SREENIDHI EDUCATIONAL GROUP | SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY AUTONOMOUS

COURSE STRUCTURE AND DETAILED SYLLABUS

for

B.Tech Four Year Degree Course (A-22 I & II year)

in

ELECTRONICS AND COMPUTER ENGINEERING (ECM)

(Applicable for the batches admitted from 2022-2023)

SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY
(An Autonomous Institution approved by UGC and affiliated to JNTUH)
(Accredited by NAAC with 'A' Grade and Accredited by NBA of AICTE)
Yamnampet, Ghatkesar, Malkajigiri Medchal District -501 301.

November, 2022

SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY

(An Autonomous Institution)

DEPARTMENT OF

ELECTRONICS AND COMPUTER ENGINEERING (ECM)

PROGRAM OBJECTIVES

ECM Ethos– Tosolve modern engineering problems with combined knowledge of hardware and software

The courses structure of ECM is arranged such that students learn the basic and continue to advance subjects in an ordered set of prerequisites. The first two years of the ECM brings the physical, analytical, computational and communication approaches required as foundation of engineering through courses in Mathematics, Physics, Computer languages (C, C++, Java), Digital Circuit Design, Database Management, English and Technical Seminars. Many of these courses include weekly labs in which students can utilize state-of the art lab facilities to simulate and solve interesting problem.

The III and IV years of the ECM study focuses on the concepts and techniques used in the design and development of advanced hardware and software systems. In addition, students will be provided with elaborate choices of elective streams (minor stream) to select based on their liking. Also, a generous allotment of open electives is included to permit student gather interdisciplinary knowledge. These synergetic efforts are made to ensure our students gain comprehensive knowledge around their core area of study and be successful in career of their choice.

Further, the program curriculum is designed by surveying the latest skills in demand for the areas of Electronics and Computer. After completing this program our graduates strive to be high achievers, responsible and thoughtful engineers contributing to society.

VISION

To emerge as a premier centre in Electronics and Computer engineering with focus on human values and professional ethics

MISSION

1. To prepare Electronics and Computer Engineering graduates to be a life- long learner with competence in basic sciences, engineering & professional core, interdisciplinary subjects, so that they can have professional career or to pursue higher studies.

2. Developing liaison with Academia, R & D institutions, software and electronics Industries for exposure of students to the practical aspects in engineering and solution of the industry oriented and societal problems, entrepreneurial pursuit and project management.

3. Inculcating interpersonal skills, team work, professional ethics, IPR and regulatory issues in students to improve their employability and promoting leadership in changing global environment

4. To continuously engage in research and development activities and to promote scientific temper in the graduates.

PROGRAMME EDUCATIONAL OBJECTIVES

1. Graduates will have strong foundation in fundamentals of basic sciences, mathematics, Engineering sciences and technology with abilities to understand societal problems

2. Graduates will have successful professional career by demonstrating good scientific and engineering breadth to comprehend the problems using modern tools , conduct experiments, analyze the results and design novel products and solutions to the real life problems.

3. Graduates will be motivated to achieve academic excellence and promote entrepreneurship and skills in project and finance management, pursue research to develop life – long learning in a world of constantly evolving technology

4. Graduates will be trained in human values, Professional ethics and Intellectual Property related issues in broader environmental and social context and sustainable development, communication skills, team work skills, leadership and multidisciplinary approach.

MAPPING

PEOs	Mission of the Department			
	M1	M2	M3	M4
1	3	2		
2	2	3		2
3	3	3		1
4		2	3	

PROGRAMME OUTCOMES (PO s) of B. Tech ECM

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in Independent and life-long learning in the broadest context of technological change.

ECM (A22 Regulation) Course Structure

B.Tech I Year I Semester

S. No.	Course Category	Dept. Course	Course Code	Name of the Course	L	T	P	C	Max. Marks	
									Int.	Ext.
1	BS	S&H	9HC07	Engineering Physics	2	1	0	3	40	60
2	ES	IT	9FC01	Problem Solving using C	3	0	0	3	40	60
3	BS	S&H	9HC11	Matrix Algebra and Calculus	2	1	0	3	40	60
4	HS	S&H	9HC01	Essential English Language Skills	2	0	0	2	40	60
5	ES	MECH	9BC01	Engineering Graphics	1	0	4	3	40	60
6	HS	S&H	9HC61	Oral Communication Lab – I	0	0	2	1	40	60
7	BS	S&H	9HC66	Engineering Physics Lab	0	0	3	1.5	40	60
8	ES	IT	9FC61	Problem Solving using C Lab	0	0	3	1.5	40	60
9	ES	MECH	9BC61	Workshop/Manufacturing Processes Lab	0	1	3	2.5	40	60
10	ES	S&H		Induction Program	1	0	0	-	-	-
				Total	**11**	**3**	**15**	**20.5**	**360**	**540**

B.Tech I Year II Semester

S. No.	Course Category	Dept. Course	Course Code	Name of the Course	L	T	P	C	Max. Marks	
									Int.	Ext.
1	BS	S&H	9HC04	Engineering Chemistry	2	1	0	3	40	60
2	ES	CSE	9EC01	Data Structures	3	0	0	3	40	60
3	BS	S&H	9HC12	Advanced Calculus	2	1	0	3	40	60
4	ES	EEE	9AC42	Electric Circuits and Networks Analysis	2	1	0	3	40	60
5	HS	S&H	9HC62	Oral Communication Lab – II	0	0	3	1.5	40	60
6	BS	S&H	9HC64	Engineering Chemistry Lab	0	0	3	1.5	40	60
7	ES	CSE	9EC61	Data Structures using C Lab	0	0	3	1.5	40	60
				Total	**9**	**3**	**9**	**16.5**	**280**	**420**

Total Credits: 37

B.Tech II Year I Semester

S. No.	Course Category	Dept. Course	Course Code	Name of the Course	L	T	P	C	Max. Marks	
									Int.	Ext.
1	HS	S&H	9HC05	Environmental Science	3	0	0	0	Pass/Fail	
2	BS	ECM	9D301	Discrete Structures and Graph Theory	3	0	0	3	40	60
3	PC	ECE	9CC01	Electronic Devices and Circuits	3	0	0	3	40	60
4	PC	ECE	9CC02	Signals and Systems	3	0	0	3	40	60
5	HS	S&H	9HC03	Universal Human Values	3	0	0	3	40	60
6	PC	CSE	9EC02	Object Oriented Programming through Java	2	1	0	3	40	60
7	BS	S&H	9HC16	Quantitative Aptitude and Logical Reasoning	3	0	0	3	40	60
8	PC	ECE	9CC71	Electronic Devices and Circuits Lab	0	0	3	1.5	40	60
9	PC	CSE	9EC62	Object Oriented Programming through Java Lab	0	0	4	2	40	60
				Total	**20**	**1**	**7**	**21.5**	**320**	**480**

B.Tech II Year II Semester

S. No.	Course Category	Dept. Course	Course Code	Name of the Course	L	T	P	C	Max. Marks	
									Int.	Ext.
1	HS	SMS	9ZC01	Business Economics and Financial Analysis	3	0	0	3	40	60
2	PC	IT	9FC02	Python Programming	2	1	0	3	40	60
3	PC	IT	9FC04	Database Management Systems	3	0	0	3	40	60
4	BS	ECM	9D402	Analog and Pulse Circuits	3	0	0	3	40	60
5	PC	ECM	9DC03	Software Engineering	3	0	0	3	40	60
6	HS	S&H	9HC63	Soft Skills Lab	2	0	0	2	40	60
7	ES	ECM	9D467	IT Workshop and Python Programming Lab	0	0	3	1.5	40	60
8	PC	IT	9FC63	Database Management Systems Lab	0	0	3	1.5	40	60
9	BS	ECM	9D461	Analog and Pulse Circuits Lab	0	0	3	1.5	40	60
10	PS	ECM	9D471	Technical Seminar	0	1	0	1	100	-
				Total	**16**	**2**	**9**	**22.5**	**460**	**540**

Note: Summer Internship – I is to be carried out during the summer vacation between 4th and 5th semesters

Total Credits: 44

B.Tech III Year I Semester

S. No.	Course Category	Dept. Course	Name of the Course	L	T	P	C	Max. Marks	
								Int.	Ext.
1	PE		**Professional Elective - I**	3	0	0	3	40	60
2	PC	IT	Design and Analysis of Algorithms	2	1	0	3	40	60
3	PC	ECE	Analog and Digital Communications	2	1	0	3	40	60
4	PC	ECE	IC Applications	3	0	0	3	40	60
5	PC	ECM	Computer Organization and Operating Systems	3	0	0	3	40	60
6	ES	ECM	Data Communication and Computer Networks	3	0	0	3	40	60
7	PC	ECE	IC Applications Lab	0	0	3	1.5	40	60
8	PC	IT	Web Technologies Lab	0	0	3	1.5	40	60
9	PS	ECM	Summer Industry Internship-I	0	0	2	1	40	60
			Total	**16**	**2**	**8**	**22**	**360**	**540**

B.Tech III Year II Semester

S. No.	Course Category	Dept. Course	Name of the Course	L	T	P	C	Max. Marks	
								Int.	Ext.
1	OE		**Open Elective - I**	3	0	0	3	40	60
2	PE		**Professional Elective – II**	3	0	0	3	40	60
3	PC	ECM	Microprocessors and Microcontrollers	3	0	0	3	40	60
4	PC	ECE	Digital Signal Processing	2	1	0	3	40	60
5	PC	ECM	Automata and Compiler Design	3	0	0	3	40	60
6	HS	S&H	Intellectual Property Rights	3	0	0	0	40	60
7	PC	ECM	Microprocessors and Microcontrollers Lab	0	0	2	1	40	60
8	PC	ECE	Digital Signal Processing Lab	0	0	4	2	40	60
9	PC	ECM	Automata and Compiler Design Lab	0	0	2	1	40	60
10	ES	ECM	Comprehensive Viva Voce	0	1	0	1	100	-
			Total	**17**	**2**	**8**	**20**	**460**	**540**

Note: Summer Internship – II (IV Year I-Semester) is to be carried out during the summer vacation between 6th and 7th semesters

Total Credits: 42

B.Tech IV Year I Semester

S. No.	Course Category	Dept. Course	Subject	L	T	P/D	C	Max. Marks	
								Int.	Ext.
1	OE		**Open Elective- II**	3	0	0	3	40	60
2	PE		**Professional Elective-III**	3	0	0	3	40	60
3	PE		**Professional Elective – IV**	3	0	0	3	40	60
4	PC	ECM	Embedded and Real Time Systems	3	0	0	3	40	60
5	PC	ECM	VLSI Design	3	0	0	3	40	60
6	ES	IT	Cyber Security and Cyber Laws	2	0	0	2	40	60
7	PC	ECM	Embedded Systems Lab	0	0	3	1.5	40	60
8	PC	ECM	VLSI Lab	0	0	3	1.5	40	60
9	PS	ECM	Summer Industry Internship-II	0	0	2	1	40	60
			Total:	**17**	**0**	**8**	**21**	**360**	**540**

B.Tech IV Year II Semester

S. No.	Course Category	Dept. Course	Subject	L	T	P/D	C	Max. Marks	
								Int.	Ext.
1	PE		**Professional Elective-V**	3	0	0	3	40	60
2	OE		**Open Elective-III**	3	0	0	3	40	60
3	PS	ECM	Major Project	-	-	20	10	40	60
			Total:	**6**	**0**	**20**	**16**	**120**	**180**

Total Credits: 37

Note: All End Examinations (Theory and Practical) are of **Three** hours duration.

T – Tutorial **L- Theory** **P/D – Practical/Drawing**
C- Credits **Int. – Internal Exam** **Ext. – External Exam**

Course code Definitions
BS- Basic Science Courses
ES- Engineering Science Courses
HS- Humanities and Social Sciences including Management courses
PC-ECM Professional core courses
PE –ECM Professional Elective courses
OE- Open Elective courses
PS- Summer Industry Internship, Projects, Comprehensive Viva Voce, technical Seminars

B. TECH ECM A22 REGULATION COURSE STRUCTURE

PROFESSIONAL ELECTIVE STREAMS

Professional Elective Streams	Professional Elective – I (3-1)	Professional Elective – II (3-2)	Professional Elective – III (4-1)	Professional Elective – IV (4-1)	Professional Elective – V (4-2)
Network Security (CSE Board)	Semantic Web and Social Networks	Advanced Computer Networks	Block Chain Technologies/ Database Security	Information Security, Management and Standards	Mobile Computing
Data Science (CSE Board)	Introduction to Data Science	Machine Learning	Big Data Analytics	Business Intelligence	Cloud Computing
Advanced Technologies (IT Board)	Computer Graphics	Image Processing / C# .NET Framework	Computer Vision	Augmented Reality and Virtual Reality	Internet of Things (IoT)
VLSI (ECE Board)	Digital Design Through Verilog (9C517)	Analog and Mixed Signal Design (9C621)	VLSI Physical Design (9C725)	Design Verification using System Verilog (9C729)	Low Power VLSI Design (9C833)
Embedded System (ECE Board)	Advanced Computer Architecture (9C518)	Embedded C Programming (9C622)	Embedded System Design using ARM (9C726)	Embedded Real Time Operating Systems (9C730)	System on Chip Architecture (9C834)

OPEN ELECTIVES STREAMS

Open Elective Streams	III-Year II-Semester / (Open Elective – I)	IV -Year I-Semester / (Open Elective – II)	IV-Year II-Semester / (Open Elective – III)
Entrepreneurship Stream	Basics of Entrepreneurship	Advanced Entrepreneurship	Product and Services
Social Sciences Stream	Basics of Indian Economy	Basics of Polity	Indian History, Culture and Geography
Finance Stream	Banking Operations, Insurance and Risk Management	Entrepreneurship Project Management and Structured Finance	Financial Institutions, Markets and Services
Mechanical	Introduction to Additive Manufacturing Processes	Principles of Operations Research	Principals of Automation and Robotics
Electrical	Control System Engineering	Fundamentals of Measurements and Instrumentation	Fundamentals of Renewable Energy Sources
Innovation and Design Thinking	Design literacy and Design Thinking	Co-Creation and Product Design	Entrepreneurship and Business Design

a	b	c	d	e	f	g	h	i	j	k	l
X		X					X				

Syllabus for B. Tech I Year I semester
Electronics and Computer Engineering
ENGINEERING PHYSICS
(Common to CSE, IT, ECM, CSD, CSO, CSI AND CSM)

Code: 9HC07

L	T	P/D	C
2	1	0	3

Course Objectives

- *Explain about the Quantum Mechanics to understand wave particle duality, necessity of quantum mechanics to explore the behavior of sub atomic particles. Schroedinger's Time Independent Wave Equation, Physical Significance of the Wave Function – Application of Schroedinger wave equation.*
- *To understand the basic concepts of normal light, Laser and its applications and to know about the fiber optics, principle (TIR), Numerical Aperture, Types of optical Fibers, Step index and graded index Fibers, attenuation in optical fibers. Applications: optical fiber communication system, fiber optic sensors, medical endoscopy.*
- *To study the concepts of magnetism and superconductivity, Bohr magneton, Hysteresis nature, domain structure, Meissner effect, types of superconductors, BCS theory and applications of superconductors.*
- *To understand the concepts of dielectrics, polarizations and its types, internal fields, Clausius-Mossotti equation, Frequency and temperature effect on dielectrics and its applications – Piezo-electricity, Pyro-electricity and ferro-electricity.*
- *To know about the semiconductors, types, carrier concentration, Hall effect and also to understand the concept of PN-junction, I-V Characteristics, LED, Solar Cell and Photo diode.*
- *To discuss about the nano-technology, preparation techniques and characterization (XRD & TEM), CNTs.*

Course Outcomes

After completing the course, students are able to

- *Differentiate the wave and particle, de-Broglie matter waves its experimental evidence, Schroedinger's wave concept and its application for a particle in one dimension box.*
- *Explain about emission, its types, laser principle, types, working and its applications and to reveals about TIR principle, optical fiber-types and signal propagation, attenuation, communication system and applications of optical fibers (sensors and medical endoscopy)*
- *Reveals about the magnetism-its origin and types, Hysteresis, domain theory, Superconductivity, experimental facts, theoretical analysis, types of superconductors and its applications.*
- *Explain the basic concepts of dielectric materials, polarization and its types, local fields, frequency and temperature effect on dielectrics and their applications (Piezo, Ferro and Pyro electricity).*
- *Explain semiconductor behavior, types, carrier concentration, Hall effect, Thermistor, demonstrate and analyze semiconductor devices like a PN-junction, I-V characteristics, LED, solar cell, photo diode and their applications.*
- *Summarize nano & bulk concepts, surface to volume ratio, quantum confinement, CNTs and preparation methods (physical & chemical), analysis the techniques like XRD & TEM.*

Unit:1

Wave nature of particles, Schroedinger equation and its application (8 Periods)

Waves and Particles, de-Broglie Hypothesis, Matter waves, Davisson and Germer's Experiment, G.P. Thomson Experiment, Heisenberg's Uncertainty Principle, Schroedinger's Time Independent Wave Equation – Physical Significance of the Wave
Function – Application of Schroedinger wave equation - Particle in One Dimensional Potential Box.

Unit:2

Lasers and Fiber Optics (6+6 Periods)

Lasers: Characteristics of LASER, Spontaneous and Stimulated Emission of Radiation, Einstein's Coefficients and their significance. Meta-stable State, Pumping, Population Inversion and Optical resonator. Ruby Laser, Helium-Neon Laser, Semiconductor Diode Laser, Applications of Lasers.

Fiber optics:
Principle and construction of optical fiber, Acceptance Angle and Numerical Aperture. Based on refractive index profile classification of Optical Fibers: Single mode & Multimode mode Step index fibers, Single mode & Multimode mode graded index fibers. Attenuation in Optical Fibers (scattering, absorption and bending losses), optical Fiber communication system, Fiber Optic Sensors-Temperature sensor, Pressure sensor and Medical Endoscopy.

Unit:3
Magnetism and Superconductivity. (5+4 Periods)
Magnetic Materials: Origin of Magnetic Moment-Bohr Magneton. Ferromagnetic domain, Magnetization process by using domain, B-H curve explanation based on Domain theory and important outcomes of the curve. Hard and Soft Magnetic Materials.
Super conducting Materials:
General properties of Superconductors. Effect of Magnetic Field, Critical current density, Meissner effect, Penetration depth. Type-I and Type-II superconductors, BCS theory, Magnetic levitation.

Unit:4 (8 Periods)
Dielectric materials: Electric Dipole, Dipole Moment, Dielectric Constant, Electric Susceptibility. Electronic, Ionic polarizability (Quantitative) and Orientation Polarization (Qualitative). Internal fields in Solids, Clausius-Mossotti equation, Frequency and temperature effect on Dielectrics (Qualitative), Applications - Piezo-electricity, Pyro-electricity and Ferro-electricity.

Unit:5 (5+5 Periods)
Semiconductors and Semiconductor devices
Semiconductors: Fermi Level in Intrinsic and Extrinsic Semiconductors. Carrier concentration of Intrinsic and Extrinsic Semiconductor (qualitative). Direct & Indirect Band Gap Semiconductors, Hall Effect in semiconductors.
Semiconductor devices:
Formation of a PN Junction and working of a PN Junction diode, Energy band Diagram of open circuited PN Diode, I-V Characteristics of PN Junction diode. Applications: LED, Solar Cell and Photo diode.

Unit:6
Nanomaterials and their fabrication: (7 Periods)
Origin of Nanotechnology, Nano Scale, Surface to Volume Ratio, Quantum Confinement, Bottom-up Fabrication, Sol-gel method, Chemical vapor Deposition technique (CVD); Top-down Fabrication; Ball Milling, Characterization of Nano materials (XRD & TEM), carbon nano tubes (CNTs), Applications of Nano Materials.

Text Books:
1. B.K. Pandey & S. Chaturvedi Engineering Physics, Cengage Learning

Reference Books:
1. P K Palanisamy, Engineering Physics, Sitech Publications
2. Charles Kittel, Introduction to Solid State Physics, John Wiley Publisher
3. A.S. Vasudeva , Modern engineering Physics, S. Chand
4. Dekker, Solid State Physics
5. Dr. M.N. Avadhanulu, Engineering Physics, S. Chand
6. Dekker, Solid State Physics
7. Halliday and Resnick, Physics
8. S.O. Pillai, Solid State Physics
9. A. Ghatak - Optics

Syllabus for B. Tech I Year I semester
Electronics and Computer Engineering
PROBLEM SOLVING USING C
(Common to All Branches)

Code: 9FC01

L	T	P/D	C
3	0	0	3

Course Objectives:
After completion of this course student will learn:
- *To acquire problem solving skills*
- *To be able to develop flowcharts*
- *To understand structured programming concepts*
- *To be able to write programs in C Language*

Course Outcomes:
After completion of this course student will learn
1. *To formulate simple algorithms for arithmetic, logical problems and to translate the algorithms to programs(in C language)*
2. *To test and execute the programs and correct syntax and logical errors, to implement conditional branching, iteration and recursion*
3. *To use arrays to formulate algorithms and programs and apply programming to solve matrix addition and multiplication problems and searching*
4. *To decompose a problem into functions and synthesize a complete program using divide and conquer approach.*
5. *To use pointers to formulate algorithms and programs.*
6. *To apply files to do various file manipulation functions.*

UNIT I
Problem solving Techniques – Algorithms, pseudo code, flowcharts with examples
Introduction to Computer Programming Languages – Machine Languages, Symbolic Languages, High-Level Languages,
Introduction to C language – Characteristics of C language, Structure of a C Program.Syntax and semantics.
Data Types, Variables – declarations and initialization, formatting input and output.

UNIT – II
C Tokens: Identifiers, Keywords, Constants, variables and operators
Expressions – Arithmetic expressions, Precedence and Associativity, evaluating expressions,
Decision control structures – if, Two-way selection – if else, nested if, dangling else, Multi-way selection – else if ladder and switch.
Repetitive control structures – Pre-test and post-test loops – initialization and updation, while, do while and for loop and nested loops.
Unconditional statements: break, continue and goto statements with examples.

UNIT III
Arrays – Definition and declaration, initialization, accessing elements of in arrays, storing values in arrays,
1-D arrays, 2-D arrays, character arrays and multidimensional arrays.
Function and arrays: passing individual elements to arrays, passing 1-D array, 2-D array to function.
Applications: Linear search, matrix addition, subtraction, multiplication and transpose

UNIT – IV
Functions – User – defined functions - Function definition, arguments, return value, prototype, arguments and parameters, inter-function communication. Standard functions – Math functions. Scope – local, global.

Parameter passing – Call by value and call by reference.
Recursive functions – Definition, examples, advantages and disadvantages.
Macros – Definition, examples, comparison with functions.
Storage Classes – auto, extern, static and Register

UNIT V
Introduction to Pointers – pointer constants, pointer values, pointer variables, accessing variables through pointers, pointer declaration and definition, declaration versus redirection, initialization of pointer variables, Pointer for inter function communication, pointer to pointers, pointer to function.
Arrays and pointers – Pointer arithmetic and arrays, array of pointers
Strings – Declaration, Initialization, Input and Output functions, strings and pointer, string handling functions.

UNIT VI
Files – Concept of a file, streams, text and binary files, stream file processing, system created steams, Standard library I/O functions, file open and close, formatting I/O functions, character I/O functions, Binary I/O, command line arguments, file status functions ,positioning functions.
Applications: Basic operations on files.

Text Books
(i) E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill
(ii) Let Us C by YashavantKanetkar

Reference Books
(i) Programming in C (2nd Edition) by Ashok N Kamthane
(ii) Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language Prentice Hall of India

a	b	c	d	e	f	g	h	i	j	k	l
3	3	2									

Syllabus for B. Tech I Year I semester
Electronics and Computer Engineering
MATRIX ALGEBRA AND CALCULUS
(Common to All Branches of Engineering)

Code: 9HC11

L	T	P/D	C
2	1	0	3

Pre Requisites*: Mathematics Knowledge at Pre-University Level*

Course Objectives: *To make the students to understand and expected to learn*

1. *Basic operation of matrices and about the linear system and some analytical methods for solution.*
2. *Concept of Eigen value and Eigen vector and their properties and applications.*
3. *Quadratic form and its properties.*
4. *Mean value theorems and their applications to the given functions, series expansions of a function.*
5. *Various analytical methods to solve first order first degree and also the equations not of first degree ordinary differential equations.*
6. *Methods to solve higher order ordinary differential equations.*

Syllabus

UNIT-I: System of Linear Equations: Elementary row/column operations -Echelon form, Rank of a matrix, Inverse of a matrix by Gauss Jordan method. Non-Homogenous and Homogenous system of linear equations- consistency or inconsistency of a system, Gauss Elimination method, Rank method and problems.Symmetric, Skew-symmetric and Orthogonal matrices.

UNIT-II: Eigen values and Eigen vectors: Definitions and Properties (without proofs). Evaluation ofEigen values and Eigenvectors for a given matrix.Cayley-Hamilton Theorem (without proof) and its applications in finding higher powers & inverse of a matrix, Diagonalization of a matrix.Hermitian, Skew-Hermitian and Unitary matrices.

UNIT-III Quadratic forms: Quadratic forms, Nature, rank, index and signature of a quadratic form. Reduction of quadratic form to canonical form.

UNIT-IV: Single Variable Calculus: Rolle's Theorem, Lagrange's and Cauchy's mean value theorems (without proof); Taylor's and Maclaurin's series (without proof) and their application for series expansions of standard functions.

UNIT-V: First order ODE: Exact differential equations, equations reduced to exact, Linear and Bernoulli's equations, Newton's law of cooling, Law of natural Growth/Decay.

UNIT-VI: Higher order ODE: Higher order linear differential equations with constant coefficients-Complementary function, Particular Integral, Method of variation of parameters.

Suggested Readings:

1. R K Jain and S R K Iyengar Advanced Engineering Mathematics, Narosa Publications.
2. B.S. Grewal, Elementary Engineering Mathematics, Khanna Publishers
3. Alan Jeffery, Advanced Engineering Mathematics, Academic Press
4. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
5. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.

Course Outcomes: *After the course completion the students will be able to*

1. *Check the consistency or inconsistency of a linear system and can solve the problems.*

2. *Find the Eigen values and Eigen vectors and can solve the problems associated with these concepts.*
3. *Find the nature, index and signature of the quadratic form.*
4. *Verify the applicability of mean value theorems and also can express the givenstandard function in series form using Taylor's and Maclaurin series.*
5. *Find the solutions of first order first degree differential equations and solve the problems on Newton's law of cooling, Natural growth and decay.*
6. *Solve higher order ordinary differential equations with constant coefficients using some standard methods.*

Syllabus for B. Tech I Year I semester
Electronics and Computer Engineering
ESSENTIAL ENGLISH LANGUAGE SKILLS (EELS)
(Common for all Branches)

Code: 9HC01

L	T	P/D	C
2	0	0	2

Maximum Marks: 100 (Internal – 30 / External – 70)

A	B	C	D	E	F	G	H	I	J	K	L
							X	X	X		X

Course Objectives:
Theory (2 per week)
To enable students to:

- *Recognize and distinguish between different parts of speech*
- *Learn the correct usage of articles in sentences*
- *Write sentences using tenses*
- *Identify when each punctuation marks is needed and its correct usage*
- *Recognize the difference between direct and indirect speech and form statements in them*
- *Understand the appropriate use of active and passive voice in certain context*

Units

1. Vocabulary-1:
1.1 Root words
1.2 Synonyms and Antonyms
1.3 Homonyms, Homophones and Homographs
1.4 One word substitutes

2. Vocabulary-2
2.1 Idioms and Phrases
2.2 Confusables

3. Grammar-1
3.1 The Parts of Speech
3.2 Use of Articles
3.3 Omission of Articles

4. Grammar-2
4.1 Tenses
4.2 Prepositions
4.3 Concord

5. Reading & Writing
5.1 Techniques of Reading, Reading Comprehension
5.2 Kinds of Sentences
5.3 Punctuation

6. Writing-2
6.1 Voice – Active voice and Passive Voice
6.2 Speech-Direct & Reported Speech
6.3 Common errors in English

Suggested Reading & References:

1. Word Power Made Easy by Norman Lewis
2. English Grammar In Use: A Self Study Reference And Practice Book Intermediate Learners Book by Raymond Murphy
3. The Logic of English Words by Logophilia Education
4. English Vocabulary In Use Elementary Book With Ans And Cd-Rom by Felicity Odell (Second Edition)
5. Effective Technical Communicatioin by M. Ashraf Rizvi
6. Intermediate grammar usage and composition; M.L.Tickoo, A.E.Subramanian, P.R.Subramanyam; OBS
7. An Interactive Grammar to Modern English by Shivendra K. Verma and HemalathaNagarajan, Frank Bros. & Co.

Course Learning Outcomes:

After completion of the course, the student will be able to:

- *Demonstrate competence with suitable accuracy in vocabulary, and language fluency.*
- *State the definition of nouns, verbs, adjectives, and adverbs.*
- *Identify the differences of each tense and use the tenses accurately.*
- *Identify specialized reading strategies for specific types of texts*
- *Produce written work that is substantive, organized, and grammatically accurate.*

Syllabus for B. Tech I Year I semester
Electronics and Computer Engineering
ENGINEERING GRAPHICS
(Common to All Branches)

Code: 9BC01

L	T	P/D	C
1	0	4	3

***Pre Requisites**: Nil*

Course objectives:

1: *To teach students the basic principles of Engineering graphics and instruments used and construct curves.*
2: *To introduce the concept of projections in drawing and its applications for simple drawing entities ie points and lines.*
3: *To impart the knowledge of various types of planes and solids and their projections in different position wrt principle planes*
4: *To teach the concept of sections of solids and their developments.*
5: *To develop a clear understanding of the basic principles involved in three dimensional Engineering drawings.*
6: *To teach conversion from three dimensional drawing to two dimensional drawing and introduce the concepts of CAD.*

Course outcomes

After completing this course, the student will able to:

1) *Get familiar to use the instruments to solve the engineering problem and draw various type of curves used in engineering*
2) *Understand Orthographic projections and draw projections of simple drawing entities such as points Lines.*
3) *Draw projections of different types of regular Planes, solids in various positions wrt principal planes of projection.*
4) *Draw Sections of various Solids including Cylinders, cones, prisms and pyramids and draw the developments of these solids and their sections.*
5) *Construct Isometric Scale, Isometric Projections and Views.*
6) *Convert Isometric to orthographic views and understand basic sketching using computer aided design (CAD) software.*

UNIT – I

Introduction to Engineering Drawing: Drawing Instruments and their uses, types of lines, Lettering, Dimensioning-Terms & notations, placing of dimensions, general rules of dimensioning
Scales(concepts).**:**RF,Reducing, Enlarging and Full Scales
Curves: Conic Sections including Rectangular Hyperbola - General method, Cycloid and Involutes of circle.

UNIT – II

Orthographic Projection: Principles of Projection – Methods of projection, First angle and third angle projections.
Projections: Projections of Points, Projections of straight lines –line inclined to one plane and line inclined to both reference planes.

UNIT –III

Projections of regular Planes: types of planes, plane inclined to one reference plane, Oblique planes
Projections of regular Solids: types of solids, Projections of: Prisms, Cylinders, Pyramids, Cones – simple position and axis inclined to one plane only

UNIT –IV

Sections and sectional views of Solids: Sections and Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid – Auxiliary views.
Development of Surfaces: Methods of development, Development of lateral Surfaces of Right Regular Solids – Prisms, Cylinders, Pyramids, Cones and their sections.

UNIT – V

Isometric Projection: Introduction, Isometric axes, lines and planes, Isometric Scale – Isometric drawing or View – Isometric drawing of planes and simple solids such as prisms, pyramids, cylinder, cone.

UNIT –VI

Conversion of isometric views to orthographic views of simple objects.

Introduction to CAD : Benefits of CAD, Graphic input and output devices - Function performed by CAD Software, AUTOCAD-Drawing Entities, Editing commands.

TextBook:

Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House (In First-angle Projection Method)

Reference Books:

1) Shah, M.B. &Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education
2) Agrawal B. &Agrawal C. M. (2012), Engineering Graphics, TMH Publication
3) AUTOCAD Software Theory and User Manuals

Syllabus for B. Tech I Year I semester
Electronics and Computer Engineering
ORAL COMMUNICATIONS LAB – I

Code: 9HC61

L	T	P/D	C
0	0	2	1

Maximum Marks: 100 (Internal – 30 / External – 70)

A	B	C	D	E	F	G	H	I	J	K	L
							X	X	X		X

Course Objectives:
To enable students to:

- *Comprehend the basic tactics to communicate effectively and set a road map to achieve their communication goals.*
- *Know the importance of pronunciation in effective communication and work on mitigating the MTI in their spoken English;*
- *Communicate in proper tense with conviction and also frame and pose questions aptly.*
- *Describe people, objects and situations, using appropriate vocabulary, phrases and sequencing of ideas.*
- *Use the right English language expressions in varying real life contexts.*
- *Develop skill of narration through listening and coordination of ideas.*
-

OC LAB (2 per week)

Unit 1: Communication Skills

Communication basics, essential elements of effective communication, barriers to communication, setting SMART communication goals.

Activities:

- Ice-breaking activities
- Personal Communication SWOT Analysis
- Communication Case Studies: The Terrible & The Terrific

Unit 2: Pronunciation Matters
Importance of pronunciation, neutralizing mother tongue interference (MTI).

Activities:
- Odd Word Out
- Minimal Pairs Masti
- Shadow reading

Unit 3: Use apt expressions in diverse situations
Self-introduction, Greetings, apologizing, complimenting, inviting, complaining etc.

Activity:
Role play in different contexts using the appropriate expressions

Unit 4:Mind your Tenses
Describing present and past habits, states, and events.
Talking about actions in progress, relating past to the present, talking about the future.
Framing questions. (confirmation/information questions)

Activities:
- Speaking activity on daily routine, how students spent their recent vacation, speaking about their childhood, speaking about future plans.
- Dumb Charades (Present/Past continuous - Present/ Past perfect)
- Guessing game (10/20 yes or no questions)

Unit 5: Hone your Describing skills
Describing people, objects, and situations

Activities:
- Picture descriptions.
- Guessing games - listening to the descriptions.
- Narrating memorable incidents from life.
- Describe your ideal world
- Once upon a time……

Unit 6: The Art of Storytelling
Story telling for career success, the basics of story telling
Activities:
- Building stories - chain activity.
- Story prompts activity.
- Narrate the story. (all the hints are given except linking words and tenses)

Suggested Reading & References:

- "An Interactive Grammar of Modern English" by Shivendra K Verma and HemalathaNagarajan, Frank Bros. & Co.
- "Skill Sutras" by JayashreeMohanraj, Prism Books Pvt. Ltd.
- "Better English pronunciation" by J.D. Connor.
- "Effective Communication" John Adair, Pan Macmillan Ltd.
- "Body Language", by Allan Pease, Sudha Publications.
- "Communicative English", by Hariprasad M. and Prakasam V, Neel Kamal Publications.

Course Learning Outcomes:
After completion of the course, the student will be able to:
- *Describe people, objects and situations using simple sentences.*
- *Use appropriate tenses and expressions in different contexts of conversations.*
- *Identify major areas of concern in their oral communication and address them.*
- *Create a SMART plan to enhance their communication skills in English*

a	b	c	d	e	f	g	h	i	j	k	l
x		x									

Syllabus for B. Tech I Year I semester
Electronics and Computer Engineering
ENGINEERING PHYSICS LAB
(Common to CSE, IT, ECM, CSD, CSO, CSI AND CSM)

Code: 9HC66

L	T	P/D	C
0	0	3	1.5

Course Objectives

- *Understand the concept of photo electric effect using photo voltaic cell.*
- *Discuss the dispersive power of prism-Minimum deviation method.*
- *Discussion of diffraction pattern using the grating – LASER.*
- *To study the concepts (numerical aperture) of an optical fiber.*
- *To explain about magnetic induction, Biot-Savart principle.*
- *Study the frequency of AC mains using Sonometer.*
- *Explaining about the electrical resonance by using the LCR circuit.*
- *To understand the rigidity modulus & periodicity.*
- *To discuss the energy gap (E_g) of a semiconductor diode.*
- *To study the LED characteristics and forward resistance.*
- *To know the time constant of RC circuit.*

List of Experiments

1. **Photo voltaic cell:**
   -Determination of Planck's constant by using photo voltaic cell.
2. **Dispersive power:**
   -Calculation of dispersive power of a given material of prism by using Spectrometer.
3. **Diffraction Grating:**
   -Determination of wavelength of a given laser source of light by using diffraction grating.
4. **Numerical Aperture:**
   -Determination of a Numerical Aperture (NA) of an optical fiber.
5. **Stewart-Gee's Experiment:**
   -Determination of magnetic induction flux density along the axis of a current carrying circular coil using Stewart and Gee's experiment.
6. **Sonometer:**
   -Calculating the frequency of AC supply by using the Sonometer.
7. **LCR Circuit:**
   -Study of series and parallel resonance of an LCR circuit.
8. **Torsional pendulum:**
   -Determination of rigidity modulus of a given wire material using the Torsional pendulum.
9. **Energy Gap:**
   -Determination of the energy gap (E_g) of a given semiconductor.
10. **Light Emitting Diode:**
    -Studying the LED characteristics and calculating the forward resistance of it.
11. **RC Circuit:**
    -Determination of time constant of an RC-circuit.

NOTE: Any **TEN** of the above experiments are to be conducted.

Course Outcomes

After completing the experiments, students are able to

- *Understand the concepts of photo electric effect, importance, photo current, colour filters, optical sensors.*
- *Know about the light properties-dispersion, prism, spectrometer and minimum deviation arrangement.*
- *Recognize the difference between the interference and diffraction, grating, laser characteristics.*
- *Analyze the concepts of fiber optics, fundamentals, numerical aperture its importance, attenuation in fiber and applications.*
- *Understand and search to apply the fundamentals of magnetic induction, Ampere's law, Oersted's law and the Biot-Savart law.*
- *Know the difference between AC and DC fundamentals, Magnetostriction, resonance, air column vibrations.*
- *Analyze the LCR circuit combination, parallel, series electrical resonance, inductance, reactance, capacitance and electrical and electronic fundamentals.*
- *Summarize the fundamentals of modulus-types, stress, strain, elasticity, plasticity and Hook's law.*
- *Analyze the concept a semiconductors, types, calculation of energy gap of a semiconductor diode and importance.*
- *Analyze the difference between normal diode & LED, forward bias, reverse bias, I-V characteristics, direct and indirect band gap semiconductors.*
- *Characterize the RC network, time constant, capacitor functioning and its application.*

Syllabus for B. Tech I Year I semester
Electronics and Computer Engineering
PROBLEM SOLVING USING C LAB
(Common to All Branches)

Code: 9FC61

L	T	P/D	C
0	0	3	1.5

Course Objectives:
After completion of this course student will learn

- *To be able to understand the fundamentals of programming in C Language*
- *To be able to write, compile and debug programs in C*
- *To be able to formulate problems and implement in C.*
- *To be able to effectively choose programming components.*
- *To solve computing problems in real-world.*

Course Outcomes:
After completion of this course student will learn

1. *To formulate the algorithms for simple problems*
2. *To translate given algorithms to a working and correct program*
3. *To be able to correct syntax errors as reported by the compilers*
4. *To be able to identify and correct logical errors encountered at run time*
5. *To be able to write iterative as well as recursive programs*
6. *To be able to represent data in arrays, string manipulation through a program*
7. *To be able to create, read and write to and from simple text files.*

[The laboratory should be preceded or followed by a tutorial to explain the approach or algorithm to be implemented for the problem given.]

1. Unit I (Cycle 1)

1. Write an algorithm for converting a given Celsius temperature to its equivalent Fahrenheit temperature and draw a flowchart.
2. Write an algorithm to find the largest of three given numbers and draw a flowchart.
3. Write an algorithm and draw a flowchart for finding the roots and nature of roots of a quadratic equation, given its coefficients.
4. Write an algorithm and flowchart for finding the first n Fibonacci numbers, give n.

2. Unit II (Cycle 2)

1. Write an algorithm, flowchart, and C program for:
2. Finding the area and circumference of a circle of given radius.
3. Finding the volume of a sphere of given radius.
4. Finding the lateral surface area of a right circular cone of given base radius and height.
5. Finding selling price of an item, given its cost price and profit percent.
6. Finding the interest on a given principal for a given period of time at a given rate of per year.
7. Write a C program to display all the sizes of data types in C.
8. Write a C program to display a given decimal integer into an equivalent octal number and hexadecimal number using %o and %x in printf function.

3. Unit II (Cycle 3)

1. Write a C program to find the roots and nature of the roots of a quadratic equation, given its coefficients.
2. Write a C program for finding the largest of three given numbers.
3. A salesman gets a commission of 5% on the sales he makes if his sales is below Rs.5000/- and a commission of 8% on the sales that exceeds Rs.5000/- together with Rs.250/-. Write an

algorithm or a flowchart and develop C program for computing the commission of the salesman, given his sales.

4. Write a C Program to demonstrate Marcos.

4. Unit III (Cycle 4)

1. Write three C programs to print a multiplication table for a given number using while, do-while, and for loops.
2. Write a C program to compute the sum of:
3. $1+x+x^2+x^3+\ldots\ldots\ldots\ldots+x^n$, given x and n.
4. 1! + 2! + 3! + . . . + n!, given n.
5. $1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10! + \ldots$ to n terms where the n^{th} term becomes less than 0.0001.

5. Unit III (Cycle 5)

1. Write a C program in the menu driven style to perform the operations +, -, *, /, % between two given integers.
2. Write a C program to find the largest and the least of some numbers given by the user.
3. Write a C program to find the sum of the digits of a positive integer.

6. Unit IV (Cycle 8)

1. Write a program to store the numbers given by the user in an array, and then to find the mean, deviations of the given values from the mean, and variance.
2. Write a C program to initially store user given numbers in an array, display them andthen to insert a given number at a given location and to delete a number at a given location.
3. Write a program to store user given numbers in an array and find the locations of minimum and maximum values in the array and swap them and display the resulting array.

7. Unit IV (Cycle 9)

1. Write a C program to implement the operations of matrices – addition, subtraction, multiplication.
2. Write a program to find whether a given matrix is symmetric, lower triangular, upper triangular, diagonal, scalar, or unit matrix.

8. Unit III (Cycle 6)

1. Write C functions for the following:

a) A function that takes an integer n as argument and returns 1 if it is a prime number and 0 otherwise.
b) A function that takes a real number x and a positive integer n as arguments and returns x^n.
c) A function that takes a positive integer n as an argument and returns the n^{th} Fibonacci number.

2. Using recursion write C functions for the following:
   a) Factorial of a non-negative integer n.
   b) Number of combinations of n things taken r at a time.
   c) Greatest Common Divisor of two integers.
   d) Least Common Multiple of two integers.

9. Unit III (Cycle 7)

a. Write a menu driven style program to compute the above functions (cycle 6) on the choice of the function given by the user.
b. Define macros for the following and use them to find sum of the squares of the minimum and maximum of two given numbers.
   a) Larger of two numbers.
   b) Smaller of two numbers.
   c) Sum of the squares of two numbers.

c. Write a program to generate Pascal's triangle.
d. Write a program to count the number of letters, words, and lines in a given text.

10. Unit V (Cycle 10)

1. Write a function to swap two numbers.
2. Write a function to compute area and circumference of a circle, having area and Circumference as pointer arguments and radius as an ordinary argument.

11. Unit VI (Cycle 12)

1. Write a program to:
   Create a file by the name given by the user or by command line argument and add the text given by the user to that file.

   a. Open the file created above and display the contents of the file.
   b. Copy a file into some other file, file names given by the user or by command line arguments.
   c. Append a user mentioned file to another file.
   d. Reverse the first n characters of a file.

12. Cycle 13:

Case study on Electricity Billing, Restaurant Billing System

Syllabus for B. Tech I Year I semester
Electronics and Computer Engineering
WORKSHOP/MANUFACTURING PROCESSES LAB
(Common to All Branches)

Code: 9BC61

L	T	P/D	C
1	0	3	2.5

COURSE OBJECTIVES:

1) *To know the different popular manufacturing process*
2) *To gain a good basic working knowledge required for the production of various engineering products*
3) *To provide hands on experience about use of different engineering materials, tools, equipment's and processes those are common in the engineering field*
4) *To identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances*

COURSE OUTCOMES: *After completion of the course, the student will be able to:*

CO-1: Use various types of conventional manufacturing Processes
CO-2: Manufacture components from wood, MS flat, GI Sheet etc. – hands on experience
CO-3: manufacturing of components by machining like shafts, holes & threaded holes, surface finishing of components etc.
CO-4: Produce small devices / products /appliances by assembling different components

LIST OF EXPERIMENTS

S.No	Trades	Experiment Name
1	Fitting Shop	1. Preparation of T-Shape Work piece 2. Preparation of U-Shape Work piece which contains: Filing, Sawing, Drilling, Grinding.
2	Carpentry	3. Cross Half Lap joint 4. Half Lap Dovetail joint
3	Electrical & Electronics	5. One lamp one switch 6. Stair case wiring
4	Welding	7. Practice of Lap and Butt joint by Arc welding
5	Casting	8. Preparation of mould cavity using solid pattern 9. Preparation of mould cavity using split pattern
6	Tin Smithy	10. Preparation of Rectangular Tray 11. Preparation of Square box
7	Plastic molding & Glass Cutting	12. Injection Moulding 13. Glass Cutting with hand tools
8	Machine Shop (Demonstration only)	Demonstration of Turning, Drilling and grinding operations on Lathe, Drilling and grinding machines

a	b	c	d	e	f	g	h	i	j	k	l
X					X	X					

Syllabus for B. Tech I Year II semester
Electronics and Computer Engineering
ENGINEERING CHEMISTRY

Code: 9HC04

L	T	P/D	C
2	1	0	3

Course Objectives:

1. *To understand microscopic chemistry in terms of atomic and molecular orbitals*
2. *To learn the preparation and applications of commercial polymers and lubricant materials*
3. *To learn the industrial problems caused by water and municipal water treatment*
4. *To acquire knowledge about different types of batteries and their working mechanism*
5. *To develop the concepts and types of corrosion, control methods and protective coatings*
6. *To learn the chemical reactions that are used in the synthesis of drug molecules*

Course Outcomes

After completion of the course, the student will be able to:

1. *Understand and analyse microscopic chemistry in terms of atomic orbitals, molecular orbitals and intermolecular forces.*
2. *Identify and differentiate polymers, thermoplastic, thermosetting plastics and various lubricants.*
3. *Recognize and select the domestic and industrial problems caused by hard water and also learn about the municipal water treatment using various methods.*
4. *Understand and interpret the important fundamental concepts of electrochemistry and solve the problems related to batteries.*
5. *Differentiate the types of corrosion and methods used to prevent the corrosion, surface coating techniques*
6. *Learn and implement synthesis of drug molecules and learn fundamentals of analytical techniques like electronic, vibrational and rotational spectroscopy.*

UNIT – I: Atomic and molecular structure (6L)

Molecular orbitals of diatomic molecules and plots of the multicentre orbitals.Equations for atomic and molecular orbitals. Energy level diagrams of diatomics (F_2, Cl_2CO, NO). Pi-molecular orbitals of butadiene and benzene and aromaticity.Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties.Band structure of solids and the role of doping on band structures.

UNIT – II: Plastics and Lubricants (8L)

Plastics: Polymerization-Addition and Condensation polymerization, Plastics – Thermosetting and Thermoplastics, preparation, properties and **engineering applications of plastics:** PVC, Teflon, Bakelite. Fibers: Nylon 6,6 and Dacron.

Rubbers – natural and artificial rubber, vulcanization of natural rubber, Buna-S, Buna-N and their **engineering applications.** Fabricated Reinforcing Polymers**- engineering applications**

Lubricants: Definition, classification and function of lubricants, Types of lubrication and mechanisms – Thick Film or Hydrodynamic Lubrication, Thin Film or Boundary Lubrication, Extreme Pressure Lubrication. Classification and properties of lubricants – Viscosity, flash and fire point, cloud and pour point and acid value.**Engineering applications.**

UNIT – III: Water Technology (8L)

(a) Introduction: - Hardness of water – types of hardness (temporary and permanent), calculation of hardness- Numerical problems. Estimation of hardness of water by EDTA Method.

(b) Water for Industrial purpose: Food, sugar, textile, paper and pharma industries, water for steam making characteristics of boiler feed water, boiler troubles- scale and sludge & Carry over (priming &foaming), boiler corrosion, caustic embrittlement.

(c) Water Treatment: Internal conditioning- phosphate, carbonate &calgon conditioning. External Treatment: Ion-exchange process. Desalination-reverse osmosis. Municipal water treatment-sedimentation, coagulation, filtration, disinfection-chlorination, ozonization. **Engineering applications: Methodology and working of mineral water plant for drinking purpose.**

UNIT – IV: Electrochemistry (8L)

Conductance – conductors (metallic and electrolytic), types of conductance – specific, equivalent and molar conductance – effect of dilution on conductance.

Free energy and emf, cell potentials, electrode potential (oxidation and reduction).Types of electrodes - redox electrode (quinhydrode electrode), metal – metal insoluble salt electrode and Ion selective electrode.Cell notation and cell reaction –Nernst equation and applications.**Engineering Applications.**

Batteries : Types of batteries

(a) Primary batteries – Lechalanche cell (dry cell), Lithium cell

(b) Secondary batteries(Accumulators) – Lead acid battery, Lithium-ion battery

(c) Fuel cells- $H_2 – O_2$ fuel cell and MeOH-O_2 fuel cell-advantages and applications.

Engineering applications – future water powered car, Hydrogen production and storage.

UNIT – V: Corrosion and Surface treatment (8L)

Corrosion – basic concepts –types of corrosion, chemical, electrochemical corrosion (absorption of O_2 and evolution of H_2) -factors affecting the rate of corrosion.

Cathodic protection – sacrificial anodic protection and impressed current cathodic protection method.

Surface treatment

Mechanical surface treatment and coatings, casehardening and surface coating, thermal spraying, vapour deposition, Ion implantation, Diffusion coating.

Methods of metallic coatings-hot dipping (tinning and galvanizing), metal cladding (Al cladding), electroplating (copper plating) and electroless plating (nickel plating), electroforming, ceramic, organic and diamond coating

UNIT-VI: Organic reactions and drug molecules (5L)

Introduction: reactions involving substitution (S_N1, S_N2) addition to double bond(C=C), elimination (E^1 and E^2), oxidation (using $KMnO_4$, CrO_3), reduction (Hydrogenation by Ni/H_2, Pd/C)

Drugs: Definition, classification structure and applications of commonly used drug molecules-paracetamol, aspirin, ibuprofen and diphenhydramine (Benadryl)

Principles of spectroscopy and selection rules: Electronic spectroscopy. Fluorescence and its applications in medicine.Vibrational and rotational spectroscopy of diatomic molecules-**Applications**.

TEXT BOOKS:

1. Engineering Chemistry: PK Jain & MK Jain, Dhanapathrai Publications (2018)
2. Engineering Chemistry: by Thirumala Chary Laxminarayana&Shashikala, Pearson Publications (2020)

REFERENCE BOOKS:

1. Textbook of Engineering Chemistry: Jaya Shree Anireddy, Wiley Publications (2019)
2. Engineering Chemistry: by &B.Rama Devi, PrsantaRath& Ch. VenkataRamana Reddy, Cengage Publications (2018)
3. Engineering Chemistry: ShashiChawla, Dhanapathrai Publications (2019)
4. Textbook of Engineering Chemistry: SS Dara, SS Umare S. Chand Publications (2004)

PO's	1	2	3	4	5	6	7	8	9	10	11	12
Level	H	M	M									

Syllabus for B. Tech I Year II semester
Electronics and Computer Engineering
DATA STRUCTURES
(Common to all Branches)

Code: 9EC01

L	T	P/D	C
3	0	0	3

Prerequisites: Problem Solving using C

Course Objectives:

1. *To provide the knowledge of structures, unions, enum and typedef.*
2. *To understand and learn the applications of Abstract data Type, linear data structures such as stacks, queues and linked list.*
3. *To comprehend different nonlinear data structures.*
4. *To understand and analyze the concepts of various searching and sorting techniques.*

Course Outcomes:

After completion of this course student will be able to:

1. *Design the programs using structures, unions and enum.*
2. *Demonstrate the concepts of Abstract data type and also applications of stacks and queues.*
3. *Implement basic operations on single, double and circular linked list.*
4. *Solve problems involving Binary Search trees and AVL trees.*
5. *Articulate the concepts of graphs, heaps and hashing.*
6. *Develop algorithms for various searching and sorting techniques and analyze their performance.*

UNIT I:

Structures: Introduction, types, initialization and accessing, Array of Structures, Nested Structures, Self-referential structures.Unions, enum, typedef, Dynamic Memory allocation.

UNIT II:

Introduction to data structures: Abstract data type (ADT), Stacks, Queues and Circular queues and their implementation with arrays.

Applications of Stack: infix to post fix conversion, postfix expression evaluation. Applications of Queues.

UNIT III:

Linked list: introduction, advantages of Linked list over Arrays.
Single linked list: creation, insertion, deletion and display operations
Double linked list: creation, insertion, deletion and display operations
Circular linked list: creation, insertion, deletion and display operations,Implementation of Stacks and Queues with singly linked list.

UNIT IV:

Trees: Terminology, Binary Tree: types, representation and traversals (in-order, pre-order, post-order).
Binary Search Tree: introduction, operations (insertion, deletion, display)
AVL Trees: Definition, examples, and operations (insertion, deletion and searching).

UNIT V:

Graphs: terminology, representation, traversals (DFS and BFS).
Heaps: Introduction, Min Heap, Max Heap, Operations on Heaps, Heap Sort.
Hashing: Hash Table, Hash functions.

Collision resolution techniques: separate chaining, open addressing-linear probing, quadratic probing, double hashing.

UNIT VI:
Searching: linear and binary search methods.
Sorting: Bubble Sort, Insertion Sort, Selection Sort, Quick sort, Merge sortPerformance analysis of Searching and Sorting Algorithms.

TEXT BOOKS:

1. Data Structures Using C second edition by ReemaThareja Oxford university press
2. Data Structure through C by YashavantKanetkar.

REFERENCES:

1. Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft. Data Structures and Algorithms. Addison Wesley,1983.
2. Data Structures using c Aaron M.Tenenbaum ,YedidyahLangsam,MosheJAugenstein.
3. Introduction to Data Structures in C ByKamtane
4. Data Structures, A pseudocode Approach with C by Richard F. Gilberg and Behrouz A. Forouzan.

a	b	c	d	e	f	g	h	i	j	k	l
3	3	2									

Syllabus for B. Tech I Year II semester
Electronics and Computer Engineering
ADVANCED CALCULUS
(Common to All Branches of Engineering)

Code: 9HC12

L	T	P/D	C
2	1	0	3

Pre Requisites*: Mathematics Knowledge at Pre-University Level*
Course Objectives: *To make the students to understand and expected to learn*

1. *Basic concepts of multivariable differential calculus.*
2. *Evaluation of double and triple integrals.*
3. *Solutions of first order linear and non-linear partial differential equations.*
4. *Series expansion of a given function in terms of sine and cosine terms.*
5. *Basic Concepts of vector differential calculus.*
6. *Concepts of vector integral calculus.*

Syllabus

UNIT-I: Functions of several variables: Limits, Continuity and partial derivative, total derivative, Jacobian, Maxima and minima of two variable functions (without constraints).

UNIT-II: Multiple Integrals: Double integrals, change of order of integration, change of variables (Cartesian to polar), Triple integrals (Cartesian form).

UNIT-III: Partial Differential Equations: Formation of partial differential equations, solutions to first order linear and non-linear partial differential equations - standard Forms,

UNIT-IV: Fourier series: Dirichlet conditions, Fourier series of functions over the intervals of length 2l& 2π. Half range sine and cosine series, Problems on Parseval's theorem (without proof).

UNIT-V: Vector Differentiation: Vector and scalar point functions, gradient, directional derivatives; divergence and curl of a vector point function and problems.

UNIT-VI: Vector Integration: Line integrals, surface integrals, volume integrals, Green, Gauss divergence and Stokes theorems (without proofs) and problems.

Suggested Readings:

1. R K Jain and S R K Iyengar Advanced Engineering Mathematics, Narosa Publications.
2. B.S. Grewal, Elementary Engineering Mathematics, Khanna Publishers
3. Alan Jeffery, Advanced Engineering Mathematics, Academic Press
4. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
5. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.

Course Outcomes: *After the course completion the students will be able to*

1. *Find the limits and test for the continuity and differentiability of a function.*
2. *Solve the problems on multiple integrals.*
3. *Solve linear and nonlinear first order partial differential equations.*
4. *Find Series expansion a function defined over the intervals.*
5. *Find directional derivative, gradient, divergence and curl of a function.*
6. *Solve problems of line, surface and volume integrals.*

Syllabus for B. Tech I Year II semester
Electronics and Computer Engineering
ELECTRIC CIRCUITS AND NETWORKS ANALYSIS

Code: 9AC42

L	T	P/D	C
3	0	0	3

Course Objective:

To learn the fundamentals and applications of circuits and networks.

Course outcomes:

1. *Understand the principle of different methods of electrical circuit reduction.*
2. *Understand the principle of single phase A.C circuits.*
3. *Understand the principle of magnetic circuits.*
4. *Understand the principles of network theorems along with its applications.*
5. *Understand the principle two port networks along with its applications.*
6. *Understand the principle of transients with both DC and AC excitation.*

UNIT – I: INTRODUCTION TO ELECTRICAL CIRCUITS:

Circuit concept, R-L-C parameters, Voltage and current sources, Independent and dependent sources, Source transformation, Kirchhoff's laws, Network reduction techniques, series, parallel, series – parallel, Star- to-delta and Delta-to-star transformation, Mesh Analysis, Nodal analysis, Super mesh, Super node concept.

Applications: For finding of voltage and current of different points of OPAMP circuit.

UNIT – II: **SINGLE PHASE A.C. CIRCUITS:**

R.M.S and Average values, Form factor for different periodic wave forms, Steady state Analysis of R, L and C (in series, parallel and series-parallel combinations) with sinusoidal excitation.

Resonance in series and parallel circuits, Concept of band width and Q factor.

APPLICATIONS: tuning of a channel in radio receiver.

UNIT – III MAGNETIC CIRCUITS:

Basic terms in Magnetic Circuits, Comparison between electric and magnetic circuits, Composite magnetic circuit, Analysis of series, parallel magnetic circuits, Faraday's Laws of electromagnetic induction, Concept of self and mutual inductance, Dot convention, Co-efficient of coupling.

APPLICATIONS: working of transformer and dc machines.

UNIT – IV: NETWORK THEOREMS:

Superposition, Reciprocity, Thevenin's, Norton's, Maximum Power Transfer and Millman's Theorems - statements and problems solving using dependent and independent sources with D.C. excitation.

Applications: For finding of voltage and current of different points of OPAMP circuits.

UNIT – V: TWO–PORT NETWORKS:

Z,Y, ABCD and h-parameters, Conversion of one parameter to another parameter, Condition for reciprocity and symmetry, two port network connections in series, parallel and cascaded configurations, Problem solving.

APPLICATIONS: analysis of electrical transmission network.

UNIT – VI: TRANSIENT ANALYSIS:

Transient response of R-L, R-C, R-L-C series circuits with D.C. and A.C excitations, Initial conditions, Solution using differential equation approach and Laplace transform methods of solutions.

APPLICATIONS: transientanalysis of electrical machines.

TEXT BOOKS:

1. Engineering Circuit Analysis – William Hayt and Jack E Kemmerly, McGraw Hill 5th Edition, 1993.
2. Circuits & Networks – M.S. Sukhija, K.N. Nagasarkar, Oxford University Press, 2nd edition.

REFERENCES:

1. Network Analysis - M.E. Vanvalkenberg, 3rd edition, PHI.
2. Circuit theory (Analysis & Synthesis) – A.Chakravarthy, Dhanpath Rai & Co., 6th edition.
   Circuits & Networks – A.Sudhakar and Shyamamohan S.Palli, Tata McGraw Hill, 3rd edition.

Syllabus for B. Tech I Year II semester
Electronics and Computer Engineering
ORAL COMMUNICATIONS LAB – II
(Common for all Branches)

Code: 9HC62

L	T	P/D	C
0	0	3	1.5

Maximum Marks: 100 (Internal – 30 / External – 70)

A	B	C	D	E	F	G	H	I	J	K	L
							X	X	X		X

Course Objectives:
To enable students to:

- *Strike a conversation and engage in effective small talk.*
- *Lose stage fear and confidently interact with others in different roles and tap their creative side.*
- *Speak for a minute, fluently and cohesively.*
- *Make official presentations with effective use of PPTs.*
- *Engage in group discussions in a confident and professional manner.*
- *Shed fear of questions from the audience and the interviewers.*

Units
OC Lab (2 hrs. per week)

Unit 1
Small talk and conversational techniques
Tips on enhancing conversation skills.
Conversation starters, small talk questions, how to talk to strangers andpractice activities on initiating informal conversations.
- Talk about your favourite things.
- Interview each other.

Unit 2
Role Play/skit/one act play
- Role play assuming fictional characters and non-fictional characters.
- One Act plays
- Ad' Venture: Advertisement creation and enacting.

Unit 3
Just a minute (JAM)
One-minute speaking activity on topics of students' choice and Extempore.

Unit 4
Presentation skills
Introduction to structural talk.Techniques of making effective presentations.
- Five minute PowerPoint presentations.

Unit 5
Group Discussions
Tips on Dos and Don'ts of Group Discussion (GD).Discussion on evaluation pattern during GD.
- Practice sessions: GDs on different topics.

Unit 6

Facing questions: Mock Interviews

Strategies of handling Question and Answer sessions after Presentations/seminars.

- Question Toss: Practice on asking and answering questions.

Suggested Reading:

- "Effective Technical Communication" by M. Ashraf Rizvi, McGraw Hill.
- "Skill Sutras" by JayashreeMohanraj, Prism Books Pvt. Ltd.
- "Technical Communication: Principles and Practice" by Meenakshi Raman, OUP.
- "Effective Communication" John Adair, Pan Macmillan Ltd.
- "Body Language", by Allan Pease, Sudha Publications.
- "Business Communication: From Principles to Practice" MM Monippally, TataMcGraw Hill.

Course Learning Outcomes:

- *Understand the nuances of striking a great conversation in formal and informal situations.*
- *Gain experience of facing an audience and speaking in public.*
- *Design a winning presentation and present it with ease.*

Syllabus for B. Tech I Year II semester
Electronics and Computer Engineering
ENGINEERING CHEMISTRY LAB
(for CSE, CSD, CSM, CSI, CSO, IT and ECM)

Code: 9HC64

L	T	P/D	C
0	0	3	1.5

***Course Objectives**:*
The student will be able to learn:

1. *To reparation of Inorganic compounds*
2. *To determine surface tension of a liquid*
3. *To determine viscosity of lubricant*
4. *To determine acid value of an oil*
5. *To estimate hardness of water*
6. *To analyze the amount of chloride content*
7. *To determine cell constant and conductance of solutions*
8. *To determine redox potential and emf of solutions*
9. *To determine the rate constant of acid*
10. *To synthesize a polymer (Thiakol rubber / Urea-Farmaldehyde resin)*
11. *To synthesize a drug- Aspirin*
12. *To estimate of Mn^{+7} by Colorimetry method*

List of Experiments

1. Preparation of coordination complex NiDMG Complex
2. Determination of surface tension
3. Determination of viscosity
4. Saponification/acid value of an oil
5. Ion exchange column for removal of hardness of water / Estimation of Hardness of water by EDTA Method
6. Determination of chloride content of water
7. Determination of cell constant and conductance of solutions (HClVsNaOH / Mixture of acid Vs Strong base)
8. Potentiometry - determination of redox potential and emf ($FeSO_4$Vs $KMNO_4$ / HClVsNaOH)
9. Determination of the rate constant of acid catalyzed hydrolysis of methylacetete
10. Synthesis of a polymer- Thiakol rubber / Urea-Farmaldehyde resin
11. Synthesis of a drug- Aspirin
12. Estimation of Mn^{+7} by Colorimetry method

Course Outcomes
After completion of the course, the student will be able to learn:

1. Preparation of Inorganic compounds
2. Determination surface tension of a liquid
3. Determination viscosity of lubricant
4. Determination acid value of an oil
5. Estimation hardness of water
6. Analysis the amount of chloride content
7. Determination of cell constant and conductance of solutions
8. Determination of redox potential and emf of solutions
9. Determination of the rate constant of acid
10. Synthesis of a polymer (Thiakol rubber / Urea-Farmaldehyde resin)
11. Synthesis of a drug- Aspirin
12. Estimation of Mn^{+7} by Colorimetry method

PO's	1	2	3	4	5	6	7	8	9	10	11	12
Level			H									

Syllabus for B. Tech I Year II semester
Electronics and Computer Engineering
DATA STRUCTURES USING C LAB
(Common to all Branches)

Code: 9EC61

L	T	P/D	C
0	0	3	1.5

Prerequisites: Problem Solving using C Lab
Course objectives:
1. *Create programs on structures and unions*
2. *Develop the programs on Linear and Non-Linear data structures*
3. *Write programs on various searching and sorting algorithms.*

Course Outcomes:
After completion of the course, the student will be able to:
1. *Write programs on structures and unions.*
2. *Implement Stacks, Queues and circular queues using arrays.*
3. *Write programs to implement basic operations on various types of linked list.*
4. *Implement insertion and traversal operations on binary search tree*
5. *Develop programs on various searching, sorting algorithms.*

Note: Lab Projects will be allocated to the students at the beginning of the semester.

Cycle 1:
1. Define a structure for complex number. Write functions on complex numbers (addition, subtraction, absolute value, multiplication, division, complex conjugate) and implement them in a menu driven style.
2. Define a structure student having members roll no., name, class, section, marks.
   Create an array of 10 students give the data and find the average marks, section-wise.

Cycle 2:
3. Write a C program that implement stack and its operations using arrays
4. Write a C program that implement Queue and its operations using arrays.
5. Write a C program that implement Circular Queue and its operations using arrays.

Cycle 3:
6. Write a C program that uses Stack operations to perform the following:
   i) Converting infix expression into postfix expression
   ii) Evaluating the postfix expression

Cycle 4:
7. Write a C program that uses functions to perform the following operations on singly linked list:
   i) Creation ii) Insertion iii) Deletion iv) Traversal

Cycle 5:
8. Write a C program that uses functions to perform the following operations on doubly linked list:
   i) Creation ii) Insertion iii) Deletion iv) Traversal in both ways

Cycle 6:

9. Write a C program using functions to perform the following operations on circular singly linked list:
   i) Creation ii) Insertion iii) Deletion iv) Traversal

Cycle 7:

10. Write a C program to implement operations on the following Data Structures Using Singly linked list:
    i) Stack ii) Queue

Cycle 8:

11. Write a C program that uses functions to perform the following:
    i) Creating a Binary Search Tree.
    ii) Traversing the above binary tree in pre-order, in-order and post-order.

Cycle 9:

12. Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers:
    i) Linear Search ii) Binary Search

Cycle 10:

13. Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
    i) Bubble Sort ii) Insertion Sort iii) Selection Sort

Cycle 11:

14. Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
    i) Quick sort ii) Merge sort iii) Heap Sort

Cycle 12:

15 Lab Projects- Design and Develop Case Studies such as ,Graph Traversal Techniques, Collision Resolution Techniques

a	b	c	d	e	f	g	h	i	j	k	l	m
1					3	3	2					

Syllabus for B. Tech II Year I semester
Electronics and Computer Engineering
ENVIRONMENTAL SCIENCE
(for CSE, CSD, CSM, CSI, CSO, IT and ECM)

Code: 9HC05

L	T	P/D	C
3	0	0	0

Course Objectives:

1. *To understand structure and function of ecosystem*
2. *To learn classification and uses of natural resources*
3. *To learn about Understanding the impacts of developmental activities and mitigation measures.*
4. *To know the source, causes and preventive methods of pollution*
5. *To understand the importance of ecological balance for sustainable development.*
6. *To understand the environmental policies and regulations*

UNIT-I Ecosystems: Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnification, ecosystem value, services and carrying capacity.

UNIT-II Natural Resources: Classification of Resources: Living and Non-Living resources, water resources: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, Land Energy resources: growing energy needs, renewable and non-renewable energy sources, use of alternate energy source.

UNIT-III Biodiversity and Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation.

UNIT-IV Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, Air Pollution: Primary and secondary pollutants. Acid rain-Threshold limit values of chemicals present in environment, Global warming, Ozone layer depletion, Water pollution: Sources and types of pollution. Soil Pollution: Sources and types, Impacts of modern agriculture, degradation of soil. Noise Pollution: Sources and Health hazards, standards, Solid waste: Municipal Solid Waste management, composition and characteristics of e-Waste and its management. Pollution control technologies: Sewage water Treatment, Kyoto protocol, and Montréal Protocol.

UNIT-V Sustainable development and Green Technology: Concept of sustainable development, threats to sustainability population and its explosion, Crazy consumerism, over- exploitation of resources, strategies for achieving sustainable development environmental education, conservation of resources, urban sprawl sustainable cities and sustainable communities, human health , role of IT in Environment, Environmental Ethics, Environmental Economic – Concept of Green Building, Clean Development Mechanism (CDM).

UNIT-VI Environmental Policy, Legislation & Environment Impact Assessment: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste

management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects.Strategies for risk assessment, Concepts of Environmental Management Plan (EMP).

Course Outcomes

After completion of the course, the student will be able to:

1. *Understand about ecosystem and energy flow among the organisms.*
2. *Know the resources available, use of them and overexploitation of the resources in the nature.*
3. *Learn the value, use and value of biodiversity.*
4. *Understand the causes and effect of pollution and implement measures in control of pollution.*
5. *Understand the sustainable development and implement green technology for sustainable development.*
6. *Learn and implement policy to protect the environment.*

TEXT BOOKS:

1. Perspectives in ***Environmental Studies***: ***Kaushik*** A. and ***Kaushik***, C.P. New Age International (P) Ltd. (2008)

REFERENCE BOOKS:

1. Environmental Studies by ErachBharucha, 2005 University Press.
2. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
3. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHI Learning Pvt. Ltd.
4. Environmental Science by Daniel B. Botkin& Edward A. Keller, Wiley INDIA edition.
5. Environmental Studies by AnubhaKaushik, 4th Edition, New age international publishers.
6. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.

Syllabus for B. Tech II Year I semester
Electronics and Computer Engineering
DISCRETE STRUCTURES AND GRAPH THEORY

Code: 9D301

L	T	P/D	C
3	0	0	3

Course Objectives: *In this course the student will learn*

- *Statements and their truth value and constructing truth tables*
- *The use of Universal and Existential quantifiers to describe predicates*
- *Different algebraic structures and their use in mathematics.*
- *To solve problems by permutations and combinations. Study of pigeonhole principle and inclusion exclusion principles.*
- *To solve various recurrence relations by using different techniques.*
- *The basics of graph theory, different ways of traversing the graph and different types of graphs and circuits*

Course Outcomes: *After completing this course, student should be able to*

1 *Describe Connectives, Normal Forms and Theory of Inference with suitable examples.*
2 *Solve problems with Predicate Calculus and generate inferences.*
3 *Solve and explain Relations and Ordering problems and solve problems of Lattices.*
4 *Distinguish algebraic systems like semi-groups, monoids and groups and apply concepts of Combinatorics for solving problems*
5 *Solve problems with recurrence relations.*
6 *Explain and apply concepts of Euler's Formula, Multigraphs, Euler's Circuits, Hamiltonian graph and Chromatic Numbers for solving problems.*

UNIT – I

Propositional Logic: Statement and notations, Connectives, Well formed Formulas, Truth Tables, Tautology, Equivalence, Implication,Arguments, Normal forms, Proof by contradiction,Conditional Proof
Applications: Useful in Switching theory and logic design, Digital Logic design

UNIT-II

First order logic: Predicates,Quantifiers, Free and Bound variables, Rules of inference, Consistency, Automatic Theorem Proving.
Applications: Useful for Artificial Intelligence

UNIT – III

Relations: Properties of Binary Relations, Equivalence,transitive closure, Compatibility & Partial Ordering Relations, Hasse Diagrams,lattices,Boolean algebra. Functions: Inverse function, composition of functions, Recursive functions, Lattice and its properties.
Algebraic structures: Algebraic systems, Examples and general properties, Semi groups and Monoids. Groups, Subgroups, Homomorphisms, Isomorphisms
Applications: Useful for writing queries DataBase Management systems, Computer Networks.

UNIT –IV

Elementary Combinatorics: Basics of counting,Combinations & Permutations with and without repetitions, Constrained repetitions. Binomial coefficients, Binomial, Multinomial theorms, Euler function, Derangemants, Principle of inclusion and exclusion, Pigeon hole principle and its applications.
Applications: Useful for Computer Networks, Machine Learning,Data Mining, Theory of Computations

UNIT V

Recurrence relations: Generating functions. Function of sequences, Calculating the coefficient of generating functions. Recurrence relations, Solving recurrence relations by substitution and generating functions. Characteristic roots. Solution of Inhomogeneous recurrence relations.
Applications: Useful and Can improve the Computer Programming skills

UNIT VI

Graph Theory: Basic concepts**,** Representation of Graph, DFS, BFS, Spanning trees, Planar graphs, coloring, Isomorphism and subgraphs, Multi graphs and Euler Circuits, Hamiltonian graphs, Chromatic numbers,connectivity,cut vertices,cut edges,Matchinga and coverings,independent sets.

Applications: Design of Algorithms, Computer Networks

TEXT BOOKS :

1. Elements of Discrete mathematics – A computer Oriented Approach- C L Liu, D P Mohapatra. Third Edition, Tata MeGraw Hill.
2. Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A. Kandel, T.P. Baker, PHI.
3. Discrete mathematics with applications to computer science, J.P.Tremblay and R.Manohar, TMH

REFERENCES :

1. Discrete and Combinational Mathematics- An Applied Introduction-5th Edition – Ralph. P.Grimaldi.PearsonEduction
2. Discrete Mathematics and its Applications, Kenneth H. Rosen, Fifth Edition.TMH.
3. Discrete Mathematical structures Theory and application-Malik &Sen, Cengage.

Syllabus for B. Tech II Year I semester
Electronics and Computer Engineering
ELECTRONIC DEVICES AND CIRCUITS

Code: 9CC01

L	T	P/D	C
3	0	0	3

COURSE OBJECTIVES COURSE OBJECTIVES: *To learn the basic principle and their applications of semiconductors, diodes, transistors, amplifiers and voltage regulators*

COURSE OUTCOMES*:*

CO1. Understand the Principle of operation and applications of CRO.
CO2. Understand the operation of diode and its application as rectifier.
CO3. Understand the Fundamentals of BJT operation, Characteristics and different biasing circuits.
CO4. Understand the Fundamentals of JFET operation, Characteristics and importance of MOSFETs.
CO5. Understand the Small signal Model of BJT and Amplifier Analysis under CB, CE and CC configurations.
CO6. Understand the Basic regulator circuits and voltage multipliers.

CO	Electronic Devices and Circuits (9CC01)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	Understand the Principle of operation and applications of CRO.	3												2		
CO2	Understand the operation of diode and its application as rectifier.	2	2											3		
CO3	Understand the Fundamentals of BJT operation, Characteristics and different biasing circuits.	3	3	1										3		
CO4	Understand the Fundamentals of JFET operation, Characteristics and importance of MOSFETs.	2	2	2										3		
CO5	Understand the Small signal Model of BJT and Amplifier Analysis under CB, CE and CC configurations.	2	2	3										3		
CO6	Understand the Basic regulator circuits and voltage multipliers.	2	2	2										3		
CO	Overall	2	2	2										3		

UNIT-I
SEMICONDUCTOR DIODES AND APPLICATIONS:
Review of p-n junction diode, Characteristics, Parameters and AC equivalent circuit.. Half-wave diode rectifier, Ripple factor, Full-wave diode rectifier, Other full-wave circuits, Break diodes and their applications in power supply circuits.
Application: Design of Dc Regulated power supply

UNIT-II
TRANSISTORS:
Bipolar Junction transistor, Transistor Voltages and currents, amplification, Common Base, Common Emitter and Common Collector Characteristics, DC Load line and Bias Point.
BIASING METHODS:

Base Bias, Collector to Base Bias, Voltage divider Bias, Comparison of basic bias circuits.
Application: Transistor as a Switch

UNIT-III
OTHER SEMI CONDUCTOR DEVICES:
Silicon Controlled Rectifier (S.C.R) and its applications, Uni Junction transistor and its applications, Junction Field Effect Transistors - JFET Characteristics, JFET Amplification (Common source).
Application: FET as amplifier

UNIT-IV
AMPLIFIERS
Concepts of Decibel and Half power points, Single Stage CE Amplifier and Capacitor coupled two stage CE amplifier (Qualitative discussions only), Negative feedback and its effects.
Applications: Design of a single-stage amplifier.

UNIT-V
OSCILLATORS: The Barkhausen Criterion for Oscillations, RC phase shift, Hartley, Colpitts and Crystal oscillator (Qualitative discussions only).
Applications: Design of oscillators for communication

UNIT-VI
VOLTAGE REGULATORS:
IC 723 voltage regulators and three terminal IC regulators, Introduction to voltage multipliers, Uninterrupted Power Supplies and Switching regulators.
Applications: Design of a voltage regulator

TEXTBOOKS:
1. Electronic Devices and Circuits: David. A. Bell; PHI, New Delhi, 2004
2. Electrical and Electronics and Computer Engineering for Scientists and Engineers Second Edition - K.A. Krishnamurthy and M.R.

REFERENCEBOOKS:
1. Electronics Devices and Circuits by Sanjeev Gupta, Dhanpat Rai Publications
2. Electronics Devices and Circuits Theory by Baystad and Nashelsky, PHI

Syllabus for B. Tech II Year I semester
Electronics and Computer Engineering
SIGNALS AND SYSTEMS

Code: 9CC02

L	T	P/D	C
3	0	0	3

Course Objectives :
To study the concepts of signals and systems their characterization in the Time as well as frequency domains

COURSE OUTCOMES:
After studying this course, the students will be able to

CO1. Understand the concepts of signals, comparison of signals, orthogonal signal space and the concepts of impulse, step and signum functions.
CO2. Apply the orthogonality properties to understand the Fourier methods of signal analysis- Fouries series and Fourier Transforms.
CO3. Understand the concepts of systems, their characterization in the Time as well as Transformed domains.
CO4. Understand and apply the mathematical tools, such as Convolution, Correlation and the Laplace transform, to analyze signals and systems.
CO5. Determine the sampling frequency for any low pass and band pass signals applying the sampling theorem.
CO6. Distinguish between continuous and Discrete time signals and systems. Apply the concepts of Z-Transforms in the analysis of DT signals and systems.

CO	Signals and Systems (9CC02)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	Understand the concepts of signals, comparison of signals, orthogonal signal space and the concepts of impulse, step and signum functions.	2	2	2									2	3		
CO2	Apply the orthogonality properties to understand the Fourier methods of signal analysis- Fouries series and Fourier Transforms.	2	2	2									2	2		
CO3	Understand the concepts of systems, their characterization in the Time as well as Transformed domains.	2	2	2									2	2		
CO4	Understand and apply the mathematical tools, such as Convolution, Correlation and the Laplace transform, to analyze signals and systems.	2	2	2									2	2		
CO5	Determine the sampling frequency for any low pass and band pass signals applying the sampling theorem.		2	3									2	2		
CO6	Distinguish between continuous and Discrete time signals and systems. Apply the concepts of Z-Transforms in the analysis of DT signals and systems.	2	2	2									2	1		
CO	Overall	2	2	2									2	2		

UNIT I
Signals
Signals.Classification of Signals. Periodic. Non-periodic. Energy and Power Signals. Exponential and Sinusoidal Signals. Concepts of Impulse Function. Unit Step Function. Signum Function.
Signal Analysis - Analogy between Vectors and Signals. Orthogonal Signal Space. Signal Approximation using Orthogonal Functions. Mean Square Error. Closed or Complete Set of Orthogonal Functions. Orthogonality in Complex Functions.

Applications: The concepts of orthogonality finds applications in DSP, DIP, DC, Design of experiments and so on.

UNIT-II

Fourier Representation of Continuous Time Signals

Periodic Signals- Fourier Series. Properties of Fourier Series. Dirichlet's Conditions. Trigonometric. Exponential & Compact (Cosine) Fourier Series. Fourier Spectrum.

Non- Periodic Signals - Fourier Transforms. Deriving Fourier Transform from Fourier Series. Fourier Transform of Arbitrary Signal. Standard Signals. Fourier Transform of Periodic Signals. Properties of Fourier Transforms. Fourier Transforms Involving Impulse and Signum Functions. Introduction to Hilbert Transform.

Applications: Knowledge of signal bandwidth is necessary in the design of a filter; in the determination of the carrier frequency and also the sampling frequency.

UNIT-III

Signal Transmission through Linear Systems

Systems. Classification of Systems.Linear System. Impulse Response (IR) of a Linear System. Linear Time Invariant (LTI) System. Linear Time Variant (LTV) System. Transfer Function of a LTI System. Filter Characteristics of Linear Systems. Distortion Less Transmission Through a System. Signal Bandwidth. System Bandwidth. Ideal LPF, HPF and BPF Characteristics. Causality and Poly-Wiener Criterion for Physical Realization. Relationship between Bandwidth and Rise Time.

Applications: The concept of system bandwidth is applied in the design of a practical filter or system.

UNIT-IV

Convolution and Correlation of Signals

Concept of Convolution in Time Domain and Frequency Domain. Graphical Representation of Convolution. Convolution Properties. Cross Correlation and Auto Correlation of Functions. Properties of Correlation Function. Energy Density Spectrum. Parseval's Theorem. Power Density Spectrum. Relation between Auto Correlation Function and Energy/Power Spectral Density Function. Relation between Convolution and Correlation.

Laplace Transforms - Review of Laplace Transforms. Partial Fraction Expansion. Inverse Laplace Transform. Concept of Region of Convergence (ROC) for Laplace Transforms. Constraints on ROC for Various Classes of Signals. Properties of LT. Relation between LT and FT of a Signal. Laplace Transform of Certain Signals using Waveform Synthesis. Laplace Transform of a Periodic Signals.

Applications: These math tools are required in the design, analysis and implementation of various filters or systems.

UNIT-V

Sampling

Sampling Theorem. Graphical and Analytical Proof for Band Limited Signals. Impulse(Ideal) Sampling. Natural(Chopped) Sampling and Flat Top(S&H) Sampling. Reconstruction of Signal from its Samples. Effect of Under Sampling . Aliasing. Introduction to Band Pass Sampling.

Applications: Sampling techniques are applied in the conversion of analog to digital conversion.

UNIT-VI

Z–Transforms

Fundamental Difference Between Continuous and Discrete Time Signals. Discrete Time Signal Representation using Complex Exponential and Sinusoidal Components. Periodicity of Discrete Time using Complex Exponential Signal. Concept of Z- Transform of a Discrete Sequence. Distinction Between Laplace, Fourier and Z Transforms. Region of Convergence in Z-Transform. Constraints on

ROC for Various Classes of Signals. Inverse Z-Transform. Properties of Z-Transforms. Introduction to Discrete Time Systems.

Applications: Analysis and Synthesis of DT signals and systems.

Text Books

1. Signals, Systems and Communications- B. P. Lathi, BSP.
2. Signal processing and Linear Syustems - B. P. Lathi, BSP.
3. Signals and Systems – Anand Kumar

References

1. Signals & Systems – Simon Haykin and Van Veen,Wiley, 2nd Edition.
2. A.V. Oppenheim, A.S. Willsky and S.H. Nawab, PHI, 2ndEdn.
3. Linear Systems and Signal Processing - B. P. Lathi, Oxford University Publications.

Syllabus for B. Tech II Year I semester
Electronics and Computer Engineering
UNIVERSAL HUMAN VALUES

Code: 9HC03

L	T	P/D	C
3	0	0	3

Human Values Courses: This course also discusses their role in their family. It, very briefly, touches issues related to their role in the society and the nature, which needs to be discussed at length in one more semester for which the foundation course named as "H-102 Universal Human Values 2: Understanding Harmony"is designed which may be covered in their III or IV semester. During the Induction Program, students would get an initial exposure to human values through Universal Human Values – I. This exposure is to be augmented by this compulsory full semester foundation course.

OBJECTIVE: *The objective of the course is four fold:*

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

COURSE TOPICS: The course has 28 lectures and 14 practice sessions in 6 modules:

Module 1: Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

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

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

Module 2: Understanding Harmony in the Human Being - Harmony in Myself!

7. Understanding human being as a co-existence of the sentient 'I' and the material 'Body'
8. Understanding the needs of Self ('I') and 'Body' - happiness and physical facility
9. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)
10. Understanding the characteristics and activities of 'I' and harmony in 'I'
11. Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail
12. Programs to ensureSanyam and Health. Include practice sessions to discuss the role others have played in making material goods available to me. Identifying from one's own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease.

Module 3: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

13. Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfillment to ensure mutual happiness; Trust and Respect as the foundational values of relationship
14. Understanding the meaning of Trust; Difference between intention and competence

15. Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship
16. Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals
17. Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.

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

Module 4: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence

18. Understanding the harmony in the Nature
19. Interconnectedness and mutual fulfillment among the four orders of nature- recyclability and self-regulation in nature
20. Understanding Existence as Co-existence of mutually interacting units in all-pervasive space
21. Holistic perception of harmony at all levels of existence.

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

Module 5: Implications of the above Holistic Understanding

22. Natural acceptance of human values
23. Definitiveness of Ethical Human Conduct
24. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order

Module 6:Harmony on Professional Ethics

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

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

3. READINGS:

3.1 Text Book

1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010 3.

2 Reference Books

1. JeevanVidya: EkParichaya, ANagaraj, JeevanVidyaPrakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5. Small is Beautiful - E. F Schumacher.
6. Slow is Beautiful - Cecile Andrews
7. Economy of Permanence - J C Kumarappa

8. Bharat Mein Angreji Raj - PanditSunderlal
9. Rediscovering India - by Dharampal
10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland (English)
13. Gandhi - Romain Rolland (English)

PO's	1	2	3	4	5	6	7	8	9	10	11	12
Level	M	M	L									H

Syllabus for B. Tech II Year I semester
Electronics and Computer Engineering
OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Code: 9EC02

L	T	P/D	C
2	1	0	3

Course Objective:

1. *Understand the concepts of Object oriented programming principles of Java.*
2. *Write the programs and execute using OOP Principles such as garbage collection, overloading methods, constructors, recursion, string handling, String Tokenizer, inheritance and its types, packages, multithreading and threads.*

Course Outcomes:

After completion of the course, the student will be able to:

1 Comprehend the fundamentals of Java, Classes, Objects and design the java programs using constructors and String handling methods.
2 Design the programs using inheritance, polymorphism and interface.
3 Develop programs using Packages, I/O Streams and collections.
4 Apply the concepts of Exception handling and Multithreading for various scenarios.
5 Create programs using AWT, Swings and develop applications using event handling.
6 Develop applications using Applets and client server programs using networking concepts.

UNIT I

History of Java, Java buzzwords, datatypes, variables, simple java program, scope and life time of variables, operators, expressions, control statements, type conversion and costing, arrays,, classes and objects – concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, recursion, string handling, StringTokenizer.
Applications: Basic operations on the bank account of a customer.

UNIT II

Inheritance –Definition, single inheritance, benefits of inheritance, Member access rules, super class, polymorphism- method overriding, Dynamic method dispatch, using final with inheritance, abstract classes, Base class object.
Interfaces: definition, variables and methods in interfaces, differences between classes and interfaces, usage of implements and extends keyword, interfaces, uses of interfaces, packages Applications: Extending the banking operations to the loan applicants.

UNIT III

Packages: Definition, types of packages, Creating and importing a user defined package. Introduction to I/O programming: DataInputStream, DataOutputStream, FileInputStream, FileOutputStream, BufferedReader.
Collections: interfaces, Implementation classes, and Algorithms (such as sorting and searching).
Applications: Searching for a string in the text. PNR status check, students' result sorting.

UNIT IV

Exception handling -exception definition, benefits of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.
Multi-Threading: Thread definition, types of multitasking, uses of multitasking, thread life cycle, creating threads using Thread class and Runnable interface, synchronizing threads, daemon thread.

Applications: Illegal entry handling in the registration form. (Example: entering incorrect intermediate hall-ticket number in EAMCET Registration form)

UNIT V

Advantages of GUI over CUI ,The AWT class hierarchy, Introduction to Swings, Swings Elements:- JComponent, JFrame, user interface components- JLabels, JButton, JScrollbars, text components, check box, check box groups, choices, lists panels – scrollpane, menubar, graphics, layout, managers –boarder, grid, flow, card and grid bag.

Event handling: Delegation event model, closing a Frame, mouse and keyboard events, Adapter classes.

Applications: developing calculator, developing feedback form, developing bio data.

UNIT VI

Applets – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

Applications: Developing of simple advertisements.

Networking – Basics of network programming, addresses, ports, sockets, simple client server program, multiple clients, sending file from server to client.

Applications: One to one Chat application

TEXT BOOKS:

1. Java; the complete reference, 6th edition, Herbert Schildt,TMH.
2. Introduction to Java programming 6th edition, Y. Daniel Liang, Pearson education.

REFERENCES:

1. Core Java 2, Vol 1, Fundamentals, Cay. S. Horstmann and Gary Cornell, seventh Edition, Pearson Education.
2. Core Java 2, Vol 2, Advanced Features, Cay. S. Horstmann and Gary Cornell, Seventh Edition, Pearson Education

a	b	c	d	e	f	g	h	i	j	k	l
2	3										

Syllabus for B. Tech II Year I semester
Electronics and Computer Engineering
QUANTITATIVE APTITUDE AND LOGICAL REASONING
(Common to CSE, IT, ECM, CSM, CSD, CSO)

Code: 9HC16

L	T	P/D	C
3	0	0	3

***Pre Requisites**: Nil*

***Course objectives:** To answer general problems in his everyday life within in short time and to improves the certain skills of a student such as numerical and logical ability, mental capacity and also in sharpening minds.*

Syllabus

Unit I: Number System: Test for Divisibility, Test of prime number, Division and Remainders – HCF and LCM of Numbers–Fractions and Decimals -Average-Problems on Ages- Problems on Numbers- Ratio and Proportion.

Unit II: Percentage – Profit, Loss and Discount – Partnership and Share-Simple Interest - Compound Interest. Time and Work- Pipes and Cisterns-Time and Distance- Problems on Trains- Boats and Streams.

Unit III: Allegation or Mixtures, Clocks & Calendar.Mensuration : Area of Plane Figures, Volume and Surface Area of Solid Figures. Data Interpretation: Tabulation, Bar Graphs, Pie Charts, Line Graphs.

Unit–IV: Series Completion: Number Series, Alphabet Series, Alpha – Numeric Series.
Analogy: Completing the Analogous Pair, Simple Analogy, Choosing the Analogous pair, Double Analogy, Word Analogy, and Number Analogy.
Classification: Word Classification, Number Classification and Letter Classification.
Coding & Decoding: Letter Coding, Number Coding, Matrix Coding, Substitution, Deciphering Message Word Codes, Jumbled Coding. Crypt arithmetic-Inequalities-Input Output Tracing

Unit–V: Blood Relations– Direction sense test- Number, Ranking & Time Sequence Test –Mathematical Operations-Arithmetical Reasoning. Puzzle Test: Classification Type Questions, Seating Arrangements, Comparison Type Questions, Sequential Order of Things, Selection Based on Given Conditions, Family Based Puzzles, Jumbled Problems.

Unit –VI: Logical Venn Diagrams –Cubes and Dice – Analytical Reasoning-Assertions and Reason– Logical Deductions-Syllogism -Statement and Arguments-Statement and Conclusions- -Data Sufficiency.

Text Books:
1. Quantitative Aptitude by R.S.Agarwal
2. Verbal and Non Verbal Reasoning by R.S.Agarwal.

Course outcomes: *By learning Quantitative Aptitude and Logical Reasoning, a student can answer the questions on*
1. *Number system, HCF and LCM, Averages, Ages and ratio and proportion.*
2. *Various important topics of quantative aptitude.*
3. *Mensuration and data interpretation topics.*
4. *Series Completion, analogy, classification and coding and decoding topics.*
5. *Various topics of logical reasoning.*
6. *Venn-diagrams, cubes and dice and also on clocks and calendar problems.*

Syllabus for B. Tech II Year I semester
Electronics and Computer Engineering
ELECTRONIC DEVICES AND CIRCUITS LAB

Code: 9CC71

L	T	P/D	C
0	0	3	1.5

Course Objectives:
This course introduces the characteristics and applications of semiconductor devices; emphasis is placed on characteristics and testing practically to strengthen the knowledge.

Course Outcomes:
After studying this course, the students will be able to

1. *Understand color coding, operations on Diode, BJT, FET and other electronic components.*
2. *Correlate theoretical concepts with practical implementation.*
3. *Apply the knowledge of Diodes, Capacitors and Transistors for the realization of rectifiers, regulators, amplifiers and Oscillator circuits.*
4. *Adapt effective Communication, presentation and report writing skills*

Mapping of Course Outcomes with Program Outcomes

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

PART A: Electronic Workshop Practice (in 3 lab sessions):

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Bread Boards.
2. Identification and Specifications of Active Devices like Diodes, BJTs and JFETs.
3. Study and operation of
   - Digital Multimeters
   - Function Generator
   - Regulated Power Supplies
   - Soldering
   - SMD components

PART B: (For Laboratory examination – Minimum of 10 experiments)

1. Study and Operation of CRO:
   Oscilloscope, CRT features, vertical amplifiers, horizontal deflection system, sweep, trigger Pulse, delay line, probes for CRO, Measurement of amplitude and frequency. Time Period measurement, Lissajous patterns.
2. Determination of Cut-in Voltage, Forward and Reverse resistances of PN Junction diode using V-I Characteristics.
3. Zener diode characteristics and Zener as voltage Regulator.
4. Input and output characteristics of BJT in CB Configuration.
5. Input and output characteristics of BJT in CE Configuration.
6. Half wave rectifier with and without filters.
7. Full wave rectifier (Center trapped and Bridge) with and without filters.

8. Drain and Transfer characteristics of FET in CS Configuration.
9. Common Emitter Amplifier Characteristics
10. Common Collector Amplifier Characteristics (Emitter Follower).
11. FET amplifier (Common Source).
12. RC Phase Shift Oscillator.

Major Equipment required for Laboratories:

1. Regulated Power Suppliers, 0-30V
2. 20 MHz, Dual Channel Cathode Ray Oscilloscopes.
3. Functions Generators-Sine and Square wave signals
4. Multimeters
5. Electronic Components

PO's	1	2	3	4	5	6	7	8	9	10	11	12
Level	M	M	M						M			H

Syllabus for B. Tech II Year I semester
Electronics and Computer Engineering
OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB
(Common to CSE, IT and ECM)

Code: 9EC62

L	T	P/D	C
0	0	4	2

Course objective:
Understand, design and execute the programs involving concepts of Java and object-oriented programming principles.

Course Outcomes:
After completion of the course, the student will be able to:

1. *Implement programs to generate Prime numbers, Roots of a quadratic equation and Fibonacci series.*
2. *Develop applications such as the banking system.*
3. *Design and develop operator, function overloading, and dynamic method dispatch.*
4. *Implement applications using interface and packages.*
5. *Create applications by using threads to remove inconsistencies on sharable resources.*
6. *Develop programs by applying the concepts of applets and event handling.*
7. *Write and execute applications to implement client and server scenarios.*

List of Programs:

1. A) Write a program to print prime numbers up to a given number.
   B) Write a program to print roots of a quadratic equationax2+bx+c=0.
   C) Write a program to print Fibonacci sequence up to a given number.

2. A) Define a class to represent a bank account and include the following members
   Instance variables:
   (i) Name of depositor (ii) Account No (iii)Type of account
   (iv) Balance amount in the account

   Instance Methods:
   To assign instance variables (Constructors-Zero argument and parameterized)
   1. To deposit an amount
   2. To withdraw amount after checking the balance
      To display name and address
      Define Execute Account class in which define main method to test above class.

   B) In the above account class, maintain the total no. of account holders present in the bank and also define a method to display it. Change the main method appropriately.
   C) In main method of Execute Account class, define an array to handle five accounts.
   D) In Account class constructor, demonstrate the use of "this" keyword.
   E) Modify the constructor to read data from keyboard.
   F) Overload the method deposit() method (one with argument and another without argument)
   G) In Account class, define set and get methods for each instance variable.

Example:
For account no variable, define the methods get Account No() and set Account No (intaccno) In each and every method of Account class, reading data from and writing data to instance variables should be done through these variables.

3. A) Define Resister class in which we define the following members: Instance variables: resistance Instance Methods: give Data():To assign data to the resistance variable display Data(): To display data in the resistance variable constructors

Define subclasses for the Resistor class called Series Circuit and Parallel Circuit in which define methods: calculate Series Resistance ( ) and calculate Parallel Resistance () respectively. Both the methods should take two Resistor objects as arguments and return Resistor object as result. In main method, define another class called Resistor Execute to test the above class.

B) Modify the above two methods which should accept array of Resistor objects as argument and return Resistor object as result.

4. A) Write a program to demonstrate method overriding.
B) Write a program to demonstrate the uses of "super" keyword (three uses)
C) Write a program to demonstrate dynamic method dispatch (i.e .Dynamic polymorphism).

5. A) Write a program to check whether the given string is palindrome or not.
B) Write a program for sorting a given list of names in ascending order.
C) Write a program to count the no. of words in a given text.

6. A) Define an interface "Geometric Shape" with methods area( ) and perimeter( ) (Both method's return type and parameter list should be void and empty respectively.

Define classes like Triangle, Rectangle and Circle implementing the "Geometric Shape" interface and also define "Execute Main" class in which include main method to test the above class

B) Define a package with name "sortapp" in which declare an interface "SortInterface" with method sort( ) whose return type and parameter list should be void and empty. Define "subsortapp" as subpackage of "sortapp" package in which define class "SortImpl" implementing "SortInterface" in which sort() method should print a message linear sort is used. Define a package "searchingapp" in which declare an interface "SearchInterface" with search( ) method whose return type and parameter list should be void and empty respectively. Define "searchingimpl" package in which define a "SearchImpl" class implementing "SearchInterface" defined in "searchingapp" package in which define a search( ) method which should print a message linear search issued.

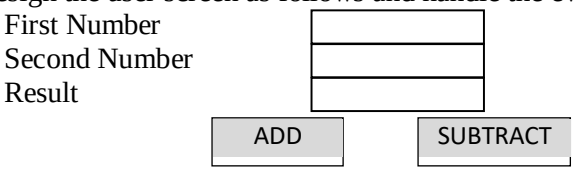
Define a class ExecutePackage with main method using the above packages (classes and its methods).

Use Array List class of Collections Framework to and use algorithms to search and sort the element of an array.

7) Modify the withdraw() method of Account class such that this method should throw "Insufficient Fund Exception" if the account holder tries to withdraw an amount that leads to condition where current balance becomes less than minimum balance otherwise allow the account holder to withdraw and update the balance accordingly.

8.A) Define two threads such that one thread should print even numbers and another thread should print odd numbers.
B) Define more than one thread to print tables using synchronization concept.
C) Define two threads such that one thread should read a line of text from text file and another thread should write that line of text to another file. (Thread communication example).

9) Design the user screen as follows and handle the events appropriately.



10) Write a Java program for handling mouse events and key events.

11) a) Write a program for handling window events.
b) Develop an applet that displays a simple message.

12) Develop a client that sends data to the server and also develop a server that sends data to the client (two-way communication)

13, 14) Develop Lab projects (such as banking application, simple gaming application, scientific calculator, Client-Server Communication in corporating file handling mechanisms, etc.)

a	b	c	d	e	f	g	h	i	j	k	l
								x		x	

Syllabus for B. Tech II Year II semester
Electronics and Computer Engineering
BUSINESS ECONOMICS AND FINANCIAL ANALYSIS

Code: 9ZC01

L	T	P/D	C
3	0	0	3

Co 1: To understand the nuances of Business and its relation to economics
Co 2: To understand the production function and cost concepts
Co 3: To learn the basic market structures and their relevance to business
Co 4: To learn the fundamentals of financial accounting concepts
Co 5: To apply the fundamental concepts of financial accounting in preparation of financialstatements.
Co 6: To understand the financial ratios that are used to analyze the financial performance of thecompany.

UNIT I: INTRODUCTION TO BUSINESS ECONOMICS:
Definition, Nature and Scope of Business Economics, Micro and Macro Economics concepts- National Income, Gross domestic product (GDP), Per capita income, Demand Analysis: Demand Determinants, Law of Demand and its exceptions, Elasticity of Demand, Types of Elasticity of Demand and Demand Forecasting – Statistical and Non-Statistical techniques.

UNIT II: THEORY OF PRODUCTION AND COST ANALYSIS:
Production Function – Isoquants and Isocosts, Internal and External Economies of Scale, Law of Returns Cost Analysis: Cost concepts, different types of costs, Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems).

UNIT III: INTRODUCTION TO MARKETS
Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition, Pricing Methods and strategies.

UNIT IV: FINANCIAL ACCOUNTING - I:
Accounting concepts and Conventions, Double-Entry system of Accounting, Accounting Cycle, Rules for maintaining Books of Accounts, Journal, Posting to Ledger, Preparation of Trial Balance.

UNIT V: FINANCIAL ACCOUNTING – II:
Introduction to Final accounts, Revenue and Capital Expenditure, elements of Financial Statements, Preparation of Final Accounts with simple adjustments (simple problems)

UNIT-VI: FINANCIAL ANALYSIS THROUGH RATIOS:
Concept of Ratio Analysis, Various Types of Ratios: Liquidity Ratios (short term solvency ratios), Leverage Ratios (long term solvency ratios), Turnover Ratios and Profitability Ratios (simple problems).

TEXT BOOKS:

- Aryasri: Managerial Economics and Financial Analysis, 2/e, TMH, 2005.

REFERENCES:

- Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.
- H. Craig Peterson & W. Cris Lewis, Managerial Economics, PHI, 4th Ed.
- Suma Damodaran, Managerial Economics, Oxford University Press.

1	2	3	4	5	6	7	8	9	10	11	12
M		M		H							

Syllabus for B. Tech II Year II semester
Electronics and Computer Engineering
PYTHON PROGRAMMING

Code: 9FC02

L	T	P/D	C
2	1	0	3

Course Objectives:-
After taking this course, you should be able to:
Use Python interactively, execute a Python script at the shell prompt, use Python types, expressions, and None, use string literals and string type, use Python statements (if...elif..else, for, pass, continue, . . .), understand the difference between expressions and statements, understand assignment semantics, write and call a simple function., utilize high-level data types such as lists and dictionaries, understand the difference between mutable and immutable types, write a simple class and access methods and attributes, import and utilize a module, read from and write to a text file.

Course Outcomes:
After taking this course, you should be able to:
CO1: Gains exposure towards Python versions and their specifications.
CO2: Build programs using primitive data types.
CO3: Write applications that include functions, modules, packages along with respective exceptional handling mechanism.
CO4: Writes applications using OO features of Python
CO5: Write applications using Files.
CO6: Hands on exposure on NumPy/Tkinter/Plotpy modules.

Unit-I :
Introduction to Python: History, Features, Modes of Execution, Setting up path, working with Python Basic Syntax, Variable and Data Types, Operators. Conditional Statements (If, If- else, Nested if-else) Looping (for, While Nested loops) Control Statements (Break, Continue, Pass).
Input-Output: Printing on screen, Reading data from keyboard, Opening and closing file

Unit-II:
Functions: Defining a function, calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables
String Manipulation: Accessing Strings, Basic Operations, String slices,Function and Methods
Lists: Accessing list, Operations, Working with lists Function and Methods
Tuple: Accessing tuples, Operations, Working.
Dictionaries: Accessing values in dictionaries, working with dictionaries, Properties Functions and Methods.

Unit-III:
Modules: Importing module,Math module,Random module, Packages
Exception Handling: Exception, Exception Handling, Except clause, Try? Finally clause User Defined Exceptions

Unit-IV:
Python- OOPs concept: Class and object, Attributes, Inheritance, Overloading Overriding, Data hiding.
Regular expressions: Match function, Search function, Matching VS Searching, Modifiers Patterns.

Unit -V:

Introduction to Files, File Handling, Working with File Structure, Directories, Handling Directories

Unit -VI:
Case Study with NumPy/PlotPy/SciPy/GUI Programming, Introduction, Tkinter programming, Tkinter widgets

TEXT BOOK:
1. [Apress]-Beginning Python. From Novice to Professional, 2nd ed. - [Hetland] (2008)

Reference books:
1. Introduction to Computation and Programming using Python, Revised and Expanded Edition, John V. Guttag, The MIT Press.
2. Programming Python, Fourth Edition by Mark Lutz, O'Relly
3. Python Programming using problem solving approach, Reema Thareja, Oxford Higher Education.

1	2	3	4	5	6	7	8	9	10	11	12
H	H										

Syllabus for B. Tech II Year II semester
Electronics and Computer Engineering
DATABASE MANAGEMENT SYSTEMS

Code: 9FC04

L	T	P/D	C
3	0	0	3

Course Objective:
After completion of this course student will learn to:

- *Understand the different issues involved in the design and implementation of a database system.*
- *Learn the physical and logical database designs, database modeling, relational, hierarchical, and network models and to understand and use data manipulation language to query, update, and manage a database.*
- *Develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency and design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.*

Course Outcomes:
After completion of this course student will learn to:

1. *Comprehend importance, significance, models, Database languages, architecture and design of DataBaseSystems.*
2. *Design Relational Models and apply Integrity Constraints, Querying fundamentals, Logical data base design and Views of databases along with application of Relational Algebra.*
3. *Apply queries in SQL Query using Nested Queries Set, Comparison Operators, Aggregative Operators, Logical connectivity's with Joins statements and develop applications.*
4. *Learn to eliminate data redundancy through normalforms.*
5. *Understand ACID properties and Serializability in Transaction management and Database Recovery.*
6. *Use different External Storage Organization techniques and apply Indexing in databases to enhance systemperformance.*

UNIT I

Data Base Systems: Data Vs Information, Data base System Applications, data base System VS file System – View of Data – Data Abstraction –Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor.

Data base design and ER diagrams – Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Data Modeling checklist.

Application- ER diagram for a college

UNIT II

Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views.

Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus.

Application - Student database design.

UNIT III

Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity's – AND, OR and NOT – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers, Embedded SQL.

Application - working with Aviation company database.

UNIT IV

Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Multi valued Dependencies – FORTH NormalForm.

Application - Faculty Evaluation Report.

UNIT V

Transaction Concept- Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability – Implementation of Isolation – Testing for serializability- Lock –Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity, Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage.

Application - Production Management System.

UNIT VI

Data on External Storage – File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic IndexStructure.

Application – Creating B+ tree on InstructorFile.

TEXT BOOKS:

1. Data base System Concepts, Silberschatz, Korth, McGraw hill, Vedition.
2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATAMcGrawHill 3rdEdition
3. Database Management Systems, Peter Rob, A.AnandaRao,Carlos Coronel ,CENGAGE Learning

REFERENCES:

1. Data base Systems design, Implementation, and Management, Peter Rob and Carlos Coronel 7thEdition.
2. Fundamentals of Database Systems, ElmasriNavratePearsonEducation
3. Introduction to Database Systems, C.J.DatePearsonEducation

Syllabus for B. Tech II Year II semester
Electronics and Computer Engineering
ANALOG AND PULSE CIRCUITS

Code: 9D402

L	T	P/D	C
3	0	0	3

Course Objectives:
To understand the basic functioning and applications of the basic building blocks of analog electronic circuits - amplifiers and oscillators.

COURSE OUTCOMES:
After studying this course, the students will be able to

1. *Distinguish between small and large signal amplifiers.*
2. *Analyze and Design tuned and RF amplifiers.*
3. *Understand linear and non-linear wave shaping methods.*
4. *Understand analyze and design various types of multivibrators, their analysis, designing and applications*
5. *Explain different sweep generators and their applications.*
6. *Analyze various types of Logic gates and Sampling gates.*

Mapping of Course Outcomes with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	3				2			2	3	3	2
CO2	3	3	3	2	3				2			2	3	3	2
CO3	3	3	3	3	3				2			2	3	3	2
CO4	3	3	3	3	3				2			2	3	3	2
CO5	3	3	3	3	3				2			2	3	3	2
C06	3	3	2	2	3				2			2	3	3	2
Overall	3	3	3	3	3				2			2	3	3	2

UNIT I
POWER AMPLIFIERS
Classification of Power Amplifiers - Class A, B, AB & C power amplifiers –push pull configuration, complementary symmetry circuits, Distortion in Amplifiers. Harmonic distortion and Crossover Distortion in Power Amplifiers– Conversion efficiency and relative performance.
Applications: Design of Noise Power amplifier

UNIT II
TUNED AMPLIFIERS
Introduction to Tuned Amplifiers, Q-Factor. single tuned capacitive coupled amplifier, tapped single tuned capacitance coupled amplifier, single tuned inductively coupled amplifier, stagger tuning, synchronous tuned Amplifier.
Applications: Design RF Tuned amplifier.

UNIT III
WAVE SHAPING – Linear and Non-linear:
RC high pass, low pass circuit response for sinusoidal, step, pulse, square, ramp & exponential inputs- Differentiator –Integrator. RL, Diode clippers- Transistor clipper- clipping at two independent levels – Emitter coupled clipper- comparator–– Applications of voltage comparators.
Clamping operation – clamping with source, diode resistances- clamping circuits theorem- practical clamping circuits.

UNIT IV

MULTIVIBRATORS:

Stable states of Bistable Multivibrator A fixed bias transistor Bistable Multivibrator -A self-biased transistor Bistable Multivibrator - commutating capacitor – Unsymmetric triggering of Bistable Multivibrator - triggering through a unilateral device- symmetrical triggering – Schmitt trigger circuit.

General operation of monostabl emultivibrator, collector coupled monostablemultivibrator - wave forms of collector coupled monostable multivibrator - Emitter coupled monostable multivibrator - triggering of monostable multivibrator. Astable multivibrator, collector coupled Astable multivibrator -Emitter coupled Astable multivibrator. Designing of Bistable, Monostable and Astable Multivibrators.

Applications: DESIGN OF FUNCTION GENERATOR

UNIT V

TIME BASE GENERATORS:

General features of time base signals-sweep circuit using a transistor switch-UJT,UJT characteristics, UJT as a sweep circuit, - General considerations & principles of Miller & Boot strap time base generators- the transistor miller time base- the transistor, Boot strap time base generator- A simple current sweep transistor current time base generator.

UNIT VI

SAMPLING and LOGIC GATES:

Basic operating principle unidirectional, Bidirectional sampling gates using diodes, transistors- reduction of pedessel effect and sampling oscilloscope.

LOGIC GATES: Digital operation of a system- OR, AND, NOT, NAND &NOR gates- DTL Logic– RTL Logic, TTL logic – comparison.

Text Books:

1. Integrated electronics-J.Milliman and C.C.Halkias, MC Graw –Hill-1972
2. Pulse digital and switching wave forms-J. Millman and H. Taub, Tata McGraw-Hill, New Delhi,2001.
3. Solid State Pulse circuits - David A. Bell, PHI, 4th Edn., 2002.

References:

1. Pulse and Digital Circuits – A. Anand Kumar, PHI, 2005.
2. Wave Generation and Shaping - L. Strauss
3. Electronic Circuit Analysis-K.Lal Kishore, 2004, BSP

Syllabus for B. Tech II Year II semester
Electronics and Computer Engineering
SOFTWARE ENGINEERING

Code: 9D403

L	T	P/D	C
3	0	0	3

Course Objectives:*In this course the student will learn about*

(i) The concepts of Software Engineering, various process and system models.
(ii) Software requirements in an engineering perspective.
(iii) Various system models and design engineering.
(iv) The concepts of objected oriented design and approaches to software testing strategies.
(v) *Metrics for products, risk management.*
(vi) *Quality management.*

Course Outcomes: *After completing this course, student should be able to*

(i) Apply process models in real world software products.
(ii) Classify software requirement specification document.
(iii) Design system models and user interface.
(iv) Evaluate test strategies for various softwares.
(v) Describe product metrics,risks.
(vi) Understand the quality management.

UNIT – I: Introduction to Software Engineering: Evolving role of software, Changing Nature of Software, Software myths.
A Generic view of process: Software engineering – A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.
Process Models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process.
Applications: Word processing, Spread sheets, Computer Graphics, multimedia, Database management, Entertainment, Personal & business, Financial applications, Insulin pump, Aerospace Engineering

UNIT – II: Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.
Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.
Applications: Developing Software Requirement Specification document for an application

UNIT - III: System models: Context Models, Behavioral models, Data models, Object models, structured methods.
Design Engineering: Design process and Design quality, Design concepts, and the design model.
Creating an architectural design: Software architecture, Data design, Architectural styles and patterns, Architectural Design.
Applications: Implementing Microwave Oven, Context model for ATM machine, Insulin Pump

UNIT – IV: Object-Oriented Design: Objects and object classes, An Object-Oriented design process, Design evolution, **UML-**Introduction to Unified Modeling Language, UML diagrams.
Performing User Interface design: Golden rules, User Interface analysis and design, interface analysis, interface design steps, Design evaluation.
Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.
Applications: Object Model for an application such as Library, Implementing testing strategy on cash counter in malls and in softwares.

UNIT – V: Product Metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.
Metrics for Process and Products: Software Measurement, Metrics for software quality.
Risk Management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.
Applications: Calculating SLOC and metrics for a software.

UNIT – VI: Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.
Applications: Applied in rating a software or an organization

TEXT BOOKS:

1. Software Engineering, Practitioner's Approach – Roger S. Pressman, 6th Edition, McGraw Hill International Edition.
2. Software Engineering – Sommerville, 7th Edition, Pearson education.

REFERENCES:

1. Software Engineering – K KAgarwal and Yogesh Singh, New Age International Publishers
2. Software Engineering, an Engineering approach – James F Peters, WitoldPedrycz, John Wiley.
3. Systems Analysis and Design – ShelyCashmanRosenlatt, Thomson Publications.
4. Software Engineering principles and practice – Waman S Jawadekar, McGraw Hill Companies

Syllabus for B. Tech II Year II semester
Electronics and Computer Engineering
SOFT SKILLS
(Common to CSE, IT, ECM, AIML, CS, DS & IOT)

Code: 9HC63

L	T	P/D	C
2	0	0	2

Maximum Marks: 100 (Internal – 30 / External – 70)

A	B	C	D	E	F	G	H	I	J	K	L
							X	X	X		X

Course objectives:
To enable students to:
- *make self-assessment.*
- *know the importance of certain soft skills like time management and goal setting.*
- *enhance their team skills and design thinking capabilities for effective critical thinking and creativity.*
- *know their emotional quotient which guides their thinking, behavior and helps them manage stress efficiently.*

Tutorial (1 per week)
Units
Unit-1
1.1 Introduction to soft skills
1.2 SWOT / SWOC Analysis
1.3 SWOT / SWOC Grid
1.4 Johari window

Unit-2
2.1 Emotional intelligence
2.2 Time management
2.3 Goal Setting
Unit-3
3.1 Attitude
3.2 Professional etiquette & Grooming

Unit-4
4.1 Styles of Communication
4.2 **Inter-personal Skills**
4.3 Team work, Team building
4.4 Leadership Skills

Unit-5
5.1 Problem Solving & Decision making
5.2 Critical & Creative thinking

Unit-6
6.1 Values : Personal, Social & Cultural
Lab (2 per week)
Unit-1
- Activities based on Soft skills
- Self-Analysis
- Questionnaire,
- SWOT Practice

Unit-2

Activities :
- big picture challenge
- Goal setting charts

Unit-3
Practice activities on
- Attitude
- Professional etiquette & Grooming

Unit-4
- Activities on social skills
- Role Plays
- Team building activities

Unit-5
Practice activities on
- Problem solving situations
- Games and puzzles
- Case Studies and Group Discussions on decision making and problem solving, creativity and innovation.

Unit-6
Practice activities
- Role Plays

Text Book: SOFT SKILLS – Dr. K. Alex, S. Chand publications

Suggested Readings: * SOFT SKILLS – MeenakshiRaman ; * Step Ahead with Soft Skills - Oxford University Press ; * Skill Sutras- JayashreeMohanraj * The Power of Soft Skills – Robert A. Johnson ; * Soft Skills for Everyone – Jeff Butterfield

Course Learning Outcomes:
After completion of the course, the student will be able to:
- *Determine the significance of soft skills in the working environment*
- *Understand how to demonstrate empathy in a wide range of situations.*
- *Effectively communicate through verbal/oral communication and improve the listening*
- *Become more effective individual through goal/target setting, self-motivation and practicing creative thinking.*
- *Develop a positive and responsible attitude to their own well-being*
- *Identify stress factors and handle stress effectively.*

Syllabus for B. Tech II Year II semester
Electronics and Computer Engineering
IT WORKSHOP AND PYTHON PROGRAMMING LAB

Code: 9D467

L	T	P/D	C
0	0	3	1.5

Course Objectives

Students will try to learn

- *Basics of Python programming, Decision Making and Functions in Python, Object Oriented Programming using Python.*
- *To introduce to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers.*

Course Outcomes

Students will be able to

1. *Apply knowledge for computer assembling and software installation and ability to solve the trouble shooting problems.*
2. *Apply the tools for preparation of PPT, Documentation and budget sheet etc.*
3. *Install and run the Python interpreter, Create and execute Python programs.*
4. *Apply the best features of mathematics, engineering and natural sciences to program real life problems.*
5. *Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python, Express different Decision Making statements and Functions, Interpret Object oriented programming in Python.*
6. *Understand and summarize different File handling operations, explain how to design GUI Applications in Python.*

IT Workshop

Week 1:

Introduction to Computer: Identify the peripherals of a computer, components/peripherals in a CPU & its functions. Introduction to the types of Operating System, Assembling and disassembling demonstration.

Week 2:

Install computer with dual boot operating system (Windows, Linux with PowerPoint presentation). Comparison of types of OS in different platform

Week3:

Introduction to S/W's, difference b/w hardware and software. Introduction to MS-Office and its importance.

Ms Word

Ms Power Point Presentation

Week4:

Introduction to Excel

Features: Accessing, Overview at toolbars, saving excel files, Gridlines, Format cells, Summation, Auto fill, formatting text.

Formula in excel – Average, Standard Deviation, Charts, Roaming & Inserting worksheets, Hyper linking, count function, lookup / Vlookup, sorting, Conditional formatting.

Python Programming Lab

Week -1:

1. Use a web browser to go to the Python website http://python.org. This page contains information about Python and links to Python-related pages, and it gives you the ability to search the Python documentation.
2. Start the Python interpreter and type help() to start the online help utility.

3. Start Python interpreter and use it as Calculator.

Week -2:

4. If you run a 10 kilometer race in 43 minutes 30 seconds, what is your average time per mile? What is your average speed in miles per hour? (Hint: there are 1.61 kilometers in a mile).
5. The volume of a sphere with radius r is 5? (Use Sphere volume formula)

6. Suppose the cover price of a book is $24.95, but bookstores get a 40% discount. Shipping costs $3 for the first copy and 75 cents for each additional copy. What is the total wholesale cost for 60 copies?

Week -3:

7. A function object is a value you can assign to a variable or pass as an argument. For example, do_twice is a function that takes a function object as an argument and calls it twice:

```
def do_twice(f):
f()
f()
```

Here's an example that uses do_twice to call a function named print_spam twice.

```
def print_spam():
print 'spam'
do_twice(print_spam)
```

a. Type this example into a script and test it.
b. Modify do_twice so that it takes two arguments, a function object and a value, and calls the function twice, passing the value as an argument.
c. Write a more general version of print_spam, called print_twice, that takes a string as a parameter and prints it twice.
d. Use the modified version of do_twice to call print_twice twice, passing 'spam' as an argument.

8. **Write a function that draws a grid like the following:**

```
+ - - - - + - - - - +
|         |         |
|         |         |
|         |         |
+ - - - - + - - - - +
|         |         |
|         |         |
|         |         |
|         |         |
+ - - - - + - - - - +
```

Hint: to print more than one value on a line, you can print a comma-separated sequence.

9. Write a function called gcd that takes parameters a and b and returns their greatest common divisor.
10. Write a function called is_palindrome that takes a string argument and returns True if it is a palindrome and False otherwise. Remember that you can use the built-in function len to check the length of a string.

Week-4:

11. Write a function called is_sorted that takes a list as a parameter and returns True if the list is sorted in ascending order and False otherwise.
12. Write a function called has_duplicates that takes a list and returns True if there is any element that appears more than once. It should not modify the original list.
12. Write a function called remove_duplicates that takes a list and returns a new list with only the unique elements from the original. Hint: they don't have to be in the same order.
13. The wordlist I provided, words.txt, doesn't contain single letter words. So you might want to

add "I", "a", and the empty string.

14. Write a python code to read a dictionary values from the user. Construct a function to invert its content. i.e., keys should be values and values should be keys.

Week-5:

15. If there are 23 students in your class, what are the chances that two of you have the same birthday? You can estimate this probability by generating random samples of 23 birthdays and checking for matches.
    Hint: you can generate random birthdays with the randint function in the random module.
16. How does a module source code file become a module object?
17. Why might you have to set your PYTHONPATH environment variable?
18. What is a namespace, and what does a module's namespace contain?
19. How do you make a module? Give an example of construction of a module using different geometrical shapes and operations on them as its functions.
20. What is the purpose of a _ _init_ _.py file in a module package directory? Explain with a suitable example.
21. Use the structure of exception handling all general purpose exceptions.

Week-6:

22. a. Write a function called draw_rectangle that takes a Canvas and a Rectangle as arguments and draws a representation of the Rectangle on the Canvas.

    b. Add an attribute named color to your Rectangle objects and modify draw_rectangle so that it uses the color attribute as the fill color.

    c. Write a function called draw_point that takes a Canvas and a Point as arguments and draws a representation of the Point on the Canvas.

    d. Define a new class called Circle with appropriate attributes and instantiate a few Circle objects. Write a function called draw_circle that draws circles on the canvas.

23. Write a Python program to demonstrate the usage of MRO in multiple levels of Inheritances.
24. Write a python code to read a phone number and email-id from the user and validate it for correctness.

Week-7:

25. Write a Python code to merge two given file contents into third file.
26. Write a Python code to open a given file and construct a function to check for given words present in it and display on found.

Week-8:

27. Import numpy, Plotpy and Scipy and explore their functionalities.
28. Write a GUI program to create a window wizard having two text labels, two text fields and two buttons as Submit and Reset.

1	2	3	4	5	6	7	8	9	10	11	12
	H	H									

Syllabus for B. Tech II Year II semester
Electronics and Computer Engineering
DATABASE MANAGEMENT SYSTEMS LAB

Code: 9FC63

L	T	P/D	C
0	0	3	1.5

Course objective:
At the end of this course, the student will be able to:

Design the optimal queries using structured and unstructured query languages like SQL and PL/SQL by making use of control structures, cursors, triggers and functions/procedures.

Course Outcomes:
At the end of this course, the student will be able to:

1 *Create tables for a database and apply Queries using ANY, ALL, IN, EXISTS,NOTEXISTS, UNION, INTERSET, Constraints.*
2 *Learn and write Queries using Aggregate functions such as [COUNT, SUM, AVG, MAX, MIN, GROUP BY, HAVING], Conversion functions and use string functions for a given application.*
3 *Implement programs using PL/SQL programs using exceptions, COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.*
4 *Design programs using WHILE LOOPS, FOR LOOPS, nested loops using BUILT–IN Exceptions and write Procedures.*
5 *Learn to write Programs for stored functions invoke functions in SQL Statement and write Programs for packages specification.*
6 *Apply and write programs using features of CURSORs and its variables.*
7 *Develop Programs implementing Triggers.*

Exercises:

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, INTERSET, 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 ofViews.
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), date functions (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 inPL/SQLblock.
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 loopsusing 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 Statement 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.
13. Queries using SQL-INJECTION: AND/OR Attack, Comments Attack, String Concatenation Attack, UNION Injection Attack

TEXT BOOKS:

1) ORACLE PL/SQL by example. Benjamin Rosenzweig, Elena Silvestrova, PearsonEducation 3Edition
2) ORACLE DATA BASE LOG PL/SQL Programming SCOTT URMAN, Tata Mc- Graw Hill.
3) SQL and PL/SQL for Oracle 10g, Black Book, Dr. P. S.Deshpande.

Syllabus for B. Tech II Year II semester
Electronics and Computer Engineering
ANALOG AND PULSE CIRCUITS LAB

Code: 9D461

L	T	P/D	C
0	0	3	1.5

Course Objectives: *To prepare students to practice the design and analysis of any Analog electronics circuit.*

Course Outcomes:

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

1. *To understand the design and working of various linear and non-linear wave shaping circuits.*
2. *To demonstrate the working principle of various multivibrators.*
3. *To verify the functionalities of various logic gates.*
4. *To perform and verify the BJT/ FET and feedback amplifiers.*
5. *To perform and verify the working of oscillators and voltage regulators.*
6. *To perform laboratory experiment to verify the conversion efficiency of various power amplifiers.*

Mapping of Course Outcomes with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3		3		3				2			2	2	3	2
CO2	3		3		3				2			2	2	3	2
CO3	2		3		3				2			2	2	3	2
CO4	3		3		3				2			2	2	3	2
CO5	2		3		3				2			2	2	3	2
C06	3		3		3				2			2	2	3	2
Overall	3		3		3				2			2	2	3	2

Syllabus Content:

Part-A: Hardware based experiments

1. Linear wave shaping.
2. Non Linear wave shaping – Clippers. clampers.
3. UJT Relaxation Oscillator
4. Astable and monostableMultivibrator.
5. BistableMultivibrator.
6. Study of Logic Gates with discrete components.

Part-B: Software Simulation based experiments (Multisim OR Pspice OR Tina Pro Or Equivalent Simulation Software)

1. Common Emitter and Common Source amplifier
2. Voltage shunt and Feedback Amplifier
3. Cascade Amplifier (CE+CE, CE+CC)
4. RC Phase Shift Oscillator using Transistors
5. Class- A and Class-B Complementary Symmetry Power Amplifier
6. Series and Shunt Voltage Regulator.

Syllabus for B. Tech II Year II semester
Electronics and Computer Engineering
TECHNICAL SEMINAR

Code: 9D471

L	T	P/D	C
0	0	2	1

Course Objective:

Develop ability to be a public speaker. Learn the importance of delivering seminars for demonstrating oratory and develop interview facing skills.

Course Outcomes: *After completing this course, the student will be able to*

1. *Identify current general, political and technology related topics.*
2. *Arrange and present seminar in a effective manner*
3. *Collect, survey and organize content in presentablemanner*
4. *Demonstrate or atory skill swith the aid of Power Point Presentations*
5. *Exhibit interview facing skills and team leading qualities*

Procedure :

1. Seminar in-charges shall highlight the significance of technical seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar in charge shall take signatures.
3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. If any student fails to present his/her seminar on the given slot, to genuine reasons, they may be asked to present in the subsequent slot/week.
5. Progress of the seminars need to be reviewed by the concerned HOD once in 15 days.
6. The evaluation for technical seminars has to be informed to students and displayed in the classrooms.
7. Report and presentation must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

There shall be a technical seminar evaluated for 100 marks each from I year I Semester to II year II Semester. The evaluation is purely internal and will be as follows:

Sl. No	Description	Marks
1	Literature survey, topic and content	10
2	Presentation including PPT	10
3	Seminar Notes	05
4	Interaction with audience after presentation	05
5	Final Report 3 copies	10
6	Class room participation	05
7	Punctuality in giving seminar as per Scheduled time and date	10
8	Mid Semester Viva (on the seminar topics completed up to the end of 9th week	15
9	End Semester Viva	30
	Total	**100 Marks**

Student must secure 40% i.e. 40 marks to be successful in sum total (Hundred Marks) in Technical Seminar.