

E.G.S. PILLAY ENGINEERING COLLEGE (AUTONOMOUS)

Approved by AICTE, New Delhi

(Affiliated to Anna University, Chennai | Re-accredited by NAAC with 'A++' Grade)

Accredited by NBA (B.Tech-IT, B.E-CSE and ECE)(Tier-1)

NAGAPATTINAM – 611002



**B.TECH - INFORMATION TECHNOLOGY
(R-2023)**

CURRICULUM AND SYLLABUS FOR FIRST YEAR

SEMESTER II									
COURSE CODE	COURSE NAME	CATEGORY	L	T	P	C	MAX.MARKS		
							CA	ES	TOTAL
Theory Courses									
2301MA204	Probability and Statistics	BSC	3	1	0	4	40	60	100
2301PH203	Physics for Information Science	BSC	3	0	0	3	40	60	100
2301CH201	Applied Chemistry in Informatics	BSC	3	0	0	3	40	60	100
2301GEX03	Problem Solving using C	ESC	2	0	4	4	50	50	100
2301ENX01	Professional English	HSMC	2	0	0	2	40	60	100
2301TA201	Tamils and Technology / தமிழரும் தொழில்நுட்பமும்	HSMC	1	0	0	1	100	-	100
Laboratory Courses									
2301PHX51	Engineering Physics Laboratory	BSC	0	0	2	1	60	40	100
2301CHX51	Engineering Chemistry Laboratory	BSC	0	0	2	1	60	40	100
2301ENX51	Communication Skills Laboratory	HSMC	0	0	2	1	100	-	100
2301GEX52	Engineering Practices Laboratory	ESC	0	0	4	2	60	40	100
2301LS201	Life Skills - II	-	-	-	-	-	100	-	100
TOTAL			14	1	14	22	690	410	1100

2301MA204	PROBABILITY AND STATISTICS (Common to CSE and IT)				L	T	P	C																																																																														
					3	1	0	4																																																																														
PREREQUISITE:																																																																																						
1. Basic concepts of Probability. 2. Basic concepts of Statistics.																																																																																						
COURSE OBJECTIVES:																																																																																						
1.This course aims at providing the required skill to apply the statistical tools in engineering problems. 2.To introduce the basic concepts of probability, random variables and two dimensional random variables. 3.To calculate the measures of central tendency, measures of dispersions and fitting of curves by least squares methods. 4. Large sample test for single propositions, difference of propositions, Chi-square test for goodness of fit and independence of attributes.																																																																																						
COURSE OUTCOMES:																																																																																						
At the end of this course, Students will be able to,																																																																																						
CO1: Apply the parameters of unpredictable experiments using probability concepts.																																																																																						
CO2: Construct probabilistic models for observed phenomena through discrete and continuous distributions.																																																																																						
CO3: Associate the random variables, by designing joint distribution and correlate the random variables.																																																																																						
CO4: Make use of the sample Measure of central tendency, Fitting curves and straight lines.																																																																																						
CO5: Apply test of significance, Chi-square test for goodness of fit and independence of attributes.																																																																																						
COs Vs POs MAPPING:																																																																																						
<table border="1"> <thead> <tr> <th>COs</th> <th>PO1</th> <th>PO2</th> <th>PO3</th> <th>PO4</th> <th>PO5</th> <th>PO6</th> <th>PO7</th> <th>PO8</th> <th>PO9</th> <th>PO10</th> <th>PO11</th> <th>PO12</th> </tr> </thead> <tbody> <tr> <td>CO1</td> <td>3</td> <td>2</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CO2</td> <td>3</td> <td>2</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CO3</td> <td>3</td> <td>2</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CO4</td> <td>3</td> <td>2</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CO5</td> <td>3</td> <td>2</td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>									COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	CO1	3	2	1										CO2	3	2	1										CO3	3	2	1										CO4	3	2	1										CO5	3	2	1									
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COURSE CONTENTS:																																																																																						
MODULE I PROBABILITY							9 Hours																																																																															
Probability- Theorems on Probability- Conditional Probability – Baye’s Theorem- Discrete and continuous random variables – Moments–Moment Generating Functions–Real Time Problems																																																																																						
MODULE II THEORETICAL DISTRIBUTION:							9 Hours																																																																															
Discrete Distributions: Binomial, Poisson, Geometric- Continuous Distributions: Uniform, Exponential, Normal distributions- Application of Distribution in Engineering Problems																																																																																						
MODULE III TWO - DIMENSIONAL RANDOM VARIABLES							9 Hours																																																																															
Joint distributions –Marginal and conditional distributions –Covariance– Correlation and Linear regression- Applications																																																																																						

MODULE IV	INTRODUCTION TO STATISTICS	9 Hours
Definition of Statistics - Basic Objectives – Collection of Data - Population - Sample - Representative -Classification -Measures of Central Tendency –Measures of Dispersion- Curve fitting by the method of least squares-fitting of straight lines- Applications.		
MODULE V	TESTING OF HYPOTHESIS	9 Hours
Test of significance: Large sample test for single proportion, difference of proportions, single mean, difference of means, Small samples: t-test, F-test, Chi-square test for goodness of fit and independence of attributes.		
TOTAL: 45 + 15 = 60 HOURS		
REFERENCES:		
1. Erwin Kreyszig, Advanced Engineering Mathematics, 9 th Edition, John Wiley & Sons, 2006.		
2. A. Goon, M. Gupta and B. Dasgupta, Fundamentals of Statistics, Vol. I & II, World Press, 2013		
3. I. R. Miller, J. E. Freund and R. Johnson, "Probability and Statistics for Engineers".		
4. Fourth Edition, PHI, 2011		
5. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability Theory, Universal Book Stall, 2003 (Reprint).		
6. S. Ross, A First Course in Probability, 6th Ed., Pearson Education India, 2002.		
7. W. Feller, An Introduction to Probability Theory and its Applications, Vol. 1, 3rd Ed., Wiley, 1968.		
8. N. P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2010.		
9. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.		
10. Veeraranjan T., Engineering Mathematics (for semester III), Tata McGraw-Hill, New Delhi, 2010		

2301PH203	PHYSICS FOR INFORMATION SCIENCE (Common to CSE & IT)				L	T	P	C				
					3	0	0	3				
PREREQUISITE:												
Basic knowledge in physics												
COURSE OBJECTIVES:												
1.To make the students understand the importance in studying electrical properties of materials. 2.To enable the students to gain knowledge in semiconductor physics 3.To instill knowledge on magnetic properties of materials 4.To establish a sound grasp of knowledge on different optical properties of materials, optical displays and applications 5.To inculcate an idea of significance of nano structures, quantum confinement, ensuing nano device applications and quantum computing.												
COURSE OUTCOMES:												
At the end of this course, Students will be able to,												
CO1:	understand clearly of semiconductor physics and functioning of semiconductor devices											
CO2:	know basics of dielectric materials, gain knowledge on the electrical properties of materials and their applications											
CO3:	understand the magnetic, optical properties of materials											
CO4:	Demonstrate a strong knowledge in optoelectronic devices and working principles of various optical devices											
CO5:	appreciate the importance of nanotechnology and nanodevices											
COs Vs POs MAPPING:												
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1										
CO2	3	1	2									
CO3	3			1	2	1	1					
CO4	3		2	1	3		1					
CO5	3	2	2	2	2	1	2					
COURSE CONTENTS:												
MODULE I	ELECTRICAL PROPERTIES OF MATERIALS								9 Hours			
Classical free electron theory - Expression for electrical conductivity – Thermal conductivity, expression - Wiedemann-Franz law – Success and failures - electrons in metals– Fermi- Dirac statistics –Fermi energy and Fermi function with effect of temperature– Density of energy states – Electron in periodic potential – Energy bands in solids - Electron effective mass – concept of hole												
MODULE II	SEMICONDUCTOR PHYSICS								9 Hours			
Intrinsic Semiconductors – Energy band diagram – direct and indirect band gap semiconductors – Carrier concentration in intrinsic semiconductors – extrinsic semiconductors - Carrier concentration in N-type & P-type semiconductors – Variation of carrier concentration with temperature – variation of Fermi level with temperature and impurity concentration – Carrier transport in Semiconductor:random motion, drift, mobility and diffusion – Hall effect and devices – Ohmic contacts – Schottky diode.												

MODULE III	MAGNETIC PROPERTIES OF MATERIALS	9 Hours
Magnetic dipole moment – atomic magnetic moments- magnetic permeability and susceptibility - Magnetic material classification: diamagnetism – paramagnetism – ferromagnetism – antiferromagnetism – ferrimagnetism – Ferromagnetism: origin and exchange interaction- saturation magnetization and Curie temperature – Domain Theory- M versus H behaviour – Hard and soft magnetic materials – examples and uses– Magnetic principle in computer data storage – Magnetic hard disc (GMR sensor).		
MODULE IV	OPTICAL PROPERTIES OF MATERIALS	9 Hours
Classification of optical materials – carrier generation and recombination processes - Absorption emission and scattering of light in metals, insulators and semiconductors (concepts only) - photo current in a P-N diode – solar cell - LED – Organic LED – Laser diodes – Optical data storage techniques.		
MODULE V	NANODEVICES AND QUANTUM COMPUTING	9 Hours
Introduction - quantum confinement – quantum structures: quantum wells, wires and dots — band gap of nanomaterials. Tunneling – Single electron phenomena: Coulomb blockade – resonant tunneling diode – single electron transistor – quantum cellular automata - Quantum system for information processing – quantum states – classical bits – quantum bits or qubits –CNOT gate - multiple qubits – Bloch sphere – quantum gates – advantage of quantum computing over classical computing.		
TOTAL: 45 HOURS		
REFERENCES:		
1.S.O. Kasap. Principles of Electronic Materials and Devices, McGraw Hill Education (Indian Edition), 2020.		
2. R.F.Pierret. Semiconductor Device Fundamentals. Pearson (Indian Edition), 2006.		
3. G.W.Hanson. Fundamentals of Nanoelectronics. Pearson Education (Indian Edition), 2009.		
4. Jasprit Singh, Semiconductor Optoelectronics: Physics and Technology, McGraw- Hill Education (Indian Edition), 2019.		
5. Charles Kittel, Introduction to Solid State Physics, Wiley India Edition, 2019		
6. https://archive.nptel.ac.in/courses/108/108/108108122/		
7. https://onlinecourses.nptel.ac.in/noc20_ph24/preview		

2301CH201	APPLIED CHEMISTRY IN INFORMATICS (Common to CSE, IT & AIDS)				L	T	P	C				
					3	0	0	3				
PREREQUISITE:												
<ul style="list-style-type: none"> Basic knowledge of science up to higher secondary level 												
COURSE OBJECTIVES:												
<ul style="list-style-type: none"> To make the students conversant with boiler feed water requirements, related problems and water treatment techniques To impart technological aspects of applied chemistry 												
COURSE OUTCOMES:												
At the end of this course, Students will be able to,												
CO1:	Describe the types of hardness and various water treatment process.(K2)											
CO2:	Summarize the construction and working of various electrodes. (K2)											
CO3:	Illustrate corrosion using electrochemical principles. (K2)											
CO4:	Describe the construction and working of batteries. (K2)											
CO5:	Summarize nano technology and polymer materials. (K2)											
COs Vs POs MAPPING:												
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1										
CO2	2	1										
CO3	2	1										
CO4	2	1										
CO5	2	1										
COURSE CONTENTS:												
MODULE I	WATER TECHNOLOGY								9 Hours			
Hardness of water – types – expression of hardness – units – estimation of hardness of water by EDTA - Alkalinity- boiler troubles (scale and sludge) – treatment of boiler feed water – Internal treatment (phosphate, colloidal, Sodium aluminate and calgon conditioning) external treatment – Ion exchange process, zeolite process – desalination of brackish water- Reverse Osmosis.												
MODULE II	ELECTROCHEMISTRY								9 Hours			
Cell terminology-Electrochemical cells- Electrolytic cells- Cell reactions- Daniel cell-Difference between electrolytic cells and electrochemical cells. Reversible cells and irreversible cells -types- EMF and its applications - Nernst equation (derivation and problems).Single electrode potential - Hydrogen electrode - Calomel electrode - Glass electrode - pH measurement using glass electrode.												
MODULE III	CORROSION AND COMPUTER COMPONENTS								9 Hours			
Corrosion – principles of corrosion – Pilling – Bed worth rule – principles of electrochemical corrosion – difference between chemical and electrochemical corrosion – galvanic corrosion – differential aeration corrosion – factors influencing corrosion – corrosion control – cathodic protection – sacrificial anodic method.												
MODULE IV	BATTERIES								9 Hours			
Batteries – introduction, Representation of a battery, Types- Alkaline battery, Lead acid, Nickel–Cadmium and Lithium ion batteries–advantages and disadvantages. Fuel Cells – Basic Structure- Hydrogen Fuel Cell. Renewable energy resources, Solar energy-application.												
MODULE V	NANOTECHNOLOGY AND POLYMER MATERIALS								9 Hours			
Nanotechnology: Basics - distinction between molecules, nanoparticles and bulk materials; size-dependent properties. Nano particles: nano cluster, nano rod, nanotube (CNT) and nanowire. Synthetic methods: chemical vapour deposition, laser ablation; synthesis of metal oxide nano particles. Polymer -functionality – degree of polymerisation- molecular weight determination (weight average and number average)- Thermoplastic & Thermo Setting- Nanoparticles embedded polymer composites.												
									TOTAL: 45 HOURS			

REFERENCES:

1. SashiChawla, A Text book of Engineering Chemistry, DhanpatRai Publishing Co., Pvt. Ltd., Educational and Technical Publishers, New Delhi, 3rd Edition, 2015.
2. S. S. Dara, *A Text book of Engineering Chemistry*, S. Chand & Co Ltd., New Delhi, 20th Edition, 2013.
3. P.C. Jain and Monica Jain, A Textbook of Engineering Chemistry, DhanpatRai publications, New Delhi, 16th edition, 2015.
4. Roussak and H.D. Gesser, *Applied Chemistry-A Text Book for Engineers and Technologists*, Springer Science Business Media, New York, 2nd Edition, 2013.
5. Alain Nouailhat, "An Introduction to Nanoscience and Nanotechnology", John Wiley, ISBN:978-1848210073
6. https://onlinecourses.nptel.ac.in/noc23_mm01/preview
7. https://onlinecourses.nptel.ac.in/noc23_me46/preview

2301GEX03	PROBLEM SOLVING USING C	L	T	P	C	
		2	0	4	4	
PREREQUISITE:						
1. Problem Solving						
COURSE OBJECTIVES:						
1. To understand the constructs of C Language.						
2. To develop C programmes using arrays and strings						
3. To develop modular applications in C using functions and pointers						
4. To develop applications in C using structures and union						
5. To do input/output and file handling in C						
COURSE OUTCOMES:						
At the end of this course, Students will be able to,						
CO1:	Demonstrate the knowledge about the techniques used to solve problems in computing					
CO2:	Build programmes using C constructs					
CO3:	Design and implement applications using arrays and strings					
CO4:	Develop and implement modular applications in C using functions and pointers					
CO5:	Develop programmes and applications in C using structures, union and files					
COURSE CONTENTS:						
MODULE I	INTRODUCTION TO PROBLEM SOLVING TECHNIQUES				6 Hours	
Problem Solving Techniques – Algorithm – Flowchart – Pseudo code - Steps to convert Algorithm to Source code.Data Types – Constants – Keywords – Expressions – Type of Errors.						
MODULE II	BASICS OF C PROGRAMMING				6 Hours	
Structure of C programme – Pre-processor directives - Compilation process, Execution of source code. Operators and operator’s precedence – I/O statements – Sequence statements – Selection statements – Looping statements – Solve Numerical / Logical problems.						
MODULE III	ARRAYS AND STRINGS				6 Hours	
Introduction to Arrays: Declaration, Initialization – One dimensional array – Two dimensional array String operations: length, compare, concatenate, copy, upper case, lower case.						
MODULE IV	FUNCTIONS AND POINTERS				6 Hours	
Function prototypes - function definition, function call – Recursion: Binary search using recursive functions. Pointers – Pointer operators – Pointer arithmetic – Arrays and pointers – Parameter passing: Pass by value, Pass by reference.						
MODULE V	STRUCTURES, UNION AND FILE PROCESSING				6 Hours	
Structure - Nested structures – Pointer and Structures – Array of structures – Dynamic memory allocation – Union - Storage classes and Visibility. Files – Types of file processing: Sequential access, Random access – Sequential access file - Random access file - Command line arguments.						
LIST OF EXPERIMENTS:						
1. Prepare programmes in C to implement basic concepts in C language.					3 Hours	
2. Produce C programmes to implement decision making and branching statements.					3 Hours	
3. Use the concept of looping to implement C programmes.					3 Hours	
4. Employ the concept of arrays to develop C programmes.					3 Hours	
5. Experiment the concepts of strings using C.					3 Hours	
6. Develop C programmes to perform code reusability using function.					3 Hours	
7. Model programmes in C to implement pointers.					3 Hours	

8. Build C programme to implement structures.	3 Hours
9. Implement C programme by making use of the concept of files.	3 Hours
10. Mini Project: using Files, Structures, Functions & Pointers.	3 Hours

HARDWARE/SOFTWARE REQUIREMENTS

1. Desktop Systems or Server Computing
2. C/C++ Compiler

TOTAL: 60 HOURS

COs Vs POs / PSOs MAPPING:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1										2	2	2
CO2	2	2	1	1	1								2	2	2
CO3	3	2	3	2	2								1	3	1
CO4	3	2	3	2	2								1	3	2
CO5	3	2	3	2	2								1	3	1

REFERENCES:

1. Yashwant Kanetkar, Let us C, 17th Edition, BPB Publications, 2020.
2. Reema Thareja, "Programming in C", Oxford University Press, Second Edition, 2016.
3. Kernighan, B.W and Ritchie, D.M, "The C Programming language", Second Edition, Pearson Education, 2015.
4. Byron S. Gottfried, "Schaum's Outline of Theory and Problems of Programming with C", McGraw-Hill Education, 1996.
5. https://onlinecourses.nptel.ac.in/noc23_cs53/course
6. <https://cse02-iiith.vlabs.ac.in/exp>
7. www.skillrack.com

2301ENX02	PROFESSIONAL ENGLISH				L	T	P	C					
	Common to B.E /B.Tech Programme (CIVIL,BME,CSE,ECE,EEE,IT,MECH)												
PREREQUISITE:													
1. Basic English Knowledge													
COURSE OBJECTIVES:													
CO1	To improve the communicative competence of learners.												
CO2	To learn using of basic grammatical structures in suitable contexts.												
CO3	To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text.												
CO4	To help learners in using the language effectively in professional contexts.												
CO5	To use the language efficiently in expressing their opinions.												
COURSE OUTCOMES:													
At the end of this course, Students will be able to,													
CO1:	Use appropriate words in a professional context												
CO2:	Gain understanding of basic grammatical structures and use them in right context.												
CO3:	Read and interpret information presented in tables, charts and other graphic forms												
CO4:	Write definitions, descriptions, narrations and essays on various topics												
CO5:	Speak fluently and accurately in formal and informal communicative contexts.												
COs Vs POs MAPPING:													
	COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1										3		
	CO2										3		
	CO3										3		
	CO4										3		
	CO5										3		
COURSE CONTENTS:													
MODULE I	FUNDAMENTALS OF COMMUNICATION								9 Hours				
Reading - Reading brochures (technical context)/ user manuals/, telephone messages / social media messages relevant to technical contexts and emails. Writing - Professional emails etiquette, emails / letters (seeking permission for Industrial visit& Complain letter) Grammar - Present Tense (simple and progressive); Question types: Why/ Yes or No/ and Tags. Vocabulary - Word forms (prefixes& suffixes); Synonyms and Antonyms, Punctuation.													
MODULE II	NARRATION AND SUMMATION								9 Hours				
Reading - Reading longer technical texts (Reading biographies/ travelogues/ newspaper reports/ travel & technical blogs). Writing - Paragraph writing Short Report on an event (field trip etc.), emails / letters (Writing responses to complaints). Grammar –Past tense (simple); Subject-Verb Agreement. Vocabulary – Preposition, Prepositional Phrases& Phrasal verbs.													
MODULE III	DESCRIPTION OF A PROCESS / PRODUCT								9 Hours				
Reading – Reading advertisements, gadget reviews. Writing – instructions, Checklists, Report Writing (Accident Report & Survey Report (IV)). Grammar – Present & Past Perfect Tenses, Voices (Active ,Passive & Impersonal Passive Voice); Vocabulary – Collocations, Homonyms; and Homophones,													
MODULE IV	CLASSIFICATION AND RECOMMENDATIONS								9 Hours				
Reading – Newspaper articles; Journal reports –and Non Verbal Communication (tables, pie charts etc.); Writing- Job / Internship application – Cover letter & Resume ,recommendations. Grammar – Articles, Adjectives of Comparison, If conditional sentences Vocabulary – Conjunctions, discourse markers (connectives & sequence words)													

MODULE V	EXPRESSION	9 Hours
Reading – Company profiles, standard operating procedure (SOP)/ an excerpt of interview with professionals. Writing – Essay Writing (Descriptive or narrative), Grammar – Future Tenses, Numerical adjectives, Relative Clauses. Vocabulary - Cause & Effect Expressions – Content vs Function words.		
		TOTAL: 45 HOURS
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 Lakshminarayanan, 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, RS Salaria, Khanna Publishing House.		
5. Learning to Communicate – Dr. V. Chellammal, Allied Publishing House, New Delhi,2003.		
6. Raman. Meenakshi, Sharma. Sangeeta (2019). Professional English. Oxford university press. New Delhi		
7. New Delhi. 2. Improve Your Writing ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, 2001, NewDelhi.		

2301TA101	தமிழரும் தொழில்நுட்பமும்/ Tamils and Technology			L	T	P	C	
				1	0	0	1	
PRE REQUISITE:								
The Tamils living in different parts of the World need to keep in touch with the motherland and the mother tongue and be knowledgeable about their heritage in order to preserve their cultural identity and observe their traditional and cultural activities.								
Recognizing this fact and for meeting the felt and emerging needs of the Tamil Communities and others interested in Tamil studies								
COURSE OBJECTIVES:								
Tamil Literature is way of a life. It focuses on the historical significance of ethics, moral culture in the Tamil context.								
Tamil Modern literature emphasizes on the modern development of the behavioral, moral and ethical								
Technology is the important key for a language and a new sector for the students to voice out for a social cause								
COURSE OUTCOMES:								
At the end of this course, Students will be able to,								
CO1:	Develop a spirit of patriotism.							
CO2:	Understand the plight of the people living in the society and Biological Struggles.							
CO3:	Remember the life style of the Sangam people and To recognize the heroic spirit of the ancient Tamil kings							
CO4:	Evaluate the quality and morals of local life through Tamil literature							
CO5:	Introducing the various Literary Genres and dramas and enable them to produce innovative ideas in modern literary theories							
COURSE CONTENTS:								
MODULE I	WEAVING AND CERAMIC TECHNOLOGY						3 Hours	
Weaving Industry during Sangam Age–Ceramic technology–Black and Red Ware Potteries (BRW) Graffition Potteries.								
அலகு I நெசவு மற்றும் பானைத் தொழில்நுட்பம்: 3								
சங்க காலத்தில் நெசவுத் தொழில் – பானைத் தொழில்நுட்பம் - கருப்பு சிவப்பு பாண்டங்கள் – பாண்டங்களில் கீறல் குறியீடுகள்.								
MODULE II	DESIGN AND CONSTRUCTION TECHNOLOGY						3 Hours	
Designing and Structural construction House & Designs in house hold 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) - ThirumalaiNayakarMahal – Chetti Nadu Houses, Indo-Saracenic architecture at Madras during British Period.								

<p>அலகு II வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்: 3 சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு- சங்க காலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் – சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் - மாமல்லபுரச் சிற்பங்களும், கோவில்களும் – சோழர் காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் – நாயக்கர் காலக் கோயில்கள் - மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் – செட்டிநாட்டு வீடுகள் – பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ-சாரோசெனிக் கட்டிடக் கலை.</p>	<p>3</p>
<p>MODULE III MANUFACTURING TECHNOLOGY</p>	<p>3 Hours</p>
<p>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 – Terra-cotta beads – Shell beads/bone beads – Archeological evidences –Gems tone types described in Silappathikaram.</p>	
<p>அலகு III உற்பத்தித் தொழில் நுட்பம்: 3 கப்பல் கட்டும் கலை – உலோகவியல் – இரும்புத் தொழிற்சாலை – இரும்பை உருக்குதல், எஃகு – வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் – நாணயங்கள் அச்சடித்தல் – மணி உருவாக்கும் தொழிற்சாலைகள் – கல்மணிகள், கண்ணாடி மணிகள் – சுடுமண் மணிகள் – சங்கு மணிகள் – எலும்புத்துண்டுகள் – தொல்லியல் சான்றுகள் – சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.</p>	<p>3</p>
<p>MODULE IV AGRICULTURE AND IRRIGATION TECHNOLOGY</p>	<p>3 Hours</p>
<p>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</p>	
<p>அலகு IV வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நுட்பம்: 3 அணை, ஏரி, குளங்கள், மதகு – சோழர்காலக் குழுழித் தூம்பின் முக்கியத்துவம் – கால்நடை பராமரிப்பு – கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் – வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள் – கடல்சார் அறிவு – மீன்வளம் – முத்து மற்றும் முத்துக்குளித்தல் – பெருங்கடல் குறித்த பண்டைய அறிவு – அறிவுசார் சமூகம்.</p>	<p>3</p>
<p>MODULE V SCIENTIFIC TAMIL & TAMIL COMPUTING</p>	<p>3 Hours</p>
<p>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.</p>	
<p>அலகு V அறிவியல் தமிழ் மற்றும் கணித்தமிழ்: 3 அறிவியல் தமிழின் வளர்ச்சி –கணித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின்பதிப்பு செய்தல் – தமிழ் மென்பொருட்கள் உருவாக்கம் – தமிழ் இணையக் கல்விக்கழகம் – தமிழ் மின் நூலகம் – இணையத்தில் தமிழ் அகராதிகள் – சொற்குவைத் திட்டம்.</p>	<p>3</p>
<p style="text-align: right;">TOTAL:15HOURS</p>	
<p>REFERENCES:</p>	
<p>1. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL –</p>	

(in print)	
2. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.	
3. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).	
4. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)	
5. 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)	
6. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)	
7. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)	
8. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.	

2301PHX51	ENGINEERING PHYSICS LABORATORY (Common for all branches)				L	T	P	C				
					0	0	2	1				
PREREQUISITE:												
Basic knowledge in physics												
COURSE OBJECTIVES:												
<ol style="list-style-type: none"> To learn the proper use of various kinds of physics laboratory equipment To learn how data can be collected, presented and interpreted in a clear and concise manner. To learn problem solving skills related to physics principles and interpretation of experimental data. To determine error in experimental measurements and techniques used to minimize such error. To make the student an active participant in each part of all lab exercises 												
COURSE OUTCOMES:												
At the end of thiscourse, Students will be able to												
CO1:	Utilize the concept of twisting couple to find the Rigidity Modulus and Moment of Inertia of a wire.											
CO2:	Experiment with properties of materials to find the Young’s modulus of the material under uniform bending											
CO3:	Choose the concept of streamline flow of liquids in capillary tubes and measure the viscosity of liquids.											
CO4:	Test the phenomenon of interference of light by forming fringes and find the thickness through air-wedge method.											
CO5:	Determine the particle size and wavelength of laser source through diffraction phenomenon.											
CO 6	Examine the velocity and wavelength of ultrasonics in a liquid and compressibility of the liquid.											
COs Vs POs MAPPING:												
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	1	1						
CO2	3	3	2	2	2	1						1
CO3	3	3	1	1	2	1						
CO4	3	3	2	2	2	1						
CO5	3		2	2	2	1						
LIST OF EXPERIMENTS (Any 7 experiments to be performed)												
1. Torsional pendulum - Determination of rigidity modulus of wire and moment of inertia of regular and irregular objects.												
2. Simple harmonic oscillations of cantilever.												
3. Non-uniform bending - Determination of Young’s modulus												
4. Uniform bending – Determination of Young’s modulus												
5. Laser- Determination of the wavelength of the laser using grating												
6. Air wedge - Determination of thickness of a thin sheet/wire												
7. a) Optical fibre -Determination of Numerical Aperture and acceptance angle b) Compact disc- Determination of width of the groove using laser.												
8. Acoustic grating- Determination of velocity of ultrasonic waves in liquids.												
9. Ultrasonic interferometer – determination of the velocity of sound and compressibility of liquids												
10. Determination of Band gap of a semiconductor.												
11. Poiseuille’s method for finding viscosity of a liquid												
12. Lee’s Disc-Thermal conductivity of bad conductor												
13. Spectrometer-determination of wavelength using grating												
Total: 30 Hours												
REFERENCES												
1. Practical Physics’, R.K. Shukla, AnchalSrivastava, New age international (2011)												
2. B.Sc. Practical Physics’, C.L Arora, S. Chand &Co. (2012)												

2301CHX51	ENGINEERING CHEMISTRY LABORATORY											L	T	P	C
COMMON TO ALL BRANCHES												0	0	2	1
PREREQUISITE:															
<ul style="list-style-type: none"> Basic knowledge of science up to higher secondary level 															
COURSE OBJECTIVES:															
<ul style="list-style-type: none"> To make the students conversant with boiler feed water requirements, related problems and water treatment techniques To impart technological aspects of applied chemistry 															
COURSE OUTCOMES:															
On the successful completion of the course, students will be able to															
CO1:	Estimate the amount of ion present in the water sample.														
CO2:	Determine the pH of the solutions.														
CO3:	Estimate the corrosion behavior of metals.														
CO4:	Determine the acid content using electrochemical principles.														
CO5:	Determine the molecular weight of the polymer.														
COs Vs POs MAPPING:															
	COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
	CO1	3	2			1			1	1					
	CO2	3	2			1			1	1					
	CO3	3	2			1			1	1					
	CO4	3	2			1			1	1					
	CO5	3	2			1			1	1					
COs Vs PSOs MAPPING															
	Cos	PSO1	PSO2	PSO3											
	CO1														
	CO2														
	CO3														
	CO4														
	CO5														
LIST OF EXPERIMENTS															
1. Determination of total, temporary & permanent hardness of water by EDTA method															
2. Comparison of alkalinities of the given water samples															
3. Estimation of iron content of the given solution using potentiometer															
4. Corrosion experiment – weight loss method															
5. Conductometric titration of strong acid Vs strong Base															
6. Determination of molecular weight of a polymer by viscometry method															
7. Determination of percentage of copper in alloy															
8. Determination of ferrous iron by Spectrophotometry method															
9. Estimation of calcium present in cement.															
10. Determination of strength of given hydrochloric acid using pH meter															
11. Estimation of sodium ion present in water by flame photometer.															

12. Estimation of dissolved oxygen in a water sample/sewage by Winklers method.

13. Synthesis of metal oxide nanoparticles by chemical method.

REFERENCES:

1.Experimental organic chemistry, Daniel R. Palleros, John Wiley & Sons, Inc., New Yor (2001)

2.Engineering Chemistry”, Jain & Jain, 15th edition, Dhanpat Rai Publishing company, New Delhi

3.Vogel’s Textbook of practical organic chemistry, Furniss B.S. Hannaford A.J, Smith P.W.G and Tatchel A.R
LBS Singapore (1994)

4.LBS Singapore (1994). Kolthoff I.M., Sandell E.B. et al Mcmillan, Madras 1980

2301GEX52		ENGINEERING PRACTICES LABORATORY											L	T	P	C
													0	0	4	2
PREREQUISITE: NIL																
COURSE OBJECTIVES:																
1. To provide hands on training for fabrication of components using sheet metal and welding equipment / tools.																
2. To develop skill for using carpentry and fitting tools to make simple components and metal joints.																
3. To provide training for making simple house hold pipe line connections using suitable tools.																
4. To develop the skill to make / operate/utilize the simple engineering components.																
COURSE OUTCOMES:																
At the end of this course, Students will be able to,																
CO1: Fabricate simple components using sheet metal using suitable tools.																
CO2: Prepare simple components using suitable fitting tools.																
CO3: Fabricate simple components using welding equipments.																
CO4: Make simple components / joints using carpentry power tools.																
CO5: Make simple house hold pipe line connections using suitable tools.																
COs Vs POs & PSOs MAPPING:																
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
CO1	2								2			1	-	-	-	
CO2	2	1							2			1	-	-	-	
CO3	2	1			1				2			1	-	-	-	
CO4	2	1			1				2			1	-	-	-	
CO5	2								2			1	-	-	-	
LIST OF EXPERIMENTS																
1. Forming of simple object in sheet metal using suitable tools.(Example: Dust Pan, Rectangular tray and Cone making)															6	Hours
2. Prepare V (or) Half round (or) Square (or) Dovetail joint from the given mild Steel flat.															5	Hours
3. Fabrication of a simple component using thin and thick plates using arc welding. (Example: Butt , Lap and T - Joints)															6	Hours
4. Making a simple component using carpentry power tools.(Example: Cross Lap, T-Lap, Dove tail joints and Electrical switch box / Tool box / Letter box)															6	Hours
5. Construct a household pipe line connections using pipes, Tee joint, four way joint, elbow, union, bend, Gate valve and Taps.															5	Hours
6. Study of gas welding equipment and its demonstration.															2	Hours
Total : 30 Hours																
References:																
1. S. Gowri&T.Jeyapooan, "Engineering Practices Lab Manual" 5th Edition,Vikas Publishing.																
2. Dr. V. Ramesh Babu,"Engineering Practices Laboratory Manual" Revised Edition 2019-20, VRB Publishers Pvt. Ltd.																

2301ENX51	COMMUNICATION SKILLS LABORATORY				L	T	P	C				
	Common to B.E /B.TechProgramme (CIVIL,BME,CSE,ECE,EEE,IT,MECH and AI&DS)				0	0	2	1				
PREREQUISITE:												
1. Basic English Knowledge												
COURSE OBJECTIVES:												
1	To facilitate computer-aided multi-media instruction enabling individualized and independent language learning											
2	To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking.											
3	To prepare them to use communicative language and participate in different types of speaking environments.											
4	To expose the Students to participate in group discussions, debates with ease.											
5	To enable the students become strong in LSRW skills.											
COURSE OUTCOMES:												
At the end of this course, Students will be able to,												
CO1:	Improve their listening, reading, speaking and writing skills.											
CO2:	Develop their communication competency.											
CO3:	Use language effectively in professional contexts.											
CO4:	Develop the ability to face campus interviews.											
CO5:	Use language efficiently in expressing their opinions											
COs Vs POs MAPPING:												
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1										3		
CO2										3		
CO3										3		
CO4										3		
CO5										3		
COURSE CONTENTS:												
MODULE I LISTENING											6 Hours	
Listening for general information-specific details Audio / video (formal & informal). Listening IELTS/TOFEL/ TED Talks and educational videos. Listening to podcasts, anecdotes / stories / event narration; documentaries and interviews with celebrities. Listening - Listen to product and process descriptions; and advertisements about products. Listening – Listening to debates/ discussions; different viewpoints on an issue; and panel discussions.												
MODULE II SPEAKING											6 Hours	
Self-Introduction - Role play exercises based on workplace contexts- Group discussion (Discussing advantages and disadvantages/ purposes and reasons)- Discussing progress toward goals- Discussing past events in life-Making telephone calls (politeness strategies- making polite requests, making polite offers, replying to polite requests and offers) Interpreting (Picture, locations in workplaces).												
MODULE III READING											6 Hours	

Reading– Intensive Reading -Comprehending general and technical articles -Cloze reading - Inductive reading- Short narrative and descriptions from newspapers – Skimming and scanning-reading and interpretation-Critical reading Interpreting and transferring graphical information- Sequencing of sentences..	
MODULE IV	WRITING 6 Hours
Writing- Precise writing –Summarizing- Interpreting visual texts (pie chart, bar chart, picture, advertisements etc., - Proposal writing (launching new units or department in a institution or industry & to get loan from bank) - Report writing (accident, progress, project, survey, Industrial visit)- Job application-Resume.	
MODULE V	PERSONALITY DEVELOPMENT 6 Hours
Introduction to life skills -emotional intelligence (visualizing and experiencing purpose)-Self-awareness - Time management-Stress management -Leadership- teamwork & dealing with ambiguity--interview planning- Mock Interviews— Self-Concept. Organizational etiquette.	
TOTAL : 30 HOURS	
REFERENCES:	
Effective Communication Skill, Kulbhusan Kumar, RS Salaria, Khanna Publishing House.	
Learning to Communicate – Dr. V. Chellammal, Allied Publishing House, New Delhi,2003.	
New Delhi. 2. Improve Your Writing ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, 2001, New Delhi.	
Developing Communication Skills by Krishna Mohan, Meera Bannerji- Macmillan India Ltd. 1990, Delhi.	
Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, Tata McGraw Hill & Co. Ltd., 2001, New Delhi.	
https://swayam.gov.in/explorer?searchText=english (Link for NPTEL/SWAYAM/MOOC Courses)	
https://ieltonlinetests.com (Link for modern tool usage)	