R19 COURSESTRUCTURE

B.Tech - INFORMATION TECHNOLOGY

Semester – 0
3 weeks Induction Program to be conducted at the beginning of the first year

Zero Semester

Induction program (mandatory)	3 weeks duration
Induction program for students to be offered at the start of the first year.	• Physical activity • Creative Arts • Universal Human Values • Literary • Proficiency Modules • Lectures by Eminent People • Visits to local Areas • Familiarization to Dept./Branch and Innovations

PRAGATI ENGINEERING COLLEGE
(AUTONOMOUS)
DEPARTMENT OF INFORMATION TECHNOLOGY

I Year – I SEMESTER

S.No.	Course Category	Course Code	Course Title	L	T	P	C
1	Humanities	19HE1T01	Professional Communicative English	3	-	-	3
2	Basic Sciences	19BM1T01	Linear Algebra and Differential Equations	3	-	-	3
3	Basic Sciences	19BP1T02	Applied Physics	3	-	-	3
4	Engineering Sciences	19CS1T01	Programming for Problem Solving using C	3	-	-	3
5	Engineering Sciences	19ME1T01	Engineering Drawing	1	-	3	2.5
6	Humanities	19HE1L01	Professional Communicative English Laboratory - I	-	-	3	1.5
7	Basic Sciences	19BP1L02	Applied Physics Laboratory	-	-	3	1.5
8	Engineering Sciences	19CS1L01	Programming for Problem Solving using C Laboratory	-	-	3	1.5
9	Mandatory Course	19HM1T05	Constitution of India	2	-	-	0
			Total Credits				**19**

I Year – II SEMESTER

S.No.	Course Category	Course Code	Course Title	L	T	P	C
1	Basic Sciences	19BM2T02	Numerical Methods and Multivariable Calculus	3	-	-	3
2	Basic Sciences	19BM2T03	Integral Transforms and Vector Calculus	3	-	-	3
3	Basic Sciences	19BC2T01	Applied Chemistry	3	-	-	3
4	Professional Core	19IT2T01	Data Structures	3	-	-	3
5	Engineering Sciences	19EE2T02	Basic Electrical and Electronics Engineering	3	-	-	3
6	Basic Sciences	19BC2L01	Applied Chemistry Laboratory	-	-	3	1.5
7	Professional Core	19IT2L01	Data Structures Laboratory	-	-	3	1.5
8	Engineering Sciences	19EE2L02	Basic Electrical and Electronics Engineering Laboratory	-	-	3	1.5
9	Humanities	19HE2L02	Professional Communicative English Laboratory - II	-	-	3	1.5
10	Mandatory Course	19BE2T01	Environmental Studies	2	-	-	0
			Total Credits				**21**

II Year – ISEMESTER

S.No.	Course Category	Course Code	Course Title	L	T	P	C
1	Basic Sciences	19BM3T04	Probability and Statistics	3	-	-	3
2	Professional Core	19CS3T03	Python Programming	3	-	-	3
3	Professional Core	19IT3T02	Database Management Systems	3	-	-	3
4	Professional Core	19IT3T03	Computer System Architecture	3	-	-	3
5	Professional Core	19IT3T04	Mathematical Foundations of Computer Science	3	-	-	3
6	Management	19HM3T01	Managerial Economics and Financial Analysis	3	-	-	3
7	Professional Core	19CS3L02	Python Programming Laboratory	-	-	3	1.5
8	Professional Core	19IT3L02	Database Management Systems Laboratory	-	-	3	1.5
9	Mandatory Course	19HM3T06	Essence of Indian Traditional Knowledge	2	--	--	0
			Total Credits				**21**

II Year– IISEMESTER

S.No.	Course Category	Course Code	Course Title	L	T	P	C
1	Professional Core	19CS4T05	Object Oriented Programming through Java	3	-	-	3
2	Professional Core	19IT4T05	Scripting Languages	3	-	-	3
3	Professional Core	19CS4T10	Software Engineering	3	-	-	3
4	Professional Core	19IT4T06	Operating Systems	3	-	-	3
5	Professional Core	19CS4T07	Formal Languages and Automata Theory	3	-	-	3
6	Professional Core	19CS4L04	Object Oriented Programming through Java Laboratory	-	-	3	1.5
7	Professional Core	19IT4L03	Scripting Languages Laboratory	-	-	3	1.5
8	Professional Core	19IT4L04	Unix Programming Laboratory	-	-	3	1.5
9	Mandatory Course	19IT4P01	Socially Relevant Activity*	-	-	-	0.5
10	Mandatory Course	19HM4T07	Professional Ethics and Human Values	2	--	--	0
			Total Credits				**20**

*15 hours in semester

III Year– I SEMESTER

S.No.	Course Category	Course Code	Course Title	L	T	P	C
1	Professional Core	19CS5T08	Computer Networks	3	-	-	3
2	Professional Core	19CS5T09	Web Application Development using J2EE	3	-	-	3
3	Professional Core	19CS5T20	Design and Analysis of Algorithms	3	-	-	3
4	Professional Core	19CS5T12	Data Warehousing and Data Mining	3	-	-	3
5	Professional Elective		**Professional Elective - I**	3	-	-	3
6	Professional Core	19CS5L05	Web Application Development using J2EE Laboratory	-	-	3	1.5
7	Professional Core	19CS5L08	OOAD with UML Laboratory	-	-	3	1.5
8	Professional Core	19CS5L06	Data Mining Laboratory	-	-	3	1.5
9	Professional Core	19IT5L06	DevOps Laboratory	-	-	3	1.5
10	Project Work	19IT5P02	Mini Project	-	-	2	1
11	Mandatory Course	19HM5T08	IPR and Patents	-	-	-	0
			Total Credits				**22**

III Year – II SEMESTER

S.No.	Course Category	Course Code	Course Title	L	T	P	C
1	Professional Core	19CS6T18	AI Tools and Techniques	3	-	-	3
2	Professional Core	19CS6T19	Mobile Computing	3	-	-	3
3	Professional Core	19IT6T08	Cryptography and Network Security	3	-	-	3
4	Professional Core	19IT6T09	Agile Methodologies	3	-	-	3
5	Professional Elective		**Open Elective - I**	3	-	-	3
6	Open Electives		**Professional Elective - II**	3	-	-	3
7	Professional Core	19CS6L07	AI Tools and Techniques Laboratory	-	-	3	1.5
8	Professional Core	19IT6L07	Cryptography and Network Security Laboratory	-	-	3	1.5
9	Mandatory Course	19IT6T10	MOOCs** / Industry Courses Approved by Department	-	-	-	0
			Total Credits				**21**

**Student can select the course of any discipline under MOOCs. However, agency will be decided by the respective BoS.

IV Year – I SEMESTER

S.No.	Course Category	Course Code	Course Title	L	T	P	C
1	Engineering Sciences	19EC7T10	Internet of Things	3	-	-	3
2	Professional Core	19IT7T11	Big Data Technologies	3	-	-	3
3	Open Elective		**Open Elective - II**	3	-	-	3
4	Professional Elective		**Professional Elective - III**	3	-	-	3
5	Professional Elective		**Professional Elective - IV**	3	-	-	3
6	Engineering Sciences	19EC7L11	Internet of Things Laboratory	-	-	3	1.5
7	Professional Core	19IT7L08	Big Data Technologies Laboratory	-	-	3	1.5
			Total Credits				**18**

IV Year– II SEMESTER

S.No.	Course Category	Course Code	Course Title	L	T	P	C
1	Management	19HM8T02	Management Science	3	-	-	3
2	Open Elective		**Open Elective - III**	3	-	-	3
3	Professional Elective		**Professional Elective - V**	3	-	-	3
4	Project Work	19IT8P03	Project Work	-	-	18	9
			Total Credits				**18**

L= Lecture   T=Tutorial   P=Practical   C=Credits

Professional Elective-I

19CS5T13	Advanced Data Structures
19CS5T14	NO SQL Databases
19IT5T07	Software Testing
19CS5T16	Functional Programming
19CS5T17	Computer Graphics

Professional Elective-II

19CS6T15	Ethical Hacking
19CS6T21	Data Science
19CS6T22	Ad-hoc and Sensor Networks
19CS6T11	Compiler Design
19CS6T24	Information Retrieval System

Professional Elective-III

19CS7T23	Mobile Application Development
19IT7T12	Machine Learning
19IT7T13	Blockchain Technology
19CS7T33	Cloud Computing
19CS7T31	Design Patterns

Professional Elective-IV

19CS7T26	Software Project Management
19CS7T32	Social Network Analysis
19CS7T30	Computer Vision
19IT7T14	High Performance Computing
19CS7T28	Cyber Security

Professional Elective-V

19IT8T15	SOA and Microservices
19IT8T16	Medical Image Processing
19CS8T35	Digital Forensics
19CS8T36	Server side Scripting Language
19CS8T37	Human Computer Interaction

Open Elective - I

19CE6T18	Environmental Impact Assessment and Management
19EE6T24	Energy Audit, Conversation and Management
19EC6T35	RFID, Sensors and Data Acquisition
19ME6T28	Industrial Robotics
19HE6T02	Soft Skills and Interpersonal Communication

Open Elective-II

19CE7T24	Waste Water Management
19EE7T36	Power Safety and Management
19EC7T31	Embedded Systems
19ME7T27	Mechatronics
19HM7T03	Entrepreneurship

Open Elective-III

19CE8T38	Remote Sensing and GIS
19EE8T12	Power Electronics
19EC8T33	Biomedical Instrumentation
19ME8T29	Supply Chain Management
19HM8T04	Marketing Management

Syllabus
I B.Tech I Semester

Professional Communicative English
(Common to CE, EEE, MECH, ECE, CSE & IT)

Course Category	Basic Sciences		Course Code	19HE1T01
Course Type	Theory		**L-T-P-C**	3 – 0 – 0 – 3
Prerequisites	LSRW + Vocabulary Synonyms, antonyms, Grammar.	**Internal Assessment**		40
		Semester End Examination		60
		Total Marks		100

COURSE OBJECTIVES	
1	Schumacher describes the education system by saying that it was mere training, something more than mere knowledge of facts. To develop extensive reading skill and comprehension for pleasure and profit.
2	The lesson centres on the pros and cons of the development of science and technology. To develop extensive reading skill and comprehension for pleasure and profit.
3	Depicts of the symptoms of Cultural Shock and the aftermath consequences. To develop extensive reading skill and comprehension for pleasure and profit.
4	Portrays the ways of living life in its true sense. To develop extensive reading skill and comprehension for pleasure and profit.
5	Supports the developments of technology for the betterment of human life. To develop extensive reading skill and comprehension for pleasure and profit.

COURSE OUTCOMES	
Upon successful completion of the course, the student will be able to:	
CO1	Emphasizes that the ultimate aim of education is to enhance wisdom and inspires the readers to serve their nation with their self-enrichment.
CO2	Enables the learners to promote peaceful co-existence and universal harmony in the society and empowers the learners to have initiation in innovation.
CO3	Imparts the students to manage different cultural shock due to globalization and to develop multiculturalism to appreciate diverse cultures and also motivates the learners to contribute to their nation.
CO4	Arouse the thought of life to lead in a well path by recognizing the importance of work besides enhancing their LSRW skills.
CO5	Inspires the learners at the advancement of software by the eminent personalities and motivates the readers to think and tap their innate talents.

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)

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

COURSE CONTENT

UNIT I	1. 'The Greatest Resource- Education" from Professional Communicative English. 2. 'War' from 'Panorama: A Course on Reading'
UNIT II	1. "A Dilemma" from Professional Communicative English. 2. "The Verger from 'Panorama: A Course on Reading"
UNIT III	1. "Cultural Shock": Adjustments to new Cultural Environments from Professional Communicative English. 2. "The Scarecrow from Panorama": A Course on Reading
UNIT IV	1. "The Secret of Work" from Professional Communicative English. 2. "A Village Lost to the Nation" from Panorama: A Course on Reading
UNIT V	1. "The Chief Software Architect" from Professional Communicative English. 2. "Martin Luther King and Africa" from Panorama: A Course on Reading.

TEXT BOOKS

1.	Professional Communicative English. Published by Maruthi Publishers.
2.	Panorama: A Course On Reading, Published by Oxford University Press India

REFERENCE BOOKS

1.	English Grammar And Composition – Wren & Martin
2.	Learner's English Grammar And Composition – N.D.V. Prasada Rao

WEB RESOURCES

1.	**Online Dictionaries:** https://dictionary.cambridge.org/ https://www.oxfordlearnersdictionaries.com/
2.	**Grammar:** https://www.oxfordlearnersdictionaries.com/grammar/ https://dictionary.cambridge.org/grammar/british-grammar/
3.	**Synonyms and Antonyms:** https://www.thesaurus.com/browse/search https://www.englishclub.com/vocabulary/synonyms-antonyms.htm

Linear Algebra and Differential Equations
(Common to CE, EEE, ME, ECE, CSE & IT)

Course Category	Basic Sciences		Course Code	19BM1T01
Course Type	Theory		L-T-P-C	3-0-0-3
Prerequisites	Basics of matrices, Differentiation, Integration		Internal Assessment Semester End Examination Total Marks	40 60 100

COURSE OBJECTIVES

1	The course is designed to equip the students with the necessary mathematical skills and techniques that are essential for an engineering course.
2	The skills derived from the course will help the student form a necessary base to develop analytic and design concepts.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:		Cognitive Level
CO1	solve systems of linear equations, determine the rank, find the eigenvalues and eigenvectors, diagonalization of a matrix.	K3
CO2	identify special properties of a matrix, such as positive definite, etc., and use this information to facilitate the calculation of matrix characteristics.	K2
CO3	solve first order differential equations and its applications	K3
CO4	solve the linear differential equations with constant coefficients by appropriate method	K3
CO5	find partial derivatives of multivariable functions and apply them to find extreme values of a function.	K3

K1: Remember, K2: Understand, K3: Apply, K4: Analyze, K5: Evaluate, K6: Create.

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	-	-	-	-	-	-	-	-	-
CO2	3	3	1	-	-	-	-	-	-	-	-	-
CO3	3	3	2	-	-	-	-	-	-	-	-	-
CO4	3	3	2	-	-	-	-	-	-	-	-	-
CO5	3	3	2	-	-	-	-	-	-	-	-	-

COURSE CONTENT

UNIT I	**Solving system of linear equations, Eigen Values and Eigen vectors** Rank of a matrix by echelon form and normal form – Solving system of homogeneous and non-homogeneous linear equations – Gauss elimination method for solving system of equations – Eigenvalues and Eigen vectors and their properties.
UNIT II	**Cayley-Hamilton Theorem and Quadratic forms** Cayley-Hamilton theorem (without proof) – Finding inverse and powers of a matrix by Cayley-Hamilton theorem – Reduction to diagonal form-Quadratic forms-nature of the quadratic form - reduction of quadratic form to canonical form by orthogonal transformation.
UNIT III	**Differential equations of first order and first degree** Linear – Bernoulli – Exact – Reducible to exact. **Applications:** Newton's Law of cooling – Law of natural growth and decay – Orthogonal trajectories.
UNIT IV	**Linear differential equations of higher order** Non-homogeneous equations of higher order with constant coefficients with RHS term of the typee^{ax}, sin ax, cos ax, polynomials in x^n, $e^{ax}V(x)$, $x^mV(x)$ - Method of Variation of parameters.
UNIT V	**Partial differentiation** Introduction – Homogeneous function – Euler's theorem – Total derivative – Chain rule – Generalized Mean value theorem for single variable (without proof) – Taylor's and Maclaurin's series expansion of functions of two variables – Jacobian – Functional dependence. **Applications:** Maxima and Minima of functions of two variables without constraints and Lagrange's method (with constraints).

TEXT BOOKS

1.	B.S.Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.
2.	Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India.

REFERENCE BOOKS

1.	Michael Greenberg, Advanced Engineering Mathematics, 9th edition, Pearson edn.
2.	Dean G. Duffy, Advanced engineering mathematics with MATLAB, CRC Press.
3.	Peter O'neil, Advanced Engineering Mathematics, Cengage Learning.
4.	Srimanta Pal, Subodh C.Bhunia, Engineering Mathematics, Oxford University Press.
5.	T.K.V. Iyengar et. al., Engineering Mathematics Volume I & III S Chand Publications.

WEB RESOURCES

1.	**UNIT I: Solving system of linear equations, Eigen Values and Eigen vectors** https://en.wikipedia.org/wiki/System_of_linear_equations https://en.wikipedia.org/wiki/Eigenvalues_and_eigenvectors

2.	**UNIT II: Cayley-Hamilton Theorem and Quadratic forms** https://www.math.hmc.edu/calculus/tutorials/eigenstuff/ https://en.wikipedia.org/wiki/Quadratic_form
3.	**UNIT III: Differential equations of first order and first degree** https://en.wikipedia.org/wiki/Differential_equation http://um.mendelu.cz/maw-html/index.php?lang=en&form=ode https://www.khanacademy.org/math/differential-equations/first-order-differential-equations
4.	**UNIT IV: Linear differential equations of higher order** https://en.wikipedia.org/wiki/Differential_equation http://um.mendelu.cz/maw-html/index.php?lang=en&form=ode https://nptel.ac.in/courses/122107037/20
5.	**UNIT V: Partial Differentiation** https://en.wikipedia.org/wiki/Partial_derivative https://www.whitman.edu/mathematics/calculus_online/section14.03.html

APPLIED PHYSICS
(Common to I-I ECE, CSE & IT)

Course Category	BASIC SCIENCES		**Course Code**	19BP1T02
Course Type	Theory		**L-T-P-C**	3 -0 -0-3
Prerequisites	Intermediate Physics	**Internal Assessment** **Semester End Examination** **Total Marks**	40 60 100	

COURSE OBJECTIVES	
1	Impart Knowledge of Physical Optics phenomena like Interference and Diffraction required to design instruments with higher resolution.
2	Understand the physics of Semiconductors and their working mechanism for their utility in Engineering applications.
3	Impart the knowledge of Dielectric and Magnetic materials with characteristic utility in appliances.

COURSE OUTCOMES		**Cognitive Level**
Upon successful completion of the course, the student will be able to:		
CO1	Analyze the optical applications using the concepts of Interference and diffraction.	K4
CO2	Apply the concepts of quantum mechanics for calculation of free quantum particle energies.	K3
CO3	Apply the basics of Laser Mechanism and fiber optics for the communications systems.	K3
CO4	Understand the electrical conductivities in semiconductors and study the types of semiconductors using Hall Effect.	K2
CO5	Understand the polarization phenomenon in dielectric materials and magnetic materials to study dependence on temperature and frequency response.	K2

K1: Remember, K2: Understand, K3: Apply, K4: Analyze, K5: Evaluate, K6: Create.

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	0	1	1										
CO2	2	2	0	1	0										
CO3	2	2	1	0	0										
CO4	3	2	2	0	0							1			
CO5	2	1	0	0	0										

COURSE CONTENT	
UNIT I	**WAVE OPTICS** **INTERFERENCE** Introduction-Principle of Superposition – Coherent Sources – Interference in parallel and non - parallel thin films (reflection geometry), Newton's rings & Applications. **DIFFRACTION** Introduction- Differences between Interference and Diffraction, Differences between Fresnel and Fraunhoffer diffraction Fraunhoffer diffraction in single slit (Qualitative), Fraunhoffer diffraction Double slit(Qualitative),Grating equation (analytical Treatment)-Rayleigh criterion of resolution and Resolving power of grating,
UNIT II	**QUANTUM MECHANICS** Introduction – Matter waves – de Broglie's hypothesis – Davisson-Germer experiment – G.P.Thomson experiment – Heisenberg's Uncertainty Principle –interpretation of wave function – Schrödinger Time Independent and Time Dependent wave equations – Particle in a potential box
UNIT III	**LASERS** Introduction-Characteristics–Spontaneous and Stimulated emission of radiation – population inversion - Pumping Mechanisms - Ruby laser – Helium Neon laser – Semiconductor laser– Applications **FIBER OPTICS:** Introduction- Structure of Optical Fiber – Total Internal Reflection-Numerical Aperture and Acceptance Angle-classification of Optical fibers- optical fiber communication system-Advantages of Optical fibers- Applications.
UNIT IV	**SEMICONDUCTOR PHYSICS** Introduction–Intrinsic semi conductors - density of charge carriers- Electrical conductivity – Fermi level – extrinsic semiconductors - p-type &n-type - Density of charge carriers -Hall effect- Hall coefficient - Applications of Hall effect
UNIT V	**DIELECTRICS** Introduction - Dielectric polarization– Dielectric Polarizability, Susceptibility and Dielectric constant-types of polarizations- Electronic Ionic and Orientational polarizations (qualitative) – Lorentz Internal field – Claussius-Mossoti equation -Applications of dielectrics. **MAGNETIC PROPERTIES** Introduction-Magnetic dipole moment-Magnetization-Magnetic susceptibility and permeability- Origin of permanent magnetic moment -Classification of Magnetic materials(Analytical)-Hysteresis-soft and hard magnetic materials & applications

TEXT BOOKS	
1.	"A Text book of Engineering Physics", M.N.Avadhanulu, P.G.Kshirsagar, S.Chand Publications.
2.	"Engineering Physics",M.R.Srinivasan, New Age international publishers.
3.	"Solid State Physics", SO Pilai, New Age international publishers

REFERENCE BOOKS	
1.	Kettles Introduction to Solid state Physics-Charles Kittel,Wiley India Edition
2.	Solid State Physics,AJ Dekker, I Edition,Macmillan Publishers India Private Limited

WEB RESOURCES	
1.	https://youtu.be/NVllY3LlNqc

	https://youtu.be/1TRdOjVpm-0 https://youtu.be/0tHcWDNCJ-o
2.	https://study.com/academy/lesson/the-de-broglie-hypothesis-definition-significance.html https://www.youtube.com/watch?v=uPvWlwOhCTo
3.	https://www.youtube.com/watch?v=fdS12EaXH3A http://folk.uio.no/ravi/cutn/cmp/band1.pdf
4.	https://www.electronics-tutorials.ws/diode/diode_1.html https://youtu.be/3csUvwZdsOg https://www.youtube.com/watch?v=_40dpUzzfhA
5.	https://youtu.be/TuvLv6SBO5s https://youtu.be/u0Qf9jVh2kc

Programming for Problem solving using C

(Common to CE, ME, EEE, ECE, CSE, IT)

Course Category	Engineering Science		Course Code	19CS1T01
Course Type	Theory		**L-T-P-C**	3-0-0-3
Prerequisites			**Internal Assessment**	40
			Semester End Examination	60
			Total Marks	100

COURSE OBJECTIVES

1	To impart adequate knowledge on the need of programming languages and problem solving techniques.
2	To develop programming skills using the fundamentals of C Language.
3	To enable effective usage of arrays, structures, functions, pointers and dynamic memory allocation.
4	To make use of file handling functions in programming.

COURSE OUTCOMES		Cognitive level
Upon successful completion of the course, the student will be able to:		
CO1	Apply the fundamentals of C Programming for Problem solving.	K3
CO2	Identify the appropriate Decision statement and Loops for a given Problem.	K2
CO3	Make use of Arrays and Strings to solve the problems in C.	K3
CO4	Apply the concepts of Functions and Pointers in Problem solving.	K3
CO5	Develop solutions for problems using Structures, Unions and Files.	K3

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	1	0	0	0	0	0	0	0	1	1	0
CO2	3	3	3	3	1	0	0	0	0	0	0	0	1	1	0
CO3	3	3	3	2	1	0	0	0	0	0	0	0	2	1	0
CO4	2	3	3	3	1	0	0	0	0	0	0	0	2	2	0
CO5	3	3	3	3	1	0	0	0	0	0	0	0	2	2	0

COURSE CONTENT	
UNIT I	**Introduction to Programming**–Introduction to Computer Software, Classification of Computer Software, Representation of Data – Bits and Bytes, Programming Languages – High and Low Level Languages, Generation of Programming Languages, Program Design Tools: Algorithms, Flowcharts, Pseudocode, Types of Errors, Testing & Debugging Approaches. **Introduction to C –** Structure of a C Program, Writing the First C Program, Header Files used in C Program, Compiling and Executing C Programs.
UNIT II	**Tokens in C:** Basic Data Types in C – Keywords, Identifiers, Variables, Constants, Input / Output statements in C, Operators in C, Precedence and Associativity Rules, Type Casting Types. **Decision Control**: Decision Control Statements: Conditional Branching Statements - if, if – else, nested if, if – else – if, and Switch – Case. **Basic Loop Structures**: Iterative Statements - for, while and do - while, Nested Loops, The 'Break', 'Continue', and 'goto' statements.
UNIT III	**Arrays:** Declaration and Initialization of Arrays, Accessing & Storing the elements of an Array, Operations on Arrays: Traversing, Inserting, Deleting, Searching, Two Dimensional Arrays: Declaring, Initializing, Accessing, Operations on Two Dimensional Arrays (Matrices), Applications of Arrays. **Strings:** String Fundamentals, String Input and Output, String Library Functions
UNIT IV	**Functions:** Function Declaration / Function Prototypes, Function Definition, Function Call (Call by Value), Passing Parameters to Functions, Return Statement, Storage Classes, Recursive Functions, Arrays as Function Arguments. **Pointers**: Declaring Pointer Variables, Pointer Arithmetic, Passing Arguments to Function using Pointers (Call by Reference), Pointers and Arrays, Pointer to Pointer, Dynamic Memory Allocation – Malloc, Calloc, Realloc, Free.
UNIT V	**Structures**: Introduction to Structures, Nested Structures, Array of Structures. **Unions:** Introduction, Array of Union Variables, Union inside Structure, Enumerated Data Types, Bit Fields. **Files**: Declaring, Opening, and Closing File, Reading from and Writing to Text Files.

TEXT BOOKS	
1.	Programming in C, Reema Thareja, 2nd Edition, Oxford University Press.
2.	The C programming Language, Dennis Richie and Brian Kernighan, Pearson Education

REFERENCE BOOKS	
1.	Programming in C – Ashok N.Kamthane, Amit Ashok Kamthane, 3rd Edition, Pearson.
2.	C Programming-A Problem Solving Approach, Forouzan, Gilberg, Cengage.
3.	Programming in C (A Practical Approach) – Ajay Mittal, First Edition, Pearson.

WEB RESOURCES	

1.	http://nptel.ac.in/courses/106104128/
2.	http://students.iitk.ac.in/programmingclub/course/#notes
3.	http://c-faq.com/~scs/cclass/cclass.html
4.	http://www.youtube.com/watch?v=b00HsZvg-V0&feature=relmfu
5.	http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-087-practical-programming-in-c-january-iap-2010/

ENGINEERING DRAWING
(Only for IT)

Course Category	Engineering Science		Course Code	19ME1T01
Course Type	Theory		**L-T-P-C**	1-0-3-2.5
Prerequisites			**Internal Assessment**	40
			Semester End Examination	60
			Total Marks	100

COURSE OBJECTIVES

1	To introduce the students to use drawing instruments and to draw polygons, Engineering Curves and Scales.
2	To introduce the students to use orthographic projections, projections of points and lines.
3	To make the students draw the projections of the planes.
4	To make the students draw the projections of the various types of solids.
5	To represent the object in 3D view through isometric views.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:	Cognitive Level*
CO1	Construct polygons, scales and engineering curves.	K3
CO2	Identify the position of points and lines with use of orthographic projections.	K3
CO3	Analyze the location and position of plane figures through orthographic projections.	K4
CO4	Analyze the location and position of solid bodies through orthographic projections.	K4
CO5	Develop 2D and 3D objects by converting their views.	K6

*K1- Remember, K2- Understand, K3- Apply, K4- Analyze, K5- Evaluate, K6- Create

Contribution of Course Outcomes towards achievement of Program Outcomes
(1 – Low, 2 - Medium, 3 – High)

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

COURSE CONTENT	
UNIT I	Introduction to Engineering Drawing. **Polygons:** Constructing regular polygons by general method. **Curves:** Parabola, Ellipse and Hyperbola by general methods tangent & normal for the curves. Cycloid and Involutes. **Scales:** Vernier and Diagonal scales.
UNIT II	**Orthographic Projections:** Introduction, importance of reference lines, projections of points in various quadrants. Projections of straight lines inclined to both the planes, determination of true lengths and angle of inclination.
UNIT III	**Projections of planes:** Regular planes perpendicular/parallel to one plane. Regular planes inclined to one plane and parallel to other, inclined to both the planes.
UNIT IV	**Projections of Solids:** Simple positions of Prisms, Pyramids, Cones and Cylinders. Solids inclined to both the planes.
UNIT V	**Isometric Projections:** Introduction, Conversion of isometric views to orthographic views, Conversion of orthographic views to isometric views. Introduction to AutoCAD (Demo only)

TEXT BOOKS	
1	Engineering Drawing by N.D. Bhatt, Chariot Publications, 56th Edition.
2	Engineering Drawing + AutoCad – K Venugopal, V. Prabhu Raja, New Age International (P) Limited (2008).

REFERENCE BOOKS	
1	Engineering Drawing by K.L.Narayana& P. Kannaiah, Scitech Publishers, 3rd Edition.
2	Engineering Graphics for Degree by K.C. John, PHI Publishers.
3	Engineering Graphics by PI Varghese, Mc Graw Hill Publishers, 2013.
4	Engineering Drawing by Basant Agarwal, Tata McGraw Hill Publishers, 2014.
5	B.V.R. Gupta & M. Raja Roy, Engineering Drawing, I.K. International Publishing House Pvt. Ltd., 2009.

WEB RESOURCES	
1	http://nptel.ac.in/courses/112103019/
2	http://www.me.umn.edu/courses/me2011/handouts/drawing/blanco-tutorial.html
3	https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/env_health_science_students/engineeringdrawing.pdf

Subject Code: 19HE1L01

<u>**Department of English**</u>

L	T	P	C
0	0	3	1.5

<u>**Professional Communicative English Lab – I**</u>
(For CE, EEE, ME, CSE & IT)

PRESCRIBED LAB MANUAL FOR SEMESTER I:

'**STRENGTHEN YOUR STEPS**: A Multimodal Course in Communication Skills' Published by Maruthi Publications.

Objectives:
To enable the students to learn the communication skills; listening, speaking, reading and writing.
Outcome:
The course enables the learner to acquire communication skills which will help the students to become successful in the competitive world.

The course content along with the study material is divided into six units.

UNIT 1:

Hello, I'm ……
Consonant Sounds

UNIT 2:

I would love to …. But,
Vowel Sounds

UNIT 3:

With your Permission, I would like to
Syllable and Accent

UNIT 4:

Why don't we……

Pronunciation and Rhythm

UNIT 5:

Could you please ……

Tones

UNIT-6:   Dialogues

APPLIED PHYSICS LABORATORY

(I-I ECE, CSE & IT)

Course Category	BASIC SCIENCES		Course Code	19BP1L02
Course Type	Lab		**L-T-P-C**	0 -0 -3-1.5
Prerequisites	Intermediate Physics	**Internal Assessment**		40
		Semester End Examination		60
		Total Marks		100

COURSE OBJECTIVES

1	The student will have exposure to various experimental skills which is essential for an Engineering student.
2	To gain practical knowledge by applying the experimental methods to correlate with the Theoretical Physics.
3	Apply the Analytical techniques and graphical analysis to the experimental data

COURSE OUTCOMES		**Cognitive Level**
Upon successful completion of the course, the student will be able to:		
CO1	Understand the basics of Interference, Diffraction in Physics using instruments like Spectrometer, Travelling microscope.	K2
CO2	Determine the Magnetic and Dielectric constants of materials.	K3
CO3	Apply the basics of Current Electricity and Semiconductors in engineering application	K3

*K1- Remember, K2- Understand, K3- Apply, K4- Analyze, K5- Evaluate, K6- Create

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2														
CO2	2														
CO3	2	2	2												

	COURSE CONTENT: (Any 10 of the following listed 12 experiments)
1.	Determination of wavelength of laser by diffraction grating.
2.	Determination of wavelength of a source-Diffraction Grating-Normal incidence.
3.	Newton's rings – Radius of Curvature of Plano - Convex Lens.
4.	Determination of thickness of a spacer using wedge film and parallel interference fringes.
5.	Magnetic field along the axis of a current carrying coil – Stewart and Gee's apparatus.
6.	Energy Band gap of a Semiconductor p - n junction.
7.	Characteristics of Thermistor – Temperature Coefficients
8.	Determination of dielectric constant by charging and discharging method
9.	Study the variation of B versus H by magnetizing the magnetic material (B-H curve).
10.	Dispersive power of diffraction grating.
11.	To Study the V-I Characteristics and determine the breakdown voltage of a Zener Diode
12.	Determination of Hall Voltage and Hall coefficients of a given semiconductor using Hall effect.

TEXT BOOKS

1.	Laboratory Manual of Engineering Physics,Dr.Y.AparnaandDr.K.Venkateswara Rao (V.G.S Publishers)

REFERENCE BOOKS

1.	College customized manual

WEB RESOURCES

1.	https://www.youtube.com/watch?v=h_hUBXz-G-Y
2.	https://youtu.be/dgxFFw_1gMo
3.	https://www.youtube.com/watch?v=v2B0QyW8XJ0
4.	https://www.youtube.com/watch?v=AYQLmFqFtlw
5.	https://youtu.be/toggy3WVxV4
6.	https://youtu.be/1CyFsGk-_l4

Programming for Problem solving using C Laboratory

(Common to CE, ME, EEE, ECE, CSE, IT)

Course Category	Engineering Science	**Course Code**	19CS1L01
Course Type	Laboratory	**L-T-P-C**	0-0-3-1.5
Prerequisites		**Internal Assessment**	40
		Semester End Examination	60
		Total Marks	100

COURSE OBJECTIVES	
1	To learn various steps in program development using Raptor.
2	To write C programs using basic concepts in C like operators, control statements etc.,
3	To design modular, reusable and readable C programs using concepts like Arrays, Functions and Pointers.
4	To write programs using Structures and Unions.
5.	To write programs to perform file operations.

COURSE OUTCOMES		**Cognitive level**
Upon successful completion of the course, the student will be able to:		
CO1	Translate given algorithms to a working programs.	K2
CO2	Design programs using Pointers to access Arrays, Strings and Functions.	K3
CO3	Develop programs using Structures, Unions and File operations.	K3

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	2	0	0	0	0	0	0	0	2	2	1
CO2	3	3	3	3	2	0	0	0	0	0	0	0	2	2	1
CO3	3	3	3	3	2	0	0	0	0	0	0	0	2	2	1

COURSE CONTENT	
1.	Construct flowcharts using Raptor Tool to a) Calculate the maximum, minimum and average of three numbers b) Calculate area of a triangle given three sides using Heron's formula.

2.	Construct flowcharts using Raptor Tool to a) Calculate simple interest for various parameters specified by the user. b) Swapping of two numbers with and without using the third variable.
3.	Write a C Program to Perform Addition, Subtraction, Multiplication and Division of two numbers.
4.	Write a C Program to find the Grade of a student by taking input of percentage using all Relational Operators (>, >=, <, <=, ==, !=)

Theory (%)	Letter Grade	Level
≥ 90	O	Outstanding
≥ 80 to < 90	S	Excellent
≥ 70 to < 80	A	Very Good
≥ 60 to < 70	B	Good
≥ 50 to < 60	C	Fair
≥ 40 to < 50	D	Satisfactory
<40	F	Fail

5.	Write a C Program to swap two given input numbers a) With using a temporary variable. b) Without using a temporary variable.
6.	Write a C Program to implement arithmetic operations using two operands and one operator using a) if – else – if condition. b) Switch – Case statement.
7.	Write a C Program to print the following patterns a) Floyd's Triangle. b) Pascal Triangle.
8.	Write a C Program a) To find the sum of its individual digits for a given positive number. b) To check whether the given number is Prime or not.
9.	Write a C Program a) To check whether the given number is a Palindrome or not. b) To check whether the given number is an Armstrong or not
10.	Write a C Program using Functions to find both the largest and smallest number in a given array numbers.
11.	Write C programs to perform swapping of two numbers by passing a value and reference.
12.	Write a C Program for two Matrices by checking the compatibility a) Addition. b) Multiplication.
13.	Write a C program on Strings to implement the following operations without string handling functions a) Concatenation of two given input strings. b)Length of a string. c) Reverse of a given string.

14.	Write C programs that use both recursive and non-recursive functions for the following i) To find the factorial of a given integer. ii) To find the GCD (greatest common divisor) of two given integers. iii) To find Fibonacci sequence
15.	Write a C program using Pointers to work on a) Matrix Addition. b) Transpose of a Matrix.
16.	Write a C program to read and print the details of an Employee (Name, Date of the Birth, Designation, Salary) using Structures.
17.	Write a C program a) To read and print the student details (Name, Register number, Address, Intermediate %) using Union. b) To display the name of the colour using Enum data type
18.	Write a C Program to a) Copy one file to another. b)Count the number of characters, words and lines in a file.

Constitution of India
(Common to all branches)

Course Category	Humanities including Management	**Course Code**	19HM1T05
Course Type	Theory	**L-T-P- C**	2 -0 -0-0
Prerequisites		**Total Marks (Internal Assessment)**	100

	Course Outcomes On successful completion of the course, the student will be able to	Blooms Taxonomy Level
CO 1	Understand the evolution of Constitution of India	K2
CO 2	Make use of their Fundamental rights.	K3
CO 3	Understand the functioning of the Union Government	K2
CO 4	Understand the functioning of the State and local self-Government.	K2
CO 5	Understand the value of Indian Constitution in functioning of the country.	K2

*K1- Remember, K2- Understand, K3- Apply, K4- Analyze, K5- Evaluate, K6- Create

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	0	0	0	0	0	3	0	3	0	1	0	2
CO2	0	0	0	0	0	1	0	2	1	1	0	1
CO3	0	0	0	0	0	1	0	1	1	1	0	0
CO4	0	0	0	0	0	1	0	1	1	1	0	0
CO5	0	0	0	0	0	1	1	1	1	1	0	2

Course Content :

Unit – I
Introduction to Indian constitution: Meaning of the term constitution - History and development – Preamble of the Constitution – Constituent Assembly – The salient features of Indian Constitution.

Unit –II
Fundamental Rights and Directive principles of state policy: Individual and Collective Rights – Limitations of the fundamental Rights – Judicial Interpretation of Fundamental Rights.
Unit –III
Union Government: Union Legislature – Lok sabha and Rajya sabha (powers and functions) – President of India (powers and functions) – Prime minister of India (powers and functions) – Union Judiciary (supreme court powers and functions).

Unit – IV State and Local self-Government:

State Government: State Legislature (Legislative Assembly / Vidhan Sabha, Legislative Council / Vidhan Parishad) – Powers and functions of state legislature – The Chief Minister of the state (powers and functions)

Local Self Government: Election commission of India (Powers and Functions)- The Union Public Service Commission (Powers and Functions)

Unit – V Working of the Indian Constitution

The values of the Indian Constitution and Ushering of Social Revolution in India – Nature and Role of Higher Judiciary in India – Amendments (Recent)

Reference Books :

1. 'Indian Polity' by Laxmikanth

2. 'Indian Administration' by Subhash Kashyap

3. 'Indian Constitution' by D.D. Basu

4. 'Indian Administration' by Avasti and Avasti

Web Resources:

1. https://www.clearias.com/historical-background-of-indian-constitution/

2. https://www.civilserviceindia.com/subject/General-Studies/notes/functions-and-responsibilities-of-the-union-and-the-states.html

3. https://www.tutorialspoint.com/indian_polity/indian_polity_how_constitution_works

PRAGATI ENGINEERING COLLEGE
(AUTONOMOUS)
DEPARTMENT OF INFORMATION TECHNOLOGY

I B.Tech II Semester
Numerical Methods and Multi-variable Calculus
(Common to CE, ME, ECE, CSE, &IT)

Course Category	Basic Sciences		Course Code	19BM2T02
Course Type	Theory		L-T-P-C	3-0-0-3
Prerequisites	Differentiation, Integration		Internal Assessment	40
			Semester End Examination	60
			Total Marks	100

COURSE OBJECTIVES

1	The course is designed to equip the students with the necessary mathematical skills and techniques that are essential for an engineering course.
2	The skills derived from the course will help the student form a necessary base to develop analytic and design concepts.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:	Cognitive Level
CO1	Apply Newton, Gauss and Lagrange interpolation formulae to find interpolating polynomials for the given data.	K3
CO2	Find the approximate roots of transcendental equations by using different numerical methods.	K2
CO3	Solve ordinary differential equations by using different numerical schemes.	K3
CO4	Find areas and volumes using double and triple integrals.	K2
CO5	Apply a range of techniques to find solutions of standard PDEs.	K3

K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 - Create.

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2												
CO2	3	3	2												
CO3	3	3	2												
CO4	3	3	2												
CO5	3	3	2												

COURSE CONTENT

UNIT I	**Interpolation** Introduction– Errors in polynomial interpolation – Finite differences – Forward differences– Backward differences –Central differences – Symbolic relations and separation of symbols – Differences of a polynomial-Newton's formulae for interpolation –Gauss formulae for

	interpolation- Interpolation with unequal intervals – Lagrange's interpolation formula.
UNIT II	**Solution of Algebraic and Transcendental Equations** Introduction- Bisection method – Method of false position – Secant method- Iteration method – Newton-Raphson method (One variable).
UNIT III	**Numerical Integration and solution of Ordinary Differential equations** Trapezoidal rule- Simpson's $1/3^{rd}$ and $3/8^{th}$ rule-Solution of ordinary differential equations by Taylor's series-Picard's method of successive approximations-Euler's method - Runge-Kutta method (second and fourth order).
UNIT IV	**Multiple integrals**: Double and triple integrals – Change of variables – Change of order of integration. **Applications:** Finding Areas and Volumes.
UNIT V	**Partial Differential Equations** Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions –solutions of first order linear (Lagrange) equation and nonlinear (standard types) equations.

TEXT BOOKS	
1.	B. S. Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.
2.	Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India.

REFERENCE BOOKS	
1.	Michael Greenberg, Advanced Engineering Mathematics, 9th edition, Pearson edn.
2.	Dean G. Duffy, Advanced engineering mathematics with MATLAB, CRC Press
3.	Peter O'neil, Advanced Engineering Mathematics, Cengage Learning.
4.	Srimanta Pal, Subodh C. Bhunia, Engineering Mathematics, Oxford University Press.
5.	T.K.V. Iyengar et. al., Engineering Mathematics Volume I & III S Chand Publications.
6.	T.Amarnath, An Elementary Course in Partial Differential Equations, Narosa Publications

WEB RESOURCES	
1.	**UNIT I: Interpolation** https://en.wikibooks.org/wiki/Introduction_to_Numerical_Methods/Interpolation
2.	**UNIT II: Solution of Algebraic and Transcendental Equations** https://en.wikibooks.org/wiki/Numerical_Methods/Equation_Solving https://www.slideshare.net/100005232690054/algebraic-and-transcendental-equations
3.	**UNIT III: Numerical Integration and solution of Ordinary Differential Equations** https://nptel.ac.in/courses/111107063/
4.	**UNIT III: Multiple Integrals** https://en.wikipedia.org/wiki/Multiple_integral http://tutorial.math.lamar.edu/Classes/CalcIII/MultipleIntegralsIntro.aspx
5.	**UNIT V: Partial Differential Equations** https://en.wikipedia.org/wiki/Partial_differential_equation

Integral Transforms and Vector Calculus

(Common to CE, EEE, ME, ECE, CSE & IT)

Course Category	Basic Sciences		Course Code	19BM2T03
Course Type	Theory		L-T-P-C	3-0-0-3
Prerequisites	NIL		Internal Assessment	40
			Semester End Examination	60
			Total Marks	100

COURSE OBJECTIVES

1	The course is designed to equip the students with the necessary mathematical skills and techniques that are essential for an engineering course.
2	The skills derived from the course will help the student form a necessary base to develop analytic and design concepts.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:	Cognitive Level
CO1	examine the properties of Laplace transformation	K3
CO2	solve ordinary differential equations by using Laplace transformation technique	K2
CO3	expand a periodic function as a Fourier series and find Fourier transform of a given function.	K3
CO4	understand vector differential properties of scalar and vector point functions and their applications.	K2
CO5	apply Green's, Stokes and Divergence theorem to evaluate line, surface and volume integrals.	K3

K1: Remember, K2: Understand, K3: Apply, K4: Analyze, K5: Evaluate, K6: Create.

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)												
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2									
CO2	3	3	2									
CO3	3	3	2									
CO4	3	3	2									
CO5	3	3	2									

COURSE CONTENT	
UNIT I	**Laplace transforms:** Laplace transforms of standard functions – Properties - Periodic functions - Unit step function – Dirac's delta function.

UNIT II	**Inverse Laplace transforms:** Inverse Laplace transforms – Properties – Convolution theorem (without proof). **Applications:** Solving ordinary differential equations (initial value problems) using Laplace transforms.
UNIT III	**Fourier Analysis:** Introduction- Periodic functions – Dirichlet's conditions - Fourier series of a function, even and odd functions –Change of interval – Half-range sine and cosine series. Fourier integral theorem (without proof) – Fourier sine and cosine integrals – sine and cosine transforms – Inverse transforms.
UNIT IV	**Vector Differentiation:** Gradient - Directional derivative - Divergence – Curl – Laplacian and second order operators – Vector identities.
UNIT V	**Vector Integration:** Line integral – Work done – Potential function – Area, Surface and volume integrals - Vector integral theorems: Greens, Stokes and Gauss Divergence theorems (without proof) and related problems.

TEXT BOOKS	
1.	B.S.Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.
2.	Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India
REFERENCE BOOKS	
1.	Micheael Greenberg, Advanced Engineering Mathematics, 9th edition, Pearson edn.
2.	Dean G. Duffy, Advanced engineering mathematics with MATLAB, CRC Press.
3.	Peter O'neil, Advanced Engineering Mathematics, Cengage Learning.
4.	Srimanta Pal, Subodh C.Bhunia, Engineering Mathematics, Oxford University Press.
5.	T.K.V. Iyengar et. al., Engineering Mathematics Volume I & III S Chand Publications.
6.	Murray R Speigel, Schaum's Outline of Vector Analysis, Schaum's Outline.
7.	Shanti Narayan, Integral Calculus – Vol. 1 & II.
WEB RESOURCES	
1.	**UNIT I: Laplace transforms** https://en.wikipedia.org/wiki/Laplace_transform https://web.stanford.edu/~boyd/ee102/laplace.pdf
2.	**UNIT II: Inverse Laplace transforms** https://www.intmath.com/laplace-transformation/7-inverse-laplace-transform.php
3.	**Unit – III: Fourier Series** https://www.mathsisfun.com/calculus/fourier-series.html https://lpsa.swarthmore.edu/Fourier/Xforms/FXformIntro.html
4.	**UNIT IV: Vector Differentiation** https://en.wikipedia.org/wiki/Vector_calculus
5.	**UNIT V: Vector Integration** https://en.wikipedia.org/wiki/Divergence_theorem http://tutorial.math.lamar.edu/Classes/CalcIII/StokesTheorem.aspx

APPLIED CHEMISTRY
(IT)

Course Category	Basic Sciences	Course Code	19BC2T02
Course Type		L-T-P-C	3-0-3-3
Prerequisites	Intermediate Chemistry	Internal Assessment Semester End Examination Total Marks	40 60 100

COURSE OBJECTIVES

1	To learn about Electrochemical cells, Batteries and Fuel cells
2	To know about spinels, magnetic materials and semi-conductors
3	To study about Nano materials, their preparation, characterization, applications and also about principles of green chemistry and green engineering applications
4	To know about Polymers, plastics and Elastomers
5	To learn about non-conventional energy sources and also Spectroscopic techniques

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:

CO1	To compare different types of batteries and explain the merits of fuel cell.	K1
CO2	Discuss the use and importance of semiconductors, magnetic materials and spinels.	K4
CO3	To explain the Green methods of Synthesis and applications of Green technologies.	K3
CO4	Analyze the importance of polymers in engineering applications.	K4
CO5	List out various sources of non-conventional energy.	K5

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)

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

COURSE CONTENT

UNIT I	**ELECTROCHEMICAL ENERGY SYSTEMS** Electrode Potential, Nernst Equation for a single electrode, EMF of the cell, Electro chemical Series and uses, Types of Electrodes - Hydrogen and Calomel electrode, Electrochemical Cell, Galvanic Cell vs Electrolytic Cell, Types of Ion Selective Electrodes- glass membrane electrode **Batteries**- Characteristics, classification and Important applications. Classical batteries –

	Dry/Lechlanche cell, Modern batteries- Zinc air, Lithium cells-Li MnO$_2$ cell. **Fuel cells**- Introduction, H$_2$-O$_2$ fuel cell.
UNIT II	**SOLID STATE CHEMISTRY** Solids – Crystalline and amorphous solids- 2D and 3D close packing of atoms and ions - spinels - normal and inverse spinels, semi-conductor – Elemental semi conducting materials - Non-elemental semiconducting Materials:- Stoichiometric, non-stoichiometric controlled valency & Chalcogen semiconductors, Preparation of Semiconductors by Zone refining and Czocharlski crystal pulling method. Semiconducting Devices - p-njunction diode as rectifier and junction transistor. Electrical Insulators and Applications of solid, liquid and gaseous insulators. Magnetic materials- Ferro and ferri magnetism. Hall effect and its applications.
UNIT III	**NANOMATERIALS AND GREEN CHEMISTRY** **III-A: Nano Materials:** Introduction to Nano materials, Preparation of Carbon Nano Tubes(CNTs) by Laser Ablation and Chemical Vapor Deposition Methods, Fullerenes - Preparation, Properties and Applications; Chemical synthesis of nano materials : Sol-gel method, Characterization of nano mateirals by BET & TEM (basic principles), Applications of nano materials in waste water treatment, lubricants, Medicine and sensors. **III-B: Green Chemistry:** Introduction-Principles of green chemistry, Green synthesis Methods- Phase Transfer Catalysis (PTC), Super critical fluid extraction method, Green engineering applications in environmental and power quality monitoring.
UNIT IV	**POLYMER CHEMISTRY** **Polymers**: Introduction-Methods of Polymerization (Emulsion and Suspension), Conducting polymers – Mechanism of conduction in poly acetylene – applications, Bio – degradable polymers. **Plastics**: Thermoplastics and thermo setting resins; Preparation, properties and applications of Polystyrene and Bakelite. **Elastomers**: Natural Rubber, Vulcanization of rubber; Synthetic Rubbers -Preparation, properties and applications of Buna-S and Thiokol.
UNIT V	**Non-Conventional Energy Sources & Spectroscopic Techniques** Non-Conventional Energy Sources: Introduction-Photo voltaic cell & Organic Photo voltaic cell - Design, Principle, advantages and disadvantages; Hydropower-Geo thermal Power - Tidal Power-Ocean thermal Energy Conversion. Spectroscopic Techniques: Electro Magnetic Spectrum- Introduction, Principles of UV and IR Spectroscopic techniques and their applications.

TEXT BOOKS

1.	P.C. Jain and M. Jain, Engineering Chemistry, 15/e, Dhanapat Rai & Sons, Delhi (2014).
2.	Engineering Chemistry by Shikha Agarwal: Cambridge University Press,2019 edition

REFERENCE BOOKS

1.	Sashi Chawla, A Textbook of Engineering Chemistry, Dhanapath Rai and sons, (2003)

2.	B.S Murthy and P. Shankar, A Text Book of NanoScience and NanoTechnology, University Press (2013).
3.	S.S. Dara, A Textbook of Engineering Chemistry, S.Chand& Co, (2010)
WEB RESOURCES	
1.	Electrochemical Energy Systems https://en.wikipedia.org/wiki/Electrochemical_cell
2.	Solid state chemistry https://en.wikipedia.org/wiki/Solid-state_chemistry www.engineeringnotes.com › Engineering › Electronics › Semiconductors
3.	Nanomaterials and Green Chemistry https://en.wikipedia.org/wiki/Green_chemistry https://www.acs.org/.../greenchemistry/principles
4.	Polymer Chemistry https://en.wikipedia.org/wiki/Polymer_chemistry
5.	Non-Conventional Energy Sources & Spectroscopic Techniques https://en.wikipedia.org/wiki/Geothermal_power; https://en.wikipedia.org/wiki/Ocean_thermal_energy_conversion www.rsc.org/learn-chemistry/collections/spectroscopy/introduction

DATA STRUCTURES
(Common to CSE and IT)

Course Category:	Professional Core	Course Code:	19IT2T01
Course Type:	Theory	L-T-P-C:	3-0-0-3
Prerequisites:	Programming for Problem Solving using C	Internal Evaluation: Semester end Evaluation: Total Marks:	40 60 100

COURSE OBJECTIVES

1	To assess how the choice of data structures and algorithm design methods impacts the performance of programs.
2	To choose the appropriate data structure and algorithm design method for a specified application.
3	To solve problems using data structures such as linear lists, stacks, queues, binary trees, binary search trees, and graphs and writing programs for these solutions.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:	Cognitive Level*
CO1 Implement sorting and searching algorithms.	K3
CO2 Develop algorithms for stacks, queues.	K3
CO3 Apply concepts of linked lists.	K3
CO4 Develop programs using concepts of trees.	K3
CO5 Implement algorithms on Graphs.	K3

*K1- Remember, K2- Understand, K3- Apply, K4- Analyze, K5- Evaluate, K6- Create

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	1	1	0	0	0	0	0	0	2	1	0
CO2	2	3	1	2	1	0	0	0	0	0	0	0	1	1	1
CO3	2	3	1	1	1	0	0	0	0	0	0	0	1	1	1
CO4	2	3	1	1	1	0	0	0	0	0	0	0	1	1	1
CO5	3	3	1	1	1	0	0	0	0	0	0	0	1	1	1

COURSE CONTENT	
UNIT I	SEARCHING: Introduction, linear search, binary search, Fibonacci search. SORTING: Introduction, Bubble Sort, Selection sort, insertion sort, merge sort.
UNIT II	Abstract Data Types (ADTs) STACKS: Introduction, stack operations, applications. QUEUES: Introduction, operations on queues, circular queues, priority queues, applications. Evaluation of expressions, expression- postfix notation- infix to postfix.
UNIT III	LINKED LISTS: Introduction, singly linked lists, circular linked lists, doubly linked lists with emphasis on operations and applications. LINKED STACKS AND LINKED QUEUES: Introduction, operations on linked stacks and linked queues, dynamic memory management, implementation of linked representations, applications. Recursion: Recursion algorithms and their implementation with stacks.
UNITIV	TREES AND BINARY TREES: Introduction, Trees: definition and basic terminologies, representation of trees. Binary trees: basic terminologies and types, representation of binary trees, binary tree traversals, applications. BINARY SEARCH TREES: Introduction, binary search trees: Heap Sort.
UNIT V	GRAPHS: Introduction, definitions and basic terminologies, graph representation, elementary graph Operation, graph traversals - Depth First Search, Breadth First Search, Topological Sorting.

TEXTBOOKS	
1	Langsam, Augenstein and Tanenbaum, "Data Structures using C", PHI.
2	Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2nd Edition, Pearson Education. Ltd.
3	E. Horowitz, S.Sahni, Dinesh Mehta, "Fundamentals of Data structures in C", Galgotia Publications, 2006.

REFERENCE BOOKS	
1	G.A.V Pai, Data Structures and Algorithms, Concepts, Techniques and Applications, Volume 1,1st Edition, Tata McGraw-Hill, 2008.
2	Richard F. Gilberg and Behrouz A. Forouzan, "Data Structures, Pseudo code Approach with C", 2nd Edition, Cengage Learning India Edition, 2007.

WEB RESOURCES	
1	http://nptel.iitm.ac.in/video.php? subjectId=106105085
2	http://cds.iisc.ac.in/courses/ds286/
3	http://www.geeksforgeeks.org/data-structures

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(For B.Tech IT)

Course Category	Engineering Sciences		Course Code	19EE2T02
Course Type	Theory		**L-T-P-C**	3-0-0-3
Prerequisites	NA		**Internal Assessment** **Semester End Examination** **Total Marks**	40 60 100

COURSE OBJECTIVES	
1	To learn the basic principles of electrical circuit analysis.
2	To understand constructional details and operating principle of DC machines & Transformers.
3	To understand constructional details and operating principle details of alternator and 3-Phase induction motor.
4	To study operation of PN junction diode, half wave, full wave rectifiers, PNP and NPN transistors and various semiconductor devices.
5	To study the operation of OP-AMPs.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:		Cognitive Level
CO1	Analyze various electrical circuits	K4
CO2	Understand constructional details and operating principle of DC machines, single phase transformer, tests and analyze their performance.	K4
CO3	Explain operation of Three phase AC machines.	K2
CO4	Analyze operation of half wave, full wave bridge rectifiers and Explain single stage CE amplifier and concept of various semiconductor devices.	K4
CO5	Analyze operation of OP-AMPs.	K4

*K1- Remember, K2- Understand, K3- Apply, K4- Analyze, K5- Evaluate, K6- Create

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	1	0	0	0	0	0	0	0	1	1	0	0
CO2	3	2	2	1	0	0	0	0	0	0	0	1	1	0	0
CO3	3	2	2	1	0	0	0	0	0	0	0	1	1	0	0
CO4	3	2	2	2	0	0	0	0	0	0	0	0	1	0	0
CO5	3	2	2	2	0	0	0	0	0	0	0	0	1	0	0

COURSE CONTENT

UNIT I	**Electrical Circuits** Basic definitions – types of network elements – Ohm's Law – Kirchhoff's Laws – inductive networks – capacitive networks – series – parallel circuits – star-delta and delta-star transformations.
UNIT II	**DC Machines & Transformers** Constructional details and operating principle – EMF equation –DC motor – torque equation – applications - speed control methods of DC motor – Swinburne's Test. Constructional details and operating principle of single phase transformers – EMF equation – equivalent circuit – Losses – OC & SC tests – efficiency.
UNIT III	**AC Machines** Constructional details and operating principle of alternators – types –Regulation of alternator by synchronous impedance method. Principle of operation of 3-Phase squirrel cage induction motor – electromagnetic torque equation - power flow - brake test - efficiency calculation – applications.
UNIT IV	**Semiconductor Devices** PN junction diodes – characteristics – half wave and full wave rectifiers - PNP and NPN junction transistor, transistor as an amplifier – transistor amplifier – frequency response of CE amplifier – concepts of feedback amplifier – SCR – MOSFET - IGBT.
UNIT V	**Operational Amplifiers** Introduction to operation amplifiers (Ideal OP-AMP) – Characteristics – applications (inverting, non-inverting, integrator and differentiator).

TEXT BOOKS

1.	William Hayt and Jack E. Kemmerley, Engineering Circuit Analysis, Mc Graw Hill Company, 6th Edition.
2.	Surinder Pal Bali, Electrical Technology, Vol-I, Vol-II, Pearson Publications, 1[st]Edition.
3.	Basic Electrical and Electronics Engineering by M.S. Sukhija and T.K. Naga Sarkar, Oxford University Press.
4.	R.L. Boylestad and Louis Nashelsky, Electronic Devices and Circuits, PEI/PHI 2006, 9th Edition.

REFERENCE BOOKS

1.	John Bird, Electrical Circuit Theory and Technology, Routledge Taylor and FrancisGroup, 5th Edition.
2.	M.S.Naidu and S.Kamakshiah, Basic Electrical Engineering, TMH Publications, 1st Edition.
3.	RajendraPrasad, FundamentalsofElectricalEngineering,PHIPublications, 2[nd]edition.
4.	R. S. Sedha, A Text Book of Electronic Devices and Circuits, S.Chand& Co. 2nd Edition
5.	David A. Bell, Electronic Devices and Circuits, Oxford University Press, 5th Edition.

WEB RESOURCES

1.	http://www.ncert.nic.in/html/learning_basket/electricity/electricity/machine/motor.html
2.	www.electricaleasy.com
3.	www.nptel.ac.in/courses/108108076/
4.	https://nptel.ac.in/courses/122106025/

19BC2LC02(I-II IT)
Applied Chemistry Laboratory

CourseCategory:	Basic sciences	Course Code	19BC2L02
CourseType:	Lab	L-T-P- C:	0 – 0 -3-1.5
Prerequisites:	Basic Chemistry	Continuous Evaluation: Semester end Evaluation: Total Marks:	40 60 100

COURSEOUTCOMES		
Upon successfulcompletion ofthecourse, thestudentwillbeableto:		
CO1	Estimate the given amount of dissolved compounds in water by using volumetric analysis and preparation of polymers and nano particles	
CO2	Learn compelxometric titrations to determine the concentration of different metal ions present in water and determine the % moisture in a coal sample.	
CO3	Identify the accurate value of conductivity of given solutions. and to estimate the viscosity and surface tension of given solutions.	

ContributionofCourseOutcomestowardsachievementofProgramOutcomes(1–Low,2-Medium,3–High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO12	PSO1	PSO2	PSO3
CO1	2	1	2												
CO2	2	1		1											
CO3	2	1													

COURSECONTENT

(Any 10 of the following listed 14 experiments)

LIST OF EXPERIMENTS:

Introduction to chemistry laboratory – Molarity, Normality, Primary, Secondary standard solutions, Volumetric titrations, Quantitative analysis

1. Estimation of HCI using standard Na_2CO_3 solutions

2. Determination of alkalinity of a sample containing Na_2CO_3 and NaOH

3. Estimation of $KMnO_4$ using standard Oxalic acid solution.

4. Estimation of Ferrous iron using standard $K_2Cr_2O_7$ solution

5. Determination of Temporary and permanent Hardness water using standard EDTA solution.

6. Determination of % moisture content in a coal sample.

7. Determination of Mg^{2+} present in an antacid

8. Conductometric Titrations between strong acid and strong base

9. Conductometric Titrations between strong acid and weak base

10. Estimation of Vitamin – C

11. Preparation of Phenol - Formaldehyde Resin

12. Determination of viscosity of a liquid

13. Determination of surface tension of a liquid

14. Preparation of Nano particles.(Cu/Zn)

TEXTBOOKS

1.	Mendham J, Denney RC, Barnes JD, Thosmas M and Sivasankar B Vogel's Quantitative Chemical Analysis 6/e, Pearson publishers (2000).
2.	N.K Bhasin and Sudha Rani Laboratory Manual on Engineering Chemistry 3/e, Dhanpat Rai Publishing Company (2007).

REFERENCEBOOKS

1.	Vogel's Textbook of Quantitative chemical analysis, J. Mendham et.al.
2.	College designed manual.

WEBRESOURCES

1.	https://pdfs.semanticscholar.org/33d4/3b264bad212a14d660667298f12944ea11d5
2.	www.bsauniv.ac.in/UploadImages/Downloads/Estimation%20of%20Hardness
3.	https://pubs.acs.org/doi/abs/10.1021/i560133a023

DATA STRUCTURES LABORATORY

(Common to CSE and IT)

Course Category:	Professional Core	**Course Code:**	19IT2L01
Course Type:	Laboratory	**L-T-P-C:**	0-0-3-1.5
Prerequisites:	Programming for Problem Solving using C	**Continuous Evaluation:** **Semester end Evaluation:** **Total Marks:**	40 60 100

COURSE OBJECTIVES

1	To provide hands on experience to implement basic linear and non-linear data structures. This course covers implementation of Stack, Queue, List, Sorting techniques, Binary Search Trees.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:		Cognitive Level
CO1	Implement sorting and searching algorithms.	K3
CO2	Implement stacks and queues using arrays Develop programs using recursive functions.	K3
CO3	Apply concepts of linked lists.	K3
CO4	Develop programs using concepts of trees.	K3

*K1- Remember, K2- Understand, K3- Apply, K4- Analyze, K5- Evaluate, K6- Create

Contribution of Course Outcomes towards achievement of Program

Outcomes (1 – Low, 2 - Medium, 3 – High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	1	1	0	0	0	0	0	0	2	1	0
CO2	2	3	1	2	1	0	0	0	0	0	0	0	1	1	1
CO3	2	3	1	1	1	0	0	0	0	0	0	0	1	1	1
CO4	2	3	1	1	1	0	0	0	0	0	0	0	1	1	1

	LAB EXPERIMENTS
1	Write C programs to implement search algorithms
2	Write C programs to implement sorting algorithms
3	Write C programs that implement the following data structures using arrays: i) Stack ii)Queue.
4	Write C programs to implement the following Stack applicationsi) Conversion of a given infix expression into postfix.ii)Evaluationsofpostfixexpression.
5	Write C programs to implement the following types ofLists i) Singly linkedlist ii) Circular Linkedlist iii) Doubly linkedlist.
6	Write C programs to implement the following data structures using Lists i)Stack ii)Queue.
7	Write a program to implement the binary search tree operations.
8	Write a C program to implementbinarytreeusingarraysand to perform binary treetraversalsusing recursion i) inorder ii)postorder iii)preorder.

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB

(For B.Tech IT)

Course Category	Lab Course		Course Code	19EE2L02
Course Type	Laboratory		**L-T-P-C**	0-0-3-1.5
Prerequisites	Basic Electrical & Electronics Engineering		**Internal Assessment** **Semester End Examination** **Total Marks**	40 60 100

COURSE OBJECTIVES

1	To determine the voltage, current and Power in Star and Delta Connected loads
2	To predetermine the efficiency of dc shunt machine using Swinburne's test.
3	To predetermine the efficiency and regulation of 1-phase transformer with O.C and S.C tests.
4	To obtain performance characteristics of DC shunt generator & 3-phase induction motor.
5	To find out regulation of an alternator with synchronous impedance method.
6	To control speed of dc shunt motor using Armature voltage and Field flux control methods.
7	To find out the characteristics of PN junction diode & transistor.
8	To determine the ripple factor of half wave & full wave rectifiers.
9	To find out the band width of transistor CE amplifier.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:		**Cognitive Level**
CO1	Determine the voltage, current and Power in Star and Delta Connected loads	K3
CO2	Compute the efficiency of DC shunt machine without actual loading of the machine.	K3
CO3	Estimate the efficiency and regulation at different load conditions and power factors for single phase transformer with OC and SC tests.	K5
CO4	Analyze the performance characteristics to determine critical speed and resistance of DC shunt generator & efficiency of 3-Phase induction motor.	K3
CO5	Pre-determine the regulation of an alternator by synchronous impedance method.	K3
CO6	Control the speed of dc shunt motor using Armature voltage and Field flux control methods.	K3
CO7	Draw the characteristics of PN junction diode & transistor.	K2
CO8	Determine the ripple factor of half wave & full wave rectifiers.	K3
CO9	Analyze the frequency response of to find the bandwidth of CE amplifier.	K4

*K1- Remember, K2- Understand, K3- Apply, K4- Analyze, K5- Evaluate, K6- Create

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
CO2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
CO3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
CO4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
CO5	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
CO6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
CO7	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
CO8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO9	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0

LIST OF EXPERIMENTS:

Section A: Electrical Engineering(Any 6 of the following experiments are to be conducted)

Experiment 1	Measurement of voltage, current and Power in Star and Delta Connected loads.
Experiment 2	Magnetization characteristics of DC Shunt Generator.
Experiment 3	Swinburne's test on D.C. Shunt machine (predetermination of efficiency of a given D.C. shunt machine working as motor and generator).
Experiment 4	Speed control of D.C. Shunt motor by a) Armature Voltage control b) Field control method.
Experiment 5	OC and SC tests on single phase transformer (predetermination of efficiency and regulation at given power factors).
Experiment 6	Load Test on Single Phase Transformer.
Experiment 7	Brake test on 3-phase Induction motor (determination of performance characteristics)
Experiment 8	Regulation of alternator by Synchronous impedance method.
Section B: Basic Electronics(Any 4 of the following experiments are to be conducted)	
Experiment 1	PN junction diode characteristics a) Forward bias b) Reverse bias
Experiment 2	Transistor CE characteristics (input and output)
Experiment 3	Half wave rectifier with and without filters.
Experiment 4	Full wave rectifier with and without filters.
Experiment 5	CE amplifiers.
Experiment 6	OP- amp applications (integrator and differentiator).

References – Lab Manuals will be provided

Subject Code: 19HE2L02

Department of English

L	T	P	C
0	0	3	1.5

PROFESSIONAL COMMUNICATIVE ENGLISH LAB- II
(For CE, EEE, CSE & IT)

PRESCRIBED LAB MANUAL FOR SEMESTER II:

'**STRENGTHEN YOUR STEPS**: A Multimodal Course in Communication Skills', Published by Maruthi Publications.

OBJECTIVES: To enable the students to learn demonstratively the communication skills of listening, speaking, reading and writing.

OUTCOME: A study of the communicative items in the laboratory will help the students become successful in the competitive world.

 The course content along with the study material is divided into six units.

UNIT-1:
   Small Talk & JAM Session

UNIT-2:
   Interviews

UNIT-3:
   Effective Telephonic Interviews

UNIT-4:
   Group Discussions

UNIT-5:
   Presentations & Public Speaking

UNIT-6:
   Debates

Environmental Studies
(Common to All Branches)

Course Category	Basic Sciences		Course Code	19BE2T01
Course Type	Theory		L-T-P-C	3– 0 – 0 – 0
Prerequisites	Exposure Basic Knowledge in Environment and protection.	**InternalAssessment** **Semester EndExamination** **Total Marks**	0 0 0	

COURSE OBJECTIVE:

1	To make the students to get awareness on environment, to understand the importance of protecting natural resources, ecosystems for future generations and pollution causes due to the day to day activities of human life to save earth from the inventions by the engineers.

COURSE OUTCOMES		LEVEL
Upon successful completion of the course, the student will be able to:		
CO1	Recognize the interconnectedness of human dependence on the earth's ecosystems	**K -II**
CO2	Comprehend environmental problems from multiple perspectives with emphasis on human modern lifestyles and developmental activities	**K -I**
CO3	Demonstrate knowledge relating to the biological systems involved in the major global environmental problems of the 21st century	**K -II**
CO4	Gain a higher level of personal involvement and interest in understanding and solving environmental problems.	**K -II**
CO5	Learn the management of environmental hazards and to mitigate disasters and have a clear understanding of environmental concerns and follow sustainable development practices	**K -III**
CO6	Influence their society in proper utilization of goods and services.	**K -I**

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	0	1	0	0	1	2	0	0	0	1	0	0	0
CO2	0	1	0	0	0	0	1	0	0	0	0	0	0	0
CO3	0	0	0	0	2	0	1	0	0	0	0	0	0	0
CO4	0	0	0	0	1	1	3	0	0	0	0	0	0	0
CO5	0	0	0	0	0	0	3	1	0	0	0	0	0	0

Course Contents:

UNIT – I

Multidisciplinary nature of Environmental Studies: Definition, Scope and Importance-Need for public awareness.

Natural Resources:

Forest resources : deforestation – Mining, dams and other effects on forest and tribal people.

Water resources :Use and over utilization of surface and groundwater.

Food resources:World food problems, effects of modern agriculture, fertilizer-pesticide problems.

Energy resources: renewable and nonrenewable energy sources.

Role of an individual in conservation of natural resources.Equitable use of resources for sustainable lifestyles.

LEARNING OUTCOMES:

Students will be able to

1. Articulate the basic structure, functions, and processes of key social systems affectingthe environment
2. Explain why renewable and non-renewable energy resources are important.
3. Explain how water resources should be used.

UNIT-II;Ecosystems, Biodiversity and its conservation: Definition of Ecosystem and its structure, Functions

Biodiversity Definition-Value of biodiversity, India as a mega-diversity nation, Threats to biodiversity, Conservation of biodiversity

LEARNING OUTCOMES:

Students will be able to

1. Get a clear picture of structure and functions of ecosystems.
2. Demonstrate knowledge and understanding of theories in the field of Biodiversity and Systematic in the broad sense.

UNIT-III: Environmental Pollution: Definition, Cause, Effects of Air pollution, Water pollution, Noise pollution, Radioactive pollution, Role of an individual in prevention of pollution.

Solid Waste Management: Sources, effects and control measures of urban and industrial waste.

LEARNING OUTCOMES Students will be able to

1. Understand Cause, effects and control measures of air pollution.
2. Explain the enforcement of Environmental legislation
3. Understand solid waste management.

UNIT-IV:Social Issues and the Environment: Air (Prevention and Control of Pollution) Act 1981. – Water (Prevention and control of Pollution) Act 1974,EPA act 1986 ,Issues involved in enforcement of environmental legislation**,** Rain water harvesting, Global Environmental challenges climate change and mitigations and Adaptations (Engineering technologies)

LEARNING OUTCOMES:

Students will be able to

1. Explain the enforcement of Environmental legislations
2. Acquire knowledge on various environmental challenges induced due to unplanned anthropogenic activities.

UNIT-V: Human population and the Environment:

Population growth,Women and child welfare, Role of Information technology in environment and human health Awareness to Environmental Assessment& clearance ,Audit .Environmental Governance in India E-Waste management Rules (Biomedical Waste, Solid Waste) **Field work:A** mini project related to Environmental issues / To visit a local polluted site (Submission of project by every student)

LEARNING OUTCOMES Students will have

1. Explain various types of information technologies
2. Explain the theories of population explosion

TEXT BOOKS	
1.	"Environmental Studies for undergraduate courses",ErachBharucha,UGC.
2.	"A Textbook of Environmental Studies",Dr.S.AzeemUnnisa,Acadamic publishing company.

3.	"Environmental Studies", P.N. Palanisamy, P. Manikandan, A. Geetha, and K. Manjula Rani; Pearson Education, Chennai
4.	A Textbook EIA Notification 2006(2019)
REFERENCE BOOKS	
1.	"Text Book of Environmental Studies",Deeshita Dave & P. UdayaBhaskar, Cengage learning.
2.	"Glimpses of Environment", K.V.S.G. Murali Krishna , Environmental Protection Society, Kakinada, A.P.
3.	"Environmental Studies", Benny Joseph, Tata McGraw Hill Co, New Delhi.
WEB RESOURCES	
1.	**UNIT-1: MULTI DISPLINARY NATURE OF ENVIRONMENT and NATURAL RESOURCES** http://www.defra.gov.uk/environment/climatechange
2.	**UNIT-2:ECOSYSTEM, BIODIVERSITY AND ITS CONSERVATION** http://conbio.net/vl/ and www.biodiversitya-z.org/content/biodiversity
3.	**UNIT-3: ENVIRONMENTAL POLLUTION** https://www.omicsonline.org/environment-pollution-climate-change.php and
4.	**UNIT-4: Social Issues and the Environment** http://www.publichealthnotes.com/solid-waste-management/
5.	**UNIT-5: HUMANPOPULATION AND THE NVIRONMENT** **http://IPCC.com**

II B.Tech I Semester
Probability and Statistics
(Common to CE, CSE & IT)

Course Category	Basic Sciences		Course Code	19BM3T04
Course Type	Theory		**L-T-P-C**	3-0-0-3
Prerequisites	NIL		**Internal Assessment**	40
			Semester End Examination	60
			Total Marks	100

COURSE OBJECTIVES

1	The course is designed to equip the students with the necessary mathematical skills and techniques that are essential for an engineering course.
2	The skills derived from the course will help the student form a necessary base to develop analytic and design concepts.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:		Cognitive Level
CO1	Apply Binomial and Poisson distributions for real data to compute probabilities, theoretical frequencies	K3
CO2	Interpret the properties of normal distribution and its applications	K2
CO3	Find the confidence intervals for a statistic from the given population	K3
CO4	Apply the concept of hypothesis testing to real world problems	K2
CO5	Find a curve which approximate the given data, coefficient of correlation and lines of regression.	K3

K1: Remember, K2: Understand, K3: Apply, K4: Analyze, K5: Evaluate, K6: Create.

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)												
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	-	2	-	-	-	-	-	-	-	-
CO2	3	3	1	2	-	-	-	-	-	-	-	-
CO3	3	3	1	2	-	-	-	-	-	-	-	-
CO4	3	3	3	2	-	-	-	-	-	-	-	-
CO5	3	3	2	2	-	-	-	-	-	-	-	-

COURSE CONTENT	
UNIT I	**Discrete Distributions:** Introduction – DiscreteRandom variables – Distribution function – Discrete distribution: Binomial and Poisson distributions.
UNIT II	**Continuous distributions:** Introduction -Continuous Random variables – Normal distributions, standard normal distribution, normal approximation to Binominal, Gamma and Weibull distributions.
UNIT III	**Sampling Theory:** Introduction – Population and samples – Sampling distribution of means for large and small samples (with known and unknown variance) – Proportion, sums and differences of means – Sampling distribution of variance – Point and interval estimation.
UNIT IV	**Test of Hypothesis:** Introduction – Type I and Type II errors – Maximum error – One tail and two tail tests –Tests concerning single mean, two means and several means. Tests concerning single, two and several proportions – Problems using Z-test, t-test, F-test and Chi –square test.
UNIT V	**Curve fitting and Correlation:** Introduction- Method of least squares – Fitting a straight line – Second degree curve – exponential curve – power curve. Simple correlation and regression – rank correlation – multiple linear regression.

TEXT BOOKS	
1.	Miller and John E. Freund, Probability and Statistics for Engineers, Prentice Hall of India.
2.	B.V. Ramana, Higher Engineering Mathematics, Tata Mcgraw Hill.

REFERENCE BOOKS	
1.	Michael Greenberg, Advanced Engineering Mathematics, 9th edition, Pearson edn
2.	Peter O'neil, Advanced Engineering Mathematics, Cengage Learning.
3.	Srimanta Pal, Subodh C.Bhunia, Engineering Mathematics, Oxford University Press.
4.	S.L. Myers, K. Ye, Ronald E Walpole, Probability and Statistics for Engineers and Scientists, Pearson, 8th Edition.

WEB RESOURCES	
1.	**UNIT I: Discrete Distributions** https://en.wikipedia.org/wiki/List_of_probability_distributions https://en.wikipedia.org/wiki/Binomial_distribution
2.	**UNIT II:Continuous distribution** https://en.wikipedia.org/wiki/Normal_distribution
3.	**UNIT III:Sampling Theory** https://en.wikipedia.org/wiki/Sampling_(statistics) https://nptel.ac.in/courses/111104073/
4.	**UNIT IV: Test of Hypothesis** https://en.wikipedia.org/wiki/Statistical_hypothesis_testing https://machinelearningmastery.com/statistical-hypothesis-tests/
5.	**UNIT V:Curve fitting and Correlation** https://en.wikipedia.org/wiki/Regression_analysis https://www.surveysystem.com/correlation.htm

Python Programming

(Common to CE, ME, EEE, ECE, CSE, IT)

Course Category	Engineering Science	Course Code	19CS3T03
Course Type	Theory	L-T-P-C	3-0-0-3
Prerequisites	Exposure to Programming for Problem Solving using C	**Internal Assessment** **Semester End Examination** **Total Marks**	40 60 100

COURSE OBJECTIVES

1	To impart various programming constructs in Python.
2	To introduce the usage of fundamental data structures like List, Tuples and Dictionaries.
3	To imbibe the philosophy of object oriented programming in Python.
4	To bring the awareness of file handling.

COURSE OUTCOMES		Cognitive Level
Upon successful completion of the course, the student will be able to:		
CO1	Develop python programs using conditional statements and expressions	K3
CO2	Apply loop statements for List and String manipulations	K3
CO3	Differentiate Tuples and Dictionary data structures	K2
CO4	Design classes with private and public members	K3
CO5	Develop Python programs using file concepts.	K3

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	0	0	0	0	0	0	1	3	3	2
CO2	3	2	1	1	1	0	0	0	0	0	0	1	3	3	2
CO3	3	2	1	1	1	0	0	0	0	0	0	1	3	3	2
CO4	3	2	2	3	3	0	0	0	0	0	0	1	3	3	2
CO5	3	2	2	3	3	0	0	0	0	0	0	1	3	3	2

COURSE CONTENT	
UNIT I	**Basics of Python Programming & Decision Statements** Features of Python, Writing and Executing First Python Program, Literal Constants, Variables and Identifiers, Data Types, Input Operation, Comments, Reserved words, Indentation,

	Operators and Expressions, if, if-else, Nested if and if-elif-else.
UNITII	**Control Statements and Lists** while loop, for loop, nested loops, break statement, continue statement and pass statement. **Strings**- Concatenating, Appending and Multiplying strings, Slice operation, Lists: Access values in List, Updating values in List, Nested Lists, Basic List Operations, List Methods
UNITIII	**Tuples and Dictionaries** **Tuples:** Creating a Tuple, Accessing values in a Tuple, updating Tuple, Basic Tuple operations, Nested Tuples, Checking the index, Counting the elements, List comprehension and Tuples, Advantages of Tuple over List. **Dictionaries:** Creating a Dictionary, Accessing values, Adding and modifying an item I a Dictionary, deleting items, Sorting Items in a Dictionary, Looping over a Dictionary, Nested Dictionaries, Difference between a List and a Dictionary.
UNITIV	**Functions**- Introduction, Function Definition, the return statement, Required Arguments, Keyword Arguments, Default Arguments, Variable length Arguments. **Object Oriented Programming:** Features of OOP, Merits and Demerits of OOP, Defining Classes, Creating Objects, Data Abstraction, and Hiding through classes, Class Method and Self Argument, The __init__() method, Public and Private data members, Private Methods.
UNITV	**Inheritance-** Introduction, Inheriting Classes in python, Types of Inheritance- Single, Multiple, Multi-level, Multi-path inheritance. **File Handling**- Introduction, Types of Files, Opening and Closing Files, Reading and Writing Files.

TEXT BOOKS

1.	Python: The Complete Reference, Martin C Brown, McGraw Hill Education
2.	Python Programming using Problem Solving Approach, Reema Thareja, OXFORD University Press, 2017.

REFERENCE BOOKS

1.	Fundamentals of Python, Kenneth A Lambert, B L Juneja, Cengage Learning
2.	Programming and Problem Solving with Python, Ashok NamdevKamthane, Amit Ashok Kamthane, McGraw Hill Education

WEB RESOURCES

1.	https://docs.python.org/3/tutorial/index.html
2.	https://swayam.gov.in/nd1_noc19_cs40/preview
3.	https://www.udemy.com/pythonforbeginnersintro/
4.	https://www.coursera.org/learn/python-programming

DATABASE MANAGEMENT SYSTEMS

(Common to CSE and IT)

Course Category	Professional Core	Course Code	19IT3T02
Course Type	Theory	L-T-P-C	3-0-0-3
Prerequisites		Internal Assessment	40
		Semester End Examination	60
		Total Marks	100

COURSE OBJECTIVES

1	To impart theoretical knowledge and practical skills in the use of databases and database management systems in information technology applications.
2	To familiarize logical design, physical design and implementation of relational databases.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:		Cognitive Level
CO1	Understand database system architecture, data models and construct Entity- Relationship diagrams.	K2
CO2	Write queries using Relational algebra, SQL	K1
CO3	Design a database with understanding on Normalization.	K3
CO4	Apply indexing techniques on relations and store data as per some RAID levels.	K3
CO5	Understand Transactions and their concurrency issues, protocols.	K2

*K1- Remember, K2- Understand, K3- Apply, K4- Analyze, K5- Evaluate, K6- Create

Contribution of Course Outcomes towards achievement of Program

Outcomes (1 – Low, 2 - Medium, 3 – High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	2	0	0	0	0	0	0	0	0	0	1	3	0
CO2	2	3	3	1	0	0	0	0	1	0	0	1	1	1	2
CO3	1	1	2	1	1	0	0	0	1	0	0	1	1	1	1
CO4	3	3	1	3	0	0	0	0	1	0	0	1	1	1	2
CO5	3	3	1	3	1	1	0	0	1	1	0	1	1	1	2

COURSE CONTENT	
UNIT I	**Overview & Introduction to Database Design:** Managing data, File systems versus a DBMS, advantages of a DBMS, describing and storing data in a DBMS, Database system structure, Database Design and ER Diagrams, Entities, Attributes, Entity sets, Relationship, Relationship sets, additional features of the ER Model, Conceptual Design with the ER Model

UNIT II	**The Relational Model:** Introduction to Relational Model, Integrity Constraints over Relations, Enforcing Integrity Constraints, Querying Relational Data, Logical Database Design: ER Relational, Introduction to Views, Destroying/ Altering Tables and views **Relational Algebra and Calculus:** Preliminaries, Relational Algebra, Relational Calculus, Expressive power of Algebra Calculus
UNIT III	**SQL - Queries, Constraints, Triggers:** Overview, the form of a basic SQL query, UNION, INTERSECT, EXCEPT, nested queries, aggregate Operators, NULL values, complex integrity constraints in SQL, Triggers and Active Databases. **Schema Refinement and normal Forms:** Introduction to schema refinement, functional dependencies, normal forms, properties of Decompositions, Normalizations.
UNIT IV	**Overview of Storage and Indexing:** Database files organizations and Indexing, Index Data Structures **Storing Data:** Disks and Files,Redundant Arrays of Independent Disks **Tree- Structured Indexing:** Indexed sequential access Method (ISAM), B+ Trees- Search, Insert, Delete Operations **Hash-Based Indexing:** Static hashing, Extendible Hashing, Linear Hashing
UNIT V	**Overview of Transaction Management:** Acid Properties, Transactions and Schedules, Concurrent Execution of Transactions **Concurrency Control:** 2PL, Serializability, Recoverability, Introduction to Lock Management, Lock Conversions, Dealing with Deadlocks, Concurrency Control without Locking **Crash Recovery:** Introduction to ARIES, The log, other recovery-related structures, the Write-Ahead Log Protocol, Check Pointing, Recovering from a System Crash

TEXTBOOKS

1.	Raghuram Krishnan, Johannes Gehrke "Database Management Systems", 3/e,Mc GrawHill, 2003.
2.	Abraham Silberschatz, Henry F. Korth, S. Sudarshan, "Database. System Concepts", Sixth Edition,McGraw-Hill Education, 2010.
3.	RamezElmasri, Shamkant B. Navathe, "Database Systems", 6/e Kindle.

REFERENCE BOOKS

1.	C.J. Date, "Introduction to Database Systems", 8/e, Pearson Education, 2006.
2.	Corlos Coronel, Steven Morris, Peter Robb, "Database Principles Fundamentals of Design Implementation and Management, Cengage Learning.

WEB RESOURCES

1.	http://www.myreadingroom.co.in/notes-and-studymaterial/65-dbms/534-concurrency-control-with-locking.html
2.	http://www.service-architecture.com/articles/database/concurrency_control_and_locking.html
3.	http://codex.cs.yale.edu/avi/db-book/db4/slide-dir/ch1-2.pdf
4.	https://www.techopedia.com/definition/24361/database-management-systems-dbms
5.	http://www.myreadingroom.co.in/notes-and-studymaterial/65-dbms/534-concurrency-control-with-locking.html

COMPUTER SYSTEM ARCHITECTURE

(Information Technology)

Course Category:	Professional Core		Course Code:	19IT3T03
Course Type:	Theory		L-T-P-C:	3-0-0-3
Prerequisites:			Internal Evaluation: Semester end Evaluation: Total Marks:	40 60 100

COURSE OBJECTIVES

1	To solve a typical number base conversion and analyse new error coding techniques.
2	Theorems and functions of Boolean algebra and behaviour of logic gates.
3	Illustration of data paths and control flow for sequencing in CPUs, Microprogramming of control unit of CPU
4	Description of different parameters of a memory system, organization and mapping of various types of memories
5	Describes the means of interaction devices with CPU, their characteristics, modes and introduction to multiprocessors.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:	Cognitive Level
CO1 Classify different number systems and apply to generate various codes.	K3
CO2 Use the concept of Boolean algebra in minimization of switching functions and Design different types of combinational logic circuits.	K3
CO3 Understand different instruction types.	K2
CO4 Students can understand how cache mapping occurs in a computer and can solve various problems related to this.	K2
CO5 Students should be able to know the circuitry to the processor I/O ports in order to interface the processor to the external devices.	K2

*K1- Remember, K2- Understand, K3- Apply, K4- Analyze, K5- Evaluate, K6- Create

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	0	0	0	2	0	0	0	0	0	0	0	0	0
CO2	1	2	0	1	2	2	0	0	0	0	0	0	0	0	0
CO3	1	3	3	2	1	0	0	0	0	0	0	0	3	2	1
CO4	2	2	1	1	2	0	0	0	0	0	0	0	0	2	0
CO5	2	3	2	2	2	0	0	0	0	0	0	0	1	2	1

COURSE CONTENT

UNIT I	**Number Systems** Binary, Octal, Decimal, Hexadecimal Number Systems. Conversion of Numbers from One Radix to Another Radix, r's Complement and (r-1)'s Complement Subtraction of Unsigned Numbers, Problems, Signed Binary Numbers, Weighted and Non weighted codes **Logic Gates and Boolean Algebra** Basic Gates NOT, AND, OR, Boolean Theorems, Complement and Dual of Logical Expressions, Universal Gates, Ex-Or and Ex-Nor Gates, SOP, POS, Minimizations of Logic Functions Using Boolean Theorems.
UNIT II	**Gate Level Minimization:** Karnaugh Map Method (K-Map): Minimization of Boolean Functions maximum up to Four Variables, POS and SOP, Simplifications with Don't Care Conditions Using K-Map. **Combinational Logic Circuits** Design of Half Adder, Full Adder, Half Subtractor, Full Subtractor, Ripple Adders and Subtractors, Ripple Adder/Subtractor Using Ones and Twos Complement Method. Design of Decoders, Encoders, Multiplexers, Demultiplexers, Higher Order Demultiplexers and Multiplexers, Priority Encoder, Code Converters, Magnitude Comparator.
UNIT III	**Register Transfer Language and Micro-operations:** Register transfer language. register transfer bus and memory transfers, arithmetic micro operations, logic micro operations, shift micro operations, arithmetic logic shift unit. **Central Processing Unit:** General register organization, stack organization, instruction formats, addressing modes, data transfer and manipulation, program control, reduced instruction set computer. **Micro Programmed Control:** Control memory, address sequencing
UNITIV	**The Memory System:** Memory hierarchy, main memory, auxiliary memory, associative memory, cache memory, virtual memory. Pipelining Arithmetic and Instruction Pipeline, Basics of vector processing and Array Processors.
UNIT V	**Input-Output Organization:** Peripheral devices, input-output interface, asynchronous data transfer, modes of transfer, priority interrupts, direct memory access. **Multi Processors:** Introduction, characteristics or multiprocessors, interconnection structures, inter processor arbitration.

TEXTBOOKS

1	Computer System Architecture, M.Morris Mano, 3/e, Pearson/PHI
2	Digital Design ,4/e, M. Morris Mano, Michael D Ciletti, PEA
3	Fundamentals of Logic Design, 5/e, Roth, Cengage

REFERENCE BOOKS

1	Digital Logic Design, Leach, Malvino, Saha,TMH
2	Computer Organization and Architecture – William Stallings, 6/e, Pearson/PHI

WEB RESOURCES

1	http://nptel.iitm.ac.in/video.php?subjectId=106106092
2	https://www.tutorialspoint.com/videos/computer_organization/index.htm

3	https://www.youtube.com/watch?v=CeD2L6KbtVM
4	Lecture series on Digital Circuits & Systems by Prof.S.Srinivasan, Department of Electrical Engineering, IIT Madras. http://nptel.iitm.ac.in

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

(Common to CSE and IT)

Course Category	Professional Core	Course Code	19IT3T04
Course Type	Theory	**L-T-P-C**	3-0-0-3
Prerequisites		**Internal Assessment**	40
		Semester End Examination	60
		Total Marks	100

COURSE OBJECTIVES

1	To familiarize with the syntax and semantics of propositional and predicate logic.
2	To understand number theory.
3	To explain with examples the basic terminology of functions, relations, and sets.
4	To use graph theory for solving problems
5	To imbibe how basic concepts in Algebra can be applied in computer science.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:	Cognitive level
CO1	Distinguish Propositional Logic from Predicate Logic.	K4
CO2	Practice problems related to fundamental theorems.	K2
CO3	Illustrate with examples the basic terminology of functions, relations and demonstrate knowledge of their associated operations.	K2
CO4	Represent graphs as mathematical structure and apply graph theory in solving computer science problems.	K3
CO5	Describe the properties of homomorphism and poset and lattices and solve problems in Abstract Algebra.	K2

*K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 – Create

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	0	0	0	0	0	0	0	0	0	3	2	1
CO2	1	2	2	0	0	0	0	0	0	0	0	0	1	1	1
CO3	3	2	1	0	0	0	0	0	0	0	0	0	1	1	1
CO4	2	2	1	0	0	0	0	0	0	1	0	1	2	1	1
CO5	3	2	2	0	0	0	0	0	0	0	0	0	1	1	1

COURSE CONTENT

UNIT I	**Mathematical logic:** Propositional calculus: statements and notations, connectives, Truth tables, Tautologies, Equivalence of formulas, Tautological Implications, Normal forms, Theory of inference for statement calculus. Predicate Calculus: predicate logic, statement functions, variables and quantifiers, free and bound variables.
UNIT II	**Number Theory:** Properties of integers, Division Theorem, The Greatest Common Divisor, Euclidean Algorithm, Least Common Multiple, Testing Prime numbers, The Fundamental Theorem of Arithmetic (Fermat's Theorem and Euler's Theorem) Mathematical induction– Principle of Mathematical Induction, Exercises
UNIT III	**Relations:** Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Hasse diagram, Lattice and its Properties. **Functions:** Inverse Function Composition of functions, recursive Functions.
UNIT IV	**Graph Theory:** Basic Concepts of Graphs, Matrix representation of graphs: Adjacency Matrices, Incidence Matrices, Isomorphic Graphs, Paths and Circuits, Eulerian graphs, Planar Graphs, Graph coloring, spanning trees.
UNIT V	**Algebraic Structures:** Algebraic systems – Semi groups and monoids, Homomorphism of Semi group and Monoids, Groups, Cosets. Partial ordering – Posets – Lattices as Posets Elementary Combinatorics: Basis of counting, Combinations & Permutations, with repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion. Pigeon hole principle and its application.

TEXTBOOKS

1.	Mott, Kandel, and Baker, "Discrete Mathematics for Computer Scientists and Mathematicians", 2nd Edition, PHI.
2.	Trembly J.P. and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw–Hill, 30th Re-print (2007).
3.	Kenneth H Rosen, " Discrete Mathematics and its Applications", 7th Edition, McGraw – Hill.

REFERENCE BOOKS

1.	Ralph. P. Grimaldi, "Discrete and Combinatorial Mathematics: An Applied Introduction", 4th Edition, Pearson Education Asia, 2002.
2.	Thomas Koshy, "Discrete Mathematics with Applications", Elsevier Publications, 2006.
3.	Seymour Lipschutz and Mark Lipson, "Discrete Mathematics", Second edition, Schaum's Outlines, Tata McGraw – Hill, 2007.

WEB RESOURCES

1.	https://www.cs.cmu.edu/~emc/15414-f12/lecture/propositional_logic.pdf.
2.	https://www.tutorialspoint.com/discrete_mathematics/discrete_mathematics_propositional_logi c.htm
3.	https://www.tutorialspoint.com/discrete_mathematics/discrete_mathematics_functions.htm
4.	http://discretemathnotes.blogspot.in/2008/08/groups.html
5.	https://people.cs.pitt.edu/~milos/courses/cs441/lectures/Class25.pdf

Managerial Economics and Financial Analysis			
(Common to all branches)			
Course Category	Humanities including Management	**Course Code**	19HM3T01
Course Type	Theory	**L-T-P-C**	3 -0 -0-3
Prerequisites		**Internal Assessment** **Semester End Examination** **Total Marks**	40 60 100

	Course Outcomes On successful completion of the course, the student will be able to	Cognitive Level
CO 1	Make use of the concepts of managerial economics and demand in managerial decision making and predicting demand for goods and services	K3
CO 2	Assess the functional relation among production, cost of production, cost concepts and Break-Even Analysis.	K5
CO 3	Classify market structures as perfect and imperfect markets for price and output decisions	K2
CO 4	Appraise the forms of business organizations and trade cycles in economic growth.	K5
CO 5	Apply accounting and capital budgeting techniques in financial decision making	K3

*K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 - Create

Contribution of Course Outcomes towards achievement of Program											
Outcomes: 1 – Low, 2 - Medium, 3 – High											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	0	2	0	0	0	0	0	0	0	0	0	0
CO2	0	1	0	0	0	0	0	0	0	0	3	0
CO3	0	1	0	0	0	0	0	0	0	0	0	0
CO4	0	0	0	0	0	0	0	0	0	0	0	1
CO5	0	3	0	0	0	0	0	0	0	0	1	0

Course Content :

Unit – I
Introduction to Managerial Economics and demand Analysis: Definition of Managerial Economics and Scope-Managerial Economics and its relation with other subjects-Basic Economic Tools used in Managerial Economics-Concepts of Demand-Types-Determinants-Law of Demand its Exceptions-Elasticity of
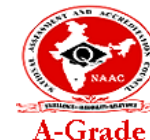
Demand-Types and Measurement- Law of Supply -Demand forecasting and Methods of demand forecasting.

Unit – II
Production and Cost Analysis: Production function- Law of Variable proportions- Iso-quants and Isocosts- Laws of Returns to Scale-Cobb-Douglas Production function-Economies of Scale-Cost Concepts-Fixed vs Variable Costs-Out of Pocket Costs vs Imputed Costs-Cost Volume Profit analysis-Determination of Break-Even Point (Simple Problems).

Unit – III
Introduction to Markets: Market Structures: Perfect Competition, Monopoly, Monopolistic and Oligopoly – Features – Price and Output Determination.

Theories of the Firm & Pricing Policies: Managerial Theories of firm: Marris and Williamson's models – Methods of Pricing: Limit Pricing, Market Skimming Pricing, Internet Pricing: Flat Rate Pricing, Usage sensitive, Transaction based pricing, Priority Pricing.

Unit – IV
Types of Business Organization and Business Cycles: Features and Evaluation of Sole Trader – Partnership – Joint Stock Company – State/Public Enterprises and their forms – Business Cycles – Meaning and Features – Phases of Business Cycles.

Unit – V
Introduction to Accounting and Capital Budgeting: Introduction to Double Entry Systems-Journal-Ledger- Trail Balance - Preparation of Financial Statements
Capital Budgeting: Meaning of Capital-Capitalization-Meaning of Capital Budgeting-Need for Capital Budgeting-Techniques of Capital Budgeting-Traditional and Modern Methods.

Textbooks:

1. Dr. B. Kuberudu and Dr. T. V. Ramana: Managerial Economics & Financial Analysis, Himalaya Publishing House 2011.
2. Dr. N. Appa Rao, Dr. P. Vijay Kumar: 'Managerial Economics and Financial Analysis', Cengage Publications, New Delhi – 2011
3.. Dr. A. R. Aryasri – Managerial Economics and Financial Analysis, TMH 2011

Reference Books :

1. V. Maheswari: Managerial Economics, Sultan Chand.
2. Suma Damodaran: Managerial Economics, Oxford 2011.
3. Prof. J.V.PrabhakaraRao, Prof. P. Venkatarao. 'Managerial Economics and Financial Analysis', Ravindra Publication.
4. Vanitha Agarwal: Managerial Economics, Pearson Publications 2011.
5. Sanjay Dhameja: Financial Accounting for Managers, Pearson.
6. Maheswari: Financial Accounting, Vikas Publications. 7. S. A. Siddiqui & A. S. Siddiqui: Managerial Economics and Financial Analysis, New Age International Publishers, 2012

Web Resources:

1. https://economictimes.indiatimes.com/definition/law-of-supply

2. https://sites.google.com/site/economicsbasics/managerial-theories-of-the-firm

3. https://www.managementstudyguide.com/capitalization.htm

Python Programming Laboratory

(Common to CSE, IT)

Course Category	Engineering Science	Course Code	19CS3L02
Course Type	Laboratory	L-T-P-C	0-0-3-1.5
Prerequisites	Exposure to Programming for Problem Solving using C Laboratory	Internal Assessment Semester End Examination Total Marks	40 60 100

COURSE OBJECTIVES

1	To introduce the usage of fundamental data structures like List, Tuples and Dictionaries.
2	To imbibe the philosophy of object oriented programming using Python
3	To perform file handling in python.

COURSE OUTCOMES

	Upon successful completion of the course, the student will be able to:	Cognitive level
CO1	Develop python programs using conditional statements and expressions	K3
CO2	Apply List and String manipulations to solve given problem.	K3
CO3	Develop programs with Tuples and Dictionary data structures	K3
CO4	Develop Python programs using file concepts.	K3

*K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 - Create

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	0	0	0	0	0	0	2	3	3	2
CO2	3	2	1	1	1	0	0	0	0	0	0	2	3	3	2
CO3	3	2	1	1	1	0	0	0	0	0	0	2	3	3	2
CO4	3	2	2	3	3	0	0	0	0	0	0	2	3	3	2

COURSE CONTENT	
1	a) Write a program to compute distance between two points taking input from the user b) Light travels at 3 * 108 meters per second. A light-year is the distance a light beam travels in one year. Write a program that calculates and displays the value of a light year. c) The marks obtained by a student in 5 different subjects are input through the keyboard. Print the student SGPA as per the Pragati Engineering College examination policy as shown below.

Assume all the five subjects have 3 credits

Theory (%)	Letter Grade	Level	Grade Point
≥ 90	O	Outstanding	10
≥ 80 to < 90	S	Excellent	9
≥ 70 to < 80	A	Very Good	8
≥ 60 to < 70	B	Good	7
≥ 50 to < 60	C	Fair	6
≥ 40 to < 50	D	Satisfactory	5
<40	F	Fail	0
		Absent	0

The SGPA is the ratio of sum of product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student i.e.

$$\text{SGPA (Si)} = \sum (Ci \times Gi) / \sum Ci$$

Where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

2

a) Write a program to calculate the Income Tax as per the rules of Indian Government.

b) Develop a program that performs arithmetic operations (Addition, Subtraction, Multiplication, and Division) on integers. Input the two integer values and operator for performing arithmetic operation through keyboard. The operator codes are as follows:

- For code '+', perform addition.
- For code '-', perform subtraction.
- For code '*', perform multiplication.
- For code '/', perform division.

c) If the first name of a student is input through the keyboard, write a program to display the vowels and consonants present in his/her name.

3

a) The factorial of an integer N is the product of all of the integers between 1 and N, inclusive. Write a while loop that computes the factorial of a given integer N.

b) The $\log_2$ of a given number N is given by M in the equation $N = 2^M$. The value of M is approximately equal to the number of times N can be evenly divided by 2 until it becomes 0. Write a loop that computes this approximation of the $\log_2$ of a given number N.

c) The German mathematician Gottfried Leibniz developed the following method to approximate the value of π:

π/4 = 1 – 1/3 + 1/5 -1/7 +………

Write a program that allows the user to specify the number of iterations used in this approximation and that displays the resulting value.

4

a) A list of integers is said to be a valley if it consists of a sequence of strictly decreasing values followed by a sequence of strictly increasing values. The decreasing and increasing sequences must be of length at least 2. The last value of the decreasing sequence is the first value of the increasing sequence.

Write a Python program that takes a list of integers and returns True if the list is a valley and False otherwise.

	Here are some examples to show how your program should work.
	[3,2,1,2,3] True [3,2,1] False [3,3,2,1,2] False b) Write a python program to test whether two strings are nearly equal. Two strings a and b are nearly equal when a can be generated by a single mutation on b. c) Two numbers r (number of rows) and c (number of columns) in a single line separated by a space. Print the Elements of the generated matrix. Each row should be printed in a new line with each element separated by a space. Also, the matrix should have elements starting from 1 to r $\times$ c with an increment of one in row manner.
5	a) Write a program to create a list 'A' to generate squares of a number (from 1 to 10), list 'B' to generate cubes of a number (from 1 to 10) and list 'C' with those elements that are even and present in list 'A', using List Comprehension. b) Demonstrate the usage of + operator, * operator and slicing operator on Tuples.
6	a) Write a program to read a text sentence from the user and create a dictionary with the number of occurrences of each word in the given sentence. Print the word which occurred more number of times in the sentence as output. b) Demonstrate Insert, Modify, Delete and Traversal of Dictionary.
7	a) Write a function eval_Quadratic_Equation(a,b,c,x) which returns the value of any quadratic equation of the form ax^2+bx+c b) Write a function calc_GCD_recur(a,b) which calculates the GCD recursively of two numbers. The function should take two positive integers and should an integer as GCD.
8	a) Write a program to create a class called Rectangle, with the method named Calc_Rect_Area( ) which takes the length and breadth as parameters and returns the computed area. Demonstrate the usage of the method Calc_Rect_Area( ) of class Rectangle. b) Write a program to create a class called Box with three member variables like width, height and depth. Provide the __init__ ( ) method for initialization. Also define the method calculate_volume( ) to compute and return the volume of the box. Demonstrate the usage of the method calculate_volume ( ) of class Box.
9	a) Write a program to create a base class called Point. Define the method Set_Coordinate(X,Y). Define the new class New_Point, which inherits the Point class. Also add draw( ) method inside the subclass to display the x and y coordinate values. b) Write a simple program to demonstrate the concept of multilevel inheritance.
10	a) Write a program to generate a list of numbers which are multiples of 5 from 1 to 1000. Write all the odd numbers in this list to a file named 'OddMultiplesOfFive.txt' and write all the even numbers in this list to file named 'EvenMultiplesOfFive.txt' b) Write a function Find_Largest( ) which accepts a file name as parameter and reports the longest line in the input text file.

PRAGATI ENGINEERING COLLEGE
(AUTONOMOUS)
DEPARTMENT OF INFORMATION TECHNOLOGY

DATABASE MANAGEMENT SYSTEMS LABORATORY

(Common to CSE and IT)

Course Category	Professional Core		Course Code	19IT3L02
Course Type	Laboratory		**L-T-P-C**	0-0-3-1.5
Prerequisites			**Internal Assessment**	40
			Semester End Examination	60
			Total Marks	100

COURSE OBJECTIVES

1	To impart database design, query and PL/SQL.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:	Cognitive Levels
CO1	Make use of DDL and DML commands for Database design and manipulation	K3
CO2	Utilize Sub-Query, Nested Query and Joins concepts in a given problem-domain	K3
CO3	Apply Built-in functions on Database	K3
CO4	Develop programs in PL/SQL with Procedures, Functions, Cursors, Packages.	K3

*K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 – Create

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	0	2	3	3	0	0	0	0	0	0	0	3	2	1
CO2	2	2	3	2	3	0	0	0	0	0	0	0	3	1	3
CO3	2	0	3	2	2	0	0	0	0	0	1	1	1	3	3
CO4	3	1	3	3	3	0	1	0	1	1	0	1	3	2	3

LIST OF EXPERIMENTS	
1	Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
2	Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSECT, Constraints. Example: Select the roll number and name of the student who secured fourth rank in the class.
3	Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

4	Queries using Conversion functions (to char, to number and to date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), dateFunctions (Sysdate, next_day, add months, last day, months between, least, greatest, trunc, Round, to char, to date)
5	i) Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found) ii) Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.
6	Develop a program that includes the features NESTED IF, CASE and CASE expression. The Program can be extended using the NULLIF and COALESCE functions.
7	Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, raise-, application error.
8	Programs development using creation of procedures, passing parameters IN and OUT of procedures.
9	Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.
10	Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.
11	Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.
12	Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers.

Essence of Indian Traditional Knowledge
(Common to all branches)

Course Category	Humanities including Management	Course Code	19HM3T06
Course Type	Theory	**L-T-P-C**	2 -0 -0-0
Prerequisites		Total Marks (Internal Assessment)	100

Course Outcomes	Cognitive level
On successful completion of the course, the student will be able to	
CO 1 Understand the significance of Indian Traditional Knowledge.	K2
CO 2 Classify the Indian Traditional Knowledge	K3
CO 3 Compare Modern Science with Indian Traditional Knowledge system.	K5
CO 4 Analyze the role of Government in protecting the Traditional Knowledge	K4
CO 5 Understand the impact of Philosophical tradition on Indian Knowledge System.	K2

*K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 - Create

Contribution of Course Outcomes towards achievement of Program											
Outcomes: 1 – Low, 2 - Medium, 3 – High											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	0	1	2	0	0	3	0	1	0	2	0	0
CO2	0	0	2	0	0	2	0	2	0	0	0	0
CO3	0	0	2	0	0	3	0	1	1	2	2	1
CO4	0	0	2	0	0	2	0	2	0	0	0	0
CO5	0	0	1	0	0	3	0	1	0	3	0	1

Course Content :

Unit I

Introduction to Traditional Knowledge: Define Traditional Knowledge- Nature and Characteristics- Scope and Importance- kinds of Traditional Knowledge- The historical impact of social change on Traditional Knowledge Systems- Value of Traditional knowledge in global economy.

Unit II

Basic structure of Indian Knowledge System: Astadash Vidya- 4 Ved - 4 Upaved (Ayurved,Dhanurved,GandharvaVed&SthapthyaAdi),6vedanga(Shisha,Kalppa,Nirukha,Vykaran,Jyothisha&Chand),4upanga(Dharmashastra,Meemamsa,purana&Tharka Shastra).

Unit III

Modern Science and Indian Knowledge System-Indigenous Knowledge, Characteristics- Yoga and Holistic Health care-cases studies.

Unit IV

 Protection of Traditional Knowledge: The need for protecting traditional knowledge -Significance of Traditional knowledge Protection-Role of government to harness Traditional Knowledge.

Unit V

Impact of Traditions: Philosophical Tradition (Sarvadarshan) Nyaya, Vyshepec, Sankhya, Yog, Meemamsa, Vedantha, Chavanka, Jain &Boudh - Indian Artistic Tradition - Chitra kala, Moorthi kala, Vasthu kala , Sthapthya, Sangeetha, NruthyaYevamSahithya

Reference Books :
1. Traditional Knowledge System in India, by Amit Jha, 2009.
2. Traditional Knowledge System and Technology in India by Basanta Kumar Mohanta and Vipin Kumar Singh, Pratibha Prakashan 2012.
3. Sivaramakrishnan (Ed.), Cultural Heritage of India-course material, Bharatiya Vidya
4. Swami Jitatmanand, Holistic Science and Vedant, Bharatiya Vidya Bhavan
5. Yoga Sutra of Patanjali, Ramakrishna Mission, Kolkata.
6. Pramod Chandra, India Arts, Howard Univ. Press, 1983.
7. Krishna Chaitanya, Arts of India, Abhinav Publications, 1987.

Web Resources:

1. https://www.wipo.int/wipo_magazine/en/2017/01/article_0004.html

2. http://iks.iitgn.ac.in/wp-content/uploads/2016/01/Indian-Knowledge-Systems-Kapil-Kapoor.pdf

3.https://www.wipo.int/edocs/mdocs/tk/en/wipo_grtkf_ic_21/wipo_grtkf_ic_21_ref_facilitators_text.pdf

Object Oriented Programming through Java

(Common to CE, ME, EEE, ECE, CSE, IT)

Course Category	Professional Core		Course Code	19CS4T05
Course Type	Theory		L-T-P-C	3-0-0-3
Prerequisites	Exposure to Programming for Problem Solving using C		Internal Assessment Semester End Examination Total Marks	40 60 100

COURSE OBJECTIVES

1	To understand how to use Java to write applications.
2	To impart primitive data types in Java and programming constructs.
3	To make use of Java Classes and Objects, methods and constructors.
4	To understand the concepts of Inheritance, Interfaces and Packages.
5	To implement Java programs using exceptions and multithreading.

COURSE OUTCOMES	Cognitive level
Upon successful completion of the course, the student will be able to:	
CO1 Apply the fundamentals of Java to solve problems	K3
CO2 Differentiate the application of decision and iteration control structures	K2
CO3 Implement classes and method overloading concepts	K3
CO4 Apply the concepts of inheritance and packages	K3
CO5 Implement Java programs using exceptions and multithreading	K3

*K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 - Create

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	3	0	0	0	0	0	0	0	3	3	2
CO2	3	3	3	2	3	0	0	0	0	0	0	0	3	3	2
CO3	3	3	3	3	3	0	0	0	0	0	0	0	3	3	2
CO4	3	3	3	3	3	0	0	0	0	0	0	0	3	3	2
CO5	3	3	3	3	3	0	0	0	0	0	0	0	3	3	2

COURSE CONTENT	
UNIT I	**Introduction to JAVA:** The History of Java, Java Virtual Machine, Java Buzzwords, Evolution of Java, An overview of Java, Object Oriented Programming and its principles, First Java Program, Lexical Issues-Identifiers, Java Keywords, Java Primitive Data types, Variables, Type Conversion and Casting, Arrays. **Programming Constructs:** Operators- Arithmetic, Bitwise, Relational, Boolean Logical, Assignment, ? Operator, Operator Precedence, Control Statements – Selection, Iteration and Jump Statements.
UNITII	**Classes and Objects:** Class Fundamentals, declaring Objects, Introducing Methods, Constructors, The this Keyword, Garbage collection. **A Closer look at Methods and Classes:** Overloading Methods, using objects as parameters, returning objects, Introducing Access Control, Understanding static, introducing final, Nested and Inner Classes, Exploring the String class, using Command-Line Arguments.
UNITIII	**Inheritance:** Types of Inheritance, Using super, Method Overriding, Using Abstract class, Using final with Inheritance. **Interfaces& Packages:** Interfaces, Multiple Inheritance Issues, Defining a Package, Finding Packages and CLASSPATH, Access protection, Importing packages, package example, Introducing to **java. lang** and **java.io** packages.
UNITIV	**Exceptions:** Introduction, Exception handling fundamentals, Exception types, using try and catch, Multiple catch clauses, nested try statements, throw, throws, finally block, Java's Built-in-Exceptions, user defined exception, Chained Exceptions, using Exceptions.
UNITV	**Multi-Threading:** The Java Thread Model, the Main Thread, Creating a Thread, Multiple threads, Using isAlive() and join(), Thread priorities, Synchronization, Interthread Communication, Suspending, Resuming threads and Stopping Threads, using Multithreading.

TEXT BOOKS	
1.	The Complete Reference Java, 9ed, Herbert Schildt, TMH
2.	Programming in JAVA, Sachin Malhotra, Saurabh choudhary, Second Edition, Oxford.

REFERENCE BOOKS	
1.	Object oriented programming with JAVA, Essentials and Applications, Raj Kumar Buyya, Selvi, Chu TMH
2.	Core Java Volume 1.Fundamentals, 8ed, Cay S.Horstmann, Gray Cornell, Pearson.
3.	Advanced Programming in Java2: Updated to J2SE6 with Swing, Servlet and RMI, K.Somaundaram.

WEB RESOURCES	
1.	https://nptel.ac.in/courses/106105191/
2.	https://docs.oracle.com/javase/tutorial/java/index.html
3.	https://www.w3schools.com/java/

PRAGATI ENGINEERING COLLEGE
(AUTONOMOUS)
DEPARTMENT OF INFORMATION TECHNOLOGY

SCRIPTING LANGUAGES

(Information Technology)

Course Category	Professional Core		Course Code	19IT4T05
Course Type	Theory		L-T-P-C	3-0-0-3
Prerequisites			Internal Assessment	40
			Semester End Examination	60
			Total Marks	100

COURSE OBJECTIVES

1	To introduce students to the programming experience and techniques associated with World Wide Web.
2	To familiarize web-based media-rich programming tools for creating interactive web pages.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:	Cognitive level
CO1	Identify elements and attributes of a web page.	K2
CO2	Understand the XML usage and web services.	K2
CO3	Develop client-side manipulations in web pages using Java Script.	K3
CO4	Develop Programs using jQuery.	K3
CO5	Build Angular JS web Application.	K3

*K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 – Create

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	3	2	0	3	0	0	0	2	0	0	1	0	2	2
CO2	1	2	3	0	2	0	0	0	2	0	0	2	0	2	3
CO3	1	2	2	0	3	0	0	0	3	0	0	1	1	3	3
CO4	2	2	3	2	3	0	0	0	3	0	0	1	1	3	3
CO5	2	2	3	2	3	0	0	0	3	0	0	1	1	3	3

COURSE CONTENT	
UNIT I	**HTML:** Basic Syntax, Standard HTML Document Structure, Basic Text Markup, Images, Hypertext Links, Lists, Tables, Forms, HTML5 **CSS:** Levels of Style Sheets, Style Specification Formats, Selector Forms, The Box Model

UNIT II	**XML:** Document Type Definition, XML schemas, Document object model, XSLT, **Web Services:** SOAP, WSDL
UNIT III	**The Basic of JavaScript:** Objects, Primitives Operations and Expressions, Screen Output and Keyboard Input **Working with JavaScript:** Control Statements, Object Creation and Modification, Arrays, Functions, Constructors, Pattern Matching using Regular Expressions
UNIT IV	**JQuery:** Our First jQuery Document, **Selectors**-The Document Object Model, The $() Factory Function CSS Selectors, XPath Selectors, Custom Selectors, DOM Traversal Methods, Accessing DOM Element
UNIT V	**Angular JS:** What is AngularJS, Data Binding and Your First Angular JS Web Application, Simple Data Binding, Best Data Binding Practices Modules, Scopes, Controllers, Expressions

TEXTBOOKS

1.	Robet W Sebesta, "Programming the World Wide Web", 7th Edition, Pearson Education, 2013.
2.	Jonathan Chaffer and Karl Swedberg, "JQuery: Learning jQuery Better Interaction Design and Web Development with Simple JavaScript Techniques" Packt Publishing; 1st Edition, 2007.
3.	Ari Lerner, "ng-book - The Complete Book on AngularJS"

REFERENCE BOOKS

1.	Web Technologies, HTML< JavaScript, PHP, Java, JSP, XML and AJAX, Black book, Dream Tech.
2.	An Introduction to Web Design, Programming, Paul S Wang, Sanda S Katila, Cengage Learning.
3.	Brad Green and Shyam Seshadri, "AngularJS", 1st Edition, Orelly.

WEB RESOURCES

1.	http://www.w3schools.com
2.	www.tutorialspoint.com/
3.	http://pepa.holla.cz/wp-content/uploads/2015/10/ng-book-The-Complete-Book-on-AngularJS.pdf

Software Engineering

(Common to CSE & IT)

Course Category	Professional Core		Course Code	19CS4T10
Course Type	Theory		**L-T-P-C**	3-0-0-3
Prerequisites			**Internal Assessment**	40
			Semester End Examination	60
			Total Marks	100

COURSE OBJECTIVES

1	To understand the principles used in developing the functionality of a software.
2	To understand the mechanism used to design software architecture and test its functionality.
3	To analyze the software quality factors and manage the software risks.

COURSE OUTCOMES		Cognitive level
Upon successful completion of the course, the student will be able to:		
CO1	Analyze various software development process models and their suitability to industrial applications	K4
CO2	Apply the methods of requirement elicitation, analysis and develop the software architecture	K3
CO3	Analyze different strategies for component level and user interface design	K4
CO4	Apply software testing approaches for conventional and object oriented applications	K3
CO5	Understand the software quality aspects and risk management mechanisms.	K2

*K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze, K5 - Evaluate, K6 - Create

Contribution of Course Outcomes towards achievement of Program													
Outcomes (1 – Low, 2 - Medium, 3 – High)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	1	1	0	0	0	0	0	2	0	2	0
CO2	3	3	3	2	2	0	0	0	0	0	2	0	2	0
CO3	3	3	3	3	2	0	0	0	0	0	2	0	2	0
CO4	3	3	1	1	3	0	0	0	0	0	2	1	2	3
CO5	3	3	3	2	2	0	0	0	0	0	2	1	2	2

COURSE CONTENT	
UNIT I	**Software and Software Engineering**: The Nature of Software, Software Engineering, The Software Process, Software Engineering Practice, Software Myths. **Process Models:** A Generic Process Model, Prescriptive Process Models, Specialized Process

	Models, The Unified Process, Personal and Team Process Models.
UNITII	**Requirements Analysis and Specification**: Eliciting Requirements, Building Requirements model, negotiating requirements, validating requirements, Flow Oriented Modeling. **Design Process:** The Design Process, Design Concepts, Architectural Styles, Architectural Design.
UNITIII	**Component Level Design**: Designing Class based components, Component level design for Web Apps, Designing Traditional components **User Interface Design**: The Golden Rules, User Interface Analysis and Design, interface Analysis, interface Design steps.
UNITIV	**Software Testing Strategies**: A strategic approach to software testing, test strategies for conventional software, validation testing, system testing, the art of debugging. **Testing Conventional and Object oriented Applications**: White box testing, Black box Testing, object oriented testing strategies, object oriented testing methods.
UNITV	**Quality:** McCall's Quality Factors, ISO 9126 Quality Factors, SQA tasks, goals, metrics, the ISO 9000 Quality Standards. **Risk Management:** Reactive versus Proactive risk strategies, software risks, Risk identification, Risk Projection, Risk Refinement, Risk mitigation, monitoring, management, RMMM Plan.

TEXT BOOKS

1.	Software Engineering A practitioner's Approach, Roger S. Pressman, Seventh Edition McGrawHill International Edition.
2.	Fundamentals of Software Engineering, Rajib Mall, Third Edition, PHI.

REFERENCE BOOKS

1.	Software Engineering, Ian Sommerville, Ninth edition, Pearson education
2.	Software Engineering : A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008

WEB RESOURCES

1.	http://nptel.ac.in/downloads/106105087/
2.	https://www.tutorialspoint.com/software_engineering/software_engineering_tutorial.pdf

OPERATING SYSTEMS

(Common to CSE and IT)

Course Category	Professional Core		Course Code	19IT4T06
Course Type	Theory		L-T-P-C	3-0-0-3
Prerequisites			Internal Assessment	40
			Semester End Examination	60
			Total Marks	100

COURSE OBJECTIVES

1	To introduce the structure and functions of Operating Systems.
2	To impart process, disk and memory management.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:	Cognitive Levels
CO1	Classify the operating system services.	K4
CO2	Evaluate Scheduling algorithms for process management.	K5
CO3	Compare various memory management schemes.	K4
CO4	Illustrate process synchronization techniques to avoid deadlocks.	K2
CO5	Analyze the structure of file systems on secondary storage devices.	K4

*K1- Remembering, K2- Understanding, K3- Applying, K4- Analyzing, K5- Evaluating, K6- Creating

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	0	1	2	0	1	0	0	0	0	0	0	0	1	0	0
CO2	2	2	0	1	0	0	0	0	0	0	0	0	1	0	0
CO3	2	2	0	0	3	0	0	0	0	0	0	0	1	1	0
CO4	2	2	3	0	0	0	0	0	0	0	0	0	0	0	0
CO5	2	2	3	2	3	0	0	0	0	0	0	0	2	0	0

COURSE CONTENT

UNIT I	**Operating System Overview:** Operating systems objectives and functions, evolution of operating systems, system calls, types of system calls.

UNIT II	**Process Management:** Process concept – The process, process state diagram, process control block, process scheduling – scheduling queues, schedulers, context switch, operations on processes, inter-process communication, multithreading models, threading issues, scheduling – basic concepts, scheduling criteria, scheduling algorithms.
UNIT III	**Memory Management Strategies:**Swapping, contiguous memory allocation, paging, structure of the page table, segmentation **Virtual Memory Management:**Virtual memory, demand paging, page-replacement algorithms, thrashing
UNIT IV	**Concurrency:**Process synchronization, the critical-section problem, Peterson's solution, synchronization hardware, semaphores, classic problems of synchronization, monitors, synchronization examples **Principles of deadlock:** System model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock
UNIT V	**File system Interface:**The concept of a file, access methods, directory structure, file system mounting, files sharing, protection. **File System Implementation:** File system structure, allocation methods, free-space management, secondary storage structure – overview of mass-storage structure, disk scheduling and algorithms

TEXTBOOKS

1.	Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", John Wiley and Sons Inc., 8th Edition, 2012.
2.	William Stallings, "Operating Systems – Internals and Design Principles", Prentice Hall, 7th Edition, 2011.

REFERENCE BOOKS

1.	Andrew S. Tanenbaum, "Modern Operating Systems", Addison Wesley, 2nd Edition, 2001.
2.	Charles Crowley, "Operating Systems: A Design-Oriented Approach", Tata Mc Graw Hill Education", 1996.
3.	D M Dhamdhere, "Operating Systems: A Concept-Based Approach", Tata Mc Graw-Hill Education, 2nd Edition, 2007.

WEB RESOURCES

1.	http://nptel.ac.in/courses/106108101 (Prof. P.C.P. Bhatt, IISc Bangalore)
2.	https://www.tutorialspoint.com/operating_system/

Formal Languages and Automata Theory

(Common to CSE, IT)

Course Category	Professional Core		Course Code	19CS4T07
Course Type	Theory		**L-T-P-C**	3-0-0-3
Prerequisites	Exposure to Mathematical Foundations of Computer Science	**Internal Assessment** **Semester End Examination** **Total Marks**		40 60 100

COURSE OBJECTIVES

1	To understand various types of finite automata
2	To understand the grammar and PDA Push Down Automata for a given language
3	To impart the comprehensive knowledge of Turing Machine

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:		Cognitive level
CO1	Apply core concepts of automata theory and Formal Languages	K3
CO2	Compare different types of Finite Automata and Transducers	K2
CO3	Solve Regular Expressions and Simplification of Context Free Grammars	K3
CO4	Construct Pushdown automata for formal languages	K3
CO5	Construct Turing Machines and List the undecidable problems	K3

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)

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

COURSE CONTENT

UNIT I	**Fundamentals of Automata**: Finite State Machine, Components of Finite State Automata, Elements of Finite State System ,Mathematical representation of Finite State Machine **Formal Language Theory**: Symbols, Alphabets and Strings, Operations on Strings, Formal Languages, Operations on Languages

UNIT II	**Finite Automata:** Deterministic Finite Automata(DFA), Non Deterministic Finite Automata(NFA), Non-Deterministic Automata with Є-moves, Equivalence of NFA/NFA-ε and DFA **Transducers:** Moore Machine, Mealy Machine, Equivalence of Moore and Mealy Machines.
UNIT III	**Regular Expressions:** Regular Languages, Properties of Regular Expressions, Arden's theorem, Equivalence between Finite Automata and Regular Expressions, Pumping Lemma for Regular Languages(RL) Closure Properties of RL. **Context Free Grammar:** Formal Definition of CFG, Types of Grammars, Derivation Tree, Ambiguous Grammars, Simplification of CFG, Chomsky Normal Form and Greibach Normal Form, Pumping Lemma for Context Free Languages(CFL), Closure Properties of CFL.
UNIT IV	**Pushdown Automata:** The formal definition of PDA, Graphical Notation for PDA, Instantaneous Descriptions of PDA, The languages of PDA.
UNIT V	**Turing Machine:** Components of a TM, Description of a TM, Elements of TM, Instantaneous Descriptions of a TM, Design of Turing Machines **Undecidability**: Undecidable Problem, P and NP Classes of Languages.

TEXT BOOKS

1.	Introduction to Automata Theory, languages and computation, John E Hopcroft, Rajeev Motwani, Jeffery D Ullman , 3rd Edition, Pearson Education.
2.	A Text Book on Automata Theory, P.K. Srimani, Nasir S.F.B, Cambridge University Press

REFERENCE BOOKS

1.	Theory of Computer Science Automata Language and Computation, K. L P Mishra, N.ChandraSekharan, 3rd edition,
2.	Theory of Computation -A problem solving approach, Kavi Mahesh, Wiley

WEB RESOURCES

1.	http://nptel.ac.in/courses/106106049/
2.	https://www.iitg.ernet.in/dgoswami/Flat-Notes.pdf
3.	http://www.ics.uci.edu/~goodrich/teach/cs162/notes/
4.	https://www.tutorialspoint.com/automata_theory/automata_theory_tutorial.pdf
5.	http://freevideolectures.com/Course/3379/Formal-Languages-and-Automata-Theory

Object Oriented Programming through Java Laboratory

(Common to CSE, IT)

Course Category	Professional Core		Course Code	19CS4L04
Course Type	Laboratory		L-T-P-C	0-0-3-1.5
Prerequisites	Exposure to Programming for Problem Solving using C		**Internal Assessment** **Semester End Examination** **Total Marks**	40 60 100

COURSE OBJECTIVES

1	To understand how to use Java to write applications.
2	To impart primitive data types in Java and programming constructs.
3	To make use of Java Classes and Objects, methods and constructors.
4	To understand the concepts of Inheritance, Interfaces and Packages.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:	Cognitive level
CO1	Implement object oriented concepts using Java	K3
CO2	Apply the concepts of inheritance and packages.	K3
CO3	Implement Java programs using exceptions and multithreading.	K3

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	3	3	3	0	0	0	0	0	0	0	3	3	2
CO2	2	2	3	3	3	0	0	0	0	0	0	0	3	3	2
CO3	2	2	3	3	3	0	0	0	0	0	0	0	3	3	2

COURSE CONTENT

1	a) Write a JAVA program to display default value of all primitive data types of JAVA b) Write a JAVA program to highlight the even numbers in the Fibonacci sequence using recursive and non-recursive functions.
2	a) Write a JAVA program to check the number of words which satisfies the palindrome condition in the given string. Example String: "Our Java subject madam is non local". b) Write a JAVA program to sort prices of all the given items as per 2017 price:

	Grocery item	2007 price	2017 price
	Pasta	52	128
	Dried beans	72	132

		Ground beef	130	250
		All-purpose flour	40	95
3	a) Write a JAVA program to display the sum of the arguments passed through command line and also print "can't do addition" if any of the argument is a string. b) Write a JAVA program to sort an array of strings from the given input excluding the Integer values from the input.			
4	a)Write a JAVA program to swap two numbers using call by value and call by reference. b) Write a JAVA program to calculate the area of a rectangle using "this" keyword having three different parameterized constructors.			
5	a) Write a JAVA program to compute the area of a circle using static variables, methods and block. b) Write a JAVA program to calculate the volume of a shape selected using 'super' keyword			
6	a) Write a JAVA program assuming there is a method getInterestRate() which returns the interest rate of a bank. RBI is the superclass and it returns 7 for getInterestRate(). There are various banks like SBI, AXIS, ICICI, etc. which extend RBI class and override the getInterestRate() method to return 7.5, 8, 8.5, etc. respectively using Method overloading, method overriding and constructor overloading. b) Write a JAVA program to create an abstract class named Shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method printArea() that prints the area of the given Shape.			
7	a) Write a JAVA program that implements educational hierarchy using inheritance. b) Write a JAVA program to find the details of the students eligible to enroll for the examination (Students, Department combined give the eligibility criteria for the enrollment class) using interfaces.			

8	a) Write a program to identify the accessibility of a variable by means of different access specifiers within and outside package. b) Write a JAVA program to create a package named my pack and import it in circle class.
9	a) Write a java program that implements Array Index out of bound Exception using built-in-Exception. b) Write a JAVA program to check a person is eligible for vote or not using user defined exception
10	a) Write an application that displays deadlock between threads. b) Write an application that executes two threads. One thread displays "An" every 1000 milliseconds and other displays "B" every 3000 milliseconds. Create the threads by extending the Thread class.

PRAGATI ENGINEERING COLLEGE
(AUTONOMOUS)
DEPARTMENT OF INFORMATION TECHNOLOGY

SCRIPTING LANGUAGES LABORATORY

(Information Technology)

Course Category	Professional Core	**Course Code**	19IT4L03
Course Type	Laboratory	**L-T-P-C**	0-0-3-1.5
Prerequisites		**Internal Assessment**	40
		Semester End Examination	60
		Total Marks	100

COURSE OBJECTIVES

1	To implement techniques associated with World Wide Web.
2	To implement web-based media-rich programming tools for creating interactive web pages.

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:	Cognitive Levels
CO1	Build static web pages using HTML and CSS.	K3
CO2	Illustrate the XML	K2
CO3	Develop client side manipulations in web pages using Java Script.	K3
CO4	Develop Programs using jQuery.	K3
CO5	Build Angular JS web Application.	K3

*K1- Remembering, K2- Understanding, K3- Applying, K4- Analyzing, K5- Evaluating, K6- Creating

Contribution of Course Outcomes towards achievement of Program Outcomes (1 – Low, 2 - Medium, 3 – High)														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	1	3	3	0	3	0	0	0	2	0	0	2	2	3	3
CO2	1	2	3	0	2	0	0	0	2	0	0	2	1	2	3
CO3	1	2	2	0	3	0	0	0	2	0	0	1	1	3	3
CO4	2	2	3	2	3	0	0	0	2	0	0	1	1	3	3
CO5	2	2	3	2	3	0	0	0	2	0	0	1	1	3	3

LIST OF EXPERIMENTS	
1	Design the following static web pages required for an online book store web site. **CATOLOGUE PAGE:** The catalogue page should contain the details of all the books available in the web site in a table. The details should contain the following: 1. Snap shot of Cover Page.

2. Author Name.

3. Publisher.

4. Price.

5. Add to cart button.

LOGIN PAGE

2

HOME PAGE:

The static home page must contain three frames.

Top frame: Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).

3

Left frame: At least four links for navigation, which will display the catalogue of respective links.

For e.g.: When you click the link "MCA" the catalogue for MCA Books should be displayed in the Right frame.

Right frame: The pages to the links in the left frame must be loaded here. Initially this page contains description of the web site.

		Web Site Name			
Logo					
Home	Login	Registration	Catalogue		Cart
mca mba BCA		Description of the Web Site			

4	**REGISTRATION PAGE:** Create a "registration form "with the following fields - Name (Text field) - Password (password field) - E-mail id (text field) - Phone number (text field) - Sex (radio button) - Date of birth (3 select boxes) - Languages known (check boxes – English, Telugu, Hindi, Tamil) - Address (text area)

5	Design a web page using CSS (Cascading Style Sheets) which includes the following:
	1) Use different font, styles:
	   In the style definition you define how each selector should work (font, color etc.).
	   Then, in the body of your pages, you refer to these selectors to activate the styles

6	Write an XML file which will display the Book information which includes the following: - Title of the book - Author Name - ISBN number - Publisher name - Edition - Price Write a Document Type Definition (DTD) to validate the above XML file.
7	Display "Hello World" message using Angular js
8	Write a Angular js program for controllers.
9	Write a Angular js program for expression, using a variable.
10	Display "Hello World" message using jQuery.
11	Write a JQuery to change text color of the elements
12	Selecting elements by element name in jQuery

PRAGATI ENGINEERING COLLEGE
(AUTONOMOUS)
DEPARTMENT OF INFORMATION TECHNOLOGY

UNIX PROGRAMMING LABORATORY
(Information Technology)

Course Category:	Professional Core	**Course Code:**	19IT4L04
Course Type:	Laboratory	**L-T-P-C:**	0-0-3-1.5
Prerequisites:		**Continuous Evaluation:** **Semester end Evaluation:** **Total Marks:**	40 60 100

COURSE OBJECTIVES

1	Provides an introduction to the fundamentals of UNIX and Unix Utilities.
2	Expose students to Shell management, Programming and File Management

COURSE OUTCOMES

Upon successful completion of the course, the student will be able to:	**Cognitive Level**
CO1 Execute UNIX commands.	K3
CO2 Manage user accounts in UNIX.	K3

*K1- Remember, K2- Understand, K3- Apply, K4- Analyze, K5- Evaluate, K6- Create

Contribution of Course Outcomes towards achievement of Program

Outcomes (1 – Low, 2 - Medium, 3 – High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	0	0	0	0	0	0	0	2	3	0
CO2	3	3	3	3	3	0	0	0	0	0	0	0	3	3	0

LAB EXPERIMENTS

1	Basic Shell Commands
2	Write a Shell Program to print Fibonacci Series
3	Write a Shell Program for Designing Calculator
4	Write a Shell Program for File Operations
5	Write a Shell Program for Base conversion
6	Usage of cut and grep commands
7	Usage of user defined functions Administration
8	Managing User Accounts
9	User Quota Management

Professional Ethics and Human Values
(Common to all branches)

Course Category	Humanities including Management	Credits	0
Course Type	Theory	**Lecture-Tutorial-Practice**	2 -0 -0
Prerequisites		**Total Marks (Internal Assessment)**	100

Course Outcomes		Cognitive Level
On successful completion of the course, the student will be able to		
CO 1	Understand different concepts in Professional Ethics and Human Values.	Understanding
CO 2	Apply ethical principles to resolve the problems that arise in work place.	Applying
CO 3	Make use of Engineers rights to fulfill their responsibilities.	Applying
CO 4	Understand the responsibility of an engineer in designing safety.	Understanding
CO 5	Analyze the social media accounts in order to create and maintain a positive digital footprint.	Analyzing

Contribution of Course Outcomes towards achievement of Program

Outcomes: 1 – Low, 2 - Medium, 3 – High

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	0	0	2	0	0	3	2	3	0	2	0	1			
CO2	0	0	2	0	0	2	2	3	0	1	0	2			
CO3	0	0	2	0	0	3	2	3	0	2	0	1			
CO4	0	0	2	0	0	3	2	3	0	2	0	1			
CO5	0	0	2	0	0	2	2	3	0	1	0	1			

Course Content:

UNIT - I
Professional Ethics and Human values:
Ethics -History of Ethics-Types of Ethics, Professional Ethics and its forms - Morals, Values – Integrity – Civic Virtue –Respect for others – Living Peacefully – Caring – Sharing – Honesty –Courage – Value time –Co-operation – Loyalty- Collegiality-Commitment – Empathy – Self-confidence – Spirituality- Character.

UNIT - II

Engineering & Organization Ethics:

Engineering Ethics-Meaning & Purpose of Engineering Ethics- Consensus and Controversy –Work Place Ethics and Business Ethics –Ethics in HRM, Finance & Marketing – Ethical Theories-Meaning & Uses of Ethical Theories-Theories of moral Development-Kohlberg's Theory – Gilligan's Argument –Heinz's Dilemma.

UNIT - III

Engineers Responsibilities and Rights:

Key Characteristics of Engineering Professionals – Professional Roles to be played by an Engineer - Ethical egoism-Collective bargaining-Confidentiality- Acceptance of Bribes/Gifts when is a Gift and a Bribe-examples of Gifts v/s Bribes-Whistle Blowing and its types-when should it be attempted-preventing whistle blowing.

UNIT - IV

Engineers' Responsibility for Safety and Risk:

Concept of Safety-Types of Safety, Risk-Types of Risks, Voluntary v/s Involuntary Risk- Short term v/s Long term Consequences- Expected Probability- Reversible Effects- Threshold Levels for Risk- Delayed v/s Immediate Risk- Safety and the Engineer – Designing for Safety – Risk-Benefit Analysis-Accidents.

UNIT - V

Ethical issues in Social Media:

Social Media- Various Social Media Platforms: Google, Facebook, YouTube, Instagram -Social Media set-up and Uses-Ethical use of Social media-Effects of Social Media on Public- Social Media (vs) News-Social Media Fame and Reputation-Trolling, Harassing, and Hating on Social Media-Legal Aspects of Social Media.

REFERENCES :

1. "Engineering Ethics includes Human Values" by M.Govindarajan, S.Natarajan and V.S.SenthilKumar-PHI Learning Pvt. Ltd-2009.
2. "Professional Ethics and Morals" by Prof.A.R.Aryasri, DharanikotaSuyodhana- Maruthi Publications.
3. "Professional Ethics and Human Values" by A.Alavudeen, R.Kalil Rahman and M.Jayakumaran-Laxmi Publications
4. "Professional Ethics and Human Values" by Prof.D.R.Kiran-
5. "Indian Culture, Values and Professional Ethics" by PSR Murthy-BS Publication
6. "Ethics in Engineering" by Mike W. Martin and Roland Schinzinger -Tata McGraw- Hill -2003
7. "Engineering Ethics" by Harris, Pritchard and Rabins, CENGAGE Learning, India Edition, 2009.

Web Resources:

1. https://study.com/academy/lesson/ethical-issues-in-internet-social-media-marketing.html

2. https://www.tutorialspoint.com/engineering_ethics/engineering_ethics_rights_of_engineers

3. https://link.springer.com/article/10.1007/s11948-997-0039-x