E.G.S. PILLAY ENGINEERING COLLEGE

(Autonomous)

NAGAPATTINAM – 611 002.

(Affiliated to Anna University, Chennai | Accredited by NAAC with 'A++' Grade
Accredited by NBA | Approved by AICTE, New Delhi)

REGULATIONS - R2023

B.Tech. – Artificial Intelligence & Data Science

FIRST SEMESTER CURRICULUM

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	C	MAX. MARKS		
							CA	ES	TOTAL
2301IP101	Induction Program	-	0	0	0	0	0	0	0
2301MA101	Engineering Mathematics –I	BSC	3	2	0	4	40	60	100
2302AS101	Fundamentals of Data Science	PCC	1	0	2	2	50	50	100
2301GEX01	Foundation of Electrical and Electronics Engineering	ESC	2	0	2	3	50	50	100
2301GEX02	Engineering Graphics and Design	ESC	2	0	2	3	50	50	100
2301GEX03	Problem Solving using C	ESC	2	0	4	4	50	50	100
2301TA101	Tamil and Technology	HSMC	1	0	0	1	100	0	100
2304FLX01	Foreign Language	EEC	2	0	2	3	50	50	100
2301GEX51	Computer Practices Laboratory	ESC	0	0	2	1	60	40	100
2301LS101	Life Skill Activity – I	-	0	0	0	0	100	0	100
TOTAL			**13**	**2**	**14**	**21**	**550**	**350**	**900**

2301MA101	ENGINEERING MATHEMATICS _- I (For AIDS) (LINEAR ALGEBRA AND CALCULUS)	L	T	P	C
		3	1	0	4

PREREQUISITE:

1. Matrices
2. Differentiation
3. Integration.

COURSE OBJECTIVES:

1. To explain the main concepts of linear algebra that are used in data analysis and machine learning.

2. To improve the student's practical skills of using linear algebra methods in machine learning and data analysis.

3. To learn the fundamentals of working with data in vector and matrix form, acquire skills for solving systems of linear algebraic equations and finding the basic matrix decompositions and general understanding of their applicability.

COURSE OUTCOMES:

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

CO1:	Use the matrix algebra methods for solving practical problems.
CO2:	Understand the concept of vector spaces and perform LU Decomposition and Singular Value Decomposition, that is essential for dimensionality reduction.
CO3:	Apply suitable techniques of differentiation and integration tools in solving various application problems.
CO4:	Make use of differential calculus ideas on several variable functions.
CO5:	Apply multiple integral ideas in solving areas, volumes and other practical problems.

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	PSO3
CO1	1		
CO2	1		
CO3	1		
CO4	1		
CO5	1		

COURSE CONTENTS:

MODULE I	MATRICES	9 Hours

Matrices- Rank of a matrix – Consistency of a system of linear equations - Rouche'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

MODULE II	VECTOR SPACES	9 Hours

Vector spaces and subspaces – Linear independence and dependence – Basis and Dimension - Null spaces, column spaces and Linear transformations - LU decomposition method - Singular Value Decomposition method.

MODULE III	DIFFERENTIAL AND INTEGRAL CALCULUS	9 Hours

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.

MODULE IV	FUNCTIONS OF SEVERAL VARIABLE	9 Hours

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.

MODULE V	MULTIPLE INTEGRALS	9 Hours

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.

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., NewDelhi.
3. David C. Lay, "Linear Algebra and its Applications", Pearson Education Asia, New Delhi, 5 th 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)

2301GEX01	FOUNDATION OF ELECTRICAL AND ELECTRONICS ENGINEERING	L	T	P	C
		2	0	2	3

PREREQUISITE:

Physics

COURSE OBJECTIVES:

1. To introduce basic electrical circuits and wiring terminologies
2. To impart knowledge in the basics of working principles and application of
   Electrical Machines and measuring instruments
3. To educate on the fundamental concepts of analog and digital electronics.

COURSE OUTCOMES:

	On the successful completion of the course, students will be able to
CO1:	Acquire basic knowledge on DC, AC circuits and wiring.
CO2:	Understand the construction, working principle and applications of Electrical Machines.
CO3:	Understand the various measuring instruments and concepts of transducers.
CO4:	Obtain the knowledge of semiconductor devices and their applications.
CO5:	Acquire basic knowledge on logic gates and Boolean algebra.

COs Vs POs MAPPING:

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

COs Vs PSOs MAPPING

COs	PSO1	PSO2	PSO3
CO1	3		
CO2	3		
CO3		3	
CO4		3	
CO5		3	

COURSE CONTENTS:

MODULE I	ELEMENTARY OF CIRCUIT CONCEPTS	5 Hours

Active and passive components; Introduction to DC and AC circuits - Ohm's Law , Kirchhoff's Laws , Simple problems; Generation of AC waveform - average value, RMS value, form factor, peak factor ; Electrical safety; Wiring and its types.

MODULE II	ELECTRICAL MACHINES	5 Hours
Construction, Working Principle and applications of DC Generators, DC Motors, single phase Transformers and single phase induction motors.		

MODULE III	MEASURING INSTRUMENTS	5 Hours
Functional elements of an instrument; Measuring instruments - Classification of instruments -PMMC, MI instruments, dynamometer type wattmeter, Energy meter, Transducers and its types.		

MODULE IV	ANALOG ELECTRONICS	5 Hours
Semiconductor devices: V-I characteristics of PN junction diode and Zener diode; Rectifiers - Half wave and full wave rectifiers; BJT, SCR, MOSFET, IGBT- construction and operation (simple approach).		

MODULE V	DIGITAL ELECTRONICS	5 Hours
Binary Number System; Logic Gates; Boolean algebra; De-Morgan's theorem; Half and Full Adder.		

TOTAL: 25 HOURS

LIST OF EXPERIMENTS:

Verification of Kirchoff's Voltage and Current Laws.	2 Hours
Determination of average value, RMS value, form factor, peak factor of sinusoidal waveform	2 Hours
Residential house wiring using fuse, switch, indicator, lamp and energy meter	2 Hours
Speed control of DC shunt motor	2 Hours
Determine the Efficiency and Voltage Regulation of a Single Phase Transformer by Load test	2 Hours
Measurement of energy using single phase energy meter	2 Hours
Measurement of temperature using transducers.	2 Hours
Full wave rectifier with and without filter.	2 Hours
I-V characteristics of Zener diode	2 Hours
Verification of Logic gates.	2 Hours

TOTAL: 20 HOURS

REFERENCES:

Mittle N., "Basic Electrical Engineering", Tata McGraw Hill Edition, New Delhi, 1990.

Sedha R.S., "Applied Electronics", S. Chand & Co., 2006.

Smarajit Ghosh, "Fundamentals of Electrical and Electronics Engineering", 2nd Edition, PHI Learning, 2010.

R. Muthusubramaniam, S. Salaivahanan and K.A. Mureleedharan, "Basic Electrical Electronics and Computer Engineering",Tata McGraw Hill, 2004

D.P. Kothari and I.J. Nagrath, "Theory and Problems of Basic Electrical Engineering", PHI learning, New Delhi, 2004.

J.B. Gupta, "Fundamentals of Electrical Engineering and Electronics", S.K. Kataria and Sons, Reprint 2012 Edition

R.L. Boylestad and L. Nashelsky, "Electronic Devices and Circuit Theory", Pearson, 11th Edition,2013.

Donald P. Leach, Albert Paul Malvino and Goutam Saha, "Digital Principles and Applications", McGraw-Hill Education, 8th Edition, 2014.

https://em-coep.vlabs.ac.in/exp/speed-control-dc-motor/simulation.html

https://de-iitr.vlabs.ac.in/exp/truth-table-gates/simulation.html

2301GEX02	ENGINEERING GRAPHICS AND DESIGN	L	T	P	C
		2	2	0	3

Prerequisite:
1. Basic knowledge about geometry
2. Lettering and Dimensioning

COURSE OBJECTIVES:

1. To develop in students, graphic skills for communication of concepts, ideas and design of Engineering products
2. To expose them to existing national standards related to technical drawings

COURSE OUTCOMES:

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

CO1:	Construct conic curves, involutes and cycloids
CO2:	Solve problems involving projection of points, lines and plane surfaces
CO3:	Draw the projection and development of a sectioned simple solids
CO4:	Draw the orthographic, isometric and projection of simple solids
CO5:	Use BIS convention and training of engineering graphics by CAD software

COs Vs POs / PSOs MAPPING:

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

COURSE CONTENTS:

MODULE I	BASIC CONCEPTS OF TECHNICAL DRAWING AND PLANE CURVES	9 Hours

Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, Scale, layout and folding of drawing sheets – Lettering and dimensioning.
Basic Geometrical constructions, Curves used in engineering practices: Conics – Construction of ellipse, parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the above curves. Practicing plane curves by CAD software.

MODULE II	PROJECTION OF POINTS, LINES AND PLANE SURFACES	9 Hours

Principal Planes-First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method. Practicing projection of lines and surfaces by CAD software.

MODULE III	PROJECTION OF SOLIDS	9 Hours

Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one of the principal planes by rotating object method. Practicing the projections of simple objects by CAD software.

MODULE IV	PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES	9 Hours

Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids – Prisms, pyramids cylinders and cones. Practicing projection of sectioned solids and development of solid surfaces by CAD software.

MODULE V	ORTHOGRAPHIC AND ISOMETRIC PROJECTION	9 Hours

Visualization concepts–Representation of Three-Dimensional objects – Layout of views- Free hand sketching of multiple views from pictorial views of Objects.

Isometric view - Prisms, pyramids, cylinders, cones. Principles of isometric projection – isometric scale – Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions and miscellaneous problems. Practicing isometric projections of simple objects by CAD software.

TOTAL: 45 HOURS

REFERENCES:

1. Bhatt N.D. and Panchal V.M., Charotar Publishing House, 53rd Edition, 2019.

2. Natrajan K.V., A Text Book of Engineering Graphics, Dhanalakshmi Publishers, Chennai, 2018.

3. Parthasarathy, N. S. and Vela Murali, "Engineering Drawing", Oxford University Press, 2015.

4. Basant Agarwal and Agarwal C.M., "Engineering Drawing", McGraw Hill, 2n d Edition, 2019.

5. Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Publications, Bangalore,27th Edition, 2017

6. Shah M.B., and Rana B.C., "Engineering Drawing", Pearson Education India, 2nd Edition, 2009.

7. Venugopal K. and Prabhu Raja V., "Engineering Graphics", New Age International (P) Limited, 2008.

2302AS101	FUNDAMENTALS OF DATA SCIENCE	L	T	P	C
	(Theory cum Lab Course)	1	0	2	2

PREREQUISITE: Nil

COURSE OBJECTIVES:

1. Learn the need for Data Science concepts
2. Understand business needs of data science and its impact in business scenario

COURSE OUTCOMES:

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

CO1	Develop a mindset with a strong focus on data – the collection of data and, through analyzing it appropriately
CO2	Use problem formulation to analysis to bring about beneficial insights and changes
CO3	Correlate data science with business problems or needs for interrogating the data and extracting useful information

COURSE CONTENTS:

Module-I	Introduction : Data Analytic Thinking	5 Hours

Data Science for Business, Conceptual Approach to Data Science, The Ubiquity of Data Opportunities, Example : Hurricane Frances, Predicting Customer Churn, Data Science, Engineering and Data-Driven Decision Making, Data Processing and Big Data, Data as Strategic Asset, Data Science versus the work of Data Scientist

Module-II	Business Problems and Data Science Solutions	5 Hours

Business Problems and Data, Business Problems to Data Mining Task, Data Understanding, Data Preparation, Modeling, Evaluation, Deployment, Implications of Managing a Data Science Team, Other Analytic Techniques and Technologies, Business Problems to Data Problems, Answering Business Questions

Module-III	Data Science and Business Strategy	5 Hours

Thinking Data-Analytically, Achieving Competitive Advantage with Data Science, Sustaining Competitive Advantage with Data Science, Unique Intellectual Property, Superior Data Science Management, Examine Data Science Case Studies, Solutions to Business Problems

	TOTAL: 15 HOURS

LIST OF EXPERIMENTS:

1. Study of basic functions in Excel	2 Hours
2. Working with Range Names and Tables	2 Hours
3. Cleaning data with Text Functions	2 Hours
4. Cleaning Data containing Data Values	3 Hours
5. Working with VLOOKUP functions	3 Hours
6. Demonstration of Data Visualization	3 Hours
7. Importing Data from External Sources into Excel	3 Hours
8. Creating a Data Model	3 Hours
9. Exploring Data with Pivot Tables and Charts	3 Hours
10. Create a dashboard for the given requirement	3 Hours
11. Implement a data analytics for the real-time data set	3 Hours
TOTAL: 30 HOURS	

COs Vs POs & PSOs MAPPING:

CO#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	-	-	-	-	-	-	-	1	-	-	-
CO2	3	2	2	1	2	-	-	-	-	-	-	1	-	-	-
CO3	3	2	2	1	-	-	-	-	-	-	-	1	-	-	-

REFERENCES:

1. Foster Provost, Tom Fawcett, "Data Science for Business", O'Reilly, 2013

2. Steven S.Skiena, "Data Science Design Manual", Spring International Publications, 2017

3. Hector Guerrero, "Excel Data Analysis :Modeling and Simulation", Springer International Publishing, 2nd Edition, 2019

4. Paul McFedries, "Excel Data Analysis for Dummies", John Wiley and Sons, 2019

5. https://jeremyjordon.me/data-science

6. https://coursera.org/learn/excel-data-analysis

7.https://onlinecourses.nptel.ac.in/noc21_cs69/preview

8. https://github.com/MukulParashar/Data-Analysis-in-Excel

9. http://dataskeptic.com/

2301GEX03	PROBLEM SOLVING USING C (Theory cum Lab Course)	L	T	P	C
		2	0	4	4

PREREQUISITE:

1. Need some Mathematical Knowledge

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:

On the successful completion of the 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.

	TOTAL: 30 HOURS

LIST OF EXPERIMENTS:	
1. Prepare programmes in C to implement basic concepts in C language.	**6 Hours**
2. Produce C programmes to implement decision making and branching statements.	**6 Hours**
3. Use the concept of looping to implement C programmes.	**6 Hours**
4. Employ the concept of arrays to develop C programmes.	**6 Hours**
5. Experiment the concepts of strings using C.	**6 Hours**
6. Develop C programmes to perform code reusability using function.	**6 Hours**
7. Model programmes in C to implement pointers.	**6 Hours**
8. Build C programme to implement structures.	**6 Hours**
9. Implement C programme by making use of the concept of files.	**6 Hours**
10. Mini Project: Using Files, Structures, Functions & Pointers.	**6 Hours**

Hardware/software requirement
1. Desktop Systems 60 Nos
2. 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
CO1	1	1						2				3	1	
CO2	2	1						2				3	1	
CO3	3	2	3					2				3	1	
CO4	3	2	3					2				3	1	
CO5	3	2	3					2				3	1	

REFERENCES:
1. Yashwant Kanetkar, Let us C, 17th Edition, BPB Publications, 2020.
2. ReemaThareja, "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   (Link for NPTEL/SWAYAM/MOOC Courses)
6. https://cse02-iiith.vlabs.ac.in/exp   (Link for virtual Lab)
7. www.skillrack.com   (Link for modern tool usage)

2301GEX51	COMPUTER PRACTICES LABORATORY	L	T	P	C
		0	0	2	1

PREREQUISITE:

There is no prerequisite for the course

COURSE OBJECTIVES:

1.To be familiar with Computer Hardware Components and installation of software.
2.Make use of office package and to be familiar with the use of Office software.
3.To learn about searching, downloading, and storing contents in the Cloud Network.

COURSE OUTCOMES:

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

CO1	Perform assembling and disassembling of desktop machine with different peripheral and software installation and servicing.
CO2	Simulate data using MS office for Presentation and Visualization.
CO3	Use browsers for searching & accessing/storing the contents to/from cloud.

LIST OF EXPERIMENTS:

1. Familiarization of Computers & Computer Hardware Components
2. Familiarization of major types of storage/memory technology
3. Installing various operating systems including software download/installation, Familiarization of basic software/tools
4. Working with MS-Office: MS Word, MS Excel, MS Powerpoint
5. Familiarization of Computer Shortcut keys
6. **Mini Project-1**: Assemble your computer and install an Operating System
7. Basics of Internet, Web browsers and Content Searching & accessing/storing the contents to/from cloud including Drop Box
8. Familiarization of various types of security threats including virus
9. Computer Ethics; Open Source way
10. **Mini Project-2**: Document preparation using MS Word, Data Processing using MS Excel and Presentation using MS Power point

TOTAL: 30 HOURS

COs Vs POs & PSOs MAPPING:

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

HARDWARE/SOFTWARE REQUIREMENT

1. Standalone Desktop Computers with Internet Connectivity
2. Office Package
3. Operating System Packages

REFERENCES:

1. Kevin Wilson, "Computer Hardware: The Illustrated Guide to Understanding Computer Hardware", 2021
2. Kumar Bittu, "Mastering MS Office", 2020
3. Ajay Mittal &Anitha Goel, "Computer Fundamentals and Programming in C", 2017
4. https://nptel.ac.in/courses/106103068
5. https://docs.oracle.com/cd/E19121-01/sf.x2100m2/819-6592-13/Chap1.html
6. https://www.linkedin.com/learning/topics/microsoft-office

2301TA101	TAMIL AND TECHNOLOGY	L	T	P	C
		1	0	0	1

PREREQUISITE:

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

COURSEOBJECTIVES:

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

COURSEOUTCOMES:

On the successful completion of the 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

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		

Cos Vs PSOs MAPPING

COs	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSECONTENTS:		
MODULE I	**WEAVING AND CERAMIC TECHNOLOGY**	**3 Hours**
Weaving Industry during Sangam Age–Ceramic technology–Black and Red Ware Potteries(BRW) Graffition Potteries.		
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)- Thirumalai Nayakar Mahal – ChettiNadu Houses, Indo-Saracenic architecture at Madras during British Period		
MODULE III	**MANUFACTURING TECHNOLOGY**	**3 Hours**
ArtofShipBuilding-Metallurgicalstudies-Ironindustry-Ironsmelting,steel-Copperandgold-Coinsassourceofhistory-MintingofCoins–Beadsmaking-industriesStonebeads-Glassbeads- Terracotta beads-Shell beads/bone beats-Archeological evidences- Gem stone types described in Silappathikaram.		
MODULE IV	**AGRICULTURE AND IRRIGATION TECHNOLOGY**	**3 Hours**
Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry -Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries —Pearl-Conchediving-AncientKnowledgeofOcean-KnowledgeSpecificSociety		
MODULEV	**SCIENTIFIC TAMIL & TAMIL COMPUTING**	**3 Hours**
DevelopmentofScientificTamil-Tamilcomputing–DigitalizationofTamilBooks–Developmentof Tamil Software – Tamil Virtual Academy – Tamil Digital Library – Online Tamil Dictionaries –Sorkuvai Project.		
		TOTAL:15HOURS

REFERENCES:

1. தமிழகவரலொாறு– மக்களும்பண்பொடும்– மக.மக. பிள்மள (தவளியீடு: தமிழ்நொடுபொடநூல்மற்றும் கல்வியியல்பணிகள்கழகம்).

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

3. கீழடி– மவமகநதிக்கமரயில்ெங்ககொலநகரநொகரிகம் (ததொல்லியல்துமற தவளியீடு)

4. தபொருமந– ஆற்றங்கமரநொகரிகம். (ததொல்லியல்துமறதவளியீடு)

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

6. Social Life of the Tamils - The Classical   Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.

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

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

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

10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)

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

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

2304FLX01	GERMAN LANGUAGE	L	T	P	C
		2	0	2	3

PREREQUISITE

1.Basic knowledge in German Language

COURSEOBJECTIVES:

1. To understand the basics of German language.
2. To speak generally in German.
3. To read and write legibly in German.

COURSEOUTCOMES:

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

CO1:	Use fundamental elements of a foreign language.
CO2:	Identify distinctive features of the culture(s) associated with the language
CO3:	Appraise basic German language skills and German grammar.
CO4:	Communicate short messages on highly predictable, everyday Topics that affect them directly
CO5:	Read a limited amount of information from highly predictable texts, basicpracticalwritingneedsusinglists,shortmessages,postcards,andsimplenotes

Cos Vs Pos MAPPING:

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

COsVs PSOs MAPPING

COs	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSECONTENTS:

MODULE I	Guten Tag – Good Day	12 Hours

Language skills –Welcome and Parting Greetings – To talk about self and others – Counting till 20 – to call out Telephone Numbers, email and Address-Spell and to talk about countries and languages Vocabulary : Numbers 1to20, Countries and Languages Grammar: W Questions, Expressions, Personal Pronouns Expressions: Alphabet Culture: Countries and Languages Film: Good day! Telephone Number, I speak.

MODULE II	Friends, Colleagues	12 Hours
Language Skills - To talk about one hobbies - To take leave from oneself - To call out Days of the week - To talk about professions, work and work timings - To count from 20 - To speak about seasons - To post a profile on the Internet Vocabulary : Hobbies, days of the week, Months, Numbers 20 onwards - Professions and Seasons Grammar: The definite articles, personal pronouns, verbs, yes / no questions, Verbs to have and to be Expressions: Sentence Melody – Questions and Answers Culture : Seasons and Typical Hobbies Film : The parting and family names.		

MODULE III	In the City	12 Hours
Language Skills - To call out squares and buildings - Questions about places - To put in order a picture story-To pose questions on things- TocallouttransportVocabulary:SquareandBuildings/Transport/Directions Grammar: Definite Articles/Indefinite articles/Negation article/ Imperative sentences Expressions: Long and short Vowels Culture: Eye witness / counting in Hamburg Film: Do you have time?/In the Restaurant/Surprise.		

MODULE IV	Have a nice Meal	12 Hours
Language Skills- To speak while eating- To plan shopping- Shopping conversation. Vocabulary: Meals time/ Provisions/ Drinks/ Shops Grammar: Position in Sentence/Akkusative Case/Verbs with Akkusative Expressions : A/o/uumlauts Culture: Eating in D–A–CH, Professions and Eating Film: Breakfast by the mountains /Shopping		

MODULE V	Day by Day	12 Hours
LanguageSkills-UnderstandingandtellingTime-Makingappointments-Speakingaboutfamily - To take leave from someone - To excuse oneself after being late - A telephone appointment fixing Vocabulary: Daily routine/ time/Family Grammar: Informing with prepositions about time - Modal verbsExpressions:"r"hearingandspeakingCulture:PunctualityatD–A–CHFilm:You never have time!, Appointments!		

		TOTAL:60HOURS

REFERENCES:
1. Edwardswick, AllyouneedtolearnGermany,AdamsMedia,2010
2 PaulCoggleandHeinerSchenke,CompleteGerman,Teachyourself,2012.
3.MargretRodi, NetzwerkA, KlettPublications, 2015.

2304FLX01	JAPANESE LANGUAGE	L	T	P	C
		2	0	2	3

PREREQUISITE

  1. Basic knowledge in Japanese Language

COURSEOBJECTIVES:

  1. To understand the basics of Japanese language.
  2. To speak generally in Japanese.
  3. To read and write legibly in Japanese.

COURSEOUTCOMES:

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

CO1:	Use fundamental elements of a foreign language
CO2:	Identify distinctive features of the culture(s) associated with the language
CO3:	Appraise basic Japanese language skills and Japanese grammar
CO4:	Communicate short messages on highly predictable, everyday Topics that affect them directly
CO5:	Read a limited amount of information from highly predictable texts, basicpracticalwritingneedsusinglists,shortmessages,postcards,andsimplenotes

COsVs POsMAPPING:

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

COsVs PSOs MAPPING

COs	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSECONTENTS:

MODULE I		12 Hours

Talking about Family – Friends – Home – Rooms – Health – School – Hobbies - Student life – Shopping - Clothes -Pets and animals Reading - Hiragana, Katakana, 800 Words (JLPT N5 Kanji and Vocabulary), Identify the general intent of very short texts enhanced by visual clues.

MODULEII		12 Hours

Talking about your plans, weather, etc: grammar-usage of ni, o, nani, verbs like okimasu, shimasu, ikimasu, kaerimasu etc., Drills and applied conversation and audio. Common daily expressions, professions, religious beliefs, Japanese house and living style.

MODULE III		12 Hours
Talking about the past things happened: grammar– Past tense of verb sikimasu, mimasu, shimasu and their negative forms. Particles e, de and mo. Drills and applied conversation and audio. Food and transport, Japanese tea ceremony, Kanji related to directions and seasons.		
MODULE IV		12 Hours
Fixing an appointment for sports activity: grammar masenka, mashooka, particles ga(but) and goro.Drillsandappliedconversationandaudio.Partsofthebody,Japanesepoliticalsystemandeconomy.		
MODULE V		12 Hours
Talking about vacations: grammar-past tense of i-ending adjectives is ogashikatta, tanoshikatta, combination of two adjectives, adverb staihen, amari , to temo. Drills and applied conversation and audio. Stationery, fruits and vegetables, places of interest in Japan.		
		TOTAL:60HOURS

TEXT BOOKS:

1.Timothy G.S tout,Japanese Hiragana &Katakana for Beginners: First Steps to Mastering the Japanese Writing System, Tuttle Publications, 2011.

2. First lessons in Japanese, ALC, Japan

REFERENCES:

1.Helen Gilhooly, Complete Japanese, Tuttle Publications,2017.

2. Eriko Sato, Learning Japanese Kanji Practice BookVolume1,Tuttle Publications,2015.

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2301LS101	ADVANCED ENGLISH COMMUNICATION	L	T	P	C
		2	0	2	3

COURSE OBJECTIVES:

1. To understand the basics of communication skills.
2. To speak well generally in English in public places.
3. To read and write legibly in English.
4. To understand the verbal and non-verbal communication.

COURSE OUTCOMES:

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

CO1:	Understand the importance of oral and written communication in day-to-day working of the organisation.
CO2:	Develop their inter personal skills and problem-solving skills.
CO3:	Understand the role of body language in effective communicate
CO4:	Implement the soft skills in theoretical and practical ways.
CO5:	Adapt the techniques of personality development.

COs Vs POs MAPPING:

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

COs Vs PSOs MAPPING

COs	PSO1	PSO2	PSO3
CO1			
CO2			
CO3			
CO4			
CO5			

COURSE CONTENTS:

MODULE I	COMMUNICATION AND WRITING SKILLS	12 Hours

Communication skills- Process of communication, verbal and non verbal communication; listening and note taking, writing skills, oral presentation skills; field diary and lab record; indexing, footnote and bibliographic procedures.

MODULE II	READING AND SPEAKING SKILLS	12 Hours

Reading and comprehension of general and technical articles, precise writing, summarizing, abstracting; individual and group presentations, impromptu presentation, public speaking; Group discussion.

MODULE III	ICT IN COMMUNICATION	12 Hours

Role of ICT in communication. Recent advances in communication- Print and electronic, internet, e-mail, fax, mobile, interactive video and teleconferencing, computer, e-governance.

MODULE IV	PERSONALITY DEVELOPMENT	12 Hours

Meaning and definition of personality; Theoretical perspectives on personality- Behavioural trait and humanistic personality pattern; moulding the personality patterns.

MODULE V	COMPONENTS OF PERSONALITY DEVELOPMENT	12 Hours

Personality development - Self perception, self concept, self esteem and gender stereotyping, persistence and changes in personality determinants (physical, intellectual, emotional, social, educational and family). Aspirations, achievements and fulfillment. Dressing for formal and informal occasions.

PRACTICAL

Listening and note taking, writing skills, oral presentation skills; field diary and lab record; indexing, footnote and bibliographic procedures. Reading and comprehension of general and technical articles, precise writing, summarizing, abstracting; individual and group presentations. Developing questionnaire to study impact of physique, educational institutions, aspirations on personality; developing questionnaire to study social prescriptions, gender and family on personality, aspirations and achievements. Collecting data through the questionnaires on small samples. Report writing and presentation. Case study of an individual suffering with personality disorders.

<div align="right">

TOTAL: 60 HOURS

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TEXT BOOKS:

1. 1. Raman, Meenakshi and Sangeetha Sharma. 2011. Technical Communication: Principles and Practice, Oxford University Press, New Delhi.

2. Rizvi and Ashraf M. 2005. Effective Technical Communication, Tata McGraw-Hill, New Delhi.

REFERENCES:

1.   Regional Institute of English. 2006. English for Engineers, Cambridge University Press, New Delhi.

2.   Rutherford and Andrea. 2001. Basic Communication Skills for Technology, Pearson, New Delhi.

3. Viswamohan A. 2008. English for Technical Communication, Tata McGraw-Hill, New Delhi.