

E.G.S. PILLAY ENGINEERING COLLEGE,(Autonomous)

Approved by AICTE, New Delhi

Affiliated to Anna University, Chennai | Accredited by NAAC with „A++ “Grade

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



NAGAPATTINAM – 611002

B. TECH - Artificial Intelligence & Data Science

R-2023

CURRICULUM FOR FIRST YEAR

B.Tech - AI&DS (R2023) – II Semester									
COURS E CODE	COURSE NAME	CATE G ORY	L	T	P	C	MAX. MARKS		
							CA	ES	TOTAL
Theory Courses									
2301MA201	Numerical Computing	BSC	3	1	0	4	40	60	100
2301PH201	Fundamentals of Physics	BSC	3	0	0	3	50	50	100
2301CH201	Applied Chemistry in Informatics	BSC	3	0	0	3	40	60	100
2301GE201	Programming using Python	ESC	3	0	2	4	50	50	100
2301GE202	Data Structure Concepts	ESC	2	0	2	3	50	50	100
2301ENX01	Professional English	HSMC	2	0	0	2	40	60	100
2301TA201	Tamils and Technology	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	-	0	0	0	0	100	-	100
TOTAL			17	1	14	25	750	450	1200

2301ENX01	PROFESSIONAL ENGLISH				L	T	P	C					
	Common to B.E /B.Tech Programme (CIVIL,BME,CSE,ECE,EEE,IT,MECH)				2	0	0	2					
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, New Delhi.

2301MA201	NUMERICAL COMPUTING				L	T	P	C				
					3	1	0	4				
PREREQUISITE:												
1. Basic concepts of numerical Techniques. 2. Optimization												
COURSE OBJECTIVES:												
1. To appreciate the use of simulation techniques 2. To introduce the basic concepts of solving algebraic and transcendental equations. 3. To introduce the numerical techniques of interpolation in various intervals and numerical techniques of differentiation and integration this plays an important role in engineering and technology disciplines.												
COURSE OUTCOMES:												
On the successful completion of the course, students will be able to												
CO1:	Formulate and find optimal solution in the real life optimizing/allocation/assignment problems involving conditions and resource constraints.											
CO2:	Simulate appropriate application/distribution problems.											
CO3:	Apply the basic concepts and techniques of solving algebraic and transcendental equations.											
CO4:	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.											
CO5:	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.											
COs Vs POs MAPPING:												
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2									
CO2	3	3	2									
CO3	3	3	2									
CO4	3	3	2									
CO5	3	3	2									
COs Vs PSOs MAPPING												
	COs	PSO1	PSO2	PSO3								
	CO1	1										
	CO2	1										
	CO3	1										
	CO4	1										
	CO5	1										

COURSE CONTENTS:		
MODULE I	MATRICES	9 Hours
<p>Matrices-Rank of a matrix – Consistency of a system of linear equations – Rouché’s theorem – Solution of a system of linear equations – Linearly dependent and independent vectors – Eigenvalues and Eigenvectors of a real matrix – Properties of eigenvalues and eigenvectors – Cayley-Hamilton theorem (excluding proof) – Orthogonal matrices – Orthogonal transformation of a symmetric matrix to diagonal form – Reduction of quadratic form to canonical form by orthogonal transformation</p>		
MODULE II	VECTOR SPACES	9 Hours
<p>Vectors spaces and subspaces – Linear independence and dependence – Basis and Dimension – Null spaces, column spaces and Linear transformations – LU decomposition method – Singular Value Decomposition method.</p>		
MODULE III	DIFFERENTIAL AND INTEGRAL CALCULUS	9 Hours
<p>Representation of functions – Limit of a function – Continuity – Derivatives – Differentiation rules – Maxima and Minima of functions of one variable – Definite and Indefinite integrals – Techniques of Integration: Substitution rule, Integration by parts, Trigonometric integrals, Trigonometric substitutions, Integration of rational functions by partial fraction.</p>		
MODULE IV	FUNCTIONS OF SEVERAL VARIABLE	9 Hours
<p>Partial differentiation – Homogeneous functions and Euler’s theorem – Total derivative – Change of variables – Jacobians – Partial differentiation of implicit functions – Taylor’s series for functions of two variables – Applications: Maxima and minima of functions of two variables and Lagrange’s method of undetermined multipliers.</p>		
MODULE V	MULTIPLE INTEGRALS	9 Hours
<p>Double integrals – Change of order of integration – Double integrals in polar coordinates – Area enclosed by plane curves – Triple integrals – Volume of solids – Change of variables in double and triple integrals – Applications : Moments and centre of mass, moment of inertia.</p>		
TOTAL: 45 + 15 = 60 HOURS		
REFERENCES:		
1. Grewal B.S., 41st Edition, 2011, “Higher Engineering Mathematics”, Khanna Publishers, New Delhi.		
2. Ramana B.V., 11th Reprint, 2010, “Higher Engineering Mathematics”, Tata McGraw Hill Co. Ltd., New Delhi.		
3. David C. Lay, “Linear Algebra and its Applications”, Pearson Education Asia, New Delhi, 5th Edition, 2016.		
4. Kreyzig E., “Advanced Engineering Mathematics”, 10th Edition, John Wiley and sons, 2011.		
5. Venkataraman M.K., “Engineering Mathematics”, The National Publishing Co., Chennai, 2003.		
6. Thomas G.B. and Finney R.L., “Calculus and Analytic Geometry”, 11th Edition, Pearson Education, 2006.		
7. https://nptel.ac.in/courses/aic22_ts29/		(Link for NPTEL/SWAYAM/MOOC Courses)
8. https://matlabacademy.mathworks.com/details/introduction-to-symbolic-math-with-matlab/symbolic		(Link for modern tool usage)

2301CH201	APPLIED CHEMISTRY IN INFORMATICS (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:												
On the successful completion of the 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										
COs Vs PSOs MAPPING												
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.Sashi Chawla, A Text book of Engineering Chemistry, Dhanpat Rai Publishing Co., Pvt. Ltd., Educational and Technical Publishers, New Delhi, 3rd Edition, 2015.		
2.S. S. Dara, <i>A Text book of Engineering Chemistry</i> , 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.O.V. Roussak and H.D. Gesser, <i>Applied Chemistry-A Text Book for Engineers and Technologists</i> , Springer Science Business Media, New York, 2nd Edition, 2013.		
5.Alain Nouailhat, “An Introduction to Nanoscience and Nanotechnology”, John Wiley, ISBN:978-1848210073		
https://onlinecourses.nptel.ac.in/noc23_mm01/preview		
https://onlinecourses.nptel.ac.in/noc23_me46/preview		

2301GE201	PROGRAMMING USING PYTHON	L	T	P	C
		3	0	2	4
PREREQUISITE: – Programming for Problem Solving					
The course assumes no prior skill or background in design, art or engineering. It is open to all undergraduates and graduate students with an interest in learning a programming language. Python is a dynamic, interpreted (bytecode-compiled) language. There are no type declarations of variables, parameters, functions, or methods in source code. This makes the code short and flexible, and you lose the compile-time type checking of the source code.					
COURSE OBJECTIVES:					
1.Cultivate the mindset and skills of successful entrepreneurs. 2.Lead innovative teams. 3.Develop and refine your strategy in today’s fast-changing, dynamic markets 4.Grow your customer base through inbound and outbound marketing.					
COURSE OUTCOMES:					
Upon successful completion of the course, students will be able to					
CO1	Apply the fundamentals of writing Python scripts				
CO2	Discover how to work with lists and sequence data				
CO3	Write Python functions to facilitate code reuse				
CO4	Use Python to read and write files				
CO5	Work with the Python standard library				
CO6	Explore Python's object-oriented features				
CO7	Search text using regular expressions				
COURSE CONTENTS:					
Module-I	Introduction to Python Programming				6 Hours
Program, Debugging, Syntax Errors, Runtime Errors, Semantic Errors, Experimental Debugging, Formal and Natural Languages, The First Program Variables, Expressions & Statements - Values and Types, Variables, Variable Names and Keywords, Operators and Operands, Expressions and Statements, Order of Operations, String Operations, Comments					
Module-II	Functions & Strings				9 Hours
Functions - Function Calls, Type Conversion Functions, Math Functions, Composition, Adding New Functions. Definitions and Uses, Flow of Execution, Parameters and Arguments, Importing with from Interface Design - TurtleWorld, Simple Repetition, Exercises, Encapsulation, Generalization, Interface, Design, Refactoring, A Development Plan, Docstring Strings - A String Is a Sequence, len, Traversal with a for Loop, String Slices, Strings Are Immutable, Searching, Looping and Counting, String Methods, The in Operator, String Comparison, Case Study : Reading Word Lists, Exercises, Search, Looping with Indices					
Module-III	Conditionals, Recursion & Iteration				6 Hours
Conditionals & Recursion - Modulus Operator, Boolean Expressions, Logical Operators, Conditional Execution, Alternative Execution, Chained Conditionals, Nested Conditionals, Recursion, Stack Diagrams for Recursive Functions, Infinite Recursion, Keyboard Input Fruitful Functions - Return Values, Incremental Development, Composition, Boolean Functions Iteration - Multiple Assignment, The while Statement, break, Square Roots, Algorithms					
Module-IV	Lists, Dictionaries & Files				15 Hours
Lists - Traversing a List, List Operations, List Slices, List Methods Map, Filter, and Reduce, Deleting Elements, Lists and Strings, Objects and Values, Aliasing, List Arguments, Dictionaries - Looping and Dictionaries, Reverse Lookup, Dictionaries and, Lists, Memos, Global Variables					

Files –Reading and Writing, Format Operator, Filenames and Paths, Catching Exceptions, Tuples - Tuples, Tuple Assignment, Tuples as Return Values, Variable-Length Argument Tuples, Lists and Tuples, Dictionaries and Tuples, Comparing Tuples, Sequences of Sequences.		
Module-V	Object Oriented Programming Concepts	9 Hours
Classes & Objects - User-Defined Types, Instances as Return Values, Objects Are Mutable, Copying, Functions – Time, Pure Functions, Modifiers, Methods - Object-Oriented Features, Printing Objects, A More Complicated Example, The init Method, The __str__ Method, Operator Overloading, Polymorphism, Interface and Implementation, Inheritance, Class Attributes, Data Encapsulation, Example Programs		
TOTAL: 45 HOURS		
Mode of Assessment: Activity/CAT/ESE		
TEXT BOOKS:		
1. Real Python Course, Part 1, Real Python Team (Real Python, 2017)		
2. Python Tricks: A Buffet of Awesome Python Features, Dan Bader (dbader.org, 2017)		
3. Fluent Python: Clear, Concise, and Effective Programming, Luciano Ramalho (O’Reilly, 2014)		
REFERENCES:		
1. Python Crash Course, Eric Matthes (No Starch Press, 2016)		
2. Head-First Python, 2nd edition, Paul Barry (O’Reilly, 2016)		
3. Invent Your Own Computer Games with Python, 4th edition, Al Sweigart (No Starch, 2017)		
4. Think Python: How to Think Like a Computer Scientist, 2nd edition, Allen B. Downey (O’Reilly, 2015)		
5. Learn Python 3 the Hard Way, Zed A. Shaw (Addison-Wesley, 2016)		
6. Rework Book by David Heinemeier Hansson and Jason Fried, 2010		
7. https://onlinecourses.nptel.ac.in/noc22_cs31/preview , The Joy of Computing using Python, NPTEL		
LIST OF EXPERIMENTS:		
1. Programs on Variable & Expressions		
2. Programs on Functions & Recursion		
3. Programs on String Operations		
4. Programs on Control Statements & Iterations		
5. Programs on Lists, Dictionaries, Tuples & Files		
6. Programs on Regular Expressions		
7. Programs on Object Oriented Programming Concepts		
8. Working with NumPy		
9. Practical introduction to Python packages for Working with Data		
10. Capstone Project on solving a real world problem using a framework		
Mode of Assessment: Continuous Assessment, PAT, ESP		

2301GE202	DATA STRUCTURES CONCEPTS	L	T	P	C
		2	0	2	3
PREREQUISITE: – NIL					
COURSE OBJECTIVES:					
1.To introduce the fundamental concept of data structures 2.To emphasize the importance of different concepts in data structures and implementing efficient algorithms.					
COURSE OUTCOMES:					
Upon successful completion of the course, students will be able to					
CO1: Assess how the choice of data structures and algorithm design methods impacts the performance of programs. CO2: Choose the appropriate data structure and algorithm design method for a specified application. CO3: Write programs using object-oriented design principles. CO4: Solve problems using data structures such as linear lists, stacks, queues, hash tables, binary trees, heaps, tournament trees, binary search trees, and graphs and writing programs for these solutions. CO5: Solve problems using algorithm design methods such as the greedy method, divide and conquer, dynamic Programming, backtracking, and branch and bound and writing programs for these solutions.					
COURSE CONTENTS:					
Module-I	LINEAR DATA STRUCTURES – LIST				5 Hours
Abstract Data Types (ADTs) – List ADT – array-based implementation – linked list implementation — singly linked lists- circularly linked lists- doubly-linked lists – applications of lists –Polynomial Manipulation – All operations (Insertion, Deletion, Merge, Traversal).					
Module-II	LINEAR DATA STRUCTURES – STACKS, QUEUES				6 Hours
Stack ADT – Operations - Applications - Evaluating arithmetic expressions- Conversion of Infix to postfix expression - Queue ADT – Operations - Circular Queue – Priority Queue – de Queue – applications of queues.					
Module-III	NON LINEAR DATA STRUCTURES – TREES				6 Hours
Tree ADT – tree traversals - Binary Tree ADT – expression trees – applications of trees – binary search tree ADT –Threaded Binary Trees- AVL Trees – B-Tree - B+ Tree - Heap – Applications of heap.					
Module-IV	NON LINEAR DATA STRUCTURES - GRAPHS				6 Hours
Definition – Representation of Graph – Types of graph - Breadth-first traversal - Depth-first traversal – Topological Sort – Bi-connectivity – Cut vertex – Euler circuits – Applications of graphs.					
Module-V	FILES &TERMINOLOGIES				7 Hours
Definition-File Organization-Sequential file Organization- Direct file Organization- Indexed Sequential- Hashed and accessing schemes-Algorithm specification- Recursion-Performance analysis-Asymptotic Notation					
TOTAL:30 HOURS					
Mode of Assessment: Activity/CAT/ESE					
TEXT BOOKS:					
1 T. H. Cormen, C. E. Leiserson, R L Rivest and C Stein, “Introduction to Algorithms” 3 rd Edition, MIT press, 2009.					
2. R.S. Salaria, “Data Structures”, Khanna Publishing House, 2021.					
3. Seymour Lipschutz, “Data Structures”, McGraw Hill Education; 1st edition, 2014.					
REFERENCES:					
1. R.B. Patel, “Expert Data Structures with C”, Khanna Book Publishing Company, 2020.					
2. M. A. Weiss, Data Structures and Problem Solving Using Java, Addison-Wesley, 1997.					
3. M. Tannenbaum, Y Langsam and M J Augenstein, Data Structures Using C++, Prentice Hall India, 1996.					
4. A.H. Aho, J. E. Hopcroft and J. Ullman, Data Structures and Algorithms, Addison-Wesley, 1987					

5. https://onlinecourses.nptel.ac.in/noc22_cs31/preview, Data structure, NPTEL

LIST OF EXPERIMENTS:

1. Array implementation of Stack and Queue ADTs

2. Array implementation of List ADT

3. Linked list implementation of List, Stack and Queue ADTs

4. Applications of List, Stack and Queue ADT

5. Implementation of Binary Trees and operations of Binary Trees

6. Implementation of AVL Trees

7. Graph representation and Traversal algorithms

8. Applications of Graphs Implementation of searching and sorting algorithms

Total Hours:30

Mode of Assessment: Continuous Assessment, PAT, ESP

2301TA201	தட மத6த p6' LM ம'/ Tamil 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.						
<p>அலகு I நெசவு மற்றும் பானைத் தொழில்நுட்பம்: 3 சங்க காலத்தில் நெசவுத் தொழில் – பானைத் தொழில்நுட்பம் - கருப்பு சிவப்பு பாண்டங்கள் – பாண்டங்களில் கீறல் குறியீடுகள்.</p>						
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>						
MODULE III	MANUFACTURING TECHNOLOGY				3 Hours	

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

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.

MODULE IV AGRICULTURE AND IRRIGATION TECHNOLOGY 3 Hours

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

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.

MODULE V SCIENTIFIC TAMIL & TAMIL COMPUTING 3 Hours

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

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.

TOTAL:15HOURS

REFERENCES:

1. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
2. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
3. Historical Heritage of the Tamils (Dr.S.V.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.

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	PS O1	PS O2	PS O3	
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.Jeyapoovan, “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.																

2301CHX51	ENGINEERING CHEMISTRY LABORATORY COMMON TO ALL BRANCHES				L	T	P	C				
					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	1										
	CO2	1										
	CO3		1									
	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 York (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