JEPPIAAR INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

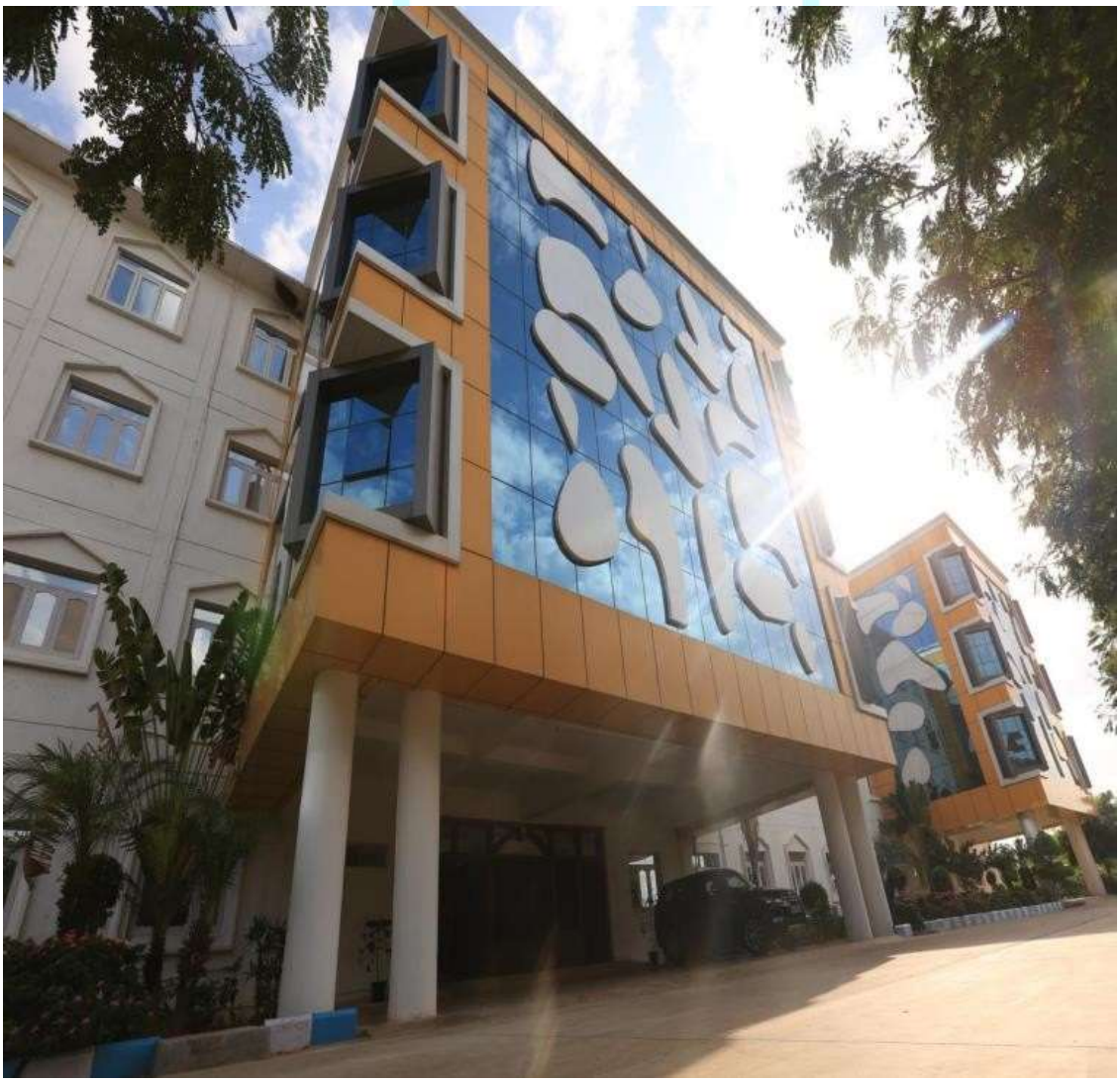
Self-Belief | Self Discipline | Self Respect

Kunnam, Sunguvarchatram, Sriperumbudur-631604

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

AUTONOMOUS SYLLABUS

REGULATION 2024



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

AUTONOMOUS CURRICULUM & SYLLABUS R2024

CHOICE BASED CREDIT SYSTEM

VISION AND MISSION OF THE INSTITUTION

VISION

❖Jeppiaar Institute of Technology aspires to provide technical education in futuristic technologies with the perspective of innovative, industrial, and social applications for the betterment of humanity

MISSION

❖To produce competent and disciplined high-quality professionals with the practical skills necessary to excel as innovative professionals and entrepreneurs for the benefit of society.

❖To improve the quality of education through excellence in teaching and learning, research, leadership, and by promoting the principles of scientific analysis, and creative thinking.

❖To provide excellent infrastructure, serene, and stimulating environment that is most conducive to learning.

❖To strive for productive partnership between the Industry and the Institute for research and development in the emerging fields and creating opportunities for employability.

❖To serve the global community by instilling ethics, values, and life skills among the students needed to enrich their lives.

VISION AND MISSION OF THE DEPARTMENT

VISION

To impart futuristic technological education, innovation and collaborative research in the field of Computer Science and Engineering and to develop Quality Professionals for the improvement of the society and industry.

MISSION

M1: To develop the students as professionally competent and disciplined engineers for the benefit of the development of the country.

M2: To produce excellent infrastructure to adopt latest technologies, industry-institute interaction and encouraging research activities.

M3: To provide multidisciplinary technical skills to pursue research activities, higher studies, entrepreneurship and perpetual learning.

M4: To enrich students with professional integrity and ethical standards to handle social challenges successfully in their life.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Apply their technical competence in computer science to solve real world problems, with technical and people leadership.

PEO2: Conduct cutting edge research and develop solutions on problems of social relevance.

PEO3: Work in a business environment, exhibiting team skills, work ethics, adaptability and lifelong learning.

PROGRAM OUTCOMES (POs)

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

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

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

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

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

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

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

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

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

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

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

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

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Exhibit design and programming skills to build and automate business solutions using cutting edge technologies.

PSO2: Strong theoretical foundation leading to excellence and excitement towards research, to provide elegant solutions to complex problems.

PSO3: Ability to work effectively with various engineering fields as a team to design, build and develop system applications.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

AUTONOMOUS CURRICULUM R2024 (CBCS)

SEMESTER I

S. No	Course Code	Course Title	Category	Periods			Credits	CIE	SEE	TOTAL
				L	T	P				
THEORY										
1	AIP101	Induction Program		0	0	0	0			
2	AMA101	Matrices and Calculus	BS	3	1	0	4	40	60	100
3	AEC103	Basics of Electrical and	ES	3	0	0	3	40	60	100
4	ACS101	Principles of Programming	PC	3	0	0	3	40	60	100
5	ACS102	Python Programming	ES	3	0	0	3	40	60	100
6	AMC101	Employment Enhancement	MC	2	0	0	0	-	-	100
7	AMC102	Professional Ethics and Human Values	MC	2	0	0	0	-	-	100
PRACTICALS										
8	AEC302	Basics of Electrical and Electronics Engineering	ES	0	0	3	2	60	40	100
9	ACS301	Python Programming Lab	ES	0	0	3	2	60	40	100
10	AHS301	Communication Skills and	HS	0	0	2	1	60	40	100
11	AEEC301	Mini Project / Professional Practices	EEC	0	0	2	1	60	40	100
			Total	16	1	10	19	400	400	1000

SEMESTER II										
S. No	**Course Code**	**Course Title**	**Category**	**Periods**			**Credits**	**CIE**	**SEE**	**TOTAL**
				L	**T**	**P**				
THEORY										
1	AMA102	Discrete Mathematics	BS	3	1	0	4	40	60	100
2	APH101	Computational Physics	BS	3	0	0	3	40	60	100
3	AAI101	Introduction to Data Science	ES	3	0	0	3	40	60	100
4	ACS103	Computer Organization	PC	3	0	0	3	40	60	100
5	ACS104	Fundamentals of Cloud Computing	ES	3	0	0	3	40	60	100
6	AHS101	Language Enhancement	HS	1	0	0	1	40	60	100
7	AMC103	Indian Constitution	MC	2	0	0	0	-	-	100
PRACTICALS										
8	APH301	Computational Physics Lab	BS	0	0	3	2	60	40	100
9	ACS302	Cloud Computing Lab	ES	0	0	3	2	60	40	100
10	AMC301	Yoga and Happy Living	MC	0	0	2	0	-	-	100
11	AEEC302	Mini Project / Professional Practice	EEC	0	0	2	1	60	40	100
			Total	19	1	8	22	420	480	1100

SEMESTER III										
S.No	**Course Code**	**Course Title**	**Category**	**Periods**			**Credits**	**CIE**	**SEE**	**TOTAL**
				L	**T**	**P**				
THEORY										
1	ACS105	Object Oriented Programming	PC	3	0	0	3	40	60	100
2	ACS106	Data structures and Algorithms	PC	3	0	0	3	40	60	100
3	AMA105	Probability and Statistics for	PC	3	0	0	3	40	60	100
4	AMB153	Business Analytics	PC	3	0	0	3	40	60	100

5	AMC104	Environmental Engineering and Sustainability	MC	2	0	0	0	-	-	100
PRACTICALS										
6	ACS303	Object Oriented Programming Lab	PC	0	0	3	2	60	40	100
7	ACS304	Data Structures and Algorithms Lab	PC	0	0	3	2	60	40	100
8	AHS302	Soft Skills I	HS	0	0	2	0	-	-	100
9	AEEC303	Mini Project / Professional Practices	EEC	0	0	2	1	60	40	100
			Total	15	0	8	17	340	360	900

SEMESTER IV

S. No	Course Code	Course Title	Category	Periods			Credits	CIE	SEE	TOTAL
				L	T	P				
THEORY										
1	ACS107	Operating Systems	PC	3	0	0	3	40	60	100
2	ACS108	Database Management Systems	PC	3	0	0	3	40	60	100
3	ACS109	Computer Networks	PC	3	0	0	3	40	60	100
4		Professional Elective 1	PE	3	0	0	3	40	60	100
PRACTICALS										
5	ACS305	Operating Systems Lab	PC	0	0	3	2	60	40	100
6	ACS306	Database Management	PC	0	0	3	2	60	40	100
7	ACS307	Computer Networks lab	PC	0	0	3	2	60	40	100
8	AHS303	Soft Skills II	HS	0	0	2	0	-	-	100
9	AEEC304	Mini Project / Internship / Professional	EEC	0	0	2	1	60	40	100
			Total	13	0	11	19	400	400	900

SEMESTER V										
S. No	**Course Code**	**Course Title**	**Category**	**Periods**			**Credits**	**CIE**	**SEE**	**TOTAL**
				L	**T**	**P**				
THEORY										
1	ACS110	Theory of Computation	PC	3	0	0	3	40	60	100
2	AAI102	Artificial Intelligence	PC	3	0	0	3	40	60	100
3		Professional Elective 2	PE	3	0	0	3	40	60	100
4		Open Elective 1	OE	3	0	0	3	40	60	100
PRACTICALS										
5	AAI301	Artificial Intelligence Lab	PC	0	0	3	2	60	40	100
6	AEEC305	Mini Project / Professional	EEC	0	0	2	1	60	40	100
			Total	13	0	3	15	280	320	600

SEMESTER VI										
S. No	**Course Code**	**Course Title**	**Category**	**Periods**			**Credits**	**CIE**	**SEE**	**TOTAL**
				L	**T**	**P**				
THEORY										
1	ACS111	Compiler Design	PC	3	0	0	3	40	60	100
2	ACS112	Software Engineering	PC	3	0	0	3	40	60	100
3		Professional Elective 3	PE	3	0	0	3	40	60	100
4		Professional Elective 4	PE	3	0	0	3	40	60	100
PRACTICALS										
5	ACS308	Compiler Design Lab	PC	0	0	3	2	60	40	100
6	AEEC306	Mini Project / Internship /	EEC	0	0	2	1	60	40	100
			Total	13	0	3	15	280	320	600

SEMESTER VII										
S.No	**Course**	**Course Title**	**Category**	**Periods**			**Credits**	**CIE**	**SEE**	**TOTAL**

	Code			L	T	P				
THEORY										
1	ACS113	Computer Vision	PC	3	0	0	3	40	60	100
2		Professional Elective 5	PE	3	0	0	3	40	60	100
3		Open Elective 2	OE	3	0	0	3	40	60	100
PRACTICALS										
5	ACS309	Computer Vision Lab	PC	0	0	3	2	60	40	100
6	ACS310	Major Project I	EEC	0	0	12	4	60	40	100
	AEEC307	Internship / Professional	EEC	0	0	2	1	60	40	100
			Total	10	0	15	16	300	300	600

SEMESTER VIII

S.No	Course Code	Course Title	Category	Periods			Credits	CIE	SEE	TOTAL
				L	T	P				
THEORY										
1		Professional Elective 6	PE	3	0	0	3	40	60	100
2		Professional Elective 7	PE	3	0	0	3	40	60	100
PRACTICALS										
5	ACS311	Major Project II	EEC	0	0	24	10	60	40	100
6	AEEC308	Internship / Professional	EEC	0	0	2	1	60	40	100
			Total	7	0	24	17	200	200	400

Area of Specializations identified for Professional Electives

- Data Science
- Full Stack Development
- Cloud Computing and Data Center Technologies
- Cyber Security and Data Privacy
- Creative Media
- Emerging Technologies
- Artificial Intelligence and Machine Learning

PROFESSIONAL ELECTIVES

SEMESTER	PE	CODE	COURSE
II-II	PE1	ACS 501	Advanced Data Structures
		ACS 502	Internet of Things
		ACS 503	Parallel Computing
		ACS 504	Network Security
		ACS 505	Human Computer Interaction
III- I	PE2	ACS 506	Graph Theory
		ACS 507	Full Stack Development
		ACS 508	Big Data Analytics
		ACS 509	Cryptography
		ACS 510	Computational Neuroscience
III-I	PE3	ACS 511	Mobile Application Development
		ACS 512	Engineering Secure Software Systems
		ACS 513	Big Data Technology
		ACS 514	Cyber security
		ACS 515	Machine Learning
III-I	PE4	ACS 516	Network Programming
		ACS 517	Fog and Edge Computing
		ACS 518	Multimedia Technologies
		ACS 519	Ethical Hacking
		ACS 520	Deep Learning
IV- I	PE5	ACS 521	React Js
		ACS 522	Block chain Technology
		ACS 523	Data Mining and Data warehousing

		ACS 524	**Digital Forensic**
		ACS 525	**Natural Language Processing**
IV-II	**PE6**	**ACS 526**	**No SQL Databases**
		ACS 527	**Quantum Computing**
		ACS 528	**Information Retrieval System**
		ACS 529	**Information Security Management**
		ACS 530	**Nature Inspired Optimization Technique**
IV- II	**PE7**	**ACS 531**	**Open Source Software**
		ACS 532	**Soft Computing**
		ACS 533	**Data Visualization Techniques**
		ACS 534	**Bioinformatics**
		ACS 535	**Reinforcement Learning**

OPEN ELECTIVE										
S. No	Course Code	Course Title	Category	Periods			Credits	CIE	SEE	TOTAL
				L	T	P				
THEORY										
1	AME701	Drone Technologies	OE	3	0	0	3	40	60	100
2	AME702	Additive Manufacturing	OE	3	0	0	3	40	60	100
3	AME703	Electric and Hybrid Vehicle Technology	OE	3	0	0	3	40	60	100
4	AEC701	Sensors and Actuators	OE	3	0	0	3	40	60	100
5	AEC702	Applied Design Thinking	OE	3	0	0	3	40	60	100
6	AEC703	Project Report Writing	OE	3	0	0	3	40	60	100
7	AMB701	Corporate Governance	OE	3	0	0	3	40	60	100
8	AMB702	Digital Marketing	OE	3	0	0	3	40	60	100
9	AMB703	Rural Marketing	OE	3	0	0	3	40	60	100
10	ACS701	System Engineering	OE	3	0	0	3	40	60	100
11	ACS702	Green Computing	OE	3	0	0	3	40	60	100
12	ACS703	Fintech Regulation	OE	3	0	0	3	40	60	100
13	AIT701	Network Essentials	OE	3	0	0	3	40	60	100
14	AIT702	Soft Computing Methodologies	OE	3	0	0	3	40	60	100
15	AIT703	Knowledge Engineering	OE	3	0	0	3	40	60	100
16	ACB701	Business Research Methods	OE	3	0	0	3	40	60	100
17	ACB702	Automation Testing Tools	OE	3	0	0	3	40	60	100
18	ACB703	Social Network Analysis	OE	3	0	0	3	40	60	100
19	AAI701	Drinking Water Supply and Treatment	OE	3	0	0	3	40	60	100
20	AAI702	Geographical Information System	OE	3	0	0	3	40	60	100
21	AAI703	IT in Agricultural System	OE	3	0	0	3	40	60	100

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AUTONOMOUS CURRICULUM & SYLLABUS R2024

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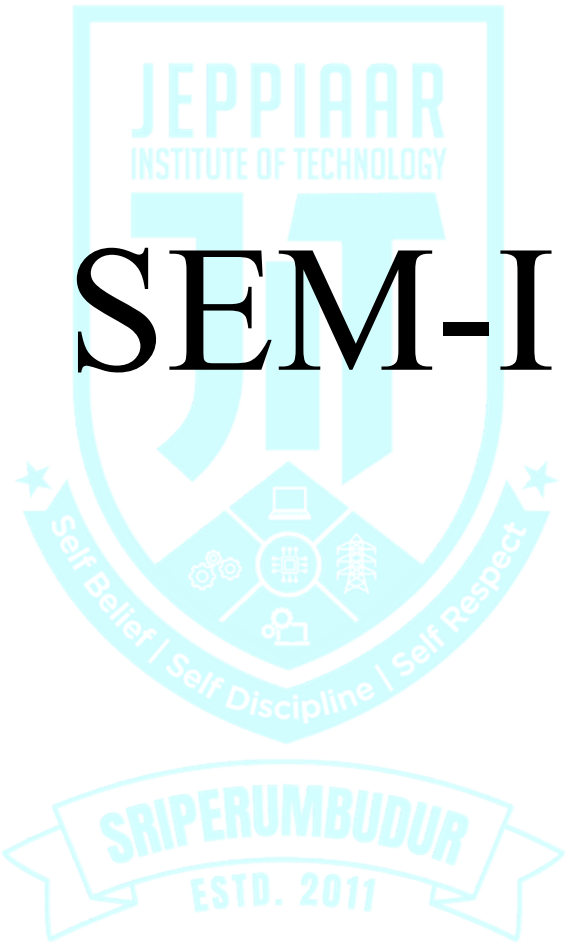

SEM-I

AMA101 - MATRICES AND CALCULUS							
Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		1	**BS**	**3**	**1**	**0**	**4**
Preamble	➢ Introduce the matrix techniques and to explain the nature of the matrix. ➢ Provide the necessary basic concepts of a few numerical methods and give procedures for solving numerically different kinds of problems occurring in Engineering and Technology. ➢ Familiarize the students with differential calculus. ➢ Understand techniques of calculus which are applied in the Engineering problems. ➢ Acquaint the student with mathematical tools needed in evaluating multiple integrals and their applications						
Unit 1	**MATRICES**						**9+3**
Matrices - Eigen values and eigenvectors - Diagonalization of matrices using orthogonal transformation – Cayley Hamilton Theorem (without proof) - Quadratic forms - Reduction to canonical form using orthogonal transformation							
Unit 2	**SOLUTION OF LINEAR SYSTEM OF EQUATIONS AND EIGENVALUE PROBLEMS**						**9+3**
Solution of linear system of equations - Gauss elimination method – Pivoting - Gauss Jordan method – Gauss Seidel iterative method - Matrix Inversion by Gauss Jordan method - Eigen values of a matrix by Power method – Jacobi method.							
Unit 3	**DIFFERENTIAL CALCULUS**						**9+3**
Limit of a function-Continuity-Derivatives-Differentiation rules (sum, product, quotient, chain rules)-Implicit Differentiation-Logarithmic Differentiation-Applications: Maxima and Minima of functions of one variable							
Unit 4	**INTEGRAL CALCULUS**						**9+3**
Definite and Indefinite integrals - Substitution rule - Techniques of Integration: Integration by parts, Trigonometric integrals, Trigonometric substitutions, Integration of rational functions by partial fraction, Integration of irrational functions – Improper integrals.							
Unit 5	**MULTIPLE INTEGRALS**						**9+3**
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 centers of mass, moment of inertia.							
							TOTAL: 60

TEXTBOOKS	
1	Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 43rd Edition, 2014.
2	Erwin Kreyszig ," Advanced Engineering Mathematics ", John Wiley and Sons, 10th Edition, New Delhi, 2016
3	Grewal. B.S., and Grewal. J.S., Numerical methods in Engineering and Science, Khanna Publishers, 9th Edition, New Delhi, 2001.
REFERENCES	
1	Ramana. B.V., "Higher Engineering Mathematics", McGraw Hill Education Pvt. Ltd, New Delhi, 2018.

2	N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008

COURSEOUTCOMES: At the end of the course, learners will be able to		**Bloom's Taxonomy Level**
CO1	Demonstrate the matrix techniques in solving the related problems in engineering and technology.	K4
CO2	Apply matrix methods to solve system of linear equations	K3
CO3	Apply differential calculus tools in solving various application problems	K3
CO4	Apply different methods of integration in solving practical problems.	K3
CO5	Evaluate multiple integrals to conduct investigations of complex problems	K5

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

AEC103 - BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING							
Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		1	**BS**	**3**	**0**	**0**	**3**
Preamble	➢ This course provides the foundation for understanding various aspects of electrical and electronics engineering. From the basics of circuit theory to the intricacies of semiconductor devices, this subject delves into the heart of electrical and electronic systems.						
Unit 1	**ELECTRICAL CIRCUITS**						**9**
DC Circuits: Circuit Components: Conductor, Resistor, Inductor, Capacitor – Ohm's Law - Kirchhoff's Laws –Independent and Dependent Sources – Simple problems- Nodal Analysis, Mesh analysis with Independent sources only (Steady state) Introduction to AC Circuits and Parameters: Waveforms, Average value, RMS Value, Instantaneous power, real power, reactive power and apparent power, power factor – Steady state analysis of RLC circuits (Simple problems only)							
Unit 2	**ELECTRICAL MACHINES**						**9**
Construction and Working principle- DC Separately and Self excited Generators, EMF equation, Types and Applications. Working Principle of DC motors, Torque Equation, Types and Applications. Construction, Working principle and Applications of Transformer, Three phase Alternator, Synchronous motor and Three Phase Induction Motor							
Unit 3	**ANALOG ELECTRONICS**						**9**
Resistor, Inductor and Capacitor in Electronic Circuits- Semiconductor Materials: Silicon &Germanium – PN Junction Diodes, Zener Diode –Characteristics Applications – Bipolar Junction							

Transistor-Biasing, JFET, SCR, MOSFET, IGBT – Types, I-V Characteristics and Applications, Rectifier and Inverters		
Unit 4	**DIGITAL ELECTRONICS**	**9**
Review of number systems, binary codes, error detection and correction codes, Combinational logic - representation of logic functions-SOP and POS forms, K-map representations - minimization using K maps (Simple Problems only).		
Unit 5	**MEASUREMENTS AND INSTRUMENTATION**	**9**
Functional elements of an instrument, Standards and calibration, Operating Principle, types -Moving Coil and Moving Iron meters, Measurement of three phase power, Energy Meter, Instrument Transformers-CT and PT, DSO- Block diagram- Data acquisition.		
		TOTAL: 45

TEXTBOOKS	
1	Kothari DP and I.J Nagrath, "Basic Electrical and Electronics Engineering", Second Edition, McGraw Hill Education, 2020
2	S.K.Bhattacharya "Basic Electrical and Electronics Engineering", Pearson Education, Second Edition, 2011
3	Sedha R.S., "A textbook book of Applied Electronics", S. Chand & Co., 2008
4	James A .Svoboda, Richard C. Dorf, "Dorf's Introduction to Electric Circuits", Wiley, 2018.
5	.K. Sawhney, Puneet Sawhney 'A Course in Electrical & Electronic Measurements & Instrumentation', DhanpatRai and Co, 2015.
REFERENCES	
1	Kothari DP and I.J Nagrath, "Basic Electrical Engineering", Fourth Edition, McGraw Hill Education, 2019
2	Thomas L. Floyd, 'Digital Fundamentals', 11th Edition, Pearson Education, 2011
3	Albert Malvino, David Bates, 'Electronic Principles, McGraw Hill Education; 1th edition, 2011
4	Mahmood Nahvi and Joseph A. Edminister, "Electric Circuits", Schaum' Outline Series, McGraw Hill.

COURSEOUTCOMES: **At the end of the course, learners will be able to**		**Bloom's Taxonomy Level**
CO1	Compute the electric circuit parameters for simple problems.	K2
CO2	Explain the working principle and applications of electrical machines.	K2
CO3	Analyze the characteristics of analog electronic devices.	K2
CO4	Explain the basic concepts of digital electronics.	K2
CO5	Explain the operating principles of measuring instruments	K2

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	2	2	1	-	-	-	-	1	-	-	-	2	-	-	1
CO2	2	2	1	-	-	-	-	1	-	-	-	2	-	-	1
CO3	2	2	1	-	-	-	-	1	-	-	-	2	-	-	1
CO4	2	2	1	-	-	-	-	1	-	-	-	2	-	-	1
CO5	2	2	1	-	-	-	-	1	-	-	-	2	-	-	1

ACS101 PRINCIPLES OF PROGRAMMING							
Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		1	**PC**	**3**	**0**	**0**	**3**
Preamble	➢ Be exposed to the basics of computers and number systems. ➢ Learn to think logically and write pseudo code or draw flow charts for problems. ➢ Be familiar with syntax and programming in C. ➢ To develop modular applications in C using functions, pointers and structures ➢ To do input/output and file handling in C						
Unit 1	**INTRODUCTION TO COMPUTERS**						**9**
Introduction – Characteristics of Computers – Evolution of Computers – Computer Generations – Classification of Computers – Basic Computer organization – Number Systems-Number Conversion							
Unit 2	**PROBLEM SOLVING AND COMPUTER SOFTWARE**						**9**
Problem formulation – Problem Solving - Algorithm – Flow Charts – Pseudocode - Computer Software –Types of Software – Software Development Steps – Internet Evolution - Basic Internet Terminology – HTML -Getting connected to Internet Applications. Application Software Packages- Introduction to Office Packages							
Unit 3	**INTRODUCTION TO C**						**9**
Overview of C – structure of a C program – compilation and linking processes, Constants, Variables and Data Types – Operators and Expressions – Managing Input and Output operators – Decision Making – Arrays, Branching and Looping, Handling of Character Strings.							
Unit 4	**FUNCTIONS, POINTERS AND STRUCTURES**						**9**
Built-in Functions-User-defined Functions – Definitions – Declarations -Call by reference – Call by value – Structures and Unions – Pointers – The Preprocessor – Developing a C Program							
Unit 5	**FILE MANIPULATION**						**9**
Introduction, Character Input output in Files, Command Line Arguments, String Input Output in Files, High level Disk I/O Functions, Direct Input Output, Error Handling functions, File Positioning, Introduction to Preprocessor, Macro substitution, File Inclusion.							
							TOTAL: 45
TEXTBOOKS							
1	Ashok.N.Kamthane,“ Computer Programming”, Pearson Education (India)						

2	Behrouz A.Forouzan and Richard.F.Gilberg, "A Structured Programming Approach Using C", II Edition, Brooks-Cole Thomson Learning Publication
REFERENCES	
1	Pradip Dey, Manas Ghoush, "Programming in C", Oxford University Press
2	Byron Gottfried, "Programming with C", 2nd Edition, (Indian Adapted Edition), TMH publications
3	Stephen G.Kochan, "Programming in C", Third Edition, Pearson Education India.
4	Brian W.Kernighan and Dennis M.Ritchie, "The C Programming Language", Pearson Education Inc.
5	E.Balagurusamy, "Computing fundamentals and C Programming", Tata McGraw-Hill Publishing Company Limited.

COURSEOUTCOMES: **At the end of the course, learners will be able to**		**Bloom's Taxonomy Level**
CO1	To enable the student to learn the major components of a computer system	K2
CO2	To demonstrate knowledge on logical thinking and problem solving	K3
CO3	Design and implement applications on C Programming constructs using arrays and strings	K3
CO4	Develop and implement modular applications in C using functions, structures and pointers.	K3
CO5	Design applications using sequential and random access file processing.	K3

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

ACS102 - PYTHON PROGRAMMING

Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		1	**ES**	**3**	**0**	**0**	**3**

Preamble	➢ To understand the basics of algorithmic problem solving. ➢ To learn to solve problems using Python conditionals and loops. ➢ To define Python functions and use function calls to solve problems. ➢ To use Python data structures - lists, tuples, dictionaries to represent complex data. ➢ To do input/output with files in Python.

Unit 1	BASICS OF PYTHON PROGRAMMING	9
Overview of programming language- Python history-Interactive mode – script mode-Tokens:Literal-Keyword-Delimiter-Identifier-Data types: Integer-Floating-Complex-Boolean-String-Indentation-Input operation-Comments		
Unit 2	**CONTROL STRUCTURE, OPERATORS AND FUNCTIONS**	**9**
Statements: if, if-else, nested if, if –elif - Iterative statements: while, for, Nested loops, else in loops, break, continue and pass statements. Operators: Arithmetic-Membership-Identity-Bitwise Functions: Types, parameters, arguments: positional arguments, keyword arguments, parameters with default values, functions with arbitrary arguments, Scope of variables: Local and global scope, Recursion		
Unit 3	**COLLECTIONS, STRINGS AND REGULAR EXPRESSIONS**	**9**
List: Create Access, Negative Indices, Slicing, Splitting, List Methods, and comprehensions Tuples: Create, Indexing and Slicing, Operations on tuples. Dictionary: Create, add, traversing and replace values, operations on dictionaries. Sets: Create and operations on set. Strings: Formatting, Comparison, Slicing, Splitting, Stripping, Negative indices, String functions. Regular expression: Matching the patterns, Search and replace		
Unit 4	**FILE HANDLING AND EXCEPTIONS**	**9**
Files: Open, Read, Write, Append, Tell, Seek and Close. Errors and Exceptions: Syntax Errors, Exceptions, Handling Exceptions, Raising Exceptions, Exception Chaining, Userdefined Exceptions, Defining Clean-Up actions		
Unit 5	**NUMPY, PANDAS, MATPLOTLIB**	**9**
Introduction - Basics of NumPy - N-dimensional Array in NumPy – Methods and Properties - Basics of SciPy - Broadcasting in NumPy Array Operations - Array Indexing in NumPy, Pandas - Introduction - Series - Data Frame - Matplotlib - Basics - Figures and Axes - Method subplot() - Axis container		
		TOTAL: 45

TEXTBOOKS	
1	Ashok Namdev Kamthane, Amit Ashok Kamthane "Programming and Problem Solving with Python" , 2nd edition , Mc Graw Hill
2	Dr.R.Nageswara Rao, "Core Python Programming",3rd edition, Deamtech Publisher
REFERENCES	
1	Paul Dietel, Harvey Deitel, " Python for Programmers", Pearson
2	Reema Thareja," Problem Solving and programming with Python, Oxford University Press

COURSEOUTCOMES: **At the end of the course, learners will be able to**		**Bloom's Taxonomy Level**
CO1	Develop algorithmic solutions to simple computational problems.	K3
CO2	Develop and execute simple Python programs.	K3
CO3	Write simple Python programs using conditionals and loops for solving problems.	K2
CO4	Decompose a Python program into functions.	K3
CO5	Represent compound data using Python lists, tuples, dictionaries etc.	K3

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

AMC101 - EMPLOYMENT ENCHANCEMENT SKILLS							
Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		1	**MC**	**2**	**0**	**0**	**0**
Preamble							
Unit 1	**RESUME WRITING**						**6**
Resume: Objective; Formats; Meticulous & Attention to Detail; Organizing Information; Highlight skills; Mistakes to avoid; Qualification & Skill; SWOT Analysis; Assignment – Draft Resume & Corrections							
Unit 2	**INTERVIEW SKILLS**						**6**
Types of Interviews; Preparation – Company, Role, Brush up Concepts, Technical Strengths; Strengths & Weakness; Importance of Grooming; Interview Questions – HR & Technical; Non Verbal Communication; Negotiation Skills; How to start/end an interview; Group Discussion; Assignment – Preparation for "Tell me about yourself", Mock Interviews.							
Unit 3	**PROFESSIONAL ETIQUETTES**						**6**
Workplace Etiquette – Global & Local; Culture Sensitivity; Gender Sensitivity; Communication Netiquettes – Phone, Email, Social Media; Avoid Gossip; How to be personable yet be professional. Meetings: Types of meetings; Agenda; Schedule & Participants; Materials required; Minutes of Meeting.							
Unit 4	**PRESENTATION SKILLS**						**6**
What is a Presentation; Develop an effective slide; Know your Slides; Know your Audience; Barriers in Presentation; Time Management; Listening to the silent audience; Question & Answer session; Feedback.							
Unit 5	**COMMUNICATION AT WORKPLACE**						**6**
Language & Communication; Types of Communication – Internal & External, Formal & Informal; Direction of Communication Flow – Downward, Upward, Lateral, Diagonal; Team Work; Emotional Intelligence							
							TOTAL: 30

TEXTBOOKS	
1	"Soft Skills & Employability Skills" by Sabina Pillai&Agna Fernandez
2	"Soft Skills" by Meenakshi Raman &ShaliniUpadhyay
3	"Campus Recruitment" by Ramanadhan Ramesh Babu, Israel Battu, Akash R Bhutada&Vijaya Lakshmi Krishnan
REFERENCES	
1	"Personality Development & Soft Skills (Old Edition)" by Barun K Mitra
2	"Soft Skills Training: A Workbook to develop Skills for Employment" by Frederick H Wentz
3	"Ten Soft Skills You Need to Advance Your Career(Andre Keys Book 9)" by Lisa smith

4	"Get Your First Job: A Companion For Getting Your First Job – A Guide to Employability Skills & Career Planning" by AJ Balasubramanian &Dr J Sadakkadulla

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

AMC102 - PROFESSIONAL ETHICS AND HUMAN VALUES							
Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		1	**MC**	**2**	**0**	**0**	**0**
Preamble	➢ To create an awareness on Engineering Ethics and Human Values. ➢ To understand social responsibility of an engineer. ➢ To appreciate ethical dilemma while discharging duties in professional life.						
Unit 1	**HUMAN VALUES**						**2**
Morals, Values and Ethics – Integrity – Work Ethic – Honesty – Courage –Empathy – Self-Confidence – Character							
Unit 2	**ENGINEERING ETHICS**						**4**
Senses of 'Engineering Ethics' - variety of moral issued - types of inquiry - moral dilemmas - moral autonomy - Kohlberg's theory - Gilligan's theory - consensus and controversy – Models of Professional Roles - theories about right action - Self-interest - customs and religion - uses of ethical theories. Valuing Time – Co-operation – Commitment							
Unit 3	**ENGINEERING AS SOCIAL EXPERIMENTATION**						**3**
Engineering as experimentation - engineers as responsible experimenters - codes of ethics - a balanced outlook on law - the challenger case study							
Unit 4	**SAFETY, RESPONSIBILITIES AND RIGHTS**						**3**
Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the three mile island and chernobyl case studies							
Unit 5	**GLOBAL ISSUES**						**3**
Multinational corporations - Environmental ethics - computer ethics - weapons development - engineers as managers-consulting engineers-engineers as expert witnesses and advisors -moral leadership							
							TOTAL: 15
TEXTBOOKS							
1	Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw-Hill, New York 1996						
2	Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004						

REFERENCES	
1	Charles D. Fleddermann, "Engineering Ethics", Pearson Education / Prentice Hall, New Jersey, 2004 (Indian Reprint now available).
2	Charles E Harris, Michael S. Protchard and Michael J Rabins, "Engineering Ethics – Concepts and Cases", Wadsworth Thompson Leatning, United States, 2000 (Indian Reprint now available).
3	John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003.
4	Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001.

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	1	-	-	-	2	1	-	-	2	-	2	-	1	-
CO2	1	-	1	-	2	-	-	-	2	-	-	-	-	-	-
CO3	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
CO4	-	2	-	-	-	-	-	2	-	-	-	-	-	-	-
CO5	-	-	-	-	2	-	-	-	2	-	2	-	1	-	-

ACS301 - PYTHON PROGRAMMING LABORATORY							
Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		1	**ES**	**0**	**0**	**4**	**2**
Preamble	➢ To understand the problem solving approaches. ➢ To learn the basic programming constructs in Python. ➢ To practice various computing strategies for Python-based solutions to real world problems. ➢ To use Python data structures - lists, tuples, dictionaries. ➢ To do input/output with files in Python.						

LIST OF EXPERIMENTS
1. Identification and solving of simple real life or scientific or technical problems, and developing flow charts for the same. (Electricity Billing, Retail shop billing, Sin series, weight of a motorbike, Weight of a steel bar, compute Electrical Current in Three Phase AC Circuit, etc.)
2. Python programming using simple statements and expressions (exchange the values of two variables, circulate the values of n variables, distance between two points).
3 Scientific problems using Conditionals and Iterative loops. (Number series, Number Patterns, pyramid pattern)
4. Implementing real-time/technical applications using Lists, Tuples. (Items present in a library/Components of a car/ Materials required for construction of a building –operations of list & tuples)
5. Implementing real-time/technical applications using Sets, Dictionaries. (Language, components of an automobile, Elements of a civil structure, etc.- operations of Sets & Dictionaries)

6. Implementing programs using Functions. (Factorial, largest number in a list, area of shape)
7. Implementing programs using Strings. (reverse, palindrome, character count, replacing characters)
8. Implementing programs using written modules and Python Standard Libraries (pandas, numpy. Matplotlib, scipy)
9. Implementing real-time/technical applications using File handling. (copy from one file to another, word count, longest word)
10. Implementing real-time/technical applications using Exception handling. (divide by zero error, voter's age validity, student mark range validation)
11. Exploring Pygame tool.
12. Developing a game activity using Pygame like bouncing ball, car race etc.
TOTAL: 60

COURSEOUTCOMES: **At the end of the course, learners will be able to**		**Bloom's Taxonomy Level**
CO1	Develop algorithmic solutions to simple computational problems	K3
CO2	Develop and execute simple Python programs.	K3
CO3	Implement programs in Python using conditionals and loops for solving problems.	K3
CO4	Deploy functions to decompose a Python program.	K3
CO5	Process compound data using Python data structures.	K3

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

AEC302 - BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY

Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		1	**ES**	**0**	**0**	**4**	**2**

Preamble	➢ Soldering and testing simple electronic circuits; ➢ Assembling and testing simple electronic components on PCB. ➢ Study of basic electrical and digital equipment.

LIST OF EXPERIMENTS
1. Soldering simple electronic circuits and checking continuity.
2. Assembling and testing electronic components on a small PCB.
3. Study of electronic components and equipment's.
(a) Resistor Color coding using digital multi-meter.

(b) Assembling electronic components on breadboard.
4. Verification of Logic Gates
5. Verification of Half Adder and Full Adder
6. Measurement of electrical quantities-voltage current, power & power factor in RLC circuit
7. Verification of KVL, KCL
8. Verification of Thevenin, Norton, Superposition Theorem
9. Fluorescent lamp wiring
10. Stair case wiring
11. Study of iron box wiring and working
12. Assembly and dismantle of computer/ laptop
TOTAL: 60

COURSEOUTCOMES: **At the end of the course, learners will be able to**		**Bloom's Taxonomy Level**
CO1	Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.	K3
CO2	Demonstrate the wiring of various electrical joints in common household electrical wire work.	K3
CO3	Test the working of basic logic gates.	K3
CO4	Understand the working of basic electrical devices	K3
CO5	Apply basic electrical concepts to implement basic electrical circuits.	K3

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

AHS301 - COMMUNICATION SKILLS AND TECHNICAL WRITING							
Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		1	**HS**	**0**	**0**	**2**	**1**
Preamble	➢ Impart a thorough understanding of the principles underlying effective technical communication. ➢ Develop the skills necessary to tailor technical communication to diverse audience needs. ➢ Enhance proficiency in using language techniques and understanding genres related to technical communication. ➢ Equip students with the ability to utilize technological tools to improve technical communication practices. ➢ Foster an awareness of ethical considerations and global perspectives in technical communication.						

Unit 1	PRINCIPLES OF TECHNICAL COMMUNICATION	12
Listening -Brief video snippets of conversational moments from movies and short documentaries Speaking- Presenting oneself, introducing others, inviting people, and explaining places. Reading - Short passages that need understanding include inference and critical analysis. Writing-Finishing missing phrases and constructing suggestions based on supplied information. Grammar- Who-Questions and Yes/No Questions - Parts of Speech. Vocabulary development: prefixes, suffixes, articles, countable and uncountable nouns.		
Unit 2	**AUDIENCE-CENTERED COMMUNICATION**	**12**
Listening: Deep Listening - Talk Shows and Debates. Reading: In depth Reading: Scanning Passages Speaking: Describe current issues, happenings, etc. Writing: Instructions, Recommendations, Note Taking, and Paragraph Writing Grammar: Continuous tenses, prepositions and articles Vocabulary: Phrasal verbs and one-word substitutes		
Unit 3	**LANGUAGE TECHNIQUES AND GENRES IN TECHNICAL COMMUNICATION**	**12**
Listening: Listening to lectures, podcasts, and audio books. Reading: Interpretation of Tables, Charts and Graphs Speaking: SWOT Analysis on oneself and Narrating incidents Writing: Formal Letter Writing, Covering Letter and Memos. Grammar: Perfect Tenses and Discourse Markers Vocabulary: Nouns, usage of keywords		
Unit 4	**TECHNOLOGICAL TOOLS USED IN COMMUNICATION**	**12**
Listening: Instructional videos, webinars on personal branding and networking and TED talks Reading: Manuals, Research papers or articles, Graphic narratives, AI tools used in reading Speaking: Participating in and conducting mock virtual meetings, focusing on presentation skills and etiquette. Mock networking events and Elevator Pitch Writing: E-Mails, drafting formal messages in social media handles, and Usage of AI prompts. Grammar: Adjectives, Verbs and Adverbs.		
Unit 5	**ETHICAL AND GLOBAL PERSPECTIVES IN TECHNICAL COMMUNICATION**	**12**
Listening: Podcasts, documentaries and webinars on digital ethics and cybersecurity. Reading: Articles on fundamental ethical principles and case studies. Speaking: Cultural sensitivity and representation ross-cultural communication strategies Mock meetings to practice global collaboration. Writing: Case study analysis reports on legal and ethical responsibilities. Proposals for implementing sustainable communication practices. Grammar: Reported Speech, Idioms and phrases and Loan words		
		TOTAL: 60

TEXTBOOKS

1	Effective Technical Communication by M. Ashraf Rizvi (Author) 2nd Edition Paperback 2017
2	Sylvan Barnet and Hugo Bedau, 'Critical Thinking Reading and Writing', Bedford/st. Martin's: Fifth Edition (June 28, 2004)
3	Meenakshi Upadhyay, Arun Sharma – Verbal Ability and Reading Comprehension.

4	Teaching Speaking: A Holistic Approach, Book by Anne Burns and Christine Chuen Meng Goh, Cambridge.
REFERENCES	
1	Technical Communication: A Reader-Centered Approach" by Paul V. Anderson
2	"Technical Writing: Process and Product" by Sharon J. Gerson and Steven M. Gerson
3	"English for Engineers and Technologists: A Skill Approach" by Jeyanthi G. and Ramasamy P
4	"A Handbook for Technical Writers and Editors" by M. Ragunathan and M. Sundararajan

COURSEOUTCOMES: **At the end of the course, learners will be able to**		**Bloom's Taxonomy Level**
CO1	To create clear and successful technical publications, use core technical communication concepts.	K2
CO2	Modify technical communication to the requirements and expectations of various audiences.	K2
CO3	Use proper language and genres to effectively communicate technical knowledge.	K2
CO4	Use technology technologies to improve the generation, management, and dissemination of technical material.	K2
CO5	Navigate ethical quandaries and explore global views in technological communication methods.	K2

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

AUTONOMOUS CURRICULUM & SYLLABUS R2024

CHOICE BASED CREDIT SYSTEM

SEM - II

AMA102 DISCRETE MATHEMATICS							
Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		2	**BS**	**3**	**1**	**0**	**4**
Preamble	➢ Extend student's Logical and Mathematical ability to deal with abstraction ➢ Acquire basics of set theory, functions and counting ,apply them in day to day problems ➢ Understand the fundamental concepts of the Graph theory and Network connectivity ➢ Gain the concepts to identify structures of algebraic nature, prove and use properties about them ➢ Learn relations, Lattice, Boolean algebras and their properties to comprehend problems in computer Science.						
Unit 1	**FOUNDATION OF LOGIC AND PROOFS**						**9+3**
Propositional Logic- Connectives - Propositional equivalences -Normal form –Predicates and Quantifiers – Nested Quantifiers -Validity of a well-formed formula– Rules of inference.							
Unit 2	**COMBINATORICS**						**9+3**
Counting: The basics of counting - The pigeonhole principle - Permutations and Combinations - Recurrence relations: solving recurrence relations, generating functions - Inclusion-Exclusion principle : application of inclusion-exclusion.							
Unit 3	**RELATIONS**						**9+3**
Relations - Equivalence relations – Functions - Bijections - Binary relations and graphs- Posets and Lattices -Hasse Diagrams – Boolean algebra.							
Unit 4	**GRAPH THEORY**						**9+3**
Graphs and Graph models- Graph terminology and special types of Graphs – Matrix representation of Graphs and Graph isomorphism – connectivity – Eulerian and Hamiltonian Graphs.							
Unit 5	**ALGEBRAIC STRUCTURE**						**9+3**
Algebraic structures with one binary operation – Semi groups and monoids - Groups – Subgroups – Homomorphism's – Normal subgroup and cosets – Lagrange's theorem – Algebraic structures (Definitions and simple examples only) with two binary operation- Ring, Integral domain and field.							
							Total: 60

TEXTBOOKS	
1	J.P.Tremblay., R.Manohar., "Discrete Mathematical Structures with Applications" Tata MCGRAW Hill 38th edition 2010
2	Kenneth.H. Rosen " Discrete Mathematics and its Applications" Tata MCGRAW Hill Special edition 2010
3	T.Veerarajan "Discrete Mathematics with Graph Theory and Cominatorics" Tata MCGRAW Hill 33rd edition 2021
REFERENCES	
1	Bernard Kolman., Robert Busby., Sharon C.Ross " Discrete Mathematical Structures " Pearson Publications 6th edition 2013.
2	Varsha H.Patil., Seymour Lipschutz., Mare lars lipson., " Discrete Mathematics" Revised 3rd edition 2013
3	https://home.iitk.ac.in/~arlal/book/mth202.pdf
4	https://archive.nptel.ac.in/courses/106/103/106103205

COURSEOUTCOMES: At the end of the course, learners will be able to		Bloom's Taxonomy Level
CO1	Demonstrate the ability to write and evaluate a proof or outline the basic structure and give examples of each proof technique described.	K3
CO2	Apply counting principles to determine probabilities in engineering problems.	K3
CO3	Demonstrate the relations and functions and to determine their properties in solving engineering problems.	K3
CO4	Develop graph theory tools to map day-to-day applications.	K3
CO5	Expose to the concepts and properties of algebraic structures which provides solutions in design and analysis of algorithms.	K2

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	-	-	-	-	-	-	-	-	-	1	-	-
CO2	3	2	1	-	-	-	-	-	-	-	-	-	1	-	-
CO3	3	3	3	1	-	-	-	-	-	-	-	-	1	1	-
CO4	3	2	3	-	-	-	-	-	-	-	-	-	-	1	-
CO5	3	2	3	-	-	-	-	-	-	-	-	1	1	-	-

APH101 - COMPUTATIONAL PHYSICS							
Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		2	**BS**	**3**	**0**	**0**	**3**
Preamble	➢ To instill knowledge on physics of semiconductors, determination of charge carriers and device applications. ➢ The students will acquire knowledge on the concepts of Photonics ➢ To provide the basic concepts of quantum mechanics and various formalism of quantum mechanics ➢ To acquire the knowledge of basic sciences required to understand the fundamentals of nano materials ➢ To motivate the students towards the applications of quantum mechanics and quantum computing						
Unit 1	**PHOTONICS AND SEMICONDUCTOR DEVICES**						**9**
Intrinsic Semiconductor- Energy Band Diagram- -Direct and Indirect Band Gap Semi-Conductors – Diode Laser-Hall Effect and Devices- Logic Gates-AND,OR, NOT,NAND, E-OR,E-NOR Gates. Introduction to theory of Laser-Characteristics-Spontaneous and Stimulated Emission- Einstein's Coefficients – Population Inversion- Applications of Photonics.							

Unit 2	DIFFERENTIAL EQUATIONS IN COMPUTATIONAL PHYSICS	9
Solution of differential equations: Taylor series method, Euler method, Runge Kutta method, predictor-corrector method. Eigen values and Eigen vectors of matrix: Determinant of a matrix, characteristic equation of a matrix, eigen values and eigen vectors of a matrix, power method.		
Unit 3	**FUNDAMENTALS OF QUANTUM MECAHNICS**	**9**
Photons and light waves- Electrons and matter waves- The Schrodinger equation (Time dependent and time independent wave equation)- Physical significance of wave function- particle in an infinite potential well: 1D, 2D and 3D Boxes-Degeneracy and Non-Degeneracy.		
Unit 4	**INTRODUCTION TO NANO MATERIAL**	**9**
Introduction to nanomaterial -Electron density in bulk material - Size dependence of Fermi energy - Quantum confinement - Quantum structures - Density of states in quantum well, quantum wire and quantum dot structure - Band gap of nanomaterial- Properties and Applications of nano materials- Tunneling: single electron phenomena and single electron transistor-Quantum dot laser.		
Unit 5	**QUANTUM INFORMATION AND COMPUTING**	**9**
Quantum computing: Introduction - Postulates of quantum Mechanics- Differences between quantum and classical computation. Quantum system for information processing-quantum states-Classical bits-quantum bits or qubits - Density matrices- Entanglement-Quantum gates-C-NOT Gate-Bloch sphere.		
		TOTAL: 45

TEXTBOOKS	
1	Hitendra K Malik, A K Singh, "Engineering Physics" Tata Mcgraw Hill Education Private Limited, New Delhi 2010.
2	Vanchna Singh, Sheetal Kumar, "Engineering Physics" Cengage Learning India Pvt.Ltd. Delhi 2010.
3	V Rajendran, "Engineering Physics" Tata Mcgraw Hill Education Private Limited, New Delhi 2011.
REFERENCES	
1	Dattu R Joshi, "Engineering Physics" Tata Mcgraw Hill Education Private Limited, New Delhi 2010.
2	A Marikani, "Engineering Physics" PHI Learning Private Limited New Delhi 2010.
3	Kenneth B. Howell, " Ordinary Differential Equations" CRC Press , 21 January 2023

COURSEOUTCOMES: **At the end of the course, learners will be able to**		**Bloom's Taxonomy Level**
CO1	Understand clearly of semiconductor physics and functioning of semiconductor devices.	K2
CO2	Solution of differential equations to understand the computational physics.	K2
CO3	Understand the basic concepts and principles of quantum mechanics	K2
CO4	Explain the effects of quantum confinement on the electronic structure and corresponding physical and chemical properties of materials	K2
CO5	Apply the quantum mechanical principals and basic concept of quantum computing	K3

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

AAI101 - INTRODUCTION TO DATA SCIENCE							
Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		2	**ES**	**3**	**0**	**0**	**3**
Preamble	➢ To understand the data science fundamentals and process. ➢ To learn to describe the data for the data science process. ➢ To learn to describe the relationship between data. ➢ To utilize the Python libraries for Data Wrangling. ➢ To present and interpret data using visualization libraries in Python						
Unit 1	**INTRODUCTION**						**9**
Data Science: Benefits and uses – facets of data - Data Science Process: Overview – Defining research goals – Retrieving data – Data preparation - Exploratory Data analysis – build the model–presenting findings and building applications - Data Mining - Data Warehousing – Basic Statistical descriptions of Data							
Unit 2	**DESCRIBING DATA**						**9**
Types of Data - Types of Variables -Describing Data with Tables and Graphs –Describing Data with Averages - Describing Variability - Normal Distributions and Standard (z) Scores							
Unit 3	**DESCRIBING RELATIONSHIPS**						**9**
Correlation –Scatter plots –correlation coefficient for quantitative data –computational formula for correlation coefficient – Regression –regression line –least squares regression line – Standard error of estimate – interpretation of r2 –multiple regression equations –regression towards the mean							
Unit 4	**PYTHON LIBRARIES FOR DATA WRANGLING**						**9**
Basics of Numpy arrays –aggregations –computations on arrays –comparisons, masks, Boolean logic – fancy indexing – structured arrays – Data manipulation with Pandas – data indexing and selection – operating on data – missing data – Hierarchical indexing – combining datasets –aggregation and grouping – pivot tables							
Unit 5	**DATA VISUALIZATION**						**9**
Importing Matplotlib – Line plots – Scatter plots – visualizing errors – density and contour plots – Histograms – legends – colors – subplots – text and annotation – customization – three dimensional plotting - Geographic Data with Base map - Visualization with Sea born.							
							TOTAL: 45
TEXTBOOKS							
1	David Cielen, Arno D. B. Meysman, and Mohamed Ali, “Introducing Data Science”, Manning Publications, 2016. (Unit I)						
2	Robert S. Witte and John S. Witte, “Statistics”, Eleventh Edition, Wiley Publications, 2017.(Units II and III						

3	Jake Vander Plas, "Python Data Science Handbook", O'Reilly, 2016. (Units IV and V)
REFERENCES	
1	Allen B. Downey, "Think Stats: Exploratory Data Analysis in Python", Green Tea Press, 2014.

COURSEOUTCOMES: **At the end of the course, learners will be able to**		**Bloom's Taxonomy Level**
CO1	Define the data science process	K1
CO2	Understand different types of data description for data science process	K2
CO3	Gain knowledge on relationships between data	K2
CO4	Use the Python Libraries for Data Wrangling	K3
CO5	Apply visualization Libraries in Python to interpret and explore data	K3

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

ACS103 - COMPUTER ORGANIZATION

Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		2	**PC**	**3**	**0**	**0**	**3**

Preamble	➢ To identify the functional units in a digital computer system. ➢ To distinguish between the various ISA styles. ➢ To trace the execution sequence of an instruction through the processor. ➢ To evaluate different computer systems based on performance metrics. ➢ To understand the fundamentals of memory and I/O systems and their interface with the processor
Unit 1	**FUNDAMENTALS OF COMPUTER SYSTEMS** **9**
Functional Units of a Digital Computer – Operation and Operands of Computer Hardware – Software Interface – Translation from a High Level Language to Machine Language – Instruction Set Architecture – RISC and CISC Architectures – Addressing Modes – Performance Metrics – Power Law – Amdahl's Law.	

Unit 2	ARITHMETIC FOR COMPUTERS	9
Addition and Subtraction – Fast Adders – Multiplication: Booths Algorithm, Bit Pair Recoding – Division: Restoring and Non-Restoring – Floating Point Numbers: Single and Double Precision – Arithmetic Operations – ALU Design.		
Unit 3	**PROCESSOR**	**9**
Design Convention of a Processor – Building a MIPS Datapath and designing a Control Unit – Execution of a Complete Instruction – Hardwired and Micro programmed Control – Introduction to Multicore – Graphics Processing Units- Case study: NVIDIA GPU		
Unit 4	**MEMORY AND I/O**	**9**
Types of Memories – Need for a hierarchical memory system –Cache memories– Memory Mapping – Improving Cache Performance – Virtual Memory – Memory Management Techniques – Accessing I/O devices – Programmed Input/output – Interrupts – Direct Memory Access.		
Unit 5	**PARALLEL ARCHITECTURE**	**9**
Exploitation of more ILP –Dynamic Scheduling: Tomasulo's Algorithm –Array Processor- Vector Processor – Basic Concepts of Pipelining – Pipelined Implementation of Datapath and Control Unit – Hazards – Structural, Data and Control Hazards–Overview of Next Generation Processors.		
		TOTAL: 45

TEXTBOOKS	
1	David A. Patterson, John L. Hennessy, "Computer Organization and Design: The Hardware/Software Interface", Fifth Edition, Morgan Kaufmann/Elsevier, 2013.
2	Carl Hamacher, ZvonkoVranesic, Safwat Zaky, Naraig Manjikian, "Computer Organization and Embedded Systems", Sixth Edition, Tata McGraw Hill, 2012.
REFERENCES	
1	William Stallings, "Computer Organization and Architecture – Designing for Performance", Tenth Edition, Pearson Education, 2016.
2	John L. Hennessey, David A. Patterson, "Computer Architecture – A Quantitative Approach", Morgan Kaufmann / Elsevier Publishers, Fourth Edition, 2007.
3	V.P. Heuring, H.F. Jordan, "Computer Systems Design and Architecture", Second Edition, Pearson Education, 2004.
4	Douglas E. Comer, "Essentials of Computer Architecture", Sixth Edition, Pearson Education, 2012

COURSEOUTCOMES: **At the end of the course, learners will be able to**		**Bloom's Taxonomy Level**
CO1	Interpret assembly language instructions.	K2
CO2	Design the ALU circuits.	K3
CO3	Implement a control unit as per the functional specification.	K3
CO4	Analyze memory, I/O devices and cache structures for processor.	K3
CO5	Evaluate the performance of computer systems.	K5

CO/PO	PO1	PO2	PO3	PO4	PO5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	2	2	1	2	2	-	-	-	-	1	1	2	2	2	1
CO2	2	3	2	3	2	-	-	-	2	2	3	2	3	2	1
CO3	2	3	2	1	1	-	-	-	2	2	3	2	2	3	1
CO4	2	3	2	2	3	-	-	-	2	2	3	2	2	3	1
CO5	2	3	1	2	2	-	-	-	-	-	-	1	3	2	2

ACS104 - FUNDAMENTALS OF CLOUD COMPUTING							
Programme & Branch	**B.E & CSE**	**Sem**	**Category**	**L**	**T**	**P**	**C**
		2	**ES**	**3**	**0**	**0**	**3**
Preamble	➢ To understand the principles of cloud architecture, models and infrastructure. ➢ To understand the concepts of virtualization and virtual machines. ➢ To gain knowledge about virtualization Infrastructure. ➢ To explore and experiment with various Cloud deployment environments. ➢ To learn about the security issues in the cloud environment.						
Unit 1	**BASIC CONCEPTS OF CLOUD COMPUTING**						**9**
Network-Based Systems- Concepts of Distributed Systems. Definition of Cloud, Concepts of Cloud Computing. Cloud Service Providers, NIST Cloud Computing, Cloud Characteristics							
Unit 2	**CLOUD INFRASTRUCTURE**						**9**
Cloud Pros and Cons. Layered Architectural Design, Cloud Delivery Models. Cloud Deployment Models, Architectural Design Challenges, Cloud Storage - Storage-as-a-Service – Advantages of Cloud Storage - Cloud Storage Providers - S3.							
Unit 3	**VIRTUALIZATION BASICS**						**9**
Virtual Machine and its architecture–VM primitive operations- Virtual Infrastructures- Data Center Virtualization for Cloud Computing–Levels of Virtualization Implementation – VMM Design Requirements, Virtualization Support at the OS Level, Physical versus Virtual Clusters. Live VM Migration Steps							
Unit 4	**BUILDING CLOUD NETWORKS**						**9**
Designing and Implementing a Data Center-Based Cloud Installing Open Source Cloud service. Virtual Box – Eucalyptus Public Cloud Platforms: Google App Engine, Amazon Web Services (AWS). Google Cloud Platform. Emerging Cloud Software Environments							
Unit 5	**CLOUD SECURITY AND APPLICATIONS**						**9**
Cloud Security Infrastructure Security Network level security- Host level security, Application level security- Data privacy and security Issues. Access Control and Authentication in cloud computing, IAM Security Standards							
							TOTAL: 45
TEXTBOOKS							
1	Kai Hwang, Geoffrey C. Fox, Jack G. Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things, Morgan Kaufmann Publishers, 2012.						

2	Mastering Cloud Computing Foundations and Applications Programming RajkumarBuyya, Christian Vechhiola, S. ThamaraiSelvi
REFERENCES	
1	Cloud Computing: Concepts, Technology & Architecture by Thomas Erl, Ricardo Puttini, Zaigham Mohammad 2013
2	Krutz, R. L., Vines, R. D, "Cloud security. A Comprehensive Guide to Secure Cloud Computing", Wiley Publishing, 2010

COURSEOUTCOMES: **At the end of the course, learners will be able to**		**Bloom's Taxonomy Level**
CO1	Understand the design challenges in the cloud.	K2
CO2	Apply the concept of virtualization and its types.	K3
CO3	Experiment with virtualization of hardware resources.	K3
CO4	Develop and deploy services on the cloud and set up a cloud environment.	K3
CO5	Explain security challenges in the cloud environment.	K2

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	3	2	2	3	1	-	-	-	2	3	1	2	3	3	3
CO2	2	2	2	3	3	-	-	-	1	2	2	3	1	1	3
CO3	3	3	3	3	3	-	-	-	2	1	1	2	2	1	3
CO4	3	3	1	1	1	-	-	-	1	3	1	3	2	1	1
CO5	3	2	2	2	3	-	-	-	2	3	2	2	2	3	3

AMC103 - INDIAN CONSTITUTION							
Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		2	**MC**	**2**	**0**	**0**	**0**
Preamble	➢ This Course intends to impart a comprehensive outlook about the nature of the Indian constitution; rights and duties of the citizens, Political Institutions of Central and State governments and its relationship with each other and the organization and functions of local government. ➢ A detailed analysis of the functions of the statutory bodies are incorporated in this course.						
Unit 1							**9**
Constitutional Assembly – Philosophy – Preamble – Salient Features of Indian Constitution							
Unit 2							**9**
Fundamental Rights – Directive Principles of State Policy – Fundamental Duties.							
Unit 3							**9**
Union Executive – President: Election – Powers and Functions – Council of Ministers – Prime							

Minister: Position and Powers – Relationship between Prime Minister and President. State Executive – Governor: Powers and functions – Chief Minister: Position and Powers – Relationship between Chief Minister and Governor.		
Unit 4		**9**
Union Legislature: Structure, Powers and Functions – Speaker: Power and Functions – Procedures of Constitutional Amendment – State Legislature: Structure, Powers and Functions.		
Unit 5		**9**
Judiciary – Supreme Court: Powers and Functions – High Court : Powers and Functions – Judicial Review		
		TOTAL: 45

TEXTBOOKS	
1	Siwach,J.R, Dynamics of Indian Government and Politics, New Delhi: Sterling, 1985.
2	Narang, A.S., Indian Government and Politics New Delhi: Gitanjali ,1995
REFERENCES	
1	Thakur, R. The Government and Politics of India : London: Macmillan, 1995.
2	Gupta,D.C, Indian Government and Politic, New Delhi, 1996

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

AHS101 - தமிழர்மரபு							
Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		2	**HS**	**1**	**0**	**0**	**1**
Preamble							
அலகு I	**மொழிமற்றும்இலக்கியம்**						**3**
இந்திய மொழிக் குடும்பங்கள்-திராவிட மொழிகள்-தமிழ் ஒரு செம்மொழி தமிழ் செவ்விலக்கியங்கள்-சங்க இலக்கியத்தின் சமயச்சார் பற்ற தன்மை சங்க இலக்கியத்தில்பகிர்தல் அறம் – திருக்குறளில் மேலாண்மைக் கருத்துக்கள்-தமிழ்க் காப்பியங்கள்,தமிழகத்தில் சமணபௌத்த சமயங்களின் தாக்கம்-பக்தி இலக்கியம்,ஆழ்வார்கள் மற்றும் நாயன்மார்கள்-சிற்றிலக்கியங்கள்-தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி தமிழ் இலக்கியவளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.							

அலகு II	**மரபு –பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை சிற்பக்கலை**	**3**
நடுகல் முதல் நவீன சிற்பங்கள் வரை – ஐம்பொன்சிலைகள்– பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப்பொருட்கள், பொம்மைகள் – தேர்செய்யும்கலை – சுடுமண்சிற்பங்கள் – நாட்டுப்புறத்தெய்வங்கள் – குமரி முனையில் திருவள்ளுவர் சிலை – இசைக்கருவிகள் – மிருதங்கம் , பறை, வீணை, யாழ், நாதஸ்வரம் – தமிழர்களின் சமூகபொருளாதார வாழ்வில் கோவில்களின் பங்கு.		
அலகு III	**நாட்டுப் புறக்கலைகள் மற்றும் வீரவிளையாட்டுகள்**	**3**
தெருக்கூத்து,கரகாட்டம், வில்லுப்பாட்டு, கணியான்கூத்து, ஒயிலாட்டம், தோல்பாவைக்கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்		
அலகு IV	**தமிழர்களின் திணைக் கோட்பாடுகள்**	**3**
தமிழகத்தின் தாவரங்களும்,விலங்குகளும் – தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக்கோட்பாடுகள் – தமிழர்கள் போற்றிய அறக்கோட்பாடு – சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும் – சங்ககால நகரங்களும் துறைமுகங்களும் – சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி – கடல் கடந்த நாடுகளில் சோழர்களின் வெற்றி.		
அலகு V	**இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு**	**3**
இந்திய விடுதலைப் போரில் தமிழர்களின் பங்கு – இந்தியாவின் பிறப்பகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் – சுயமரியாதை இயக்கம் – இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின்பங்கு – கல்வெட்டுகள், கையெழுத்துப்படிகள் - தமிழ்ப் புத்தகங்களின் அச்சுவரலாறு.		
		Total: 15

TEXTBOOKS	
1	**தமிழகவரலாறு – மக்களும்பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு:தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).**
2	**கணினித்தமிழ் – முனைவர்இல. சுந்தரம். (விகடன்பிரசுரம்).**
3	Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
REFERENCES	
1	**கீழடி – வைகை நதிக்கரையில் சங்க கால நகர நாகரிகம் (தொல்லியல்துறைவெளியீடு)**
2	**பொருநை ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)**
3	Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (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.)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	2	-	1	-	2	-	-	-
CO5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-

AHS101 -HERITAGE OF TAMILS							
Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		2	**HS**	**1**	**0**	**0**	**1**
Preamble							
UNIT I	**LANGUAGE AND LITERATURE**						**3**
Language Families in India - Dravidian Languages – Tamil as a Classical Language - Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature - Management Principles in Thirukural - Tamil Epics and Impact of Buddhism & Jainism in Tamil Land - Bakthi Literature Azhwars and Nayanmars - Forms of minor Poetry - Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan.							
UNIT II	**HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE**						**3**
Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.							
UNIT III	**FOLK AND MARTIAL ARTS**						**3**
Therukoothu, Karagattam, VilluPattu, KaniyanKoothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.							
UNIT IV	**THINAI CONCEPT OF TAMILS**						**3**
Flora and Fauna of Tamils &Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas							
UNIT V	**CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE**						**3**
Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts – Print History of Tamil Books.							
							Total: 15
TEXTBOOKS							
1	**தமிழகவரலாறு – மக்களும்பண்பாடும் – கே.கே. பிள்ளை** (**வெளியீடு:தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்**).						
2	**கணினித்தமிழ் – முனைவர்இல. சுந்தரம்.** (**விகடன்பிரசுரம்**).						
3	Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)						

REFERENCES	
1	கீழடி – வைகை நதிக்கரையில் சங்க கால நகர நாகரிகம் (தொல்லியல்துறைவெளியீடு)
2	பொருநை ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)
3	Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (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.)

APH301 COMPUTATIONAL PHYSICS LAB

Programme & Branch	B.E & CSE	Sem.	Category	L	T	P	C
		2	BS	0	0	4	2

Preamble	➢ To learn the proper use of various kinds of physics laboratory equipment. ➢ To learn how data can be collected, presented and interpreted in a clear and concise manner ➢ To make the student an active participant in each part of all exercises.

LIST OF EXPERIMENTS

1.Torsional pendulum - Determination of rigidity modulus of wire and moment of inertia of regular and irregular objects

2.Simple harmonic oscillations of cantilever

3. Non-uniform bending - Determination of Young's modulus

4. Uniform bending - Determination of Young's modulus

5. Laser- Determination of the wavelength of the laser using grating

6. Air wedge - Determination of thickness of a thin sheet/wire

7. (a) Optical fibre -Determination of Numerical Aperture and acceptance angle

(b) Compact disc- Determination of width of the groove using laser.

8.Ultrasonic interferometer – determination of the velocity of sound and compressibility of liquids

TOTAL:60

COURSEOUTCOMES: At the end of the course, learners will be able to		Bloom's Taxonomy Level
CO1	Understand the functioning of various physics laboratory equipment.	K2
CO2	Use graphical models to analyze laboratory data.	K4
CO3	Use mathematical models as a medium for quantitative reasoning and describing physical reality.	K2
CO4	Access, process and analyze scientific information.	K4
CO5	Solve problems individually and collaborative.	K3

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

ACS302	**CLOUD COMPUTING LABORATORY**						
Programme & Branch	**B.E & CSE**	**Sem.**	**Category**	**L**	**T**	**P**	**C**
		2	**ES**	**0**	**0**	**4**	**2**
Preamble	➢ To learn the basics and types of Virtualization ➢ To understand the Hypervisors and its types ➢ To Explore and experiment the Virtualization Solutions & platforms						

LIST OF EXPERIMENTS

1. Create type 2 virtualization in VMWARE or any equivalent Open Source Tool. Allocate memory and storage space as per requirement. Install Guest OS on that VMWARE.
2. Find a procedure for the following
   a. Shrink and extend virtual disk
   b. Create, Manage, Configure and schedule snapshots
   c. Create Spanned, Mirrored and Striped volume
   d. Create RAID 5 volume
3. Desktop Virtualization using VNC and Chrome Remote Desktop
4. Create type 2 virtualization on ESXI 6.5 server
5. Create a VLAN in CISCO packet tracer
6. Install KVM in Linux
7. Create Nested Virtual Machine(VM under another VM)
8. Install a C compiler in the virtual machine created using a virtual box and execute Simple Programs
9. Install Google App Engine. Create a hello world app and other simple web applications using python/java.
10. Find a procedure to transfer the files from one virtual machine to another virtual machine

TOTAL: 60

COURSEOUTCOMES: **At the end of the course, learners will be able to**		**Bloom's Taxonomy Level**
CO1	Analyze the virtualization concepts and Hypervisor	K4
CO2	Apply the Virtualization for real-world applications	K3
CO3	Install & Configure the different VM platforms	K2
CO4	Experiment with the VM with various software	K4

CO5	Develop and deploy services on the cloud and setup a cloud environment	K3

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