

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI  
(AUTONOMOUS)  
B.Tech  
(COMPUTER SCIENCE AND ENGINEERING - INTERNET OF THINGS AND CYBER  
SECURITY INCLUDING BLOCKCHAIN TECHNOLOGY)  
(Effective for the batches admitted in 2020-2021)**

<b>INDUCTION PROGRAM (3 weeks duration)</b>	
	<ul style="list-style-type: none"> <li>❖ Physical activity</li> <li>❖ Creative Arts</li> <li>❖ Universal Human Values</li> <li>❖ Literary</li> <li>❖ Proficiency Modules</li> <li>❖ Lectures by Eminent People</li> <li>❖ Visits to local Areas</li> <li>❖ Familiarization to Dept./Branch &amp; Innovations</li> </ul>

**Semester I (First year)**

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
							<b>C</b>			
1	BS	20ABS9901	Algebra & Calculus	3	0	0	3	30	70	100
2	BS	20ABS9904	Chemistry	3	0	0	3	30	70	100
3	ES	20AES0501	Problem Solving and Programming	3	0	0	3	30	70	100
4	ES	20AES0301	Engineering Graphics	1	0	4	3	30	70	100
5	ES	20AES0505	Information Technology and Numerical Methods	3	0	0	3	30	70	100
6	ES LAB	20AES0506	Computer Science and Engineering Workshop	0	0	3	1.5	30	70	100
7	BS LAB	20ABS9909	Chemistry Lab	0	0	3	1.5	30	70	100
8	ES LAB	20AES0503	Problem Solving and Programming Lab	0	0	3	1.5	30	70	100
			<b>Total credits</b>				<b>19.5</b>	<b>240</b>	<b>560</b>	<b>800</b>

**Semester II (First year)**

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	BS	20ABS9902	Applied Physics	3	0	0	3	30	70	100
2	BS	20ABS9911	Probability and Statistics	3	0	0	3	30	70	100
3	HS	20AHS9901	Communicative English	3	0	0	3	30	70	100
4	ES	20AES0502	Data Structures	3	0	0	3	30	70	100
5	ES	20AES0507	Web Design	1	0	4	3	30	70	100
6	HS LAB	20AHS9902	Communicative English Lab	0	0	3	1.5	30	70	100
7	BS LAB	20ABS9907	Applied Physics Lab	0	0	3	1.5	30	70	100
8	ES LAB	20AES0504	Data Structures Lab	0	0	3	1.5	30	70	100
	MC	20AMC9903	Environmental Studies	2	0	0	0	30	0	30
			<b>Total credits</b>				<b>19.5</b>	<b>270</b>	<b>560</b>	<b>830</b>

**Semester III (Second year)**

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	BS	20ABS9914	Discrete Mathematical Structures	3	0	0	3	30	70	100
2	PC	20APC3601	Digital Electronics and Microprocessors	3	0	0	3	30	70	100
3	PC	20APC3602	Database Management Systems	3	0	0	3	30	70	100
4	PC	20APC3604	Basics of Python Programming	3	0	0	3	30	70	100
5	ES	20AES0205	Basics of Electrical and Electronics Engineering	3	0	0	3	30	70	100
6	PC Lab	20APC3603	Database Management Systems Laboratory	0	0	3	1.5	30	70	100
7	PC Lab	20APC3605	Basics of Python Programming Lab	0	0	3	1.5	30	70	100
8	ES Lab	20AES0206	Basics of Electrical and Electronics Engineering Lab	0	0	3	1.5	30	70	100
9	SC	20ASC3601	Client Side Scripting	1	0	2	2	100	0	100
10	MC	20AMC9902	Constitution of India	2	0	0	0	30	0	30
			<b>Total credits</b>				<b>21.5</b>	<b>370</b>	<b>560</b>	<b>930</b>

**Semester IV (Second year)**

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	PC	20APC3606	Computer Organization	3	0	0	3	30	70	100
2	PC	20APC3607	Computer Networks	3	0	0	3	30	70	100
3	PC	20APC3609	Object Oriented Programming through Java	3	0	0	3	30	70	100
4	PC	20APC3611	Operating Systems	3	0	0	3	30	70	100
5	HS	20AHSMB01	Managerial Economics and Financial Analysis	3	0	0	3	30	70	100
6	HS	20AHS9905	Universal Human Values	3	1	0	3	30	70	100
7	PC Lab	20APC3608	Computer Networks Lab	0	0	3	1.5	30	70	100
8	PC Lab	20APC3610	Object Oriented Programming through Java Lab	0	0	3	1.5	30	70	100
9	PC Lab	20APC3612	Operating Systems Lab	0	0	3	1.5	30	70	100
10	SC	20ASC3602	Server Side Scripting	1	0	2	2	100	0	100
<b>Total credits</b>							<b>24.5</b>	<b>370</b>	<b>630</b>	<b>1000</b>
<b>Internship 2 Months (Mandatory) during summer vacation</b>										
<b>Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)</b>				<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Semester V (Third year)**

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	PC	20APC3613	Cryptography and Network Security	3	0	0	3	30	70	100
2	PC	20APC3615	Sensors and IoT	3	0	0	3	30	70	100
3	PC	20APC3617	Artificial Intelligence	3	0	0	3	30	70	100
4	OE	20AOE3601	Business Data Analytics	2	0	2	3	30	70	100
		20AOE3602	Cyber Security Standards, Policies and Practices							
		20AOE3603	Quantum Computing							
5	PE	20APE3601	Information Modeling and Database Design	3	0	0	3	30	70	100
		20APE3602	Design and Analysis of Algorithms							
		20APE3603	Object Oriented Analysis Design and Testing							
6	PC Lab	20APC3616	Sensor and IoT Lab	0	0	3	1.5	30	70	100
7	PC Lab	20APC3614	Cryptography and Network Security Lab	0	0	3	1.5	30	70	100
8	SC	20ASC3603	Programming in Arduino	1	0	2	2	100	0	100
9	MC		Biology for Engineers	2	0	0	0	30	0	30
<b>Summer Internship 2 Months (Mandatory) after second year (to be evaluated during V semester</b>				0	0	0	1.5	50	0	50
<b>Total credits</b>							<b>21.5</b>	<b>390</b>	<b>490</b>	<b>880</b>
<b>Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)</b>				4	0	0	4	0	0	0

**Semester VI (Third year)**

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	PC	20APC3618	Foundations of Block chain Technology	3	1	0	3	30	70	100
2	PC	20APC3620	Ethical Hacking and Penetration Testing	3	0	0	3	30	70	100
3	PC	20APC3622	Grid and Cloud Computing	3	0	0	3	30	70	100
4	PE	20APE3604 20APE3605 20APE3606	Privacy and Security in IoT Digital Forensics Mobile Application Development	3	0	0	3	30	70	100
5	OE	20AOE0305  20APC0323 20APE0416	Robotic Sensors, Vision and Hardware Implementation Operational Research Wireless Sensor Networks	2	0	2	3	30	70	100
6	PC Lab	20APC3619	Block chain Application Development Lab	0	0	3	1.5	30	70	100
7	PC Lab	20APC3621	Ethical Hacking and Penetration Testing Lab	0	0	3	1.5	30	70	100
8	PC Lab	20APC3623	Grid and Cloud Computing Lab	0	0	3	1.5	30	70	100
9	SC	20ASC3604	Programming Raspberry Pi	1	0	2	2	100	0	100
10	MC	19AMC9904	Professional Ethics and Human Values	2	0	0	0	30	0	30
<b>Total credits</b>							<b>21.5</b>	<b>370</b>	<b>560</b>	<b>930</b>
<b>Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)</b>				<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Industrial/Research Internship (Mandatory) 2 Months during summer vacation</b>										

**Semester VII  
(Fourth year)**

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	PC	20APC3624	Information Security	3	0	0	3	30	70	100
2	PE	20APE3607 20APE3608 20APE3609	Smart Sensor Technology for IoT Cognitive IoT Big Data Analytics for IoT	3	0	0	3	30	70	100
3	PE	20APE3610 20APE3611 20APE3612	Cyber Security Risk Management and Mitigation Cloud Security Offensive, Defensive Cyber Security Techniques	3	0	0	3	30	70	100
4	PE	20APE3613 20APE3614 20APE3615	Blockchain Technologies and Use Cases Crypto currencies Fundamentals Bit Coin Technology	3	0	0	3	30	70	100
5	OE	20APE0415	Speech Processing Data Science Management Science	2	0	2	3	30	70	100
6	OE	20AOE3604 20AOE3605 20AOE3606	Programming for the Internet of Things Project Cyber security and its 10 domains Blockchain Applications and Limitation	2	0	2	3	30	70	100
7	SC	20ASC3605	Industrial and Medical IOT	1	0	2	2	100	0	100
<b>Industrial/Research Internship 2 Months (Mandatory) after third year (to be evaluated during VII semester)</b>				0	0	3	3	100	0	100
<b>Total credits</b>							<b>23</b>	<b>380</b>	<b>420</b>	<b>800</b>

**Semester VIII  
(Fourth year)**

Sl.	Category	Course Code	Course Title	Hours per week			Credits	CIE	SEE	TOTAL
				L	T	P				
1	Major Project	20APR3601	Project Project work, seminar and internship in industry	0	0	0	12	60	140	200
<b>INTERNSHIP (6 MONTHS)</b>								0	0	0
<b>Total credits</b>							<b>12</b>	<b>60</b>	<b>140</b>	<b>200</b>



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AUTONOMOUS**

Year : I B.Tech

Semester : I

Branch of Study : Common to All

Code:20ABS9901	Subject Name: <b>Algebra and Calculus</b>	L	T	P	Credits:3
		3	0	0	

**Course Outcomes:**

1. Develop the use of matrix algebra techniques that is needed by engineers for practical applications.
2. Utilize mean value theorems to real life problems.
3. Familiarize with functions of several variables which is useful in optimization.
4. Students will also learn important tools of calculus in higher dimensions. Students will become familiar with 2- dimensional coordinate systems
5. Students will become familiar with 3- dimensional coordinate systems and also learn the utilization of special functions

**Unit I : Matrix Operations and Solving Systems of Linear Equations**

Rank of a matrix by echelon form, solving system of homogeneous and non-homogeneous equations linear equations. Eigen values and Eigen vectors and their properties, Cayley-Hamilton theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton theorem

**Unit II : Quadratic Forms and Mean Value Theorems**

Diagonalisation of a matrix, quadratic forms and nature of the quadratic forms, reduction of quadratic form to canonical forms by orthogonal transformation.

Rolle's Theorem, Lagrange's mean value theorem, Cauchy's mean value theorem, Taylor's and Maclaurin's theorems with remainders (without proof);

**Unit III: Multivariable calculus**

Partial derivatives, total derivatives, chain rule, change of variables, Jacobians, maxima and minima of functions of two variables, method of Lagrange multipliers.

**Unit IV: Multiple Integrals**

Double integrals, change of order of integration, double integration in polar coordinates, change of Variables in double integration (Cartesian to polar), areas enclosed by plane curves. Evaluation of triple integrals.

**Unit V: Special Functions**

Beta and Gamma functions and their properties, relation between beta and gamma functions, Bessel functions, Bessel's equation, Recurrence formulae or  $J_n(x)$ , Generating function- Orthogonality of Bessel's functions.

**Textbooks:**

1. B. S. Grewal, Higher Engineering Mathematics, 44/e, Khanna Publishers, 2017.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 10/e, John Wiley & Sons, 2011.

**References:**

1. Dr.T.K.V Iyengar, B.Krishna Gandhi, S. Ranganatham and M.V.S.S.N Prasad, Mathematics – 1,

S.Chand publications.

2. R. K. Jain and S. R. K. Iyengar, Advanced Engineering Mathematics, 3/e, Alpha Science International Ltd., 2002.
3. B.V.Ramana, Higher Engineering Mathematics, Mc Graw Hill Education.
4. N.Bali, M.Goyal, C.Watkins, Advanced Engineering Mathematics, Infinity Science Press.

<b>List of COs</b>	<b>PO no. and keyword</b>	<b>Competency Indicator</b>	<b>Performance Indicator</b>
CO1	PO1: Apply the knowledge of mathematics	1.1	1.1.1
CO2	PO1: Apply the knowledge of mathematics	1.1	1.1.1
CO3	PO1: Apply the knowledge of mathematics	1.1	1.1.1
CO4	Po2 : analyse complex engineering problems	2.1	2.1.3
CO5	Po2 : analyse complex engineering problems	2.1	2.1.3

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**Year : I B.Tech**

**Semester : I**

**Branch of Study : Common to All**

Code:20ABS9904	Subject Name: <b>CHEMISTRY</b>	L T P 3 0 0	Credits:3
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**Course Outcomes:**

1. Understand the behaviour of, and interactions between matter and energy at both the atomic and molecular levels
2. Compare the materials of construction for battery and electrochemical sensors
3. Understand the preparation, properties, and applications of thermoplastics & thermosetting, elastomers & conducting polymers.
4. HPLC and GC methods used for separation of gaseous and liquid mixtures.
5. Understand the disadvantages of using hard water and select suitable treatments domestically and industrially.

**Unit I: Structure and Bonding Models**

Planck's quantum theory, Schrodinger wave equation, significance of  $\Psi^1$  and  $\Psi^2$ , applications to hydrogen, particle in a box and their applications for conjugated molecules, crystal field theory – salient features – energy level diagrams for transition metal ions – splitting of orbitals in tetrahedral and octahedral complexes, magnetic properties, molecular orbital theory – bonding in homo- and heteronuclear diatomic molecules – energy level diagrams of  $O_2$ ,  $N_2$  and CO, calculation of bond order.

**Unit II: Electrochemistry and Applications**

Electrodes – concepts, reference electrodes (Calomel electrode, Ag/AgCl electrode and glass electrode) electrochemical cell, Nernst equation, cell potential calculations, numerical problems, concept of pH, pH meter and applications of pHmetry (acid-base titrations), potentiometry-potentiometric titrations (redox titrations), concept of conductivity, conductivity cell, conductometric titrations (acid-base titrations), photovoltaic cell – working and applications, photogalvanic cells with specific examples. Electrochemical sensors – potentiometric sensors with examples, amperometric sensors with examples.

Primary cells – Zinc-air battery, alkali metal sulphide batteries, Fuel cells, hydrogen-oxygen, methanol fuel cells – working of the cells.

Secondary cells – lead acid, nickel-metal hydride and lithium ion batteries- working of the batteries including cell reactions, button cells

**Unit III: Polymer Chemistry**

Introduction to polymers, functionality of monomers, chain growth and step growth polymerization, coordination polymerization, copolymerization (stereospecific polymerization) with specific examples and mechanisms of polymer formation.

Plastics - Thermoplastics and Thermosetting, Preparation, properties and applications of – Bakelite, urea-formaldehyde, Nylon-66, carbon fibres, Elastomers–Buna-S, Buna-N–preparation, properties and applications.

Conducting polymers – polyacetylene, polyaniline, polypyrroles – mechanism of conduction and applications.

**Unit IV: Instrumental Methods and Applications**

Principle and applications of Colorimetry, AAS, AES, UV-Visible spectrophotometry (Beer-Lambert's law, Instrumentation), Principles and applications of Chromatographic techniques (GC & HPLC), separation of gaseous mixtures and liquid mixtures (GC & HPLC methods).

## Unit 5: Water Technology

Introduction –Soft Water and hardness of water, Estimation of hardness by EDTA Method - Boiler troubles - scale and sludge, Industrial water treatment – specifications for drinking water, Bureau of Indian Standards(BIS) and World health organization(WHO) standards, zeolite and ion-exchange processes - desalination of brackish water, reverse osmosis (RO) and electro dialysis.

### Text books:

1. Jain and Jain, Engineering Chemistry, 16/e, Dhanpat Rai, 2013.
2. Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10/e, Oxford University Press, 2010.

### Reference books:

1. J. D. Lee, Concise Inorganic Chemistry, 5/e, Oxford University Press, 2008.
2. Skoog and West, Principles of Instrumental Analysis, 6/e, Thomson, 2007.
3. Ben L. Feringa and Wesley R. Browne, Molecular Switches, 2/e, Wiley-VCH, 2011.
4. Willard Merritt Dean Settle, 7 th Edition Instrumental methods for analysis

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO: 1	PO 1: Apply the knowledge of basic science	1.2	1.2.1
CO: 2	PO 1: Apply the knowledge of basic science	1.4	1.4.1
CO: 3	PO 1: Apply the knowledge of basic science	1.2	1.2.1
CO: 4	PO 4: Analyse complex engineering problems	2.4	2.4.4
CO: 5	PO 1: Apply the knowledge of Basic science	1.2	1.2.1

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**Year :** I B.Tech

**Semester :** I

**Branch of Study :** Common to All

Code:20AES0501	Subject Name: <b>PROBLEM SOLVING AND PROGRAMMING</b>	L 3	T 0	P 0	Credits:3
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**Course Objectives:**

1. Introduce the internal parts of a computer, and peripherals.
2. Introduce the Concept of Algorithm and use it to solve computational problems
3. Identify the computational and non-computational problems
4. Teach the syntax and semantics of a C Programming language
5. Demonstrate the use of Control structures of C Programming language
6. Illustrate the methodology for solving Computational problems

**Unit I: Computer Fundamentals:** What is a Computer, Evolution of Computers, Generations of Computers, Classification of Computers, Anatomy of a Computer, Memory revisited, Introduction to Operating systems, Operational overview of a CPU.

Introduction to Programming, Algorithms and Flowcharts: Programs and Programming, Programming languages, Compiler, Interpreter, Loader, Linker, Program execution, Fourth generation languages, Fifth generation languages, Classification of Programming languages, Structured programming concept, Algorithms, Pseudo-code, Flowcharts, Strategy for designing algorithms, Tracing an algorithm to depict logic, Specification for converting algorithms into programs.

**Unit II: Introduction to computer problem solving:** Introduction, the problem-solving aspect, top- down design, implementation of algorithms, the efficiency of algorithms, the analysis of algorithms.

**Fundamental algorithms:** Exchanging the values of two variables, counting, summation of a set of numbers, factorial computation, sine function computation, generation of the Fibonacci sequence, reversing the digits of an integer.

**Unit III: Types, Operators, and Expressions:** Variable names, data types and sizes, constants, declarations, arithmetic operators, relational and logical operators, type conversions, increment and decrement operators, bitwise operators, assignment operators and expressions, conditional expressions precedence and order of evaluation.

**Input and output:** standard input and output, formatted output-Printf, formatted input-Scanf. **Control Flow:** Statements and blocks, if-else, else-if, switch, Loops-while and for, Loops-Do- while, break and continue, Goto and labels.

**Functions and Program Structure:** Basics of functions, functions returning non-integers, external variables, scope variables, header variables, register variables, block structure, initialization, recursion, the C processor.

**Unit IV: Factoring methods:** Finding the square root of a number, the smallest divisor of a number, the greatest common divisor of two integers, generating prime numbers.

**Pointers and arrays:** Pointers and addresses, pointers and function arguments, pointers and arrays, address arithmetic, character pointers and functions, pointer array; pointers to pointers, Multi-dimensional arrays, initialization of arrays, pointer vs. multi-dimensional arrays, command line arguments, pointers to functions, complicated declarations.

**Array Techniques:** Array order reversal, finding the maximum number in a set, removal of duplicates from an order array, finding the k<sup>th</sup> smallest element

**Unit V: Sorting and Searching:** Sorting by selection, sorting by exchange, sorting by insertion, sorting by partitioning, binary search.

**Structures:** Basics of structures, structures and functions, arrays of structures, pointers to structures, self-

referential structures, table lookup, typedef, unions, bit-fields.

**Some other Features:** Variable-length argument lists, formatted input-Scanf, file access, Error handling- stderr and exit, Line Input and Output, Miscellaneous Functions.

**Text Books:**

1. Pradip Dey, and Manas Ghosh, -Programming in C, 2018, Oxford University Press.
2. R.G. Dromey, —How to Solve it by Computer. 2014, Pearson.
3. Brian W. Kernighan, and Dennis M. Ritchie, -The C Programming Language, 2<sup>nd</sup> Edition, Pearson.

**Reference Books:**

1. RS Bichkar —Programming with C, 2012, Universities Press.
2. Pelin Aksoy, and Laura Denardis, -Information Technology in Theory, 2017, Cengage Learning.
3. Byron Gottfried and Jitender Kumar Chhabra, -Programming with C, 4<sup>th</sup> Edition, 2019, McGraw Hill Education.

**Course Outcomes:**

1. Construct his own computer using parts.
2. Recognize the importance of programming language independent constructs
3. Solve computational problems
4. Select the features of C language appropriate for solving a problem
5. Design computer programs for real world problems
6. Organize the data which is more appropriated for solving a problem

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO1	PO1: Engineering Knowledge	1.3	1.3.1
CO2	PO2: Problem analysis	2.1	2.1.1
CO3	PO2: Problem analysis	2.2	2.2.2
CO4	PO2: Problem analysis	2.1	2.1.1
CO5	PO2: Problem analysis	2.3	2.3.1
CO6	PO2: Problem analysis	2.2	2.2.3

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**Year : I B.Tech**

**Semester : I**

**Branch of Study : Common to All**

Code:20AES0301	Subject Name: <b>ENGINEERING GRAPHICS</b>	L	T	P	Credits:3
		1	0	4	

**Course Outcomes:**

- CO: 1 Draw various curves applied in engineering.
- CO: 2 Show projections of solids and sections graphically.
- CO: 3 Draw the development of surfaces of solids.
- CO: 4 Use computers as a drafting tool.
- CO: 5 Draw isometric and orthographic drawings using CAD packages.

**Unit I: Introduction to Engineering graphics:** Principles of Engineering Graphics and their significance-Conventions in drawing-lettering - BIS conventions.

- a) Conic sections including the rectangular hyperbola- general method only,
- b) Cycloid, epicycloids and hypocycloid
- c) Involutives

**Unit II: Projection of points, lines:** Projection of points in any quadrant, lines inclined to one or both planes, finding true lengths, angle made by line.

**Unit III: Projections of Planes:** Projection of points in any quadrant, lines inclined to one or both planes, finding true lengths, angle made by line. Projections of regular plane surfaces.

**Projections of Solids:** Projections of regular solids inclined to one or both planes by rotational or auxiliary views method.

**Unit IV: Sections of solids:** Section planes and sectional view of right regular solids- prism, cylinder, pyramid and cone. True shapes of the sections.

**Development of surfaces:** Development of surfaces of right regular solids-prism, cylinder, pyramid, cone and their sectional parts.

**Unit V: Orthographic Projections:** Systems of projections, conventions and application to orthographic projections.

**Isometric Projections:** Principles of isometric projection- Isometric scale; Isometric views: lines, planes, figures, simple and compound solids.

**Text Books and Reference Books:**

1. K.L.Narayana & P.Kannaiah, Engineering Drawing, 3/e, Scitech Publishers
2. N.D.Bhatt, Engineering Drawing, 53/e, Charotar Publishers
3. Dhanajay A Jolhe, Engineering Drawing, Tata McGraw-Hill
4. Shah and Rana, Engineering Drawing, 2/e, Pearson Education
5. Basant Agarwal & C.M.Agarwal, Engineering Drawing, Tata McGraw-Hill

**Additional Sources**

YouTube: [http://sewor,Carleton.cag.kardos/88403/drawings.html](http://sewor.Carleton.cag.kardos/88403/drawings.html) conic sections-online, red woods.edu

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO: 1	PO 1: Engineering knowledge	1.3	1.3.1
CO: 2	PO 3: Design/Development of Solutions	3.2	3.2.1
CO: 3	PO 1: Engineering knowledge	1.3	1.3.1
CO: 4	PO 3: Design/Development of Solutions	3.2	3.2.2
CO: 5	PO 5: Problem analysis	5.1	5.1.1



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**Year : I B.Tech**

**Semester : I**

**Branch of Study : Common to All**

Code:20AES0505	Subject Name: <b>INFORMATION TECHNOLOGY AND NUMERICAL METHODS</b>	L 3	T 0	P 0	Credits:3
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**INFORMATION TECHNOLOGY**

**Course Outcomes:**

1. Usage of Digital World and Exploring Cyber space
2. Explain the needs of hardware and software required for a computation task.
3. Familiarize peripheral devices, networking and internet

**Unit I :**

**INTRODUCTION TO INFORMATION TECHNOLOGY** Your Digital World: The Practical User: How Becoming Computer Savvy Benefits You, Information Technology & Your Life: The Future Now, Infotech Is All Pervasive: Cell phones, Email, the Internet, & the E-World, The —All-Purpose Machine!: The Varieties of Computers, Understanding Your Computer: How Can You Customize (or Build) Your Own PC?, Where Is Information Technology Headed?  
**THE INTERNET & THE WORLD WIDE WEB** Exploring Cyberspace: Connecting to the Internet: Narrowband, Broadband, & Access Providers, How Does the Internet Work? The World Wide Web, Email & Other Ways of Communicating over the Net, The Online Gold Mine: Telephony, Multimedia, Webcasting, Blogs, E-Commerce, & the Social Web, The Intrusive Internet: Snooping, Spamming, Spoofing, Phishing, Pharming, Cookies, & Spyware.

**Unit II:**

**SOFTWARE** Tools for Productivity & Creativity: **SOFTWARE: TOOLS FOR PRODUCTIVITY & CREATIVITY**, System Software: The Power Behind the Power, The Operating System: What It Does? Other System Software: Device Drivers & Utility Programs, Common Features of the User Interface, Common Operating Systems, Application Software: Getting Started, Word Processing, Spreadsheets, Database Software, Specialty Software  
**HARDWARE: THE CPU & STORAGE** How to Choose a Multimedia Computer System:  
**HARDWARE: THE CPU & STORAGE: HOW TO CHOOSE A MULTIMEDIA COMPUTER SYSTEM**, Microchips, Miniaturization, & Mobility, the System Unit: The Basics, More on the System Unit, Secondary Storage, Future Developments in Processing & Storage

**Unit III:**

**HARDWARE: INPUT & OUTPUT** Taking Charge of Computing & Communications: Input & Output, Input Hardware, Output Hardware, Input & Output Technology & Quality of Life: Health & Ergonomics, The Future of Input & Output  
**COMMUNICATIONS, NETWORKS, & SAFEGUARDS** The Wired & Wireless World: From the Analog to the Digital Age, Networks, Wired Communications Media, Wireless Communications Media, Cyber Threats, Hackers, & Safeguards

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO: 1	PO 12: Life-long learning	12.2	12.2.1
CO: 2	PO 12: Life-long learning	12.2	12.2.2
CO: 3	PO 12: Life-long learning	12.2	12.2.1

## NUMERICAL METHODS

### **Course Outcomes:**

1. Analyze the concepts of Errors, Relative and Percentage Errors
2. Analyze the concepts of Algebraic & Transcendental Equations to solve different Engineering problems
3. Analyze Interpolation using the concepts of the Numerical Methods
4. Apply the concepts of Integration in Numerical Methods
5. Apply the concepts of O.D.E on Numerical Methods

### **Unit – I:**

Errors in Numerical computations: Errors and their Accuracy, Mathematical Preliminaries, Errors and their Analysis, Absolute, Relative and Percentage Errors, A general error formula, Error in a series approximation.

Solution of Algebraic and Transcendental Equations: The Bisection Method – The Method of False Position– Newton-Raphson Method, Solution of linear simultaneous equation: Crout's triangularisation method, Gauss - Seidal iteration method.

### **UNIT – II:**

Interpolation: Newton's forward and backward interpolation formulae – Lagrange's formulae. Gauss forward and backward formula, Stirling's formula, Bessel's formula.

Curve fitting: Fitting of a straight line – Second degree curve – Exponential curve-Power curve by method of least squares. Numerical Differentiation for Newton's interpolation formula. Numerical Integration: Trapezoidal rule – Simpson's 1/3 Rule – Simpson's 3/8 Rule.

### **UNIT – III:**

Numerical solution of Ordinary Differential equations: Solution by Taylor's series-Picard's Method of successive Approximations-Euler's Method- Runge - Kutta Methods. Numerical solutions of Laplace equation using finite difference approximation. Initial Value Problem, Eigen Value Problem and Boundary-value Problem

### **Textbooks:**

1. Using Information Technology 9th Edition By Brian Williams and Stacey Sawyer, Mcgraw Hill Publications
2. —Computer Oriented Numerical Methods| by V Rajaraman

### **References:**

1. Uttam K Roy, —Web Technologies|, Oxford University Press, 1st Edition, 2010.
2. HTML and CSS: Design and Build Websites 1st Edition by Jon Duckett (Author) india price
3. Steven Holzner, —The Complete Reference PHP|, Tata McGraw-Hill, 1st Edition, 2007.
4. HTML & CSS: The Complete Reference, Fifth Edition (Complete Reference Series)
5. Deitel and Deitel and Nieto, —Internet and World Wide Web - How to Program|, Prentice Hall, 5 th Edition, 2011.
- 6 Numerical Methods by E Balaguruswamy

### **Web References:**

1. <http://www.scoopworld.in>
2. <http://www.sxecw.edu.in>
3. <http://www.technofest2u.blogspot.com>
4. <http://www.ptutorial.com/php-example/php-upload-image>
5. <http://www.ptutorial.com/php-example/php-change-case>
6. <https://www.math.ust.hk/~machas/numerical-methods.pdf>

<b>List of COs</b>	<b>PO no. and keyword</b>	<b>Competency Indicator</b>	<b>Performance Indicator</b>
CO1	PO1: Knowledge of Mathematics	1.2	1.2.1
CO2	PO1: Knowledge of Mathematics	1.2	1.2.1
CO3	PO1: Knowledge of Mathematics	1.2	1.2.1
CO4	PO1: Knowledge of Mathematics	1.2	1.2.1
CO5	PO1: Knowledge of Mathematics	1.2	1.2.1

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES:: TIRUPATI  
AUTONOMOUS**

**Year : I B.Tech**

**Semester : I**

**Branch of Study : Common to All**

Code:20AES0506	Subject Name: <b>COMPUTER SCIENCE AND ENGINEERING WORKSHOP</b>	L	T	P	Credits:1.5
		0	0	3	

**Course Outcomes:**

1. Construct a computer from its parts and prepare it for use
2. Develop Documents using Word processors
3. Develop presentations using the presentation tool
4. Perform computations using spreadsheet tool
5. Design Graphics, Videos and Web pages
6. Connect things to computers

**Preparing your computer**

**Task 1: Assembling a Computer:** Disassemble and assemble the PC back to working condition. Students should be able to trouble shoot the computer and identify working and non-working parts. Student should identify the problem correctly by various methods available (eg: beeps). Students should record the process of assembling and trouble shooting a computer.

**Task 2: Install Operating system:** Student should install Linux on the computer. Student may install another operating system (including proprietary software) and make the system dual boot or multi boot. Students should record the entire installation process.

**Productivity tools**

**Task 3: Word Processor:** Students should be able to create documents using the word processor tool. Some of the tasks that are to be performed are inserting and deleting the characters, words and lines, Alignment of the lines, Inserting header and Footer, changing the font, changing the colour, including images and tables in the word file, making page setup, copy and paste block of text, images, tables, linking the images which are present in other directory, formatting paragraphs, spell checking, etc. Students should be able to prepare project cover pages, content sheet and chapter pages at the end of the task using the features studied. Students should submit a user manual of the word processor considered.

**Task 4: Spreadsheet:** Students should be able to create, open, save the application documents and format them as per the requirement. Some of the tasks that may be practiced are Managing the worksheet environment, creating cell data, inserting and deleting cell data, format cells, adjust the cell size, applying formulas and functions, preparing charts, sorting cells. Students should submit a user manual of the Spreadsheet application considered.

**Task 5: Presentations:** creating, opening, saving and running the presentations, selecting the style for slides, formatting the slides with different fonts, colours, creating charts and tables, inserting and deleting text, graphics and animations, bulleting and numbering, hyperlinking, running the slide show, setting the timing for slide show. Students should submit a user manual of the Presentation tool considered.

**IoT**

**Task 6: Raspberry Pi**

Study the architecture of Raspberry pi, configure software, Install SD card, Connect the cables, Install Raspbian (or any other) operating system, Configure Wi-Fi, Remotely connect to your Raspberry Pi.

**Story Telling**

**Task 7: Storytelling**

Use Adobe spark or any other tool to create Graphics, Webpages, and Videos.

**Reference Books:**

1. B. Govindarajulu, —IBM PC and Clones Hardware Trouble shooting and Maintenance, 2nd edition, Tata McGraw-Hill, 2002
2. MOS study guide for word, Excel, Powerpoint & Outlook Exams, Joan Lambert, Joyce Cox, PHI.

3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
4. Rusen, Networking your computers and devices, PHI
5. Bigelows, Trouble shooting, Maintaining & Repairing PCs, TMH.
6. <https://www.adobe.com>
7. <https://www.raspberrypi.org>

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO 1	PO 1: Engineering knowledge	1.3	1.3.1
CO 2	PO 1: Engineering knowledge	1.3	1.3.1
CO 3	PO 1: Engineering knowledge	1.3	1.3.1
CO 4	PO 1: Engineering knowledge	1.3	1.3.1
CO 5	PO 1: Engineering knowledge	1.3	1.3.1
CO 6	PO 1: Engineering knowledge	1.3	1.3.1

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES:: TIRUPATI  
AUTONOMOUS**

**Year : I B.Tech**

**Semester : I**

**Branch of Study : Common to All**

Code:20ABS9909	Subject Name: <b>CHEMISTRY LAB</b>	L 0	T 0	P 3	Credits:1.5
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**Course Outcomes:**

1. To familiarize the students with the basic concepts of chemistry of materials
2. Prepare advanced polymer materials
3. Measure the strength of an acid present in secondary batteries
4. To familiarize with digital and instrumental methods of analysis

**List of Experiments:**

1. Determination of Hardness of a groundwater sample.
2. Estimation of iron (II) using Diphenylamine indicator (Dichrometry – Internal indicator method)
3. Determination of pH metric titration of strong acid vs. strong base,
4. Conductometric titration of strong acid vs. strong base
5. Determination of Fe(II) in Mohr's salt by potentiometric method.
6. Determination of percentage of Iron in Cement sample by colorimetry
7. Determination of Strength of an acid in Pb-Acid battery
8. Preparation of phenol-formaldehyde resin
9. Preparation of TiO<sub>2</sub>/ZnO nano particles
10. Estimation of Calcium in port land Cement
11. Adsorption of acetic acid by charcoal
12. Thin layer chromatography

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO:1	PO 4: Analysis and interpretation of data	4.3	4.3.3
CO:2	PO 4: Analysis and interpretation of data	4.3	4.3.1
CO:3	PO 4: Analysis and interpretation of data	4.3	4.3.1
CO:4	PO 4: Analysis and interpretation of data	4.3	4.3.2

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AUTONOMOUS**

**Year : I B.Tech**

**Semester : I**

**Branch of Study : Common to All**

Code:20AES0503	Subject Name: <b>PROBLEM SOLVING AND PROGRAMMING LAB</b>	L	T	P	Credits:1.5
		0	0	3	

**Course outcomes:**

1. Construct a Computer given its parts
2. Select the right control structure for solving the problem
3. Analyze different sorting algorithms
4. Design solutions for computational problems
5. Develop C programs which utilize the memory efficiently using programming constructs like pointers.

**Laboratory Experiments #**

1. Assemble and disassemble parts of a Computer
2. Design a C program which reverses the number
3. Design a C program which finds the second maximum number among the given list of numbers.
4. Construct a program which finds the kth smallest number among the given list of numbers.
5. Design an algorithm and implement using C language the following exchanges  $a \leftarrow b \leftarrow c \leftarrow d \leftarrow a$
6. Develop a C Program which counts the number of positive and negative numbers separately and also compute the sum of them.
7. Implement the C program which computes the sum of the first n terms of the series  $Sum = 1 - 3 + 5 - 7 + 9$
8. Design a C program which determines the numbers whose factorial values are between 5000 and 32565.
9. Design an algorithm and implement using a C program which finds the sum of the infinite series  $1 - x^2/2! + x^4/4! - x^6/6! + \dots$
10. Design a C program to print the sequence of numbers in which each number is the sum of the three most recent predecessors. Assume first three numbers as 0, 1, and 1.
11. Implement a C program which converts a hexadecimal, octal and binary number to decimal number and vice versa.
12. Develop an algorithm which computes the all the factors between 1 and 100 for a given number and implement it using C.
13. Construct an algorithm which computes the sum of the factorials of numbers between m and n.
14. Design a C program which reverses the elements of the array.
15. Given a list of n numbers, Design an algorithm which prints the number of stars equivalent to the value of the number. The stars for each number should be printed horizontally.
16. Implement the sorting algorithms a. Insertion sort b. Exchange sort c. Selection sort d. Partitioning sort.
17. Illustrate the use of auto, static, register and external variables.
18. Design algorithm and implement the operations creation, insertion, deletion, traversing on a singly linked list.
19. Develop a C program which takes two numbers as command line arguments and finds all the common factors of those two numbers.
20. Design a C program which sorts the strings using array of pointers.

Instructors may add some experiments to the above list. Moreover, 50% of the experiments are to be changed every academic year. Instructors can choose the experiments, provided those experiments are not repetitions.

**References:**

1. B. Govindarajulu, —IBM PC and Clones Hardware Trouble shooting and Maintenance, Tata McGraw- Hill, 2<sup>nd</sup> edition, 2002.
2. R.G. Dromey, —How to Solve it by Computer. 2014, Pearson.

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO1	PO2: Problem analysis	2.1	2.1.1
CO2	PO2: Problem analysis	2.2	2.2.2
CO3	PO2: Problem analysis	2.1	2.1.1
CO4	PO2: Problem analysis	2.3	2.3.1
CO5	PO2: Problem analysis	2.2	2.2.3



**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES:: TIRUPATI  
AUTONOMOUS**

**Year : I B.Tech**

**Semester : II**

**Branch of Study : Common to All**

Code:20ABS9902	Subject Name: <b>APPLIED PHYSICS</b>	L	T	P	Credits:3
		3	0	0	

**Course Outcomes**

1. Analyze the wave properties of light and the interaction of energy with the matter.
2. Apply electromagnetic wave propagation in different guided media.
3. Asses the electromagnetic wave propagation and its power in different media
4. Analyze the conductivity of semiconductors.
5. Interpret the difference between normal conductor and superconductor and apply the nanomaterials for engineering applications.

**Unit I : Optics and EM Theory**

Interference of light -principle of superposition-Conditions for sustained Interference-Interference in thin films (reflected light) - Newton's Rings -Determination of Wavelength. Diffraction-Fraunhofer diffraction- Single slit and double slit- Diffraction Grating. Divergence and Curl of Electric and Magnetic Fields - Gauss' theorem for divergence and Stokes' theorem for curl - Maxwell's Equations (Quantitative) – Electromagnetic wave - propagation in non-conducting medium - Poynting's Theorem.

**Unit II: Lasers and Fiber Optics**

Lasers – Introduction – Characteristics – Spontaneous and Stimulated Emission – Einstein Coefficients – Population Inversion – Excitation Mechanism and Optical Resonator - He-Ne Laser -Nd: YAG Laser – Semiconductor Diode Laser – Applications of Lasers and Holography. Introduction to Optical Fibers – Total Internal Reflection – Critical angle of propagation – Acceptance angle – Numerical Aperture – Classification of fibers based on Refractive index profile – Propagation of electromagnetic wave through optical fiber – modes – importance of V-number-Attenuation, Block Diagram of Fiber optic Communication – Industrial Applications – Fiber optic Sensors.

**Unit III: Dielectric and Magnetic Materials**

Introduction—Dielectric polarization-Dielectric polarizability, Susceptibility and Dielectric constant- Types of polarizations: Electronic and Ionic,(Quantitative), Orientation Polarizations (Qualitative)- Frequency dependence of polarization-Lorentz (internal) field-Claussius-Mosotti equation-Applications of Dielectrics: Ferroelectricity.

Introduction-Magnetic dipole moment - Magnetization-Magnetic susceptibility and permeability-Origin of permanent magnetic moment – Classification of Magnetic materials - Weiss theory of ferromagnetism (qualitative) – Hysteresis– soft and hard magnetic materials – Magnetic memory device applications .

**Unit IV: Semiconductors**

Origin of Energy bands (Qualitative)-Intrinsic and Extrinsic semiconductors –Direct and indirect band gap semiconductors- Density of charge carriers – Fermi energy--Dependence of Fermi energy on carrier concentration and temperature – Electrical conductivity – Drift and Diffusion currents – Continuity equation - Hall effect -Applications of Hall effect and Semiconductors.

**Unit V: Superconductors and Nanomaterials**

Superconductors-Properties-Meissner's effect-BCSTheory(Qualitative) - Josephson effect (AC&DC)- Types of Superconductors-Applications of superconductors.

Nanomaterials—Significance of nanoscale—: Physical, Mechanical, Magnetic, Optical properties of nanomaterials –Synthesis of nanomaterials:Top-down-Ball Milling, Bottom-up-Chemical vapour deposition–Characterization of nanomaterials : X-Ray Diffraction (XRD), Scanning Electron Microscope (SEM)-Applications of Nanomaterials.

**Textbooks:**

1. M. N. Avadhanulu, P. G. Kshirsagar & TVS Arun Murthyl A Text book of Engineering Physicsl- S. Chand Publications, 11th Edition 2019.
2. B.K.Pandey and S.Chaturvedi, Engineering Physics, Cengage Learning, 2012.

**References:**

1. K Thyagarajan –Engineering Physicsl,-Mc Graw Hill Publishing Company Ltd, 2016
2. Shatendra Sharma, Jyotsna Sharma, — Engineering Physicsll, Pearson Education, 2018
3. David J.Griffiths,—Introduction to Electrodynamicsl-4/e, Pearson Education, 2014
4. T Pradeep, –A Text book of NanoScience and NanoTechnologyl-Tata Mc Graw Hill 2013.

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO: 1	PO1 : Apply the knowledge of science	1.2	1.2.1
CO: 2	PO1: Apply the knowledge of science	1.2	1.2.1
CO: 3	PO1: Apply the knowledge of science	1.2	1.2.1
CO: 4	PO1: Apply the knowledge of science	1.2	1.2.1
CO: 5	PO1: Apply the knowledge of science	1.2	1.2.1

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**Year : I B.Tech**

**Semester : II**

**Branch of Study : Common to All**

Code:20ABS9911	Subject Name: <b>PROBABILITY AND STATISTICS</b>	L 3	T 0	P 0	Credits:3
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**Course Outcomes:**

1. Interpret the association of characteristics and through correlation and regression tools.
2. Make use of the concepts of probability and their applications.
3. Apply discrete and continuous probability distributions.
4. Design the components of a classical hypothesis test for large sample.
5. Design the components of a classical hypothesis test for small samples.

**Unit 1: Descriptive statistics and methods for data science**

Data science, Statistics Introduction, Population vs Sample, Collection of data, primary and secondary data, Type of variable: dependent and independent Categorical and Continuous variables, Data visualization, Measures of Central tendency, Measures of Variability (spread or variance) Skewness Kurtosis, correlation, correlation coefficient, rank correlation, regression coefficients, principle of least squares, method of least squares, regression lines

**UNIT 2: Probability**

Probability, probability axioms, addition law and multiplicative law of probability, conditional probability, Baye's theorem, random variables (discrete and continuous), probability density functions, properties, mathematical expectation.

**UNIT 3: Probability distributions**

Probability distribution - Binomial, Poisson approximation to the binomial distribution and normal distribution-their properties.

**Unit4: Estimation and Testing of hypothesis, large sample tests**

Estimation-parameters, statistics, sampling distribution, point estimation, Formulation of null hypothesis, alternative hypothesis, the critical and acceptance regions, level of significance, two types of errors and power of the test. Large Sample Tests: Test for single proportion, difference of proportions, test for single mean and difference of means. Confidence interval for parameters in one sample and two sample problems

**Unit 5: Small sample tests**

Student t-distribution (test for single mean, two means and paired t-test), testing of equality of variances (F-test),  $\chi^2$  - test for goodness of fit.

**Textbooks:**

1. Miller and Freunds, Probability and Statistics for Engineers,7/e, Pearson, 2008.
2. S.C. Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, 11/e, Sultan Chand & Sons Publications, 2012.

**Reference Books:**

1. S. Chand ,Probability and Statistics, Dr.T.K.V. Iyengar, Dr.B. Krishna Gandhi, S. Ranganatham, Dr.M.V.S.S.N. Prasad
2. S. Ross, a First Course in Probability, Pearson Education India, 2002.
3. W. Feller, an Introduction to Probability Theory and its Applications, 1/e, Wiley, 1968.

List of COs	PO no and keyword	Competency Indicator	Performance Indicator
CO1	<b>PO1:</b> Knowledge of Engineering fundamentals	1.2	1.2.2
CO2	<b>PO 2:</b> Principles of mathematics	2.8	2.8.1
CO3	<b>PO 2 :</b> Principles of mathematics	2.6	2.6.4

CO4	<b>PO 4:</b> Analysis and interpretation of data	4.6	4.6.1
CO5	<b>PO 4:</b> Analysis and interpretation of data	4.6	4.6.4

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES:: TIRUPATI  
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**Year : I B.Tech**

**Semester : II**

**Branch of Study : Common to All**

Code:20AHS9901	Subject Name: <b>COMMUNICATIVE ENGLISH</b>	L 3	T 0	P 0	Credits:3
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**Course Outcomes:**

At the end of the course, the learners will be able to

1. Identify the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English
2. Formulate sentences using proper grammatical structures and correct word forms
3. Speak clearly on a specific topic using suitable discourse markers in informal discussions
4. Write summaries based on global comprehension of reading/listening texts
5. Produce a coherent paragraph interpreting a figure/graph/chart/table
6. Take notes while listening to a talk/lecture to answer questions

**Unit 1: EXPLORATION**

**Listening:** Identifying the topic, the context and specific pieces of information by listening to short audio texts and answering a series of questions.

**Speaking:** Asking and answering general questions on familiar topics such as home, family, work, studies and interests; introducing oneself and others.

**Reading:** A Proposal to Girdle the Earth, Nellie Bly - Skimming to get the main idea of a text; scanning to look for specific pieces of information.

**Reading for Writing:** Beginnings and endings of paragraphs - introducing the topic, summarizing the main idea and/or providing a transition to the next paragraph.

**Grammar and Vocabulary:** Content words and function words; word forms: verbs, nouns, adjectives and adverbs; nouns: countable and uncountable; singular and plural; basic sentence structures; simple question form - wh-questions; word order in sentences.

**Unit 2: ON CAMPUS**

**Listening:** Answering a series of questions about main idea and supporting ideas after listening to audio texts.

**Speaking:** Discussion in pairs/ small groups on specific topics followed by short structured talks.

**Reading:** The District School As It Was by One who Went to it, Warren Burton - Identifying sequence of ideas; recognizing verbal techniques that help to link the ideas in a paragraph together.

**Writing:** Paragraph writing (specific topics) using suitable cohesive devices; mechanics of writing - punctuation, capital letters.

**Grammar and Vocabulary:** Cohesive devices -linkers, sign posts and transition signals; use of articles and zero article; prepositions.

**Unit 3: THE FUTURE OF WORK**

**Listening:** Listening for global comprehension and summarizing what is listened to.

**Speaking:** Discussing specific topics in pairs or small groups and reporting what is discussed

**Reading:** The Future of Work - Reading a text in detail by making basic inferences - recognizing and interpreting specific context clues; strategies to use text clues for comprehension.

**Writing:** Summarizing - identifying main idea/s and rephrasing what is read; avoiding redundancies and repetitions.

**Grammar and Vocabulary:** Verbs -tenses; subject-verb agreement; direct and indirect speech, reporting verbs for academic purposes.

**Unit 4: FABRIC OF CHANGE**

**Listening:** Making predictions while listening to conversations/ transactional dialogues without

video; listening with video.

**Speaking:** Role plays for practice of conversational English in academic contexts (formal and informal) - asking for and giving information/directions.

**Reading:** H.G. Wells and the Uncertainties of Progress, Peter J. Bowler - Studying the use of graphic elements in texts to convey information, reveal trends / patterns / relationships, communicate processes or display complicated data.

**Writing:** Information transfer; describe, compare, contrast, identify significance / trends based on information provided in figures/charts/graphs/tables.

**Grammar and Vocabulary:** Quantifying expressions - adjectives and adverbs; comparing and contrasting; degrees of comparison; use of antonyms.

#### Unit 5: TOOLS FOR LIFE

**Listening:** Identifying key terms, understanding concepts and answering a series of relevant questions that test comprehension.

**Speaking:** Formal oral presentations on topics from academic contexts - without the use of PPT slides.

**Reading:** Leaves from the Mental Portfolio of a Eurasian, Sui Sin Far - Reading for comprehension.

**Writing:** Writing structured essays on specific topics using suitable claims and evidences.

**Grammar and Vocabulary:** Editing short texts – identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject- verb agreement)

**Text Book:** English all round: Communication Skills for Under graduation Learners Vol. I, Orient BlackSwan Publisers, First Edition 2019.

#### Reference Books

1. Bailey, Stephen. *Academic writing: A handbook for international students*. Routledge,2014.  
Chase, Becky Tarver. *Pathways: Listening, Speaking and Critical Thinking*. Heinley,ELT; 2nd Edition, 2018.
2. Skillful Level 2 Reading & Writing Student's Book Pack (B1) Macmillan Educational.
3. Hewings, Martin. *Cambridge Academic English (B2)*. CUP, 2012.

#### Sample Web Resources

Grammar/Listening/Writing, 1-language.com, <http://www.5minuteenglish.com/>,  
<https://www.englishpractice.com/>, Grammar/Vocabulary, English Language Learning Online  
<http://www.bbc.co.uk/learningenglish/>, <http://www.better-english.com/>,  
<http://www.nonstopenglish.com/>, <https://www.vocabulary.com/>, BBC Vocabulary Games

Free Rice

Vocabulary Game

Reading

<https://www.usingenglish.com/comprehension/>, <https://www.englishclub.com/reading/short-stories.htm>, <https://www.english-online.at/>

#### **Listening**

<https://learningenglish.voanews.com/z/3613>, <http://www.englishmedialab.com/listening.html>

#### **Speaking**

<https://www.talkenglish.com/>, BBC Learning English – Pronunciation tips, Merriam-Webster – Perfect pronunciation Exercises

#### **All Skills**

<https://www.englishclub.com/>, <http://www.world-english.org/>,  
<http://learnenglish.britishcouncil.org/> Online Dictionaries, Cambridge dictionary online, MacMillan dictionary, Oxford learner's dictionaries

List of COs	PO no. and keyword	Competency Indicator: Description	Performance Indicator: Description
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CO1.	PO6 Apply contextual knowledge to assess societal, health, safety, legal, and cultural issues.	6.1	6.1.1
CO2.	PO10-Able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	10.1	10.1.1
CO3.	PO9-Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	9.2	9.2.1
CO4.	PO10-Able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	10.1	10.1.1
CO5	PO10-Able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	10.3	10.3.1
CO6.	PO10-Able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	10.2	10.2.1

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES:: TIRUPATI  
AUTONOMOUS**

**Year : I B.Tech**

**Semester : II**

**Branch of Study : Common to All**

Code:20AES0502	Subject Name: <b>DATA STRUCTURES</b>	L	T	P	Credits:3
		3	0	0	

**Course Objectives:**

1. To teach the representation of solution to the problem using algorithm
2. To explain the approach to algorithm analysis
3. To introduce different data structures for solving the problems
4. To demonstrate modeling of the given problem as a graph
5. To elucidate the existing hashing techniques

**Unit I: Introduction**

Algorithm Specification, Performance analysis, Performance Measurement. Arrays: Arrays, Dynamically Allocated Arrays. Structures and Unions. Sorting: Motivation, Quick sort, how fast can we sort, Merge sort, Heap sort

**Unit II: Stack, Queue and Linked lists**

Stacks, Stacks using Dynamic Arrays, Queues, Circular Queues Using Dynamic Arrays, Evaluation of Expressions, Multiple Stacks and Queues. Linked lists: Singly Linked Lists and Chains, Representing Chains in C, Linked Stacks and Queues, Additional List Operations, Doubly Linked Lists.

**Unit III: Trees**

Introduction, Binary Trees, Binary Tree Traversals, Additional Binary Tree Operations, Binary Search Trees, Counting Binary Trees, Optimal Binary search Trees, AVL Trees. B-Trees: B-Trees, B + Trees. **Unit IV: Graphs and Hashing**  
The Graph Abstract Data Type, Elementary Graph Operations, Minimum Cost Spanning Trees, Shortest Paths and Transitive Closure  
Hashing: Introduction to Hash Table, Static Hashing, Dynamic Hashing.

**Unit V: Files and Advanced sorting**

File Organization: Sequential File Organization, Direct File Organization, Indexed Sequential File Organization.  
Advanced sorting: Sorting on Several keys, List and Table sorts, Summary of Internal sorting, External sorting.

**Text Books:**

1. Ellis Horowitz and Sartaj Sahni, —Fundamentals of Data Structures in C++, 2<sup>nd</sup> Edition, Galgotia Book Source, Pvt. Ltd., 2004.
2. Alan L. Tharp, —File Organization and Processing, Wiley and Sons, 1988.

**Reference Books:**

1. D. Samanta, —Classic Data Structures, 2<sup>nd</sup> Edition, Prentice-Hall of India, Pvt. Ltd., India, 2012.
2. Peter Bras, —Advanced Data Structures, Cambridge University Press, 2016
3. Richard F. Gilberg, Behrouz A. Forouzan, —Data Structures A Pseudo code Approach with C, Second Edition, Cengage Learning 2005.

**Course Outcomes:**

1. Select Appropriate Data Structure for solving a real world problem
2. Select appropriate file organization technique depending on the processing to be done
3. Construct Indexes for Databases



4. Analyse the Algorithms

5. Develop Algorithm for Sorting large files of data

<b>List of COs</b>	<b>PO no. and keyword</b>	<b>Competency</b>	<b>Performance Indicator</b>
CO1	PO1: Engineering Knowledge	1.4	1.4.1
CO2	PO4: Conduct investigations of complex problems	4.1	4.1.4
CO3	PO1: Engineering Knowledge	1.3	1.3.1
CO4	PO2: Problem analysis	2.1	2.1.2
CO5	PO2: Problem analysis	2.3	2.3.1

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES:: TIRUPATI  
AUTONOMOUS**

**Year : I B.Tech**

**Semester : II**

**Branch of Study : Common to All**

Code:20AES0507	Subject Name: <b>WEB DESIGN</b>	L	T	P	Credits:3
		1	0	4	

**Course Outcomes:**

1. Add elements to web pages, including colors, text, images, and more
2. Add advanced features to your website including special effects

**Unit I :**

Where Do I Start-What Does a Web Designer Do, What Languages Do I Need to Learn, What Do I Need to Buy, How the Web Works-The Internet Versus the Web, Serving Up Your Information, A Word About Browsers, Web Page Addresses (URLs), The Anatomy of a Web Page, Some Big Concepts You Need to Know-A Dizzying Multitude of Devices, Sticking with the Standards, Progressive Enhancement, Responsive Web Design, One Web for All (Accessibility), The Need for Speed (Site Performance) HTML Markup for Structure: Creating a Simple Page-A Web Page, Launch a Text Editor, Step 1: Start with Content, Step 2: Give the Document Structure, Step 3: Identify Text Elements, Step 4: Add an Image, Step 5: Change the Look with a Style Sheet, When Good Pages Go Bad, Validating Your Documents. Marking Up Text-Paragraphs, Headings, Lists, More Content Elements, Organizing Page Content, The Inline Element Roundup, Generic Elements (div and span), Some Special Characters

**Unit II :**

HTML Markup for Structure: Adding Links-The href Attribute, Linking to Pages on the Web, Linking Within Your Own Site, Targeting a New Browser Window, Mail Links, Telephone Links. Adding Images-First, a Word on Image Formats, The img Element, A Window in a Window. Table Markup-How Tables Are Used, Minimal Table Structure, Spanning Cells, Table Accessibility, Wrapping Up Tables HTML Markup for Structure: Forms-How Forms Work, The form Element, Variables and Content, The Great Form Control Roundup, Form Accessibility Features, Form Layout and Design. What's Up, HTML5-A Funny Thing Happened on the Way to XHTML 2, In the Markup Department, Meet the APIs, Video and Audio, Canvas

**Unit III:**

CSS for Presentation: Cascading Style Sheets Orientation-The Benefits of CSS, How Style Sheets Work, The Big Concepts, Moving Forward with CSS. Formatting Text-The Font Properties, Changing Text Color, A Few More Selector Types, Text Line Adjustments, Underlines and Other —Decorations, Changing Capitalization, Spaced Out, Text Shadow, Changing List Bullets and Numbers. Colors and Backgrounds-Specifying Color Values, Foreground Color, Background Color, Playing with Opacity, Introducing...Pseudo-class Selectors, Pseudo-element Selectors, Attribute Selectors, Background Images, The Shorthand background Property, Like a Rainbow (Gradients), External Style Sheets. Thinking Inside the Box-The Element Box, Specifying Box Dimensions, Padding, Borders, Margins, Assigning Display Roles, Adding Drop Shadows to Boxes

**Unit IV:**

CSS for Presentation: Floating and Positioning- Normal Flow, Floating, Positioning Basics, Relative Positioning, Absolute, Positioning, Fixed Positioning. Page Layout with CSS- Page Layout Strategies, page Layout Techniques, Multicolumn Layouts Using Floats, Positioned Layout, Top-to-Bottom Column Backgrounds. Transitions, Transforms, and Animation- Ease-y Does It (CSS Transitions), CSS Transforms, Keyframe Animation. CSS Techniques- A Clean Slate (CSS Reset), Image Replacement Techniques, CSS Sprites, Styling Forms, Styling Tables, Basic Responsive Web Design, Wrapping Up Style Sheets.

**Unit V:**

1. Design a page having suitable background colour and text colour with title –My First Web Page using all the attributes of the Font tag.

2. Create a HTML document giving details of your [Name, Age], [Address, Phone] and [Register Number, Class] aligned in proper order using alignment attributes of Paragraph tag.
3. Write HTML code to design a page containing some text in a paragraph by giving suitable heading style.
4. Create a page to show different character formatting (B, I, U, SUB, SUP) tags.
  - i. viz :  $\log_b m^p = p \log_b m$
5. Write HTML code to create a Web Page that contains an Image at its centre.
6. Create a web page with an appropriate image towards the left hand side of the page, when user clicks on the image another web page should open.
7. Create web Pages using Anchor tag with its attributes for external links.
8. Create a web page for internal links; when the user clicks on different links on the web page it should go to the appropriate locations/sections in the same page.
9. Write a HTML code to create a web page with pink colour background and display moving message in red colour.
10. Create a web page, showing an ordered list of all second semester courses (Subjects).
11. Create a web page, showing an unordered list of names of all the Diploma Programmes (Branches) in your institution.
12. Create a HTML document containing a nested list showing a content page of any book.
13. Create the following table in HTML

Student	Maths	Physics	Chemistry	Computer
I-R2C1	I-R1C1	I-R4C1	I-C2	
	II-C1		II-C1	II-R1C5
III-R2C2			III-C1	
			IV-C1	

14. Create a web page which divides the page in two equal frames and place the audio and video clips in frame-1 and frame-2 respectively.

<b>i. FRAME-1</b>	<b>ii. FRAME-2</b>
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15. Create a web page which should generate following output:

<b>i. FRAME-1</b>	<b>ii. FRAME-2</b>
	<b>iii. FRAME-3</b>

16. Create a table to show your class time table.
17. Use tables to provide layout to your HTML page describing your college infrastructure.
18. Use <span> and <div> tags to provide a layout to the above page instead of a table layout.
19. Use frames such that page is divided into 3 frames 20% on left to show contents of pages, 60% in center to show body of page, remaining on right to show remarks.
20. Embed Audio and Video into your HTML web page.
21. Create a webpage with HTML describing your department use paragraph and list tags.
22. Apply various colors to suitably distinguish key words , also apply font styling like italics, underline and two other fonts to words you find appropriate , also use header tags.
23. Create links on the words e.g. —Wi-Fi and —LAN to link them to Wikipedia pages.
24. Insert an image and create a link such that clicking on image takes user to other page.

25. Change the background color of the page; At the bottom create a link to take user to the top of the page.
26. Develop static pages (using only HTML) of an online book store, the pages should resemble: www.amazon.com, the website should consist the following pages, home page, registration and user login, user profile page, books catalog, shopping cart, payment by credit card, order confirmation.
27. Create a web page using Embedded CSS and multimedia
28. Write an HTML page that contains a selection box with a list of 5 countries, when the user selects a country, its capital should be printed next to the list; Add CSS to customize the properties of the font of the capital (color, bold and font size).
29. Wap in html to design a Bio-Data.
30. Wap in html to create a webpage with four frames (Picture, table, list, and hyperlink).
31. Wap in html to show all character elements in html.
32. Wap in html to create a webpage to show the block level elements and text level elements.
33. Wap in html to create a webpage to show various confectionary items using ordered list and unordered list.
34. Wap in html to create a webpage to show different hobbies.
35. Wap in html to show India map.
36. Wap in html to create a web page using style sheet.
37. Wap in html to create a web page to show registration
38. Wap in html to show books in inventory in different tables by using rowspan and colspan.
39. Create a Web Page in HTML to show Admission form in OITM
40. A Web Page in HTML to show your resume using Appropriate Formatting Elements.
41. A Web Page in HTML to show all the Text, Color, Background and Font Elements
42. Write a Program to Create a Nested List.

#### Textbooks:

1. Jennifer Niederst Robbins, –Learning Web Design, OREILLY 4th Edition

#### References:

1. Uttam K Roy, —Web Technologies, Oxford University Press, 1st Edition, 2010.
2. HTML and CSS: Design and Build Websites 1st Edition by Jon Duckett (Author) india price
3. Steven Holzner, —The Complete Reference PHP, Tata McGraw-Hill, 1st Edition, 2007.
4. HTML & CSS: The Complete Reference, Fifth Edition (Complete Reference Series)
5. Deitel and Deitel and Nieto, —Internet and World Wide Web - How to Program, Prentice Hall, 5th Edition, 2011.

#### Web References:

1. <http://www.scoopworld.in>
2. <http://www.sxecw.edu.in>
3. <http://www.technofest2u.blogspot.com>
4. <http://www.ptutorial.com/php-example/php-upload-image>
5. <http://www.ptutorial.com/php-example/php-change-case>

List of COs	PO no and keyword	Competency Indicator	Performance Indicator
CO1	PO3: Design/Development of Solutions	3.3	3.3.1
CO2	PO 3: Design/Development of Solutions	3.4	3.4.1

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES:: TIRUPATI  
AUTONOMOUS**

**Year : I B.Tech**

**Semester : II**

**Branch of Study : Common to All**

Code:20AHS9902	Subject Name: <b>COMMUNICATIVE ENGLISH LAB</b>	L 0	T 0	P 3	Credits:1.5
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**Course Outcomes**

1. Remember and understand the different aspects of the English language proficiency with emphasis on LSRW skills
2. Apply communication skills through various language learning activities
3. Analyze the English speech sounds, stress, rhythm, intonation and syllable division for better listening and speaking comprehension.
4. Evaluate and exhibit acceptable etiquette essential in social and professional settings.
5. Create awareness on mother tongue influence and neutralize it in order to improve fluency in spoken English.

**Unit 1**

1. Phonetics for listening comprehension of various accents
2. Reading comprehension
3. Describing objects/places/persons

**Unit 2**

1. JAM
2. Group Discussions
3. Oral Presentations – Power Point Presentations and Poster Presentations

**Unit 3**

1. Situational dialogues – Greeting and Introduction
2. Formal letter writing and e-mail writing

**Unit 4**

1. Asking for Information and Giving Directions
2. CV/Resume writing – Cover letter

**Unit 5**

1. Vocabulary Building
2. Debates

**Software Source:**

K-Van Solutions Software

**Reference:**

Teaching English - British Council

List of COs	PO No. and keyword	Competency Indicator: Description	Performance Indicator: Description
CO1	PO10: Able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	10.2	10.1.1

CO2	<u>PO10:</u> Able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	10.3	10.3.1
CO3	PO10:	10.2	10.2.1
	Able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.		
CO4	PO 9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	9.2	9.2.1
CO5	PO10: Able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	10.2	10.2.1

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES:: TIRUPATI  
AUTONOMOUS**

**Year : I B.Tech**

**Semester : II**

**Branch of Study : Common to All**

Code:20ABS9907	Subject Name: <b>APPLIED PHYSICS LAB</b>	L 0	T 0	P 3	Credits:1.5
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**Course Outcomes**

1. Analyze the wave properties of light and the interaction of energy with the matter.
2. Apply electromagnetic wave propagation in different guided media.
3. Asses the electromagnetic wave propagation and its power in different media
4. Analyze the conductivity of semiconductors.
5. Interpret the difference between normal conductor and superconductor and apply the nanomaterials for engineering applications.

**List of Experiments**

1. Determination of the thickness of the wire using wedge shape method.
2. Determination of the radius of curvature of the lens by Newton's ring method
3. Determination of wavelength by plane diffraction grating method
4. Dispersive power of a diffraction grating
5. Study of the Magnetic field along the axis of a circular coil carrying current.
6. Study the variation of B versus H of the magnetic material (B-H curve)
7. Determination of the numerical aperture of a given optical fiber and angle of acceptance.
8. Determination of Hall voltage and Hall coefficient of a given semiconductor using Hall effect.
9. Determination of the energy gap of a semiconductor
10. Determination of crystallite size using X-Ray diffraction spectra.
11. Determination of Wavelength of LASER using diffraction grating.
12. Determination of particle size using LASER.
13. Determination of the resistivity of semiconductor by Four probe method.
14. Determination of dielectric constant by charging and discharging method.
15. Study the temperature dependence of resistance of a thermister.

**References:**

1. S. Balasubramanian, M.N.Srinivasan, –A Text book of Practical Physics|S Chand Publishers, 2017.
2. <http://vlab.amrita.edu/index.php-VirtualLabs>, Amrita University.

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO: 1	PO 4: Analysis and interpretation of data	4.3	4.3.3
CO: 2	PO 4: Analysis and interpretation of data	4.3	4.3.1
CO: 3	PO 4: Analysis and interpretation of data	4.3	4.3.1
CO: 4	PO 4: Analysis and interpretation of data	4.3	4.3.2
CO: 5	PO 4: Analysis and interpretation of data	4.3	4.3.2

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES:: TIRUPATI  
AUTONOMOUS**

**Year : I B.Tech**

**Semester : II**

**Branch of Study : Common to All**

Code:20AES0504	Subject Name: <b>DATA STRUCTURES LAB</b>	L	T	P	Credits:1.5
		0	0	3	

**Course Objectives:**

1. To introduce to the different data structures
2. To elucidate how the data structure selection influences the algorithm complexity
3. To explain the different operations that can be performed on different data structures
4. To introduce to the different search and sorting algorithms.

**Laboratory Experiments**

1. String operations using array of pointers
2. Searching Algorithms (With the Number of Key Comparisons) Sequential, Binary and Fibonacci Search Algorithms.
3. Sorting Algorithms: Insertion Sort, Selection Sort, Shell Sort, Bubble Sort, Quick Sort, Heap Sort, Merge Sort, and Radix Sort. Using the system clock, compute the time taken for sorting of elements. The time for other operations like I/O etc should not be considered while computing time.
4. Implementation of Singly Linked List, Doubly Linked List, Circular Linked List
5. Stack implementation using arrays
6. Stack implementation using linked lists
7. Queue implementation using arrays. Implement different forms of queue. While implementing you should be able to store elements equal to the size of the queue. No positions should be left blank.
8. Queue implementation using linked lists
9. Creation of binary search tree, performing operations insertion, deletion, and traversal.
10. Breadth first search
11. Depth first search
12. Travelling sales man problem
13. File operations
14. Indexing of a file
15. Reversing the links (not just displaying) of a linked list.
16. Consider a linked list consisting of name of a person and gender as a node. Arrange the linked list using ‘\_Ladies first’ principle. You may create new linked lists if necessary.
17. An expression can be represented in three ways: infix, prefix and postfix. All the forms are necessary in different contexts. Write modules to convert from one form to another form.
18. A table can be defined as a collection of rows and columns. Each row and column may have a label. Different values are stored in the cells of the table. The values can be of different data types. Numerical operations like summation, average etc can be performed on rows/columns which contain numerical data. Such operations are to be prevented on data which is not numeric. User may like to insert row/columns in the already existing table. User may like to remove row/column. Create table data type and support different operations on it.

**Course Outcomes:**

1. Select the data structure appropriate for solving the problem
2. Implement searching and sorting algorithms
3. Design new data types
4. Illustrate the working of stack and queue
5. Organize the data in the form of files



List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO1	PO1: Engineering Knowledge	1.4	1.4.1
CO2	PO 2: Problem analysis	2.2	2.2.4
CO3	PO1: Engineering Knowledge	1.3	1.3.1
CO4	PO1: Engineering Knowledge	1.4	1.4.1
CO5	PO1: Engineering Knowledge	1.4	1.4.1

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES:: TIRUPATI  
AUTONOMOUS**

**Year : I B.Tech**

**Semester : II**

**Branch of Study : Common to All**

Code:20AMC9903	Subject Name: <b>ENVIRONMENTAL STUDIES</b>	L 2	T 0	P 0	Credits:0
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**Course Outcomes**

1. Students get sufficient information that clarifies modern environmental concepts like equitable use of natural resources, more sustainable life styles etc.
2. Students realize the need to change their approach, so as to perceive our own environmental issues correctly, using practical approach based on observation and self learning.
3. Students become conversant with the fact that there is a need to create a concern for our environment that will trigger pro-environmental action; including simple activities we can do in our daily life to protect it.
4. . Interpretation of different types of environmental pollution problems and designing of new solid waste management techniques usage
5. To get knowledge on various environmental acts and to engage all the students life - long learning of rain water harvesting

**UNIT – I**

**Multidisciplinary Nature of Environmental Studies:** Introduction , Multidisciplinary Nature of Environmental Studies ,Definition, Scope and Importance – Need for Public Awareness.

**Natural Resources:** Renewable and non-renewable energy resources – Natural resources and associated problems.

**Forest resources:** Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people.

**Water resources:** Use and over utilization of surface and sub-surface – Floods, drought, conflicts over water, dams – benefits and problems.

**Mineral resources:** Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

**Food resources:** World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticides problems, water logging, salinity, case studies.

**Energy resources:** Renewable and non-renewable energy resources.

**UNIT – II**

**Ecosystems:** Concept of an ecosystem. – Structure and functions of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem and Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

**Biodiversity And Its Conservation :** Introduction- Definition: genetic, species and ecosystem diversity – Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and local levels – India as a mega-diversity nation – Hot-spots of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

**UNIT – III**

**Environmental Pollution:** Definition, Causes, effects and its control measures of : Air Pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution and Nuclear hazards.

**Solid Waste Management:** Causes, effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management:

floods, earthquake, cyclone, Tsunami and landslides.

#### UNIT – IV

**Social Issues and the Environment:** From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting and watershed management – Resettlement and rehabilitation of people □ Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies– Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act ,Public awareness.

#### UNIT – V

**Human Population and the Environment:** Population growth, variation among nations. Population explosion – Family Welfare Programmed. – Environment and human health – Human Rights – Value Education – HIV/AIDS – Women and Child Welfare – Role of information Technology in Environment and human health – Case studies.

#### TEXT BOOKS:

1. Text book of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission, Universities Press.
2. Environmental Studies by Kaushik, New Age Publishers.
3. Environmental Studies by Sri Krishna Hitech publishing Pvt. Ltd.

#### REFERENCES:

1. Environmental studies by R.Rajagopalan, Oxford University Press.
2. Comprehensive Environmental studies by J.P.Sharma, Laxmi publications.
3. Introduction to Environmental engineering and science by Gilbert M. Masters and Wendell P. Ela - Printice hall of India Private limited.
4. Environmental studies by A. Ravi Krishnan, G. Sujatha Sri Krishna Hitech publications.

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO:1	PO1:Apply the knowledge of Basic science	1.2	1.2.1
CO:2	PO1:Apply the knowledge of Basic science	1.2	1.2.1
CO:3	PO1:Apply the knowledge of Basic science	1.2	1.2.1
CO:4	PO1:Apply the knowledge of Basic science	1.2	1.2.1
CO:5	PO1:Apply the knowledge of Basic science	1.2	1.2.1



## Hamiltonian Graphs, Chromatic Numbers, The Four Color Problem

### Textbooks:

1. Joe L. Mott, Abraham Kandel and Theodore P. Baker, Discrete Mathematics for Computer Scientists & Mathematicians, 2nd Edition, Pearson Education.
2. J.P. Tremblay and R. Manohar, Discrete Mathematical Structures with Applications to Computer Science, Tata McGraw Hill, 2002.

### Reference Books:

1. Kenneth H. Rosen, Discrete Mathematics and its Applications with Combinatorics and Graph Theory, 7th Edition, McGraw Hill Education (India) Private Limited.
2. Graph Theory with Applications to Engineering and Computer Science by Narsingh Deo.

### Online Learning Resources:

<http://www.cs.yale.edu/homes/aspnes/classes/202/notes.pdf>

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO1	PO1: Apply the knowledge of mathematics	1.2	1.2.1
CO2	PO1: Apply the knowledge of mathematics	1.2	1.2.1
CO3	PO1: Apply the knowledge of mathematics	1.2	1.2.2
CO4	PO1: Apply the knowledge of mathematics	1.6	1.6.1
CO5	PO1: Apply the knowledge of mathematics	1.6	1.6.1
CO6	PO1: Apply the knowledge of mathematics	1.6	1.6.1

<b>Course Code</b>	<b>Digital Electronics &amp; Microprocessors (Common to : CSE, CIC, AIM, AID)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>20APC3601</b>		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Pre-requisite**

**Basic Electronics**

**Semester**

**II-I**

**Course Objectives:**

- To understand all the concepts of Logic Gates and Boolean Functions.
- To learn about Combinational Logic and Sequential Logic Circuits.
- To design logic circuits using Programmable Logic Devices.
- To understand basics of 8086 Microprocessor and 8051 Microcontroller.
- To understand architecture of 8086 Microprocessor and 8051 Microcontroller.
- To learn Assembly Language Programming of 8086 and 8051.

**Course Outcomes (CO):**

After Completion of this course, the student will be able to:

- Design any Logic circuit using basic concepts of Boolean Algebra.
- Design any Logic circuit using basic concepts of PLDs.
- Design and develop any application using 8086 Microprocessor.
- Design and develop any application using 8051 Microcontroller.

**UNIT - I**

**Number Systems & Code Conversion**

Number Systems & Code conversion, Boolean Algebra & Logic Gates, Truth Tables, Universal Gates, Simplification of Boolean functions, SOP and POS methods – Simplification of Boolean functions using K-maps, Signed and Unsigned Binary Numbers.

**UNIT - II**

**Combinational Circuits**

Combinational Logic Circuits: Adders & Subtractors, Multiplexers, Demultiplexers, Encoders, Decoders, Programmable Logic Devices.

**UNIT - III**

**Sequential Circuits**

Sequential Logic Circuits: RS, Clocked RS, D, JK, Master Slave JK, T Flip-Flops, Shift Registers, Types of Shift Registers, Counters, Ripple Counter, Synchronous Counters, Asynchronous Counters, Up-Down Counter.

**UNIT - IV**

**Microprocessors - I**

8085 microprocessor Review (brief details only), 8086 microprocessor, Functional Diagram, register organization 8086, Flag register of 8086 and its functions, Addressing modes of 8086, Pin diagram of 8086, Minimum mode & Maximum mode operation of 8086, Interrupts in 8086.

**UNIT - V**

**Microprocessors - II**

Instruction set of 8086, Assembler directives, Procedures and Macros, Simple programs involving arithmetic, logical, branch instructions, Ascending, Descending and Block move programs, String Manipulation Instructions. Overview of 8051 microcontroller, Architecture, I/O ports and Memory organization, addressing modes and instruction set of 8051 (Brief details only), Simple Programs.

**Text Books:**

1. M. Morris Mano, Michael D. Ciletti, Digital Design, Pearson Education, 5<sup>th</sup> Edition, 2013
2. Anil K. Maini, Digital Electronics: Principles, Devices and Applications, John Wiley & Sons, Ltd., 2007.
3. N. Senthil Kumar, M. Saravanan, S. Jeevanathan, Microprocessor and Microcontrollers, Oxford Publishers, 2010.
4. Advanced microprocessors and peripherals-A.K Ray and K.M. Bhurchandani, TMH, 2nd edition, 2006.

**Reference Books:**

1. Thomas L. Floyd, Digital Fundamentals – A Systems Approach, Pearson, 2013.
2. Charles H. Roth, Fundamentals of Logic Design, Cengage Learning, 5th, Edition, 2004.
3. D.V. Hall, Microprocessors and Interfacing. TMGH, 2nd edition, 2006.

4. Kenneth.J.Ayala, The 8051 microcontroller, 3rd edition, Cengage Learning,2010.

**Online Learning Resources:**

NPTEL, SWAYAM

<b>List of COs</b>	<b>PO no. and keyword</b>	<b>Competency Indicator</b>	<b>Performance Indicator</b>
CO1	PO1: Apply the knowledge of mathematics	1.1	1.1.1
CO2	PO3: Design system components	3.4	3.4.3
CO3	PO2: Analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics	2.2	2.2.3
CO4	PO2: Analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics	2.2	2.2.3

<b>Course Code</b>	<b>Database Management Systems (Common to : CSE, CIC, AIM, AID, ECE)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20APC3602		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Pre-requisite**

**NIL**

**Semester**

**II-I**

### Course Objectives:

This course is designed to:

- Train in the fundamental concepts of database management systems, database modeling and design, SQL, PL/SQL and system implementation techniques.
- Enable students to model ER diagrams for any customized application
- Inducting appropriate strategies for optimization of queries.
- Provide knowledge on concurrency techniques
- Demonstrate the organization of Databases

### Course Outcomes (CO):

After completion of the course, students will be able to

- Design a database for a real-world information system
- Define transactions that preserve the integrity of the database
- Generate tables for a database
- Organize the data to prevent redundancy
- Pose queries to retrieve the information from the database.

#### **UNIT - I Introduction, Introduction to Relational Model 9Hrs**

**Introduction:** Database systems applications, Purpose of Database Systems, view of Data, Database Languages, Relational Databases, Database Design, Data Storage and Querying, Transaction Management, Database Architecture, Data Mining and Information Retrieval, Specialty Databases, Database users and Administrators,

**Introduction to Relational Model:** Structure of Relational Databases, Database Schema, Keys, Schema Diagrams, Relational Query Languages, Relational Operations

#### **UNIT - II Introduction to SQL, Advanced SQL 9 Hrs**

**Introduction to SQL:** Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions, Nested Sub-queries, Modification of the Database. Intermediate SQL: Joint Expressions, Views, Transactions, Integrity Constraints, SQL Data types and schemas, Authorization.

**Advanced SQL:** Accessing SQL from a Programming Language, Functions and Procedures, Triggers, Recursive Queries, OLAP, Formal relational query languages.

#### **UNIT - III Database Design and the E-R Model, Relational Database Design 8Hrs**

**Database Design and the E-R Model:** Overview of the Design Process, The Entity-Relationship Model, Constraints, Removing Redundant Attributes in Entity Sets, Entity-Relationship Diagrams, Reduction to Relational Schemas, Entity-Relationship Design Issues.

#### **Relational Database Design:**

Features of Good Relational Designs, Atomic Domains and First Normal Form, Decomposition Using Functional Dependencies, Functional-Dependency Theory, Algorithms for Decomposition, Decomposition Using Multivalued Dependencies, More Normal Forms.

#### **UNIT - IV Query Processing, Query optimization 8 Hrs**

**Query Processing:** Overview, Measures of Query cost, Selection operation, sorting, Join Operation, other operations, Evaluation of Expressions.

**Query optimization:** Overview, Transformation of Relational Expressions, Estimating statistics of Expression results, Choice of Evaluation Plans, Materialized views, Advanced Topics in Query Optimization.

#### **UNIT - V Transaction Management, Concurrency Control, Recovery System 10Hrs**

**Transaction Management:** Transactions: Concept, A Simple Transactional Model, Storage Structures, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Isolation and Atomicity, Transaction Isolation Levels, Implementation of Isolation Levels, Transactions as SQL Statements.

**Concurrency Control:** Lock-based Protocols, Deadlock Handling, Multiple granularity, Timestamp-based Protocols, and Validation-based Protocols.



**Recovery System:** Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with Loss of Nonvolatile Storage, Early Lock Release and Logical Undo Operations.

**Textbooks:**

1. A.Silberschatz, H.F.Korth, S.Sudarshan, “Database System Concepts”,6/e, TMH 2019

**Reference Books:**

1. Database Management System, 6/e Ramez Elmasri, Shamkant B. Navathe, PEA
2. Database Principles Fundamentals of Design Implementation and Management, Carlos Coronel, Steven Morris, Peter Robb, Cengage Learning.
3. Database Management Systems, 3/e, Raghurama Krishnan, Johannes Gehrke, TMH

**Online Learning Resources:**

[https://onlinecourses.nptel.ac.in/noc21\\_cs04/preview](https://onlinecourses.nptel.ac.in/noc21_cs04/preview)

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO1	PO 1: Engineering knowledge	1.4	1.4.1
CO2	PO 2: Problem analysis	2.2	2.2.3
CO3	PO 3: Design/Development of Solutions	3.2	3.2.1
CO4	PO 4: Conduct investigations of complex problems	4.2	4.2.1
CO5	PO 2: Problem analysis	2.3	2.3.1

20APC3604	Basics of Python Programming (Common to : CSE, CIC, AIM, AID)	L	T	P	C
		3	0	0	3
Pre-requisite	Nil	Semester		II-I	

### Course Objectives:

- To learn the fundamentals of Python
- To elucidate problem-solving using a Python programming language
- To introduce a function-oriented programming paradigm through python
- To get training in the development of solutions using modular concepts
- To introduce the programming constructs of python

### Course Outcomes (CO):

- Apply the features of Python language in various real applications.
- Select appropriate data structure of Python for solving a problem.
- Design object oriented programs using Python for solving real-world problems.
- Apply modularity to programs.

### UNIT - I

9Hrs

**Introduction:** What is a program, Running python, Arithmetic operators, Value and Types. **Variables, Assignments and Statements:** Assignment statements, Script mode, Order of operations, string operations, comments. **Functions:** Function calls, Math functions, Composition, Adding new Functions, Definitions and Uses, Flow of Execution, Parameters and Arguments, Variables and Parameters are local, Stack diagrams, Fruitful Functions and Void Functions, Why Functions.

### UNIT - II

9 Hrs

**Case study:** The turtle module, Simple Repetition, Encapsulation, Generalization, Interface design, Refactoring, docstring. **Conditionals and Recursion:** floor division and modulus, Boolean expressions, Logical operators, Conditional execution, Alternative execution, Chained conditionals, Nested conditionals, Recursion, Infinite Recursion, Keyboard input. **Fruitful Functions:** Return values, Incremental development, Composition, Boolean functions, more recursion, Leap of Faith, Checking types

### UNIT - III

8Hrs

**Iteration:** Reassignment, Updating variables, The while statement, Break, Square roots, Algorithms. **Strings:** A string is a sequence, len, Traversal with a for loop, String slices, Strings are immutable, Searching, Looping and Counting, String methods, The in operator, String comparison. **Case Study:** Reading word lists, Search, Looping with indices. **Lists:** List is a sequence, Lists are mutable, Traversing a list, List operations, List slices, List methods, Map filter and reduce, Deleting elements, Lists and Strings, Objects and values, Aliasing, List arguments.

### UNIT - IV

8 Hrs

**Dictionaries:** A dictionary is a mapping, Dictionary as a collection of counters, Looping and dictionaries, Reverse Lookup, Dictionaries and lists, Memos, Global Variables.

**Tuples:** Tuples are immutable, Tuple Assignment, Tuple as Return values, Variable-length argument tuples, Lists and tuples, Dictionaries and tuples, Sequences of sequences.

**Files:** Persistence, Reading and writing, Format operator, Filename and paths, Catching exceptions, Databases, Pickling, Pipes, Writing modules.

**Classes and Objects:** Programmer-defined types, Attributes, Instances as Return values, Objects are mutable, Copying.

### UNIT - V

10Hrs

**Classes and Functions:** Time, Pure functions, Modifiers, Prototyping versus Planning **Classes and Methods:** Object oriented features, Printing objects, The init method, The \_\_str\_\_method, Operator overloading, Type-based Dispatch, Polymorphism, Interface and Implementation.**Inheritance:** Card objects, Class attributes, Comparing cards, decks, Printing the Deck, Add Remove shuffle and sort, Inheritance, Class diagrams, Data encapsulation. **The Goodies:** Conditional expressions, List comprehensions, Generator expressions, any and all, Sets, Counters, defaultdict, Named tuples, Gathering keyword Args.

**Textbooks:**

1. Allen B. Downey, “Think Python”, 2nd edition, SPD/O’Reilly, 2016.

**Reference Books:**

1. Martin C.Brown, “The Complete Reference: Python”, McGraw-Hill, 2018.
2. Kenneth A. Lambert, B.L. Juneja, “Fundamentals of Python”, CENGAGE, 2015.
3. R. Nageswara Rao, “Core Python Programming”, 2nd edition, Dreamtech Press, 2019

<b>List of COs</b>	<b>PO no. and keyword</b>	<b>Competency Indicator</b>	<b>Performance Indicator</b>
CO1	PO1 Engineering knowledge	1.3	1.3.1
CO2	PO2 Problem analysis	2.1	2.1.2
CO3	PO3 Design/Development of Solutions	3.1	3.1.6
CO4	PO1 Engineering knowledge	1.4	1.4.1

<b>Course Code</b>	<b>Basics of Electrical &amp; Electronics Engineering</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>20AES0205</b>		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Pre-requisite** Nil **Semester** **II-I**

**Course Outcomes (CO):**

- Apply concepts of KVL/KCL in solving DC circuits
- Illustrate working principles of induction motor - DC Motor
- Identify type of electrical machine based on their operation
- Describe operation and characteristics of diodes and transistors.
- Make use of diodes and transistors in simple, typical circuit applications.
- Understand operation of basic op-amp circuits.

**PART-A (Electrical Engineering)**

**UNIT - I DC & AC Circuits 9Hrs**

Electrical circuit elements (R - L and C) - Kirchhoff laws - Series and parallel connection of resistances with DC excitation. Superposition Theorem - Representation of sinusoidal waveforms - peak and rms values - phasor representation - real power - reactive power - apparent power - power factor - Analysis of single-phase ac circuits consisting of RL - RC - RLC series circuits.

**UNIT - II DC & AC Machines 9 Hrs**

Principle and operation of DC Generator - EMF equations - OCC characteristics of DC generator – principle and operation of DC Motor – Performance Characteristics of DC Motor - Speed control of DC Motor – Principle and operation of Single Phase Transformer - OC and SC test on transformer - principle and operation of Induction Motor [ Elementary treatment only ]

**UNIT - III Basics of Power Systems 8Hrs**

Layout & operation of Hydro, Thermal, Nuclear Stations - Solar & wind generating stations – Typical AC Power Supply scheme – Elements of Transmission line – Types of Distribution systems: Primary & Secondary distribution systems

**Text Books:**

1. D. P. Kothari and I. J. Nagrath - “Basic Electrical Engineering” - Tata McGraw Hill - 2010.
2. V.K. Mehta & Rohit Mehta, “Principles of Power System” – S.Chand – 2018.

**References:**

1. L. S. Bobrow - “Fundamentals of Electrical Engineering” - Oxford University Press - 2011.
2. E. Hughes - “Electrical and Electronics Technology” - Pearson - 2010.
3. C.L. Wadhwa – “Generation Distribution and Utilization of Electrical Energy”, 3rd Edition, New Age International Publications.

**PART-B (Electronics Engineering)**

**UNIT - I PN JUNCTION DIODE & SPECIAL DIODE 8 Hrs**

## CHARACTERISTICS

Overview of Semiconductors, PN junction diode, Zener diode, Applications of diode as switch and rectifier, Zener diode as regulator, special purpose diodes: schottky diode, tunnel diode, varactor diode, photodiode, phototransistor and LED.

### UNIT - II TRANSISTOR CHARACTERISTICS

10Hrs

BJT construction, operation, configuration and characteristics, JFET and MOSFET construction, operation, characteristics (CS configuration), applications

Operational Amplifiers: Introduction, block diagram, basic op-amp circuits: Inverting, Non Inverting, summer, subtractor, voltage follower.

### UNIT - III COMMUNICATION SYSTEMS

Introduction, Elements of Communication Systems, EM spectrum, basics of electronic communication, Amplitude and Frequency modulation, Pulse modulation, Communication receivers, Examples of communication systems: Microwave & Satellite, Fibre optic, Television, mobile communication (block diagram approach).

#### Textbooks:

1. D.P. Kothari, I.J.Nagrath, Basic Electronics, 2<sup>nd</sup> edition, McGraw Hill Education(India)Private Limited
2. S.K. Bhattacharya, Basic Electrical and Electronics Engineering, 2<sup>nd</sup> edition, Pearson India Private Limited

#### Reference Books:

1. R. Muthu subramanian, S. Salivahanan, "Basic Electrical and Electronics Engineering", Tata McGraw-Hill Education, Reprint 2012.
2. David Bell, Electronic Devices and Circuits: Oxford University Press, 5th edition. 2008.

CO	PO	CI	PI
CO1	PO1	1.3	1.3.1
	PO2	2.3	2.3.1
	PO3	3.3	3.3.1
CO2	PO1	1.3	1.3.1
	PO2	2.3	2.3.1
	PO3	3.3	3.3.1
CO3	PO1	1.3	1.3.1
	PO2	2.3	2.3.1
	PO3	3.3	3.3.1
CO4	PO1	1.3	1.3.1
	PO2	2.3	2.3.1
	PO3	3.3	3.3.1
CO5	PO1	1.3	1.3.1
	PO2	2.3	2.3.1
	PO3	3.3	3.3.1
CO6	PO1	1.3	1.3.1
	PO2	2.3	2.3.1
	PO3	3.3	3.3.1



<b>Course Code</b>	<b>Database Management Systems Laboratory (Common to : CSE, CIC, AIM, AID)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20APC3603		<b>0</b>	<b>0</b>	<b>3</b>	<b>1.5</b>
<b>Pre-requisite</b>	<b>NIL</b>	<b>Semester</b>			<b>II-I</b>

**Course Objectives:**

- To implement the basic knowledge of SQL queries and relational algebra.
- To construct database models for different database applications.
- To apply normalization techniques for refining of databases.
- To practice various triggers, procedures, and cursors using PL/SQL.
- To design and implementation of a database for an organization

**Course Outcomes (CO):**

After completion of the course, students will be able to

- Design database for any real world problem
- Implement PL/SQL programs
- Define SQL queries
- Decide the constraints
- Investigate for data inconsistency

**List of Experiments:**

**Week-1: CREATION OF TABLES**

1. Create a table called Employee with the following structure.

<b>Name</b>	<b>Type</b>
Empno	Number
Ename	Varchar2(20)
Job	Varchar2(20)
Mgr	Number
Sal	Number

- Add a column commission with domain to the Employee table.
  - Insert any five records into the table.
  - Update the column details of job
  - Rename the column of Employ table using alter command.
  - Delete the employee whose empno is 19.
2. Create department table with the following structure.

<b>Name</b>	<b>Type</b>
Deptno	Number
Deptname	Varchar2(20)
location	Varchar2(20)

- Add column designation to the department table.
  - Insert values into the table.
  - List the records of emp table grouped by deptno.
  - Update the record where deptno is 9.
  - Delete any column data from the table
3. Create a table called Customertable

<b>Name</b>	<b>Type</b>
Cust name	Varchar2(20)
Cust street	Varchar2(20)
Cust city	Varchar2(20)

- Insert records into the table.

- b. Add salary column to the table.
- c. Alter the table column domain.
- d. Drop salary column of the customer table.
- e. Delete the rows of customer table whose ust\_city is 'hyd'.
- f. Create a table called branch table.

Name	Type
Branch name	Varchar2(20)
Branch city	Varchar2(20)
asserts	Number

4. Increase the size of data type for asserts to the branch.
  - a. Add and drop a column to the branch table.
  - b. Insert values to the table.
  - c. Update the branch name column
  - d. Delete any two columns from the table
5. Create a table called sailor table

Name	Type
Sid	Number
Sname	Varchar2(20)
rating	Varchar2(20)

- a. Add column age to the sailor table.
  - b. Insert values into the sailor table.
  - c. Delete the row with rating>8.
  - d. Update the column details of sailor.
  - e. Insert null values into the table.
6. Create a table called reserves table

Name	Type
Boat id	Integer
sid	Integer
day	Integer

- a. Insert values into the reserves table.
- b. Add column time to the reserves table.
- c. Alter the column day data type to date.
- d. Drop the column time in the table.
- e. Delete the row of the table with some condition.

## Week-2: QUERIES USING DDL AND DML

1.
  - a. Create a user and grant all permissions to the user.
  - b. Insert the any three records in the employee table and use rollback. Check the result.
  - c. Add primary key constraint and not null constraint to the employee table.
  - d. Insert null values to the employee table and verify the result.
2.
  - a. Create a user and grant all permissions to the user.
  - b. Insert the any three records in the employee table and use rollback. Check the result.
  - c. Add primary key constraint and not null constraint to the employee table.
  - d. Insert null values to the employee table and verify the result.
3.
  - a. Create a user and grant all permissions to the user.
  - b. Insert the any three records in the employee table and use rollback. Check the result.
  - c. Add primary key constraint and not null constraint to the employee table.
  - d. Insert null values to the employee table and verify the result.
4.
  - a. Create a user and grant all permissions to the user.



- b. Insert values in the department table and use commit.
- c. Add constraints like unique and not null to the department table.
- d. Insert repeated values and null values into the table.
- 5. a. Create a user and grant all permissions to the user.
- b. Insert values into the table and use commit.
- c. Delete any three records in the department table and use rollback.
- d. Add constraint primary key and foreign key to the table.
- 6. a. Create a user and grant all permissions to the user.
- b. Insert records in the sailor table and use commit.
- c. Add save point after insertion of records and verify save point.
- d. Add constraints not null and primary key to the sailor table.
  - 7. a. Create a user and grant all permissions to the user.
  - b. Use revoke command to remove user permissions.
- c. Change password of the user created.
- d. Add constraint foreign key and not null.
- 8. a. Create a user and grant all permissions to the user.
- b. Update the table reserves and use save point and rollback.
- c. Add constraint primary key , foreign key and not null to the reserves table
- d. Delete constraint not null to the table column

### Week-3:QUERIES USING AGGREGATE FUNCTIONS

1. a. By using the group by clause, display the enames who belongs to deptno 10 along with average salary.
- b. Display lowest paid employee details under each department.
- c. Display number of employees working in each department and their department number.
- d. Using built in functions, display number of employees working in each department and their department name from dept table. Insert deptname to dept table and insert deptname foreach row, do the required thing specified above.
- e. List all employees which start with either B or C.
- f. Display only these ename of employees where the maximum salary is greater than or equal to 5000.
2. a. Calculate the average salary for each different job.
- b. Show the average salary of each job excluding manager.
- c. Show the average salary for all departments employing more than three people.
- d. Display employees who earn more than the lowest salary in department 30
- e. Show that value returned by sign (n)function.
- f. How many days between day of birth to current date
3. a. Show that two substring as single string.
- b. List all employee names, salary and 15% rise in salary.
- c. Display lowest paid emp details under each manager
- d. Display the average monthly salary bill for each deptno.
- e. Show the average salary for all departments employing more than two people.
- f. By using the group by clause, display the eid who belongs to deptno 05 alongwith average salary.
4. a. Count the number of employees in department20
- b. Find the minimum salary earned by clerk.
  - c. Find minimum, maximum, average salary of all employees.
  - d. List the minimum and maximum salaries for each job type.
  - e. List the employee names in descending order.
  - f. List the employee id, names in ascending order byempid.
5. a. Find the sids ,names of sailors who have reserved all boats called "INTERLAKE  
Find the age of youngest sailor who is eligible to vote for each rating level with at least twosuch sailors.
- b. Find the sname , bid and reservation date for each reservation.

- c. Find the ages of sailors whose name begin and end with B and has at least 3 characters.
- d. List in alphabetic order all sailors who have reserved redboat.
- e. Find the age of youngest sailor for each rating level.
- 6. a. List the Vendors who have delivered products within 6 months from order date.
- b. Display the Vendor details who have supplied both Assembled and Subparts.
- c. Display the Sub parts by grouping the Vendor type (Local or NonLocal).
- d. Display the Vendor details in ascending order.
- e. Display the Sub part which costs more than any of the Assembled parts.
- f. Display the second maximum cost Assembled part

#### Week-4: PROGRAMS ON PL/SQL

- 1. a. Write a PL/SQL program to swap two numbers.
- b. Write a PL/SQL program to find the largest of three numbers.
- 2. a. Write a PL/SQL program to find the total and average of 6 subjects and display the grade.
- b. Write a PL/SQL program to find the sum of digits in a given number.
- 3. a. Write a PL/SQL program to display the number in reverse order.
- b. Write a PL/SQL program to check whether the given number is prime or not.
- 4. a. Write a PL/SQL program to find the factorial of a given number.
- b. Write a PL/SQL code block to calculate the area of a circle for a value of radius varying from 3 to 7. Store the radius and the corresponding values of calculated area in an empty table named areas, consisting of two columns radius and area.
- 5. a. Write a PL/SQL program to accept a string and remove the vowels from the string. (When 'hello' passed to the program it should display 'Hll' removing e and o from the worldHello).
- b. Write a PL/SQL program to accept a number and a divisor. Make sure the divisor is less than or equal to 10. Else display an error message. Otherwise Display the remainder in words.

#### Week-5: PROCEDURES AND FUNCTIONS

- 1. Write a function to accept employee number as parameter and return Basic +HRA together as single column.
- 2. Accept year as parameter and write a Function to return the total net salary spent for a given year.
- 3. Create a function to find the factorial of a given number and hence find NCR.
- 4. Write a PL/SQL block to print prime Fibonacci series using local functions.
- 5. Create a procedure to find the lucky number of a given birth date.
- 6. Create function to the reverse of given number

#### Week-6: TRIGGERS

- 1. Create a row level trigger for the customers table that would fire for INSERT or UPDATE or DELETE operations performed on the CUSTOMERS table. This trigger will display the salary difference between the old values and new values:

CUSTOMERS table:

ID	NAME	AGE	ADDRESS	SALARY
1	Alive	24	Khammam	2000
2	Bob	27	Kadappa	3000
3	Catri	25	Guntur	4000
4	Dena	28	Hyderabad	5000
5	Eeshwar	27	Kurnool	6000
6	Farooq	28	Nellore	7000

- 2. Creation of insert trigger, delete trigger, update trigger practice triggers using the passenger database. Passenger( Passport\_ id INTEGER PRIMARY KEY, Name VARCHAR (50) Not NULL, Age Integer Not NULL, Sex Char, Address VARCHAR (50) Not NULL);
  - a. Write a Insert Trigger to check the Passport\_id is exactly six digits or not.

- b. Write a trigger on passenger to display messages '1 Record is inserted', '1 record is deleted', '1 record is updated' when insertion, deletion and updation are done on passenger respectively.
3. Insert row in employee table using Triggers. Every trigger is created with name any trigger have same name must be replaced by new name. These triggers can raised before insert, update or delete rows on data base. The main difference between a trigger and a stored procedure is that the former is attached to a table and is only fired when an INSERT, UPDATE or DELETE occurs.
4. Convert employee name into uppercase whenever an employee record is inserted or updated. Trigger to fire before the insert or update.
5. Trigger before deleting a record from emp table. Trigger will insert the row to be deleted into table called delete \_emp and also record user who has deleted the record and date and time of delete.
6. Create a transparent audit system for a table CUST\_MSTR. The system must keep track of therecords that are being deleted or updated

### **Week-7:PROCEDURES**

1. Create the procedure for palindrome of given number.
2. Create the procedure for GCD: Program should load two registers with two Numbers and then apply the logic for GCD of two numbers. GCD of two numbers is performed by dividing the greater number by the smaller number till the remainder is zero. If it is zero, the divisor is theGCD if not the remainder and the divisors of the previous division are the new set of two numbers. The process is repeated by dividing greater of the two numbers by the smaller number till the remainder is zero and GCD is found.
3. Write the PL/SQL programs to create the procedure for factorial of given number.
4. Write the PL/SQL programs to create the procedure to find sum of N natural number.
5. Write the PL/SQL programs to create the procedure to find Fibonacci series.
6. Write the PL/SQL programs to create the procedure to check the given number is perfect or not

### **Week-8: CURSORS**

1. Write a PL/SQL block that will display the name, dept no, salary of fist highest paid employees. Update the balance stock in the item master table each time a transaction takes place in the item transaction table. The change in item master table depends on the item id is already present in the item master then update operation is performed to decrease the balance stock bythe quantity specified in the item transaction in case the item id is not present in the item master table then the record is inserted in the item master table.
3. Write a PL/SQL block that will display the employee details along with salary using cursors.
4. To write a Cursor to display the list of employees who are working as a Managers or Analyst.
5. To write a Cursor to find employee with given job and deptno.
6. Write a PL/SQL block using implicit cursor that will display message, the salaries of all the employees in the 'employee' table are updated. If none of the employee's salary are updated we get a message 'None of the salaries were updated'. Else we get a message like for example, 'Salaries for 1000 employees are updated' if there are 1000 rows in 'employee' table

### **Week-9: CASE STUDY: BOOK PUBLISHING COMPANY**

A publishing company produces scientific books on various subjects. The books are written by authors who specialize in one particular subject. The company employs editors who, not necessarily being specialists in a particular area, each take sole responsibility for editing one or more publications.

A publication covers essentially one of the specialist subjects and is normally written by a singleauthor. When writing a particular book, each author works with on editor, but may submit another work for publication to be supervised by other editors. To improve their competitiveness, the company tries to employ a variety of authors, more than one author being a specialist in a particularsubject for the above case study, do the following:

1. Analyze the data required.
2. Normalize the attributes.

Create the logical data model using E-R diagrams

## **Week-10: CASE STUDY GENERAL HOSPITAL**

A General Hospital consists of a number of specialized wards (such as Maternity, Pediatric, Oncology, etc.). Each ward hosts a number of patients, who were admitted on the recommendation of their own GP and confirmed by a consultant employed by the Hospital. On admission, the personal details of every patient are recorded. A separate register is to be held to store the information of the tests undertaken and the results of a prescribed treatment. A number of tests may be conducted for each patient. Each patient is assigned to one leading consultant but may be examined by another doctor, if required. Doctors are specialists in some branch of medicine and may be leading consultants for a number of patients, not necessarily from the same ward. For the above case study, do the following.

1. Analyze the data required.
2. Normalize the attributes.

Create the logical data model using E-R diagrams

## **Week-11: CASE STUDY: CAR RENTAL COMPANY**

A database is to be designed for a car rental company. The information required includes a description of cars, subcontractors (i.e. garages), company expenditures, company revenues and customers. Cars are to be described by such data as: make, model, year of production, engine size, fuel type, number of passengers, registration number, purchase price, purchase date, rent price and insurance details. It is the company policy not to keep any car for a period exceeding one year. All major repairs and maintenance are done by subcontractors (i.e. franchised garages), with whom CRC has long-term agreements. Therefore the data about garages to be kept in the database includes garage names, addresses, range of services and the like. Some garages require payments immediately after a repair has been made; with others CRC has made arrangements for credit facilities. Company expenditures are to be registered for all outgoings connected with purchases, repairs, maintenance, insurance etc. Similarly the cash inflow coming from all sources: Car hire, car sales, insurance claims must be kept of file. CRC maintains a reasonably stable client base. For this privileged category of customers special credit card facilities are provided. These customers may also book in advance a particular car. These reservations can be made for any period of time up to one month. Casual customers must pay a deposit for an estimated time of rental, unless they wish to pay by credit card. All major credit cards are accepted. Personal details such as name, address, telephone number, driving license, number about each customer are kept in the database. For the above case study, do the following:

1. Analyze the data required.
2. Normalize the attributes.

Create the logical data model using E-R diagrams

## **Week-12: CASE STUDY: STUDENT PROGRESS MONITORING SYSTEM**

A database is to be designed for a college to monitor students' progress throughout their course of study. The students are reading for a degree (such as BA, BA (Hons.) M.Sc., etc) within the framework of the modular system. The college provides a number of modules, each being characterized by its code, title, credit value, module leader, teaching staff and the department they come from. A module is coordinated by a module leader who shares teaching duties with one or more lecturers. A lecturer may teach (and be a module leader for) more than one module. Students are free to choose any module they wish but the following rules must be observed: Some modules require pre-requisites modules and some degree programs have compulsory modules. The database is also to contain some information about students including their numbers, names, addresses, degrees they read for, and their past performance i.e. modules taken and examination results. For the above case study, do the following:

1. Analyze the data required.
2. Normalize the attributes.
3. Create the logical data model i.e., ER diagrams.
4. Comprehend the data given in the case study by creating respective tables with primary keys and foreign keys wherever required.
5. Insert values into the tables created (Be vigilant about Master-Slave tables).
6. Display the Students who have taken M.Sc course
7. Display the Module code and Number of Modules taught by each Lecturer.
8. Retrieve the Lecturer names who are not Module Leaders.

9. Display the Department name which offers 'English' module.
10. Retrieve the Prerequisite Courses offered by every Department (with Department names).
11. Present the Lecturer ID and Name who teaches 'Mathematics'.
12. Discover the number of years a Module is taught.
13. List out all the Faculties who work for 'Statistics' Department.
14. List out the number of Modules taught by each Module Leader.
15. List out the number of Modules taught by a particular Lecturer.
16. Create a view which contains the fields of both Department and Module tables. (Hint- The fields like Module code, title, credit, Department code and its name).

Update the credits of all the prerequisite courses to 5. Delete the Module 'History' from the Module table.

**References:**

1. Ramez Elmasri, Shamkant, B. Navathe, "Database Systems", Pearson Education, 6th Edition, 2013.
2. Peter Rob, Charles Coronel, "Database System Concepts", Cengage Learning, 7th Edition, 2008.

**Online Learning Resources/Virtual Labs:**

<http://www.scoopworld.in> <http://vlabs.iitb.ac.in/vlabs-dev/labs/dblab/index.php>

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO1	PO 3: Design/Development of Solutions	3.2	3.2.2
CO2	PO 3: Design/Development of Solutions	3.2	3.2.1
CO3	PO 3: Design/Development of Solutions	3.2	3.2.1
CO4	PO 3: Design/Development of Solutions	3.2	3.2.2
CO5	PO 4: Conduct investigations of complex problems	4.1	4.1.2

<b>Course Code</b>	<b>Basics of Python Programming Lab (Common to : CSE, CIC, AIM, AID)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20APC3605		<b>0</b>	<b>0</b>	<b>3</b>	<b>1.5</b>
<b>Pre-requisite</b>	NIL	<b>Semester</b>			<b>II-I</b>

**Course Objectives:**

- To train the students in solving computational problems
- To elucidate solving mathematical problems using Python programming language
- To understand the fundamentals of Python programming concepts and its applications.
- To understand the object-oriented concepts using Python in problem solving.

**Course Outcomes (CO):**

- Write, Test and Debug Python Programs
- Implement Conditionals and Loops for Python Programs
- Use functions and represent Compound data using Lists, Tuples and Dictionaries
- Read and write data from & to files in Python and develop Application using Pygame

**List of Experiments:**

1. Install Python Interpreter and use it to perform different Mathematical Computations. Try to do all the operations present in a Scientific Calculator
2. Write a function that draws a grid like the following:

```

+ - - - - + - - - - +
|           |           |
|           |           |
|           |           |
+ - - - - + - - - - +
|           |           |
|           |           |
|           |           |
+ - - - - + - - - - +

```

3. Write a function that draws a Pyramid with # symbols

```

#
###
####
#####
#####

```

Up to 15 hashes at the bottom

4. Using turtles concept draw a wheel of your choice
5. Write a program that draws Archimedean Spiral
6. The letters of the alphabet can be constructed from a moderate number of basic elements, like vertical and horizontal lines and a few curves. Design an alphabet that can be drawn with a minimal number of basic elements and then write functions that draw the letters. The alphabet can belong to any Natural language excluding English. You should consider at least Ten letters of the alphabet.
7. The time module provides a function, also named time that returns the current Greenwich Mean Time in “the epoch”, which is an arbitrary time used as a reference point. On UNIX systems, the epoch is 1 January 1970.

```

>>> import time
>>> time.time()

```

1437746094.5735958

Write a script that reads the current time and converts it to a time of day in hours, minutes, and seconds, plus the number of days since the epoch.

8. Given  $n+r+1 \leq 2r$ .  $n$  is the input and  $r$  is to be determined. Write a program which computes minimum value of  $r$  that satisfies the above.

9. Write a program that evaluates Ackermann function

10. The mathematician Srinivasa Ramanujan found an infinite series that can be used to generate a numerical approximation of  $1/\pi$ :

Write a function called `estimate_pi` that uses this formula to compute and return an estimate of  $\pi$ .

$$\frac{1}{\pi} = \frac{2\sqrt{2}}{9801} \sum_{k=0}^{\infty} \frac{(4k)!(1103 + 26390k)}{(k!)^4 396^{4k}}$$

It should use a while loop to compute terms of the summation until the last term is smaller than  $1e^{-15}$  (which is Python notation for  $10^{-15}$ ). You can check the result by comparing it to `math.pi`.

11. Choose any five built-in string functions of C language. Implement them on your own in Python. You should not use string related Python built-in functions.

12. Given a text of characters, Write a program which counts number of vowels, consonants and special characters.

13. Given a word which is a string of characters. Given an integer say 'n', Rotate each character by 'n' positions and print it. Note that 'n' can be positive or negative.

14. Given rows of text, write it in the form of columns.

15. Given a page of text. Count the number of occurrences of each letter (Assume case insensitivity and don't consider special characters). Draw a histogram to represent the same

16. Write program which performs the following operations on list's. Don't use built-in functions

a) Updating elements of a list

b) Concatenation of list's

c) Check for member in the list

d) Insert into the list

e) Sum the elements of the list

f) Push and pop element of list

g) Sorting of list

h) Finding biggest and smallest elements in the list

i) Finding common elements in the list

17. Write a program to count the number of vowels in a word.

18. Write a program that reads a file, breaks each line into words, strips whitespace and punctuation from the words, and converts them to lowercase.

19. Go to Project Gutenberg (<http://gutenberg.org>) and download your favorite out-of-copyright book in plain text format. Read the book you downloaded, skip over the header information at the beginning of the file, and process the rest of the words as before. Then modify the program to count the total number of words in the book, and the number of times each word is used. Print the number of different words used in the book. Compare different books by different authors, written in different eras.

20. Go to Project Gutenberg (<http://gutenberg.org>) and download your favorite out-of-copyright book in plain text format. Write a program that allows you to replace words, insert words and delete words from the file.

21. Consider all the files on your PC. Write a program which checks for duplicate files in your PC and displays their location. Hint: If two files have the same checksum, they probably have the same contents.

22. Consider turtle object. Write functions to draw triangle, rectangle, polygon, circle and sphere. Use object oriented approach.
23. Write a program illustrating the object oriented features supported by Python.
24. Design a Python script using the Turtle graphics library to construct a turtle bar chart representing the grades obtained by N students read from a file categorizing them into distinction, first class, second class, third class and failed.
25. Design a Python script to determine the difference in date for given two dates in YYYY:MM:DD format(0 <= YYYY <= 9999, 1 <= MM <= 12, 1 <= DD <= 31) following the leap year rules.
26. Design a Python Script to determine the time difference between two given times in HH:MM:SS format.( 0 <= HH <= 23, 0 <= MM <= 59, 0 <= SS <= 59)

**References:**

1. Allen B. Downey , “ Think Python: How to Think Like a Computer Scientist”, Second Edition, Updated for Python 3, Shroff/O’Reilly Publishers, 2016.
2. Shroff “Learning Python: Powerful Object-Oriented Programming; Fifth edition, 2013.
3. David M.Baezly “Python Essential Reference”. Addison-Wesley Professional; Fourth edition, 2009.
4. David M. Baezly “Python Cookbook” O’Reilly Media; Third edition (June 1, 2013) by.

**Online Learning Resources/Virtual Labs:**

<http://www.edx.org>

<b>List of COs</b>	<b>PO no. and keyword</b>	<b>Competency Indicator</b>	<b>Performance Indicator</b>
CO1	PO1:Engineering Knowledge	1.4	1.4.1
CO2	PO2: Problem Analysis	2.2	2.2.4
CO3	PO1:Engineering Knowledge	1.3	1.3.1
CO4	PO1:Engineering Knowledge	1.4	1.4.1



<b>Course Code</b>	<b>Basics of Electrical &amp; Electronics Engineering Lab</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20AES0206		<b>0</b>	<b>0</b>	<b>3</b>	<b>1.5</b>
<b>Pre-requisite</b>	<b>NIL</b>	<b>Semester</b>			<b>II-I</b>

**Course Outcomes (CO):**

- Verify Kirchoff's Laws & Superposition theorem for dc supply
- Analyze the performance of AC and DC Machines by testing.
- Study I – V Characteristics of PV Cell & Perform speed control of dc shunt motor
- Ability to operate diodes for finding V-I Characteristics.
- Ability to construct and operate rectifiers without & with filters
- Ability to construct and operate BJT & FET Characteristics.

**List of Experiments:**

**Part A: Electrical Engineering Lab**

1. Verification of Kirchhoff laws.
2. Verification of Superposition Theorem.
3. Open circuit characteristics of a DC Shunt Generator.
4. Speed control of DC Shunt Motor.
5. OC & SC test of 1 – Phase Transformer.
6. Brake test on 3 - Phase Induction Motor.
7. I – V Characteristics of Solar PV cell
8. Brake test on DC Shunt Motor.

**Part B: Electronics Engineering Lab**

1. Draw and study the characteristics of semi-conductor diode
2. Draw and study the characteristics of Zener diode
3. Construct half wave rectifier without filter and with filter and also find the ripple factor and plot the output waveforms.
4. Construct full wave rectifier without filter and with filter and also find the ripple factor and plot the output waveforms.
5. Draw and study the input and output characteristics of transistor in common emitter configuration
6. Draw and study the static and transfer characteristics of FET in common source configuration
7. Study of op-amp as an inverting amplifier, non-inverting amplifier, voltage follower, summer and subtractor.
8. Conduct an experiment on am modulation & de-modulation; plot the corresponding modulated and demodulated signals.
9. Conduct an experiment on fm modulation & demodulation, plot the corresponding modulated and demodulated signals.

<b>CO</b>	<b>PO</b>	<b>CI</b>	<b>PI</b>
CO1	PO1	1.3	1.3.1
	PO2	2.3	2.3.1
	PO3	3.3	3.3.1
CO2	PO1	1.3	1.3.1
	PO2	2.3	2.3.1
	PO3	3.3	3.3.1
CO3	PO1	1.3	1.3.1
	PO2	2.3	2.3.1
	PO3	3.3	3.3.1

CO4	PO1	1.3	1.3.1
	PO2	2.3	2.3.1
	PO3	3.3	3.3.1
CO5	PO1	1.3	1.3.1
	PO2	2.3	2.3.1
	PO3	3.3	3.3.1
CO6	PO1	1.3	1.3.1
	PO2	2.3	2.3.1
	PO3	3.3	3.3.1

<b>Course Code</b>	<b>Client Side Scripting</b> <b>(Common to : CSE, CIC, AIM, AID)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20ASC3601		<b>1</b>	<b>0</b>	<b>2</b>	<b>2</b>

**Pre-requisite**

**NIL**

**Semester**

**II-I**

**Course Objectives:**

- To provide knowledge on basic concepts of web Programming
- To design Web Pages and form validation using java scripting.
- To learn the important concepts like CSS, DOM, DNS, AJAX and XML.
- To Demonstrate the functions of html in web communication.
- To quickly be able to understand the different parts of a web page

**Course Outcomes (CO):**

- Analyze and understand the basic concepts of web programming.
- Apply techniques of form validation using Java Script.
- Describe important concepts related to client side Web Security.
- Demonstrate the function of Hypertext Markup Language (HTML) in Web communications.
- Develop the function of JavaScript as a dynamic webpage creating tool

**UNIT - I**

**Basics of JavaScript Programming**

3+6 Hrs

Features of JavaScript, Object Name, Property, Method, Dot Syntax, Main Event, Values and Variables, Operators and Expressions – Primary Expressions, Object and Array Initializers, Function Definition Expression, Property Access Expressions, Invocation Expressions, If Statement, if...else, if..elseif, Nested if Statement, Switch... Case Statement, Loop Statement – for Loop, for...in Loop, while Loop, do...while Loop, continue Statement, Querying and Setting Properties and Deleting Properties, Property Getters and Setters.

WAP to print hello world

WAP to use comments in JavaScript.

WAP to add a no script block.

Write a Script in <head>...</head> section.

Write a Script in <body>...</body> section.

Write a Script in <body>...</body> and <head>...</head> sections.

Write a Script using arithmetic, Comparison, Logical, Bitwise, and Assignment operators

Write code to understand how the Conditional Operator and typeof operator works in JavaScript.

Write code to understand the working of if statement, if...else statement, and if...else if... statement.

Implement switch-case statement.

Implement while loop, do-while and for loop in JavaScript.

WAP to print the web browser's Navigator object using for loop.

WAP To implement break, continue and label in JavaScript.

Write code to call the function that displays the text message on clicking a button.

**UNIT - II**

**Array, Function and String**

3+6 Hrs

Array – Declaring an Array, Initializing an Array, Defining an Array Elements, Looping an Array, Adding an Array Element, Sorting an Array Element, Combining an Array Elements into a String, Changing Elements of an Array, Objects as Associative Arrays, Function – Defining a Function, Writing a Function, Adding an Arguments, Scope of Variable and Arguments, Calling a Function – Calling a Function With or Without an Argument, Calling Function from HTML, Function Calling another Function, Returning the Value from a Function, String – Manipulate a String, Joining a String, Retrieving a Character from given Position, Retrieving a Position of Character in a String, Dividing Text, Copying a Sub-string, Converting String to Number and Numbers to String, Changing the Case of String, Finding a Unicode of a Character – charCodeAt(), fromCharCode().

Write code to call the function that displays the text message on clicking a button.

WAP to call a function that takes two parameters, name and age. Print the same.

Define a function that takes two parameters and concatenates them before returning the resultant in the calling program.

**UNIT - III**

**Form and Event Handling**

3+6 Hrs



<b>Course Code</b>	<b>Constitution Of India (Common to : CSE, CIC, AIM, AID)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>20AMC9902</b>		<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Pre-requisite</b>	<b>NIL</b>	<b>Semester</b>		<b>II-I</b>	

**Course Outcomes (CO):**

Students will be able to:

- Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
- Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
- Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.
- Discuss the Powers and functions of Governor, President, Judiciary.
- Discuss the functions of local administration bodies

**UNIT - I**

8Hrs

History of Making of the Indian Constitution - History Drafting Committee, (Composition & Working).

**UNIT - II**

9Hrs

Philosophy of the Indian Constitution - Preamble Salient Features

**UNIT - III**

8Hrs

Contours of Constitutional Rights & Duties - Fundamental Rights - Right to Equality- Right to Freedom - Right against Exploitation - Right to Freedom of Religion - Cultural and Educational Rights - Right to Constitutional Remedies - Directive Principles of State Policy - Fundamental Duties.

**UNIT - IV**

8Hrs

Organs of Governance - Parliament - Composition - Qualifications and Disqualifications - Powers and Functions - Executive - President - Governor - Council of Ministers - Judiciary, Appointment and Transfer of Judges, Qualifications - Powers and Functions

**UNIT - V**

9 Hrs

Local Administration - District's Administration head: Role and Importance - Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation- Pachayati raj: Introduction, PRI: ZillaPachayat - Elected officials and their roles, CEO Zilla Panchayat: Position and role - Block level: Organizational Hierarchy (Different departments) - Village level: Role of Elected and Appointed officials - Importance of grass root democracy.

**Textbooks:**

1. The Constitution of India, 1950 (Bare Act), Government Publication.
2. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.
3. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
4. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.

<b>List of COs</b>	<b>PO no. and keyword</b>	<b>Competency Indicator</b>	<b>Performance Indicator</b>
CO1	PO 6: The engineer and society	6.2	6.2.1
CO2	PO 6: The engineer and society	6.2	6.2.1
CO3	PO 6: The engineer and society	6.2	6.2.1
CO4	PO 6: The engineer and society	6.2	6.2.1
CO5	PO 6: The engineer and society	6.2	6.1.1

<b>Course Code</b>	<b>Computer Organization (Common to : CSE, CIC, AIM, AID)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20APC3606		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Pre-requisite</b>	Digital Electronics and Microprocessors	<b>Semester</b>			<b>II-II</b>

**Course Objectives:**

- To learn the fundamentals of computer organization and its relevance to classical and modern problems of computer design
- To understand the structure and behavior of various functional modules of a computer.
- To learn the techniques that computers use to communicate with I/O devices
- To acquire the concept of pipelining and exploitation of processing speed.
- To learn the basic characteristics of multiprocessors

**Course Outcomes (CO):**

After completion of the course, students will be able to

- Understand computer architecture concepts related to the design of modern processors, memories and I/Os
- Identify the hardware requirements for cache memory and virtual memory
- Design algorithms to exploit pipelining and multiprocessors
- Understand the importance and trade-offs of different types of memories.
- Identify pipeline hazards and possible solutions to those hazards

UNIT - I                      **Basic Structure of Computer, Machine Instructions and Programs**                      8Hrs

**Basic Structure of Computer:** Computer Types, Functional Units, Basic operational Concepts, Bus Structure, Software, Performance, Multiprocessors and Multicomputer.

**Machine Instructions and Programs:** Numbers, Arithmetic Operations and Programs, Instructions and Instruction Sequencing, Addressing Modes, Basic Input/output Operations, Stacks and Queues, Subroutines, Additional Instructions.

UNIT - II                      **Arithmetic, Basic Processing Unit**                      9Hrs

**Arithmetic:** Addition and Subtraction of Signed Numbers, Design of Fast Adders, Multiplication of Positive Numbers, Signed-operand Multiplication, Fast Multiplication, Integer Division, Floating-Point Numbers and Operations.

**Basic Processing Unit:** Fundamental Concepts, Execution of a Complete Instruction, Multiple-Bus Organization, Hardwired Control, and Multi programmed Control.

UNIT - III                      **The Memory System**                      8Hrs

**The Memory System:** Basic Concepts, Semiconductor RAM Memories, Read-Only Memories, Speed, Size and Cost, Cache Memories, Performance Considerations, Virtual Memories, Memory Management Requirements, Secondary Storage.

UNIT - IV                      **Input/Output Organization**                      8Hrs

**Input/Output Organization:** Accessing I/O Devices, Interrupts, Processor Examples, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces.

UNIT - V                      **Pipelining, Large Computer Systems**                      9 Hrs

**Pipelining:** Basic Concepts, Data Hazards, Instruction Hazards, Influence on Instruction Sets.

**Large Computer Systems:** Forms of Parallel Processing, Array Processors, The Structure of General-Purpose multiprocessors, Interconnection Networks.

**Textbooks:**

1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky, "Computer Organization", 5<sup>th</sup> Edition, McGrawHill Education, 2013.

**Reference Books:**

1. M.Morris Mano, "Computer System Architecture", 3<sup>rd</sup> Edition, Pearson Education.
2. Themes and Variations, Alan Clements, "Computer Organization and Architecture", CENGAGE Learning.
3. Smruti Ranjan Sarangi, "Computer Organization and Architecture", McGraw Hill Education.
4. John P.Hayes, "Computer Architecture and Organization", McGraw Hill Education

**Online Learning Resources:**

<https://nptel.ac.in/courses/106/103/106103068/>

<b>List of COs</b>	<b>PO no. and keyword</b>	<b>Competency Indicator</b>	<b>Performance Indicator</b>
CO1	PO2:Problem Analysis	2.4	2.4.3
CO2	PO1:Engineering Knowledge	1.4	1.4.1
CO3	PO1:Engineering Knowledge	1.4	1.4.1
CO4	PO5:Modern tool Usage	5.2	5.2.2
CO5	PO3:Design/Development	3.1	3.1.6

<b>Course Code</b>	<b>Computer Networks</b> <b>(Common to : CSE, CIC, AIM, AID)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20APC3607		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Pre-requisite</b>	<b>NIL</b>	<b>Semester</b>		<b>II-II</b>	

### Course Objectives:

The students will be able to

- run and manage the Internet, part of the Internet, or an organization's network that is connected to the Internet.
- understand the basics of data communications and networking
- the protocols used in the Internet communication

### Course Outcomes (CO):

Student will be able to

- understand the basics of data communications and networking
- classify the functionalities of two sub layers of Data link Layer
- know briefly about Network Layer through algorithms and protocols
- distinguish the services provided by Transport Layer
- recognize the services offered by Application Layer to the user

#### UNIT - I

#### Introduction

9Hrs

Introduction: Data Communications, Networks, Network Types, Internet History, Standards and Administration.

Network Models: Protocol Layering, TCP/IP Protocol Suite, The OSI Model

Introduction to Physical Layer: Data and Signals, Transmission Impairment, Data Rate Limits, Performance.

Transmission Media: Introduction, Guided Media, Unguided Media, Switching: Introduction, Circuit Switched Networks, Packet Switching

#### UNIT - II

#### The Data Link Layer

9 Hrs

The Data Link Layer: Introduction, Link layer addressing, Error detection and Correction: Cyclic codes, Checksum, Forward error correction, Data link control: DLC Services, Data link layer protocols, HDLC, Point to Point Protocol.

Media Access control: Random Access, Controlled Access, Channelization, Connecting devices and virtual LANs: Connecting Devices.

#### UNIT - III

#### The Network Layer

8Hrs

The Network Layer: Network layer design issues, Routing algorithms, Congestion control algorithms, Quality of service, Internetworking.

The network layer in the Internet: IPV4 Addresses, IPV6, Internet Control protocol, OSPF, BGP, IP, ICMPv4, IGMP.

#### UNIT - IV

#### The Transport Layer

8 Hrs

The Transport Layer: The Transport Service, Elements of Transport Protocols, Congestion Control, The internet transport protocols: UDP, TCP, Performance problems in computer networks, Network performance measurement.

#### UNIT - V

#### The Application Layer

10Hrs

The Application Layer: Introduction, Client-Server Programming, WWW and HTTP, FTP, e-mail, TELNET, Secure Shell, Domain Name System, SNMP.

#### Textbooks:

1. "Data communications and networking", Behrouz A. Forouzan, Mc Graw Hill Education, 5th edition, 2012.
2. "Computer Networks", Andrew S. Tanenbaum, Wetherall, Pearson, 5th edition, 2010.

#### Reference Books:



1. Data Communication and Networks, Bhushan Trivedi, Oxford
2. “Internetworking with TCP/IP – Principles, protocols, and architecture - Volume 1, Douglas E. Comer, 5th edition, PHI
3. “Computer Networks”, 5E, Peterson, Davie, Elsevier.
4. “Introduction to Computer Networks and Cyber Security”, Chawan- Hwa Wu, Irwin, CRC Publications.
5. “Computer Networks and Internets with Internet Applications”, Comer.

**Online Learning Resources:**

npTEL videos

<b>List of COs</b>	<b>PO no. and keyword</b>	<b>Competency Indicator</b>	<b>Performance Indicator</b>
CO1	PO1. Engineering knowledge	1.3	1.3.1
CO2	PO2. Problem Analysis	2.2	2.2.2
CO3	PO1. Engineering knowledge	1.3	1.3.1
CO4	PO1. Engineering knowledge	1.4	1.4.1
CO5	PO2. Problem Analysis	2.1	2.1.1

<b>Course Code</b>	<b>Object Oriented Programming through Java (Common to : CSE, CIC, AIM, AID)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20APC3609		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Pre-requisite</b>	<b>NIL</b>	<b>Semester</b>		<b>II-II</b>	

### Course Objectives:

At the end of the course, the students will be able to:

- To understand object oriented programming concepts, and apply them in solving Problems.
- To introduce the principles of inheritance and polymorphism and implementation of packages and interfaces.
- To learn java's exception handling mechanism, String Handling Methods.
- To introduce the concepts of multithreading and Collection Framework and internet programming using applets.
- To introduce the design of Graphical User Interface using AWT and swing controls.

### Course Outcomes (CO):

- Understanding the Syntax, Semantics and features of Java Programming Language.
- To gain knowledge on Object Oriented Programming concepts.
- Design the method of creating Multi-threading programs and handle exceptions.
- Understanding the concepts of java Collection Framework, Applets.
- Ability to create GUI applications & perform event handling.

### UNIT - I

9Hrs

**Object Oriented Thinking:** History of Java, Java Buzzwords, Overview of OOP CLASSES AND **Objects:** Classes, Objects, Simple Java Program, Methods, Constructors, this Keyword, Garbage Collection, Data Types, Variables, Arrays, Operators, Control Statements Overloading of Methods and Constructors, Parameter Passing, Recursion, String Class and String handling methods.

### UNIT - II

9 Hrs

**Inheritance:** Inheritance Basics, Using Super, Multilevel Hierarchy, Method Overriding, Dynamic Method Dispatch, Abstract Classes, Using final with Inheritance, Object Class.

**Packages:** Packages, Access Protection, Importing Packages.

**Interfaces:** Defining an Interface, Implementing Interface, Applying Interface, Variables in Interfaces, Interfaces can be extended.

### UNIT - III

8Hrs

**Exception Handling:** Exception Handling Fundamentals, Exception Types, Uncaught Exceptions, Using try and catch, Multiple catch Clauses, Nested try Statements, throw, throws, finally, Java's Built in Exceptions, Creating Own Exception Sub Classes.

**Input and Output Operations:** I/O basics, reading console input, writing console output, the PrintWriter class, reading and writing files, automatically closing a file.

**Generic Programming** — Generic classes — generic methods — Bounded Types — Restrictions and Limitations.

### UNIT - IV

8 Hrs

**Multithreading:** Java Thread Model, The Main Thread, Thread Life Cycle, Creating Thread and Multiple Threads, isAlive() and join(), Thread Priorities, Synchronization, Inter thread Communication, Suspending, Resuming and Stopping Threads.

**Collection Framework:** Collection Overview, Collection Interfaces: The Collection Interface, the List Interface, the Queue Interface, Collection Classes: Array List Class, Linked List Class, String Tokenizer, Scanner.

### UNIT - V

10Hrs

**Applets:** Applet Basics, Life Cycle of an Applet, Simple Applet Display Methods, The HTML APPLET tag, Passing Parameters to Applets.

**Swing:** Introduction to Swing Model-View-Controller design pattern button, layout management, Swing Components.

**Textbooks:**

1. Herbert Schildt. Java. The complete reference, TMH. 9<sup>th</sup> Edition.
2. Cay. S. Horstmann and Gary Cornell Core Java 2, Vol 2, Advanced Features, Pearson Education, 7<sup>th</sup> Edition, 2004

**Reference Books:**

1. J.Nino and F.A. Hosch, An Introduction to programming and OO design using Java, JohnWiley&sons.
2. Y. Daniel Liang, Introduction to Java programming, Pearson Education 6<sup>th</sup> Edition
3. R.A. Johnson- Thomson, An introduction to Java programming and object oriented application development,
4. Cay.S.Horstmann and GaryCornell Core Java 2, Vol 2, AdvancedFeatures, PearsonEducation, 7<sup>th</sup> Edition,
5. P. Radha Krishna, Object Oriented Programming through Java, University Press.

**Online Learning Resources:**

[www.javatpoint.com](http://www.javatpoint.com)

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO1	PO1: Understand Basics of concepts	1.4	1.4.1
CO2	PO1: Demonstrate competence in engineering fundamentals	1.3	1.3.1
CO3	PO3: Demonstrate an ability to generate a diverse set of alternative design solutions	3.2	3.2.1
CO4	PO1: Understand Basics of concepts	1.4	1.4.1
CO5	PO5: ability to identify / create modern engineering tools, techniques and resources	5.1	5.1.2

<b>Course Code</b>	<b>Operating Systems (Common to : CSE, CIC, AIM, AID)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>20APC3611</b>		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Pre-requisite</b>	<b>Basics of CO and DBMS</b>	<b>Semester</b>			<b>II-II</b>

### Course Objectives:

The course is designed to

- To understand the basic concepts and functions of operating systems.
- To understand Processes and Threads.
- To analyze Scheduling algorithms.
- To understand the concept of Deadlocks.
- To analyze various memory management schemes.
- To understand I/O management and File systems.

### Course Outcomes (CO):

After completion of the course, students will be able to

- Distinguish between the different types of operating system environments.
- Apply the concepts of process synchronization & CPU scheduling
- Develop solutions to deadlock and memory management
- Analyze various disk scheduling algorithms and file system interfaces
- Analyze the various security issues and goals of protection

UNIT - I      **Operating Systems Overview, System Structures, Processes**      8Hrs

**Operating Systems Overview:** Operating system functions, Operating system structure, operating systems Operations, protection and security, Computing Environments, Open- Source Operating Systems

**System Structures:** Operating System Services, User and Operating-System Interface, systems calls, Types of System Calls, system programs, operating system structure, operating system debugging, System Boot.

**Processes:** Process concept, process Scheduling, Operations on processes, Inter process Communication, Examples of IPC systems.

UNIT - II      **Threads, Process Synchronization, CPU Scheduling**      10Hrs

**Threads:** overview, Multicore Programming, Multithreading Models, Thread Libraries, Implicit Threading, Threading Issues.

**Process Synchronization:** The critical-section problem, Peterson's Solution, Synchronization Hardware, Mutex Locks, Semaphores, Classic problems of synchronization, Monitors, Synchronization examples, Alternative approaches.

**CPU Scheduling:** Scheduling-Criteria, Scheduling Algorithms, Thread Scheduling, Multiple-Processor Scheduling, Real-Time CPU Scheduling, Algorithm Evaluation.

UNIT - III      **Memory Management, Virtual memory, Deadlocks**      Lecture 8Hrs

**Memory Management:** Swapping, contiguous memory allocation, segmentation, paging, structure of the page table.

**Virtual memory:** demand paging, page-replacement, Allocation of frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory

**Deadlocks:** System Model, deadlock characterization, Methods of handling Deadlocks, Deadlock prevention, Detection and Avoidance, Recovery from deadlock.

UNIT - IV      **Mass-storage structure, File system Interface, File system Implementation**      Lecture 9Hrs

**Mass-storage structure:** Overview of Mass-storage structure, Disk structure, Disk attachment, Disk scheduling, Swap-space management, RAID structure, Stable-storage implementation.

**File system Interface:** The concept of a file, Access Methods, Directory and Disk structure, File system mounting, File sharing, Protection.

**File system Implementation:** File-system structure, File-system Implementation, Directory Implementation, Allocation Methods, Free-Space management.

**UNIT - V I/O systems, Protection, Security**

Lecture 8Hrs

**I/O systems:** I/O Hardware, Application I/O interface, Kernel I/O subsystem, Transforming I/O requests to Hardware operations.

**Protection:** Goals of Protection, Principles of Protection, Domain of protection, Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems, Language – Based Protection

**Security:** The Security problem, Program threats, System and Network threats, Cryptography as a security tool, User authentication, Implementing security defenses, Firewalling to protect systems and networks, Computer–security classifications.

**Textbooks:**

1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Wiley , Eight Edition, 2014.

**Reference Books:**

1. Operating systems by A K Sharma, Universities Press,
2. Operating Systems, S.Haldar, A.A.Aravind, Pearson Education.
3. Modern Operating Systems, Andrew S Tanenbaum, Second Edition, PHI.
4. Operating Systems, A.S.Godbole, Second Edition, TMH.
5. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.
6. Operating Systems, G.Nutt, N.Chaki and S.Neogy, Third Edition, Pearson Education.
7. Operating Systems, R.Elmasri, A,G.Carrick and D.Levine, Mc Graw Hill.
8. Principles of Operating Systems, B.L.Stuart, Cengage learning, India Edition.
9. Operating System Desgin, Douglas Comer, CRC Press, 2nd Edition.

**Online Learning Resources:**

<https://nptel.ac.in/courses/106/106/106106144/http://peterindia.net/OperatingSystems.html>

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO1	PO3. Design/development of solutions	3.1 & 3.3	3.1.6 & 3.3.1
CO2	PO3. Design/development of solutions	3.1	3.1.6
CO3	PO2. Problem Analysis	2.2	2.2.1 & 2.1.3
CO4	PO5. Modern tool usage	5.1	5.1.1
CO5	PO2. Problem Analysis	2.1, 2.2	2.1.3 & 2.2.1

<b>Course Code</b>	<b>Managerial Economics And Financial Analysis (Common to : CSE, CIC, AIM, AID)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>20AHSMB01</b>		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Pre-requisite** NIL **Semester** II-II

### Course Outcomes (CO):

After completion of this course, the student will able,

- Understand the fundamentals of Economics and Managerial economics viz., Demand, Production, cost, revenue and markets.
- Apply the Concept of Production cost and revenues for effective Business decision
- Analyze how to invest their capital and maximize returns.
- Evaluate the capital budgeting techniques.
- Define the concepts related to financial accounting and management and able to develop the Accounting statements and evaluate the financial performance of business entity.

UNIT - I **Managerial Economics** 8Hrs

Introduction – meaning, nature, significance, functions, and advantages, ME and its role in other fields. Demand - Concept, Function, Law of Demand - Demand Elasticity- Types – Measurement. Demand Forecasting- Factors governing forecasting, Methods.

UNIT - II **Production and Cost Analysis** 10Hrs

Introduction – Nature, meaning, significance, functions and advantages. Production Function– Least-cost combination– Short run and Long run Production Function- Isoquants and Isocosts, MRTS - Cobb-Douglas Production Function - Laws of Returns - Internal and External Economies of scale. Cost & Break-Even Analysis - Cost concepts and Cost behavior- Break-Even Analysis (BEA) - Determination of Break-Even Point (Simple Problems)-Managerial significance and limitations of Break-Even Analysis.

UNIT - III **Business Organizations and Markets** Lecture 8Hrs

Introduction – Nature, meaning, significance, functions and advantages. Forms of Business Organizations- Sole Proprietary - Partnership - Joint Stock Companies - Public Sector Enterprises. Types of Markets - Perfect and Imperfect Competition - Features of Perfect Competition Monopoly- Monopolistic Competition–Oligopoly- Price-Output Determination - Pricing Methods and Strategies.

UNIT - IV **Capital Budgeting** Lecture 9Hrs

Introduction to Capital, Sources of Capital. Short-term and Long-term Capital : Working capital, types, Estimating Working capital requirements. Capital Budgeting – Features, Proposals, Time value of money. Methods and Evaluation of Projects – Pay Back Method, Accounting Rate of Return (ARR), Net Present Value (NPV), and Internal Rate Return (IRR) Method (simple problems).

UNIT - V **Financial Accounting and Analysis** Lecture 8Hrs

Introduction – Nature, meaning, significance, functions and advantages. Concepts and Conventions- Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profitand Loss Account and Balance Sheet with simple adjustments). **Financial Analysis** - Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability.

#### Textbooks:

1. Varshney&Maheswari: Managerial Economics, Sultan Chand, 2013.
2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH, 2019

#### Reference Books:

1. Ahuja HI Managerial economics Schand,3/e,2013
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International, 2013.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi.
4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage, 2013.

#### Online Learning Resources:

<https://www.slideshare.net/123ps/managerial-economics-ppt> <https://www.slideshare.net/rossanz/production-and-cost-45827016> <https://www.slideshare.net/darkyla/business-organizations-19917607> <https://www.slideshare.net/balarajbl/market-and-classification-of-market>

<https://www.slideshare.net/ruchi101/capital-budgeting-ppt-59565396>  
<https://www.slideshare.net/ashu1983/financial-accounting>.

<b>List of Cos</b>	<b>PO no. and keyword</b>	<b>Competency Indicator</b>	<b>Performance Indicator</b>
CO1	PO 1: Engineering knowledge	1.2	1.2.1
CO2	PO 1: Engineering knowledge	1.2	1.2.1
CO3	PO 1: Engineering knowledge PO 6: The engineer and society	1.2 6.2	1.2.1 6.2.1
CO4	PO 11: Project management and finance	11.2	11.2.1
CO5	PO 11: Project management and finance	11.1	11.1.2

<b>Course Code</b>	<b>Universal Human Values (Common to : CSE, CIC, AIM, AID)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20AHS9905		<b>3</b>	<b>1</b>	<b>0</b>	<b>3</b>
<b>Pre-requisite</b>	<b>NIL</b>	<b>Semester</b>			<b>II-II</b>

**Course Objectives :**

- Development of a holistic perspective based on self-exploration about themselves (human being), family, society and nature/existence.
- Understanding (or developing clarity) of the harmony in the human being, family, society and nature/existence
- Strengthening of self-reflection.
- Development of commitment and courage to act.

**Course Outcomes (CO):**

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

- Students are expected to become more aware of themselves, and their surroundings (family, society, nature)
- They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
- They would have better critical ability.
- They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
- It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

**UNIT - I Course Introduction - Need, Basic Guidelines, Content and Process for Value Education 8Hrs**

- Purpose and motivation for the course, recapitulation from Universal Human Values-I
- Self-Exploration–what is it? - Its content and process; ‘Natural Acceptance’ and Experiential Validation- as the process for self-exploration
- Continuous Happiness and Prosperity- A look at basic Human Aspirations
- Right understanding, Relationship and Physical Facility- the basic requirements for fulfillment of aspirations of every human being with their correct priority
- Understanding Happiness and Prosperity correctly- A critical appraisal of the current. scenario
- Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

**Include practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility (living in relationship, harmony and co-existence) rather than as arbitrariness in choice based on liking-disliking. .**

**UNIT - II Understanding Harmony in the Human Being - Harmony in Myself! 10Hrs**

- Understanding human being as a co-existence of the sentient ‘I’ and the material ‘Body’
- Understanding the needs of Self (‘I’) and ‘Body’ - happiness and physical facility
- Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer)
- Understanding the characteristics and activities of ‘I’ and harmony in ‘I’
- Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail
- Programs to ensure Sanyam and Health.

**Include practice sessions to discuss the role others have played in making material goods available to me. Identifying from one’s own life. Differentiate between prosperity and**



**accumulation. Discuss program for ensuring health vs dealing with disease.**

**UNIT - III      Understanding Harmony in the Family and Society-      Lecture 8Hrs**  
**Harmony in Human- Human Relationship.**

- Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfillment to ensure mutual happiness; Trust and Respect as the foundational values of relationship
- Understanding the meaning of Trust; Difference between intention and competence
- Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship
- Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals
- Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family

**Include practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students' lives**

**UNIT - IV      Understanding Harmony in the Nature and Existence -      Lecture 9Hrs**  
**Whole existence as Coexistence**

- Understanding the harmony in the Nature
- Interconnectedness and mutual fulfillment among the four orders of nature recyclability and self-regulation in nature
- Understanding Existence as Co-existence of mutually interacting units in all- pervasive space
- Holistic perception of harmony at all levels of existence. Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc.

**Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc.**

**UNIT - V      Implications of the above Holistic Understanding of      Lecture 8Hrs**  
**Harmony on Professional Ethics.**

- Natural acceptance of human values
- Definitiveness of Ethical Human Conduct
- Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
- Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems.
- Case studies of typical holistic technologies, management models and production systems
- Strategy for transition from the present state to Universal Human Order: a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers b. At the level of society: as mutually enriching institutions and organizations
- Sum up.

**Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions eg. To discuss the conduct as an engineer or scientist etc.**

**Textbooks:**

1. R R Gaur, R Asthana, G P Bagaria, “A Foundation Course in Human Values and Professional Ethics”, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93- 87034-47-1
2. R R Gaur, R Asthana, G P Bagaria, “Teachers’ Manual for A Foundation Course in Human Values and Professional Ethics”, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2

**Reference Books:**

1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amar kantik, 1999.
2. A. N. Tripathi, “Human Values”, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. Mohandas Karamchand Gandhi “The Story of My Experiments with Truth”
5. E. F.Schumacher. “Small is Beautiful”
6. Slow is Beautiful –Cecile Andrews
7. J C Kumarappa “Economy of Permanence”
8. Pandit Sunderlal “Bharat Mein Angreji Raj”
9. Dharampal, “Rediscovering India”
10. Mohandas K. Gandhi, “Hind Swaraj or Indian Home Rule”
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland(English)
13. Gandhi - Romain Rolland (English)

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO 1	<b>PO 7: Environment and sustainability :</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and the need for sustainable development	7.1	7.1.2
CO 2	<b>PO 7: Environment and sustainability :</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and the need for sustainable development	7.1	7.1.2
CO 3	<b>PO 8: Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice	8.1 8.2	8.1.1 8.2.2
CO 4	<b>PO 8: Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice	8.1 8.2	8.1.1 8.2.2
CO5	<b>PO 8: Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice	8.1 8.2	8.1.1 8.2.2

<b>Course Code</b>	<b>Computer Networks Lab (Common to : CIC, AIM, AID)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20APC3608		<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>
<b>Pre-requisite</b>	<b>C &amp; JAVA</b>	<b>Semester</b>			<b>II-II</b>

### Course Objectives:

This course is designed to:

- Understand the different types of networks
- Discuss the software and hardware components of a network
- Enlighten the working of networking commands supported by operating system
- Impart knowledge of Network simulator 2/3
- Familiarize the use of networking functionality supported by JAVA
- Familiarize with computer networking tools.

### Course Outcomes (CO):

Upon completion of the course, the students should be able to:

- Deal with Error detection/ correction techniques
- Learn about Data link layer protocols
- Learn about network layer protocols
- Able to get knowledge about simulator

### List of Experiments:

1. Implementation of Error Detection / Error Correction Techniques
2. Implementation of Stop and Wait Protocol and sliding window
3. Implementation and study of Go-back-N and selective repeat protocols
4. Implementation of High Level Data Link Control
5. Write a socket Program for Echo/Ping/Talk commands.
6. To create scenario and study the performance of network with CSMA / CA protocol and compare with CSMA/CD protocols.
7. Implementation of Link state routing algorithm
8. Implement the data link layer framing methods such as character, character-stuffing and bitstuffing.
9. Write a program to compute CRC code for the polynomials CRC-12, CRC-16 and CRC CCIP
10. Develop a simple data link layer that performs the flow control using the sliding window protocol, and loss recovery using the Go-Back-N mechanism.
11. Implement Dijkstra's algorithm to compute the shortest path through a network
12. Take an example subnet of hosts and obtain a broadcast tree for the subnet.
13. Implement distance vector routing algorithm for obtaining routing tables at each node.
14. Write a program for congestion control using Leaky bucket algorithm.
15. Do the following using NS2 Simulator
  - a. NS2 Simulator-Introduction
  - b. Simulate to Find the Number of Packets Dropped
  - c. Simulate to Find the Number of Packets Dropped by TCP/UDP
  - d. Simulate to Find the Number of Packets Dropped due to Congestion
  - e. Simulate to Compare Data Rate & Throughput.
  - f. Simulate to Plot Congestion for Different Source/Destination
  - g. Simulate to Determine the Performance with respect to Transmission of Packets

### References:

1. Shivendra S.Panwar, Shiwen Mao, Jeong-dong Ryoo, and Yihan Li, “TCP/IP Essentials A Lab-Based Approach”, Cambridge University Press, 2004.
2. Cisco Networking Academy, “CCNA1 and CCNA2 Companion Guide”, Cisco Networking Academy Program, 3rd edition, 2003.
3. Ns Manual, Available at: <https://www.isi.edu/nsnam/ns/ns-documentation.html>, 2011.
4. Elloitte Rusty Harold, “Java Network Programming”, 3rd edition, O’REILLY, 2011.

**Online Learning Resources/Virtual Labs:**

<http://www.edx.org>

<b>List of Cos</b>	<b>PO no. and keyword</b>	<b>Competency Indicator</b>	<b>Performance Indicator</b>
CO1	PO4. Conduct investigations of complex problems	4.1	4.1.1
CO2	PO 1: Engineering knowledge	1.3	1.3.1
CO3	PO 1: Engineering knowledge	1.3	1.3.1
CO4	PO 1: Engineering knowledge	1.3	1.3.1

<b>Course Code</b>	<b>Object Oriented Programming through Java Lab (Common to : CSE, CIC, AIM,AID)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20APC3610		<b>0</b>	<b>0</b>	<b>3</b>	<b>1.5</b>

**Pre-requisite**

**NIL**

**Semester**

**II-II**

### Course Objectives:

- To experiment with the syntax and semantics of java language and gain experience with java programming
- Learn to use object orientation to solve problems and use java language to implement them.

### Course Outcomes (CO):

- Demonstrate java compiler and eclipse platform and learn how to use net beans IDE to create java application
- Ability to create user friendly interfaces
- Ability to solve the problem using object oriented approach and design solutions which are robust
- Implement exception handling and Templates

### List of Experiments:

#### Week-1: (Unit-1)

Installation of Java software, study of any integrated development environment, Use Eclipse or Net bean platform and acquaint with the various menus. Create a test project, add a test class and run it.

Practice Java Basic Programs on Classes and Objects.

#### Week-2: (Unit-1)

Develop a Java application to generate Electricity bill. Create a class with the following members: Consumer no., consumer name, previous month reading, current month reading, type of EB connection (i.e domestic or commercial). Compute the bill amount using the following tariff.

If the type of the EB connection is domestic, calculate the amount to be paid as follows:

First 100 units - Rs. 1 per unit; 101-200 units - Rs. 2.50 per unit; 201 -500 units - Rs. 4 per unit;

501 units - Rs. 6 per unit. If the type of the EB connection is commercial, calculate the amount to be paid as follows: First 100 units - Rs. 2 per unit; 101-200 units - Rs. 4.50 per unit; 201 -500 units - Rs. 6 per unit; > 501 units - Rs. 7 per unit.

Write a java program to illustrate the concept of class with method overloading. C) Write a java program to illustrate the concept of class with Constructors overloading.

#### Week-3:(Unit-2)

a) Write a program to create a class named shape. It should contain 2 methods, draw() and erase() that prints "Drawing Shape" and "Erasing Shape" respectively. For this class, create three sub classes, Circle, Triangle and Square and each class should override the parent class functions - draw () and erase (). The draw() method should print "Drawing Circle", "Drawing Triangle" and "Drawing Square" respectively. The erase() method should print "Erasing Circle", "Erasing Triangle" and "Erasing Square" respectively. Create objects of Circle, Triangle and Square in the following way and observe the polymorphic nature of the class by calling draw() and erase() method using each object. Shape c=new Circle(); Shape t=new Triangle(); Shape s=new Square();

b) Write a Java Program to demonstrate inheritance & usage of super

#### Week-4:(Unit-2)

Write a Java Program to implement multilevel inheritance.

Write a Java program to implement the method overriding

Write a Java program to implement dynamic method dispatch.

#### Week-5:(Unit-2)

Write a Java program to implement abstract class.

Write a Java Program to implement Packages.

Write a Java Program to implement Access Protection in Packages.

**Week-6:(Unit-2)**

Write a Java program to demonstrate interfaces.

Write a Java program to implement the multiple inheritance using interfaces.

**Week-7:(Unit-3)**

Write a Java program to implement the exception handling mechanism.

Write a Java program to implement the nested try statement.

Write a Java program to implement your own exception class.

**Week-8:(Unit-3)**

Write a Java Program to demonstrate the following String Handlings.

String Length& Concatenation.

Character Extraction.

String Comparison.

Searching and modifying String.

Write a Java Program to demonstrate String Buffer Class.

**Week-9:(Unit-4)**

Write a Java program for multi-thread implementation.

Write a Java program to implement producer consumer problem using inter-thread communication mechanism.

**Week-10:(Unit-4)**

Practice any two Programs on Collections.

Practice any two Programs on String Tokenizer & Scanner.

**Week-11:(Unit-5)**

Write a Java Program to develop an applet that displays a simple message.

Develop an applet that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named —Compute! is clicked.

Write a java program to handle keyboard events.

Write a java program to handle Mouse events

**Week-12:(Unit-5)**

Write a Java Program to demonstrate AWT Label & Button.

Write a Java Program to demonstrate JLabel, JTextField & JButton.

Write a program to design a calculator using event driven programming paradigm of java

**References:**

1. Herbert Schildt.Java. The complete reference, TMH. 9<sup>th</sup>Edition.
2. H.M. Dietel and P.J. Dietel, Java How to Program 6<sup>th</sup>Edition,PearsonEducation/PHI
3. Y.DanielLiang, Introduction to Java programming, Pearson Education, 6<sup>th</sup>Edition.
4. Cay Horstmann, Big Java, 2<sup>nd</sup>edition, Wiley Student Edition, Wiley India Private Limited.

Online Learning Resources/Virtual Labs:

<http://www.javatpoint.com>

List of CO's	PO no. and keyword	Competency Indicator	Performance Indicator
CO1	PO1: Apply the knowledge of mathematics	1.1	1.1.1
CO2	PO1:Apply the knowledge of mathematics	1.1	1.1.1
CO3	PO2:Analyse complex engineering problems	2.1	2.1.3
CO4	PO2:Analyse complex engineering problems	2.4	2.4.1

<b>Course Code</b>	<b>Operating Systems Lab (Common to : CSE, CIC, AIM, AID)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20APC3612		<b>0</b>	<b>0</b>	<b>3</b>	<b>1.5</b>
<b>Pre-requisite</b>	<b>Basics of CO and DBMS</b>	<b>Semester</b>		<b>II-II</b>	

**Course Objectives:**

- To understand the design aspects of operating system
- To solve various synchronization problems

**Course Outcomes (CO):**

After completion of the course, students will be able to

- Ensure the development of applied skills in operating systems related areas.
- Able to write software routines modules or implementing various concepts of operating system.

**List of Experiments:**

1. Practicing of Basic UNIX Commands.
2. Write programs using the following UNIX operating system calls Fork, exec, getpid, exit, wait, close, stat, opendir and readdir
3. Simulate UNIX commands like cp, ls, grep, etc.,
4. Simulate the following CPU scheduling algorithms
  - a) Round Robin b) SJF c) FCFS d) Priority
5. Simulate all file allocation strategies
  - a) Sequential b) Indexed c) Linked
6. Simulate MVT and MFT
7. Simulate all File Organization Techniques
  - a) Single level directory b) Two level c) Hierarchical d) DAG
8. Simulate Bankers Algorithm for Dead Lock Avoidance
9. Simulate Bankers Algorithm for Dead Lock Prevention
10. Simulate all page replacement algorithms
  - a) FIFO b) LRU c) LFU Etc. ...
11. Simulate Paging Technique of memory management
12. Control the number of ports opened by the operating system with
  - a) Semaphore b) monitors
13. Simulate how parent and child processes use shared memory and address space
14. Simulate sleeping barber problem
15. Simulate dining philosopher's problem
16. Simulate producer and consumer problem using threads (use java)
17. Simulate little's formula to predict next burst time of a process for SJF scheduling algorithm.
18. Develop a code to detect a cycle in wait-for graph
19. Develop a code to convert virtual address to physical address
20. Simulate how operating system allocates frame to process
21. Simulate the prediction of deadlock in operating system when all the processes announce their resource requirement in advance.

**References:**

1. "Operating System Concepts", Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Eighth edition, John Wiley.
2. "Operating Systems: Internals and Design Principles", Stallings, Sixth Edition– 2009, Pearson Education
3. "Modern Operating Systems", Andrew S Tanenbaum, Second Edition, PHI.
4. "Operating Systems", S.Haldar, A.A.Aravind, Pearson Education.
5. "Principles of Operating Systems", B.L.Stuart, Cengage learning, India Edition.2013-2014

6.“Operating Systems”, A.S.Godbole, Second Edition, TMH.

7.“An Introduction to Operating Systems”, P.C.P. Bhatt, PHI.

Online Learning Resources/Virtual Labs:

<https://www.cse.iitb.ac.in/~mythili/os/>

<http://peterindia.net/OperatingSystems.html>

<b>List of COs</b>	<b>PO no. and keyword</b>	<b>Competency Indicator</b>	<b>Performance Indicator</b>
CO1	PO3. Design/development of solutions	3.3	3.3.1
CO2	PO5. Modern tool usage	5.1	5.1.1





<b>Course Code</b>	<b>Server Side Scripting</b> <b>(Common to : CSE, CIC, AIM, AID)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
20ASC3602		<b>1</b>	<b>0</b>	<b>2</b>	<b>2</b>
<b>Pre-requisite</b>	<b>NIL</b>	<b>Semester</b>			<b>II-II</b>

**Course Objectives:**

- To learn about PHP with database connectivity
- To know about server side programming
- To gain the Knowledge of XML and its applications

**Course Outcomes (CO):**

- Learn the installation guide of MY SQL,XAMP,APACHE and PHP
- Able to design code for simple dynamic web pages
- Design PHP and MySQL Integration.
- Design Basic Projects like Creating an Online Address Book - Creating a Simple Discussion Forum etc.
- Able to provide protection to web server

**UNIT - I                      Getting Up and Running, PHP Language Structure                      10 Hrs**

Getting Up and Running: Installation Quick Start Guide with XAMPP5 - Installing and Configuring MySQL - Installing and Configuring Apache - Installing and Configuring PHP - PHP Language Structure: The Building Blocks of PHP - Flow Control Functions in PHP - Working with Functions - Working with Arrays - Working with Objects

1. Installation of XAMPP server
2. Write PHP code to print Hello World program
3. Demonstrate 8 basic data types in PHP.
4. Demonstrate the scope of variables declared in PHP code.
5. Demonstrate Arithmetic, Comparison, Logical (or Relational), Assignment and Conditional (or ternary) Operators.
6. Demonstrate if, elseif ...else and switch statements.
7. Demonstrate for, while, do – while, and for each loop.
8. Write code to create and access numeric arrays.
9. Demonstrate the usage of associative arrays.
10. Implement Multi-dimensional arrays
11. Create a multidimensional array of movies organized by genre. This should take the form of an associative array with genres as keys, such as Science Fiction, Action, Adventure, and so forth. Each of the array’s elements should be an array containing movie names, such as Alien, Terminator 3, Star Wars, and so on. After creating your arrays, loop through them, printing the name of each genre and its associated movies.
12. Create a function that accepts four string variables and returns a string that contains an HTML table element, enclosing each of the variables in its own cell.
13. Create a class called baseCalc() that stores two numbers as properties. Next, create a calculate() method that prints the numbers to the browser.
14. Create classes called addCalc(), subCalc(), mulCalc(), and divCalc() that inherit functionality from baseCalc() but override the calculate() method and print appropriate totals to the browser.

**UNIT - II                      Getting Involved with the Code                      10 Hrs**

Working with Strings, Dates, and Time - Working with Forms - Working with Cookies and User Sessions - Working with Files and Directories - Working with Images

1. Create a feedback form that accepts a user’s full name and an email address. Use case-conversion functions to capitalize the first letter of each name the user submits and print the result back to the browser. Check that the user’s email address contains the @ symbol and print a warning otherwise.
2. Create an array of doubles and integers. Loop through the array, converting each element to a floating-point number with a precision of 2. Right-align the output within a field of 20 characters.
3. Create a birthday countdown script. Given form input of month, day, and year, output a message that tells the user how many days, hours, minutes, and seconds until the big day.
4. Create a calculator script that enables the user to submit two numbers and choose an

operation (addition, multiplication, division, or subtraction) to perform on them.

5. Use hidden fields with the script you created in activity 1 to store and display the number of requests that the user submitted.
6. Create a script that uses session functions to track which pages in your environment the user has visited.
7. Create a new script that will list for the user all the pages he/she has visited within your environment, and when.
8. Create a form that accepts a user's first and second name. Create a script that saves this data to a file.
9. Create a script that reads the data file you created in the first activity. In addition to writing its contents to the browser (adding a tag to each line), print a summary that includes the number of lines in the file and the file's size.
10. Draw a New Image, shapes and lines.
11. Create a New Image with Color Fills.
12. Draw A Basic Pie Chart and 3D Pie Chart
13. Creating a New Image from an Existing Image.
14. Creating an Image from User Input.
15. Creating an Image with Custom Font and Text

### **UNIT - III                      PHP with database connectivity                      10 Hrs**

Understanding the Database Design Process - Learning Basic SQL Commands - Using Transactions and Stored Procedures in MySQL - Interacting with MySQL Using PHP

1. to open and close a database connection.
2. to select a database. to select a database.
3. to create a table
4. to drop a database.
5. to drop a table
6. to insert record into employee table.
7. take input using HTML Form and insert records into table.
8. to display all the records from employee table.
9. to display all the records from employee table using `mysql_fetch_assoc()` function.
10. to display all the records from employee table using `MYSQL_NUM` argument.
11. to release cursor memory at the end of `SELECT` statement.
12. to display 10 records per page.
13. to take user input of employee ID and update employee salary.
14. to take user input of employee ID and delete an employee record from employee table.
15. Use `SELECT INTO OUTFILE` query for creating table backup.

### **UNIT - IV                      Basic Projects                      10 Hrs**

Managing a Simple Mailing List - Creating an Online Address Book - Creating a Simple Discussion Forum - Creating an Online Storefront - Creating a Shopping Cart Mechanism - Creating a Simple Calendar - Restricting Access to Your Applications - Logging and Monitoring Web Server Activity - Application Localization - Working with XML and JSON

1. Common Functions in an Included File
2. Subscribe and Unsubscribe with `manage.php`
3. Send Mail to Your List of Subscribers
4. Modify the `manage.php` script to display the user's email as part of the response message for any action that is taken.
5. Modify the `sendmymail.php` script to add additional form fields that will correspond to section headings in the message string itself. Remember that when the form is submitted, those strings will have to be concatenated into one message string that is sent to the `mail()` function.

### **UNIT - V                      Administration and Fine-Tuning                      5 Hrs**

Apache Performance Tuning and Virtual Hosting - Setting Up a Secure Web Server - Optimizing and Tuning MySQL - Performing Software Upgrades - Using Application Frameworks

**Textbooks:**

1. Sams Teach Yourself PHP, MySQL and Apache All in One, by Julie C. Meloni, Pearson Education, Inc © 2012.
2. Beginning PHP6, Apache, MySQL Web Development, by Timothy Boronczyk, Elizabeth Naramore,

**Reference Books:**

1. Jason Gerner, Yann Le Scouarnec, Jeremy Stolz, Michael K. Glass, Wiley Publishing, Inc © 2009
2. PHP 6 and MySQL 6 Bible, by Steve Suehring, Tim Converse, Joyce Park, Wiley Publishing, Inc © 2009.
3. PHP & MySQL Web Development All-in-One Desk Reference For Dummies, by Janet Valade with Tricia Ballard and Bill Ballard, Wiley Publishing, Inc © 2008.

**Online Learning Resources:**

www.nptelvideos.com, <https://www.tutorialspoint.com/php/>

<b>List of COs</b>	<b>PO no. and keyword</b>	<b>Competency Indicator</b>	<b>Performance Indicator</b>
CO1	PO2: Apply the knowledge of algorithms	2.1	2.1.1
CO2	PO1:Apply the knowledge of modules	2.1	2.1.1
CO3	PO1:Apply the knowledge to design database connection process	1.1	1.1.1
CO4	PO3: Design solutions for complex engineering problems	3.2	3.2.1
CO5	PO1:Apply the knowledge of modules	1.4	1.4.1