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

Approved by AICTE, New Delhi

Affiliated to Anna University, Chennai | Accredited byNAAC with 'A++ 'Grade

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

NAGAPATTINAM – 611002
B.Tech – Computer Science & Business Systems
R-2023
CURRICULUM FOR FIRST YEAR

SEMESTER II

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	C	MAX. MARKS		
							CA	ES	TOTAL
Theory Courses									
2301MA 206	Linear Algebra	BSC	3	1	0	4	40	60	100
2301MA 207	Statistical Methods	BSC	3	1	0	4	50	50	100
2302BS201	Data Structures & Algorithms	PCC	3	1	4	6	50	50	100
2301GE203	Principles of Electronics	ESC	2	0	2	3	50	50	100
2301HS201	Business Communication & Value Science – II	HSMC	2	0	0	2	100	0	100
2301HS202	Fundamentals of Economics	HSMC	2	0	0	2	40	60	100
2301TA201	Tamils and Technology / தமிழரும் தொழில்நுட்பமும்	HSMC	1	0	0	1	100	0	100
Laboratory Courses									
2301LS201	Life Skills – II	-	0	0	2	0	100	0	100
TOTAL			16	3	8	22	530	270	800

2301MA206	LINEAR ALGEBRA	L	T	P	C
		3	1	0	4

PREREQUISITE:

Basic concepts of algebra

COURSE OBJECTIVES:

1. To understand the basic concepts of matrices and their Eigen values and Eigen vectors.
2. To analyze the system of vectors by different vector space techniques

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO1	Make use of Echelon forms in finding the solution sets of linear systems
CO2	Use the Cayley -Hamilton theorem to compute a relationship between the powers of matrices
CO3	Apply the LU factorization to solve systems of equations
CO4	Use the concept of dimension of a vector space to assist in finding a basis.
CO5	Apply the concept of Gram-Schmidt process to construct an orthogonal basis

COs Vs POs MAPPING:

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									

COs Vs PSOs MAPPING

COs	PSO1	PSO2
CO1	1	
CO2	1	
CO3	1	
CO4	1	
CO5	1	

COURSE CONTENTS:

MODULE I	MATRICES	
		9 Hours

Determinants - Properties of determinants - Matrices - Operations in matrices -Hermitian and Unitary matrices - Rank of a matrix - Solution of system of Linear equations: Cramer's rule - Matrix Inversion method - Rank method.

MODULE II	EIGEN VALUES AND EIGEN VECTORS	
		9 Hours

Eigen Values and Eigen Vectors of a real matrix - Properties of Eigen Values- Cayley - Hamilton Theorem

MODULE III	MATRIX DECOMPOSITION	9 Hours
Positive definite matrix -Gauss Elimination method - Gauss Jordan method - LU decomposition -Singular value decomposition.		

MODULE IV	VECTOR SPACES	9 Hours
Vector spaces - Subspaces - Linear combinations and linear system of equations - Linear independence and linear dependence - Linear Transformations - Basis and dimensions		

MODULE V	INNER PRODUCT SPACES	9 Hours
Inner products - Norms - Orthogonality of vectors - Projections - Gram-Schmidt orthogonalization – QR decomposition.		

	TOTAL:45 + 15 = 60 HOURS

REFERENCES:

1. Gilbert Strang, Introduction to linear algebra, Fifth Edition, ANE Books, 2016.
2. Kreyszig Erwin, Advanced Engineering Mathematics, 7th Edition, John Wiley, 1993
3. B. S. Grewal, Higher Engineering Mathematics, Khanna Publication, 2017
4. Michael. D. Greenberg, Advanced Engineering Mathematics, Second Edition, Pearson, 2002.
5. https://machinelearningmastery.com/introduction-matrices-machine-learning
6. https://matlabacademy.mathworks.com/details/introduction-to-symbolic-math-with-matlab/symbolic

2301MA207	STATISTICAL METHODS (ForComputerScience&BusinessSystems)	L	T	P	C
		3	1	0	4

PREREQUISITE:

1.Basicconcepts ofProbability
2.Basic conceptsofStatistics

COURSEOBJECTIVES:

1. To introduce the necessary statistical background for analyzing engineering problems.
2. To learn the fundamental concepts of estimation methods and Time series.
3. To introduce R programming language.

COURSEOUTCOMES:

Onthesuccessful completionofthecourse,students willbeableto

CO1:	Use several statistical methods for the given data to infer the relation among the given variables.
CO2:	Estimate the population parameters and sufficient statistic for a given real time problem.
CO3:	Use the appropriate non parametric hypothesis testing procedures based on inferences.
CO4:	Construct the model for the given time series and estimate the required forecasting.
CO5:	Explore the features of R language to implement statistical tests for the given data.

COsVsPOsMAPPING:

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									

COsVsPSOsMAPPING

COs	PSO1	PSO2	PSO3
CO1	1		
CO2	1		
CO3	1		
CO4	1		
CO5	1		

COURSECONTENTS:

MODULE I	LINEAR STATISTICAL MODELS	9 Hours
Multiple Correlation -Multiple Regression-Analysis of variance: Completely randomized design - Randomized block design.		

MODULE II	ESTIMATION	9 Hours
Point and Interval estimates for population parameters of large sample and small samples - Criteria for good estimates (Un-biasedness & Consistency)- Maximum likelihood estimator- Determining the sample size.		

MODULE III	NON-PARAMETRIC INFERENCE	9 Hours
Comparison with parametric inference - Sign test for paired data - Wilcoxon signed rank test - Mann-Whitney test - Kruskal Wallis test -Run test - Kolmogorov-Smirnov test - Spearman's and Kendall's test.		

MODULE IV	TIME SERIES ANALYSIS	9 Hours
Basics of Time series- Components of time series- Trend analysis- Cyclical variations- Seasonal variations- Irregular variations-Forecasting errors.		

MODULE V	R PROGRAMMING	9 Hours
Introduction to R – Features of R- Working with Data - Data Types in R- Working with Vectors and Matrices - Lists in R-Factors in R- Data frames in R- Variables in R- Functions in R –Operators in R -Control flow and Loops – Basic data Visualization.		
TOTAL: 45+ 15 = 60HOURS		

REFERENCES:
1. R. Miller, J.E. Freund and R. Johnson, Probability and Statistics for Engineers, Fourth Edition, Pearson, 2015.
2. A. Goon, M. Gupta and B.Dasgupta, Fundamentals of Statistics (Vol. II), The Word Press, 1933.
3. A. Goon, M. Gupta and B.Dasgupta, Fundamentals of Statistics (Vol. I), The Word Press, 1933.
4. D.C. Montgomery and E.Peck , Introduction to Linear Regression Analysis, Third Edition, Wiley, 2010.
5. Garrett Grolemund, Hands-on Programming with R, Shroff Publishers & Distributors Pvt Ltd, 2018.
6. Jared P. Lander, R for Everyone: Advanced Analytics and Graphics, Second Edition, Addison-Wesley Professional, 2017.

		L	T	P	C
2302BS201	**DataStructures and Algorithm + LAB**	3	1	4	6

PREREQUISITE:

To introduce the fundamental concept of data structures and to emphasizethe importance of choice of correct data structures in developing and implementingefficient algorithms and to introduce simple data structure and algorithms which are thebuildingblocksformorecomplexdatastructuresusedinproblemsolvingusingprogramming. Further the students should be able to decompose bigger problems usingabstractionssuchasobject-o r i e n t e d designsandprogramminganddevelopeffective techniques of software engineering such as decomposition, procedural abstraction, andsoftwarereuse

COURSE OBJECTIVES:

CO1: Analyses the various data structure concepts.
CO2: Apply the different linear data structures to problem solutions.
CO3: Apply the different non-linear data structures to problem solutions.
CO4: Exemplify the concept of files and its operations.
CO5: Understand files accessing mechanisms.
CO6: Critically analyses the various sorting algorithms.

Module I	**INTRODUCTION TO ALGORITHM & DATA ORGANISATION**	6+3 = 9Hours

Algorithm specification, Recursion, Performance analysis, Asymptotic Notation - The Big-O, Omega and Theta notation, Programming Style, Refinement of Coding - TimeSpace Trade Off, Testing, Data Abstraction

Module II	**LINEAR DATA STRUCTURE**	6+3 = 9 Hours

Array, Stack, Queue, Linked-list and its types, Various Representations, Operations & Applications of Linear Data Structures

ModuleIII	**NON-LINEAR DATA STRUCTURES**	12+3 = 15Hours

Trees (Binary Tree, Threaded Binary Tree, Binary Search Tree, B & B+ Tree, AVL Tree, Splay Tree), Operations & Applications of Non-Linear Data Structures

Module IV	**GRAPHS AND FILES**	12+3 = 15Hours

Basic Terminologies and Representations, Graph search and traversal algorithms and complexity analysis. File: Organisation (Sequential, Direct, Indexed Sequential, Hashed) and various types of accessing schemes.

ModuleV	**SEARCHING AND SORTING**	6+3 = 9 Hours

Sequential Search, Binary Search, Comparison Trees, Breadth First Search, Depth First Search Insertion Sort, Selection Sort, Shell Sort, Divide and Conquer Sort, Merge Sort, Quick Sort, Heapsort, Introduction to Hashing

	TotalHours:60

ModeofAssessment :CAT/Assignment/Quiz/Seminar/Presentation/ESE

CourseOutcomes:

CO1: Analyse the various data structure concepts.
CO2: Apply the different linear data structures to problem solutions.
CO3: Apply the different non-linear data structures to problem solutions.
CO4: Exemplify the concept of files and its operations.
CO5: Understand files accessing mechanisms.
CO6: Critically analyses the various sorting algorithms.

2301GE203	PRINCIPLESOFELECTRONICS	L	T	P	C
		2	0	2	3

COURSE OBJECTIVES:

1. To introduce semiconductor diodes and transistors.

2. To teach the concepts of Operational Amplifiers

3. To present the fundamentals of digital electronics.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to

CO1: Design different semiconductor diodes and their applications.

CO2: Construct various configurations of BJT.

CO3: Classify various configurations of FET.

CO4: Illustrate the concepts of operational amplifiers.

CO5: Explain the fundamentals of digital electronics.

COs Vs POs MAPPING:

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

COs Vs PSOs MAPPING

COs	PSO1	PSO2
CO1	3	
CO2	3	
CO3	3	
CO4	3	
CO5	3	

MODULE I	SEMICONDUCTOR DIODES AND ITS APPLICATIONS		6 Hours

Conductor, Semiconductors & Insulators, Semiconductors: intrinsic & extrinsic, energy band diagram, P&N-type semiconductors, drift & diffusion carriers. Characteristics of PN Junction Diode, Rectifier Circuits Full wave circuits, Efficiency, PIV, Ripple factor and AC and DC current and voltage in rectifier.Metal-Semiconductor Junction- MESFET, FINFET, PINFET, CNTFET, DUAL GATE MOSFET, Schottky barrier diode-Zener diode-Varactor diode –Tunnel diode-LASER diode-LDR

MODULEII	BIPOLAR JUNCTION TRANSISTOR		6 Hours

Structure and working of bipolar junction transistor, CB, CC, CE configurations, relation between alpha and beta, Concept of transistor as an amplifier

MODULEIII	FIELDEFFECTTRANSISTOR		6 Hours
Field Effect Transistors: JFET –principle of operation-Drain and Transfer characteristics,Pinch off Voltage and its significance,MOSFET–Depletion and enhancement modes Construction and characteristics.Applications			
MODULE IV	OPERATIONAL AMPLIFIERS		6 Hours
Concept (Block diagram), properties, positive and negative feedback, loop gain, open loop gain, feedback factors, Introduction to integrated circuits: operational amplified and its terminal properties; Application of operationalamplifier; inverting and non-inverting mode of operation, Adders, Subtractors, Voltage follower,			
MODULE V	DIGITAL ELECTRONICS FUNDAMENTALS		6 Hours
Difference between analog and digital signals, Boolean algebra, Basic and Universal Gates, Symbols, Truth tables,logic expressions, Logic simplification using K- map, Logic ICs, half and full adder/subtractor, multiplexers, demultiplexers			
			TOTAL:30HOURS

LISTOFEXPERIMENTS:			
Experiment 1:	ToplotV-IcharacteristicsofPNjunctiondiode.		1.5 Hours
Experiment 2:	Toplotregulationcharacteristicsofhalfwaverectifier		1.5 Hours
Experiment 3:	ToplotregulationcharacteristicsofFullwaverectifier		1.5 Hours
Experiment 4:	Toplotinput-outputcharacteristicsofCE configurationofBJT.		1.5 Hours
Experiment 5:	To study Biasing techniques of BJT-to find stability factor of self-bias, Collector to base bias, fixed bias circuits.		1.5 Hours
Experiment 6:	To plot frequency response of single stage FET amplifier (CS/CD Configuration) and find its bandwidth.		1.5 Hours
Experiment 7:	TostudyColpittsOscillator.		1.5 Hours
Experiment 8:	Study of OP-AMP circuits: Inverting and Non-inverting Amplifier.		1.5 Hours
Experiment 9:	StudyofbasiclogicgatesandDe-Morgan'sTheorem.		1.5 Hours
Experiment 10:	Studyofhalf adderandfulladder		1.5 Hours
			TOTAL:15HOURS

REFERENCES:

1. LRobertBoylestead,LouisNashelsky,ElectronicDevicesandCircuitTheoryPearsonEducation,2012.
2. JMillman,C.Halkias&Satyabratajit,ElectronicDevicesandCircuits,TataMcGraw-Hill,2010
3. William Hayt, J V Jack, E Kemmerly and Steven M Durbin, Engineering Circuits Analysis, Tata McGraw-Hill,2013
4. RamakantA.Gayakwad,OP-AMPandLinearIC's,PrenticeHallofIndia,2002.
5. ThomasL.Floyd,DigitalFundamentals,PrenticeHall,11[th]Edition,2015.
6. S. Salivahana, N. Suresh Kumar, A. Vallavaraj (2008), Electronic Devices and Circuits, 2nd edition, Tata McGraw Hill, New Delhi.

2301HS201	BUSINESS COMMUNICATION AND VALUE SCIENCE - II Computer Science & Business System	L	T	P	C
		2	0	0	2

PREREQUISITE:

1. Basic English Knowledge

COURSE OBJECTIVES:

CO1	To understand and apply essential grammar in everyday life communication.
CO2	To Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English.
CO3	To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text.
CO4	To help learners use language effectively in professional contexts.
CO5	To develop learners' ability to read and write complex texts, summaries, articles, blogs, definitions, essays and user manuals.
CO6	To use language efficiently in expressing their opinions
CO7	To develop various listening strategies to comprehend various types of audio materials like lectures, discussions, videos etc.
CO8	To write short essays of a general kind and personal letters and emails in English.

COURSE OUTCOMES:

On the successful completion of the 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 infer the denotative and connotative meanings of technical texts
CO4:	Read and interpret information presented in tables, charts and other graphic forms
CO5:	Comprehend conversations and short talks delivered in English
CO6:	Listen to and comprehend general as well as complex academic and non academic informations
CO7:	Speak fluently and accurately in formal and informal communicative contexts
CO8:	Visualize and to project isometric and perspective sections of simple solids.

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		
CO6												
CO7												
CO8												

COs Vs PSOs MAPPING

COs	PSO1	PSO2	PSO3
CO1	-	-	-
CO2	-	-	-
CO3	-	-	-
CO4	-	-	-
CO5	-	-	-

CO6				
CO7				
CO8				

COURSE CONTENTS:

MODULE I	ESSENTIAL GRAMMAR – II	6 Hours

Parts of Speech – Listen to an audio clip and note down the different parts of speech   followed by discussion.

Tenses-Applications of tenses in Functional Grammar (Take a quiz and then discuss) Sentence formation (general & Technical), Common errors, Voices. Show sequence from

film where a character uses wrong sentence structure (e.g. Zindagi Na Milegi Dobara   where the characters use 'the' before every

MODULE II	VOCABULARY ENRICHMENT	6 Hours

Vocabulary Enrichment: Exposure to words fromGeneral Service List (GSL) by West, Academic word list (AWL) technical specific terms related to the field of technology, phrases, idioms, significant abbreviations formal business vocabulary – Read Economic Times, Reader's Digest, National Geographic and take part in a GD, using the words you learnt/liked from the articles.
Group discussion using words learnt- Toastmaster style Table Topics speech with evaluation.

MODULE III	WRITTEN COMMUNICATION	7Hours

Summary writing- story writing **-**Email writing: Formal and informal emails, activity-Build your CV– start writing your comprehensive CV including every achievement in your life, no format, no page limit- Create a podcast on a topic that will interest college students

MODULE IV	LIFE SKILLS	7 Hours

 Stress management, working with rhythm and
 balance, colours, and teamwork- Movie based learning – Pursuit of Happiness. What are the skills and values you can identify, what can you relate to?- Introduction to life skills
 What are the critical life skills- Multiple Intelligences Embracing diversity – Activity on appreciation of diversity- Community service – work with an NGO and make
a presentation- Create a musical using the learning from unit&

MODULE V	SOFT SKILLS	6 Hours

Join a trek – Values to be learned: Leadership, teamwork, dealing with ambiguity, managing stress, motivating people, creativity, resultorientation

	TOTAL: 32 HOURS

REFERENCES:

1. English vocabulary in use – Alan Mc'carthy andO'dell.

2.APAART: Speak Well 1 (English language andcommunication)

3.APAART: Speak Well 2 (SoftSkills)

4.Business Communication – Dr.SarojHiremath

5.Train your mind to perform under pressure- Simonsinek
https://curiosity.com/videos/simon-sinek-on-training-your-mind-to-perform-under-pressure-capture-your-flag/

6.Brilliant way one CEO rallied his team in the middle oflayoffs
https://www.inc.com/video/simon-sinek-explains-why-you-should-put-people-before-numbers.html

7.Will Smith's Top Ten rules for
successhttps://www.youtube.com/watch?v=bBsT9omT

eh0
8.https://www.coursera.org/learn/learning-how-to-learn
9.https://www.coursera.org/specializations/effective-business-communication

2301HS202	**FUNDAMENTALS OF ECONOMICS**	**L**	**T**	**P**	**C**
		2	**0**	**0**	**2**

MODULES I	**MICRO ECONOMICS**	**6 Hours**
Principles of Demand and Supply - Supply Curves of Firms - Elasticity of Supply; Demand Curves of Households - Elasticity of Demand; Equilibrium and Comparative Statics (Shift of a Curve and Movement along the Curve);		
MODULES II	**WELFARE ANALYSIS**	**6 Hours**
Consumers and Producers Surplus- Price Ceilings and Price Floors; Consumer Behaviour - Axioms of Choice- Budget Constraints and Indifference Curves; Consumers Equilibrium Effects of a Price Change, Income and Substitution Effects Derivation of a Demand Curve		
MODULES III	**APPLICATIONS**	**6 Hours**
Tax and Subsidies - Inter temporal Consumption -Suppliers- Income Effect; Theory of Production - Production Function and Isoquants - Cost Minimization; Cost Curves - Total, Average and Marginal Costs - Long Run and Short Run Costs; Equilibrium of a Firm Under Perfect Competition; Monopoly and Monopolistic Competition		
MODULES IV	**MACRO ECONOMICS**	**6 Hours**
National Income and its Components - GNP, NNP, GDP, NDP Consumption Function; Investment; Simple Keynesian Model of Income Determination and the Keynesian Multiplier; Government Sector - Taxes and Subsidies; External Sector - Exports and Imports; Money -Definitions; Demand for Money Transaction and Speculative Demand; Supply of Money - Banks Credit Creation Multiplier; Integrating Money and Commodity Markets - IS, LM Model		
MODULES V	**BUSINESS CYCLES AND STABILIZATION**	**6 Hours**
Monetary and Fiscal Policy - Central Bank and the Government; the Classical Paradigm - Price and Wage Rigidities - Voluntary and Involuntary Unemployment.		
MODULES VI	**BUSINESS CYCLES AND STABILIZATION**	**6 Hours**
Monetary and Fiscal Policy - Central Bank and the Government; the Classical Paradigm - Price and Wage Rigidities - Voluntary and Involuntary Unemployment.		
TOTAL: 36 HOURS		
REFERENCES:		
1. Pindyck, Robert S and Daniel L. Rubinfeld , Microeconomics, Eighth Edition, 2013 . 2. Dornbusch, Fischer and Startz, Macroeconomics, Tenth Edition, Tata Mcgraw Hill, 2012. 3. Paul Anthony Samuelson, William D. Nordhaus, Economics, Nineteenth Edition, McGraw-Hill Education, 2010. 4. Hal R, Varia, Intermediate Microeconomics: A Modern Approach, Eighth Edition Affiliated East- West Press, 2006 5. N. Gregory Mankiw, Principles of Macroeconomics, Seventh Edition, Cengage Learning, 2018.		

2301TA201	தமிழரும்தொழில்நுட்பமும்/	L	T	P	C
	Tamils and Technology	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.

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.

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 beats – 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 குமுழித் 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.