

SDG:4,12

L	T	P	C
3	0	0	3

COURSE OBJECTIVE:

1. To familiarize with various laws and theorems to solve electric and electronic circuits
2. Provide an overview on working principle of machines
3. Excel the concepts of semiconductor devices, op-amps and digital circuits

UNIT 1 DC CIRCUITS 7

Basic circuit elements and sources; Ohms law; Kirchhoff's laws; Series and Parallel connection of circuit elements; Mesh current analysis; Node voltage analysis; Theorems: Thevenin's, Maximum power transfer and Superposition theorem.

UNIT 2 AC CIRCUITS 8

Alternating voltages and currents, RMS, average, maximum values, Single Phase RL, RC, RLC series circuits, Power in AC circuits, Power Factor, Three phase balanced systems, Star and delta Connections, Electrical Safety, Fuses and Earthing.

UNIT 3 MAGNETIC CIRCUITS 7

Magnetic field; Toroidal core: Flux density, Flux linkage; Magnetic circuit with airgap; Reluctance in series and parallel circuits; Self and mutual inductance; Transformer: turn ratio determination.

UNIT 4 8

Construction, working principle and applications of DC Machines, Transformers, Three phase Induction motors, synchronous generators, single phase induction motors, special machines stepper motor, universal motor and BLDC motor

UNIT 5 D/A AND A/D CONVERTERS 7

Characteristics: PN junction diode, Zener diode, BJT, MOSFET; Applications: Rectifier, Voltage regulator, Operational amplifier.

UNIT 6 DIGITAL ELECTRONICS 8

Binary arithmetic; Number base conversion; Boolean algebra: simplification of Boolean functions using K-maps; Logic gates; Design of basic combinational circuits: adders, multiplexers, de-multiplexers.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Recall and describe basic circuit elements, electrical sources, Ohm's Law, Kirchhoff's laws, Magnetic field concepts, Flux density, Flux linkage, and Self/Mutual inductance principles in toroidal cores.

CO2: Understand and explain the principles of series and parallel connections, electrical safety mechanisms, Characteristics of semiconductor devices.

CO3: Illustrate various types of electrical machines and their applications, as well as Binary arithmetic and Number base conversions.

CO4: Apply laws and theorems to construct DC circuit parameters, and utilize Boolean algebra and K-maps to design digital circuits by simplifying Boolean functions.

CO5: Analyze AC circuit parameters, Magnetic circuits (including air gaps and reluctance), turns ratios, and design adders, multiplexers, and de-multiplexers using logic gates.

TOTAL: 45 PERIODS

TEXTBOOKS:

1. Allan R. Hambley, "Electrical Engineering -Principles & Applications", 2019, 6th Edition, Pearson Education

2. V. D. Toro, Electrical Engineering Fundamentals, 2nd edition. PHI, 2014

REFERENCES:

1. DP Kothari & Nagrath, "Basic Electric Engineering", 2019, Tata McGraw Hill

2. R. L. Boylestad and L. Nashelsky, Electronic Devices and Circuit Theory, 11th edition. Pearson, 2012

WEB RESOURCES:

1. https://onlinecourses.nptel.ac.in/noc22_ee113/preview

2. https://onlinecourses.nptel.ac.in/noc21_ee55/preview

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

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	-	-	-	-	-	-	-	-	-	1	1	-	-
CO2	3	1	-	-	-	1	-	-	-	-	-	1	-	1	
CO3	3	1	-	-	-	-	-	-	-	-	-	1	-	-	1
CO4	3	3	2	-	-	-	-	-	-	-	-	1	-	-	-
CO5	3	3	2	-	-	-	-	-	-	-	-	1	1	-	-

Correlation levels: 1 – low	2 – medium	3 – high	"-"- no correlation

COURSE DESIGNED BY	APPROVED BY
Mr.V.Satheeswaran/AP(SG)-ECE	Dr.S.Pathur Nisha – Professor & Head/ CSE
Name and Department	**Name and Department of BoS Chairman**

Category : HSMC

U23HS202 TAMIL AND TECHNOLOGY

L	T	P	C
1	0	0	1

COURSE OBJECTIVE:

1. To learn the extensive literature of classical Tamil.
2. To review the fine arts heritage of Tamil culture.
3. To realize the contribution in Indian freedom struggle.

UNIT 1 TAMIL AND TECHNOLOGY 3

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

UNIT 2 DESIGN AND CONSTRUCTION TECHNOLOGY 3

Designing and Structural construction House & Designs in household materials during Sangam Age - Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study (Madurai Meenakshi Temple)- Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period.

UNIT 3 MANUFACTURING TECHNOLOGY 3

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

UNIT 4 AGRICULTURE AND IRRIGATION TECHNOLOGY 3

Dam, Tank, ponds, Sluice, Significance of KumizhiThoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society.

UNIT 5 SCIENTIFIC TAMIL & TAMIL COMPUTING 3

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

COURSE OUTCOMES:

At the end of the course, students would

CO1: Understand the extensive literature of Tamil and its classical nature (understand).

CO2: Understand the heritage of sculpture, painting and musical instruments of ancient people (understand).

CO3: Review on folk and martial arts of Tamil people (understand).

CO4: Realization of thinai concepts, trade and victory of chozha dynasty (understand).

CO5: Understand the contribution of Tamils in Indian freedom struggle, self-esteem movement and siddha medicine (understand).

TOTAL: 15 PERIODS

TEXT BOOKS:

1.தமிழகவரலாறு – மக்களும்பண்பாடும்– .கக.ககபிள்ளை (வவைியீடு): தமிழ்நாடுபாடநூல்மற்றும்கல்வியியல்பணிகள்கழகம்.

2.கணினித்தமிழ் – முளனவர்இல. சுந்தரம் . (விகடன்பிரசுரம்).

3.கீழடி – ளவளகநதிக்களரயில்சங்ககாலநகரநாகரிகம் (வதால்லியல்துளை (வவைியீடு).

REFERENCES:

1.Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)

2.Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).

3.National The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: Interl Institute of Tamil Studies).

4.Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu.

5.Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu).

6.Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

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

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO2	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-

CO3	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO4	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
CO5	-	-	-	-	-	-	3	3	-	2	-	3	-	-	-
Correlation levels: 1 – low 2 – medium 3 – high "-"- no correlation															

COURSE DESIGNED BY	APPROVED BY
Prof. A.Prabhakaran – AP/ Tamil	Dr.M.Kumaresan – Professor & Head/ S&H
Name and Department	**Name and Department of BoS Chairman**

U23EE202 **Category : EEC**
SDG:17 **CAREER ENHANCEMENT TRAINING II**

L	T	P	C
2	0	0	1

COURSE OBJECTIVE:

1. To help students demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.
2. To enable students critically evaluate various real-life situations by resorting to an analysis of key issues and factors.
3. To help them improve their communicative English for Interview and corporate readiness.

UNIT 1 NUMERICAL REASONING 6

Problems on Ages – Arithmetic Reasoning - Ratio & Proportion – Alligation & Mixtures

UNIT 2 GEOMETRY & SHAPES 6

Mensuration 2D –Mensuration 3D – Height – Distance - Perimeter – Area – Volume

UNIT 3 COMBINATIONS & CALENDARS 6

Permutation and Combination – Probability-Circular Permutation - Clocks and Calendars

UNIT 4 CLASSIC REASONING 6

Blood Relation – Direction Sense – Seating Arrangement – Syllogism – Statement & Conclusion

UNIT 5 VERBAL APTITUDE 6

Synonyms Antonyms – Spotting Error – Sentence Correction – Change of Voice – Change of Speech –

Spelling – Reading Comprehension – Select Words – Closet Test.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Demonstrate problem-solving skills and critical thinking abilities in the context of Engineering Aptitude.

CO2: To use appropriate strategies and shortcuts to improve speed and accuracy in solving aptitude problems during recruitment processes.

CO3: Evaluate and interpret aptitude test results to identify areas of improvement and develop a personalized study plan for further enhancement.

CO4: Use the correct Grammar, Vocabulary, Spelling and Comprehension ensuring the enhancement their language skills and the ability to use the skills for effective Communication

TOTAL: 30 PERIODS

TEXT BOOKS:

1. The Pearson Guide to Quantitative Aptitude For Competitive Examinations, Dinesh Khattar. Pearson
2. Quantitative Aptitude Dr. R.S. Aggarwal S. Chand Publication
3. A modern Approach to Verbal and Non-Verbal Reasoning R.s. Aggarwal

REFERENCES:

1. Quantitative Aptitude for CAT, Arun Sharma.
2. Fast Track Objective Arithmetic, Rajesh Verma, Arihant Publication.
3. Quantitative Aptitude Quantum CAT Common Admission Tests for Admission into IIMs, Sarvesh K. Verma.
4. Wiley's Exam Expert Quantitative Ability for CAT, 2ed, Ashu Jain.

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

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	3	3	-	-	-	-	-	1	-	-			
CO2	3	2	1	3	-	-	-	-	-	1	-	-			
CO3	3	1	1	2	-	-	-	-	-	1	-	-			
CO4	1	1	1	1	-	-	-	-	-	3	-	-			
CO5	-	-	-	-	-	-	-	-	-	-	-	-			

Correlation level: 1 – low 2 – medium 3 – high "-"- no correlation

COURSE DESIGNED BY	APPROVED BY
Prof. Ramesh Raja – Head/ NCPIR	Dr.S.Pathur Nisha – Professor & Head/ CSE
Name and Department	**Name and Department of BoS Chairman**

U23GE212 **ENGINEERING PRACTICES LABORATORY** **Category : ESC**

SDG:4 **(Common for CSE & IT)**

L	T	P	C
0	0	2	1

COURSE OBJECTIVE:

1. Connecting various pipe fittings used in common household plumbing work; Planning; making joints in wood materials used in common household wood work.
2. Welding various joints in steel plates using arc welding work; Machining various simple processes like turning and drilling in parts.
3. Assembling simple mechanical assembly of common household equipments; Making a tray out of metal sheet using sheet metal work.
4. Wiring various electrical joints in common household electrical wire work.
5. Soldering and testing simple electronic circuits; Assembling and testing simple electronic components.

LIST OF EXPERIMENTS

GROUP A (CIVIL & MECHANICAL)

PART I-CIVIL ENGINEERING PRACTICES

Plumbing Work:

1. Connecting various basic pipe fittings like valves, taps and other components which are commonly used in household.

Wood Work:

2. Planning
3. Making T- Joint.

PART II-MECHAINICAL ENGINEERING PRACTICES

Welding Work:

4. Welding of Butt Joints using arc welding.
5. Practicing gas welding

Basic Machining Work:

6. (Simple)Turning.
7. (Simple)Drilling.

Machine Assembly Practice:

8. Study of Centrifugal pump.
9. Study of Air conditioner.

Sheet Metal Work:

10. Making of a square tray.

GROUP B (ELECTRICAL & ELECTRONICS)

PART I- ELECTRICAL ENGINEERING PRACTICES

1. Introduction to switches, fuses, indicators and lamps - Basic switch board wiring with lamp, fan and three pin sockets.
2. Staircase wiring.
3. Fluorescent Lamp wiring with introduction LED types.

PART II- ELECTRONICS ENGINEERING PRACTICES

4. Study of Electronic components and equipment – Resistor, color coding measurement of AC signal parameter (peak-peak, rms period, frequency) using CRO.
5. Soldering simple electronic circuits and checking continuity.
6. Assembly and dismantle of LED TV.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Fabricate carpentry components and pipe connections including plumbing works.
CO2: Use welding equipment to join the structures.
CO3: Carry out the basic assembling and machining operations; Make the models using sheet metal.
CO4: Carry out basic home electrical works and appliances and to measure the electrical quantities.
CO5: Soldering the simple electronic circuits; Assemble the simple electronic devices.

TOTAL: 30 PERIODS

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

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO3
CO1	2	2	2	2	0	0	0	0	1	2	2	1	0	0	0
CO2	2	2	2	2	0	0	0	0	1	2	2	1	0	0	0
CO3	2	2	2	2	0	0	0	0	1	2	2	1	0	0	0

CO4	2	2	2	2	0	0	0	0	1	2	2	1	0	0	0
CO5	2	2	2	2	0	0	0	0	1	2	2	1	0	0	0
Correlation levels: 1 – low 2 – medium 3 – high "-"- no correlation															

COURSE DESIGNED BY	APPROVED BY
Prof. S.Satheeshkumar – AP/Mechanical & Prof. V. Satheeswaran – AP/ECE	Dr.S.Pathur Nisha – Professor & Head/ CSE
Name and Department	**Name and Department of BoS Chairman**

U23GE213 **ENGINEERING GRAPHICS LABORATORY** **Category : ESC**

SDG:4

L	T	P	C
0	0	2	1

COURSE OBJECTIVE:

1. To improve imagination skills.
2. To develop graphic skills for communication of concepts, ideas and design of Engineering products.
3. To learn drafting & modeling packages in orthographic and isometric drawings.
4. To train the usage of 2D and 3D modeling.
5. To learn graphical representation of machine components.

INTRODUCTION TO CAD

Basic drawing and editing commands: line, circle, rectangle, erase, view, undo, redo, snap, object editing, moving, copying, rotating, scaling, mirroring, layers, templates, polylines, trimming, extending, stretching, fillets, arrays, dimensions. Dimensioning principles and conventional representations.

ORTHOGRAPHIC PROJECTIONS

Systems of projections, conventions and application to orthographic projections - simple objects. Lines, planes, simple solids.

ISOMETRIC PROJECTIONS

Principles of isometric projection- Isometric scale; Isometric views

1. Introduction to Computer Aided Drafting software packages.
2. Practice on features of a Computer Aided Drafting package.
3. Practice Sheet -Title Block.

4. Loci of Points.
5. Engineering curves.
6. Projection of Lines.
7. Projection of Planes.
8. Projection of Solids.
9. Drafting of Isometric Projection.
10. Drafting of Orthographic views of simple parts.

COURSE OUTCOMES:

At the end of the course, students would

CO1: Understand the standards and common cases as well as dimensioning in technical drawings development

CO2: Communicate the technical ideas in the form of drawings.

CO3: Apply the drawing skills in representing various geometrical features.

CO4: Develop orthographic projections and isometric views of various objects.

CO5: Sketch simple objects and their pictorial views using CAD.

TOTAL: 30 PERIODS

TEXT BOOKS:

1. K. Venugopal, V.Prabhu Raja, Engineering Drawing + Auto Cad, New Age International Publishers.

2.Kulkarni D.M, AP Rastogi and AK Sarkar, Engineering Graphics with Auto Cad, PHILearning, Eastern Economy editions.

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

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
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CO2	1	-	2	-	2	-	-	-	1	-	-	1	2	2	1
CO3	1	-	2	-	2	-	-	-	1	-	-	1	2	2	1
CO4	1	-	2	-	2	-	-	-	1	-	-	1	2	2	1
CO5	1	-	2	-	2	-	-	-	1	-	-	1	2	2	1

Correlation levels: 1 – low 2 – medium 3 – high "-"- no correlation

COURSE DESIGNED BY	APPROVED BY
Prof. A. Balthilak – AP/Mechanical	Dr.S.Pathur Nisha – Professor & Head/ CSE
Name and Department	**Name and Department of BoS Chairman**

SUSTAINABLE DEVELOPMENT GOALS

SDG	Short Form	Full Form
1	No Poverty	End poverty in all its forms everywhere
2	Zero Hunger	End hunger, achieve food security and improved nutrition, And promote sustainable agriculture
3	Good health and well being	Ensure healthy lives and promote well-being for all at all Ages
4	Quality education	Ensure inclusive and equitable quality education and Promote lifelong learning opportunities for all
5	Gender Equality	Achieve gender equality and empower all women and girls
6	Clean water and sanitation	Ensure availability and sustainable management of water and sanitation for all
7	Affordable and clean energy	Ensure access to affordable, reliable, sustainable and modern energy for all
8	Decent work and Economic Growth	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
9	Industry, Innovation and Infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
10	Reducing Inequality	Reduce income inequality within and among countries
11	Sustainable cities and communities	Make cities and human settlements inclusive, safe, Resilient and sustainable
12	Responsible consumption and production	Ensure sustainable consumption and production patterns
13	Climate action	Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy
14	Life below water	Conserve and sustainably use the oceans, seas and marine Resources for sustainable development
15	Life on Land	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and Halt biodiversity loss
16	Peace, justice and string Institutions	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17	Partnerships for the goals	Strengthen the means of implementation and revitalize the Global partnership for sustainable development