CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous)
Kandlakoya, Hyderabad – 501 401
B. Tech (CSE-Cyber Security) Course Structure-20, Regulation-18

Semester –I							
Course Code	**Category**	**Ccourse Title**	**Hours/ Week**			**Credits**	**Total Contact Hours/ Week**
			L	T	P	C	
A30004	BSC	Linear Algebra and Calculus	3	1	0	4	4
A30009	BSC	Applied Physics	3	1	0	4	4
A30501	ESC	Programming for Problem Solving	3	0	0	3	3
A30313	ESC	Engineering Drawing	1	0	3	2.5	4
A30023	BSC	Applied Physics Lab	0	0	3	1.5	3
A30502	ESC	C Programming Lab	0	0	3	1.5	3
A30505	ESC	Basic Internet of Things Lab	0	0	2	1	2
A30020	HSMC	Introduction to Social Innovation	0	0	2	1	2
Total			**10**	**2**	**13**	**18.5**	**25**

Semester –II							
Course Code	**Category**	**Course Title**	**Hours /Week**			**Credits**	**Total Contact Hours/ Week**
			L	T	P	C	
A30005	BSC	Ordinary Differential Equations and Multivariable Calculus	3	1	0	4	4
A30001	HSMC	English	2	0	0	2	2
A30011	BSC	Engineering Chemistry	3	0	0	3	3
A30503	ESC	Data Structures & Algorithms	3	0	0	3	3
A30002	HSMC	English Language Communication Skills Lab	0	0	3	1.5	3
A30012	BSC	Engineering Chemistry Lab	0	0	3	1.5	3
A30504	ESC	Data Structures & Algorithms Lab	0	0	3	1.5	3
A30314	ESC	Engineering Workshop	0	0	3	1.5	3
A30019	BSC	Engineering Exploration &Practice	0	0	3	1.5	3
Total			**11**	**1**	**15**	**19.5**	**27**
Total Credits I year: 38							

Course Code	Category	Course Title	Hours Per Week			Credits	Total Contact Hours/ Week
			L	T	P	C	
A30506	PCC	Discrete Mathematics	3	0	0	3	3
A30511	PCC	Design & Analysis of Algorithms	3	1	0	4	4
A30513	PCC	Computer Organization & Architecture	3	1	0	4	4
A36201	PCC	Object Oriented Programming	3	0	0	3	3
A30509	PCC	Database Management Systems	3	1	0	4	4
A36202	PCC	JAVA Lab	0	0	3	1.5	3
A30510	PCC	Database Management Systems Lab	0	0	3	1.5	3
A30016	MC	Gender Sensitization	0	0	2	0	2
Total			**15**	**3**	**8**	**21**	**26**

Semester –III

Course Code	Category	CourseTitle	Hours Per Week			Credits	Total Contact Hour/ Week
			L	T	P	C	
A36203	PCC	Cyber Security	3	0	0	3	3
A30514	PCC	Computer Networks	3	0	0	3	3
A30007	BSC	Numerical Techniques & Probability Distributions	3	1	0	4	4
A30516	PCC	Operating Systems	3	0	0	3	3
A30228	ESC	Basic Electrical Engineering	3	0	0	3	3
A30229	ESC	Basic Electrical Engineering Lab	0	0	3	1.5	3
A36204	PCC	Operating Systems & Computer Networks Lab	0	0	3	1.5	3
A30021	SMC	Social Innovation in Practice	0	0	2	1	2
A30015	MC	Soft Skills & Professional Ethics	0	0	2	0	2
Total			**15**	**1**	**10**	**20**	**26**
	Total Credits II year: 41						

Semester –IV

Course Code	Category	Course Title	Hours/week L	T	P	Credits C	Total Contact Hours/ Week
		Semester –V					
A36205	PCC	Cryptography & Network Security	3	0	0	3	3
A30523	PCC	Web Technologies	3	0	0	3	3
A36207	PCC	Automata and Compiler Design	3	0	0	3	3
A36209	PCC	Intrusion Detection & Prevention Systems	3	0	0	3	3
	PEC	Professional Elective-I	3	0	0	3	3
A30524	PCC	Web Technologies Lab	0	0	3	1.5	3
A36208	PCC	Automata and Compilers Design Lab	0	0	3	1.5	3
A36206	PCC	Cryptography & Network Security Lab	0		3	1.5	3
A30003	HSMC	Advanced English Communication Skills Lab	0	0	3	1.5	3
A30022	MC	NCC/NSS	0	0	2	0	2
A30017	MC	Indian Constitution	2	0		0	2
A30018	MC	Essence of Indian Traditional Knowledge		0	0		
Total			**17**	**0**	**14**	**21**	**31**
A36226	MC	Mini Project-I	During Summer Vacations / Non-Credit				
A36231		Summer Internship-I					

Semester –VI

Course Code	Category	Course Title	Hours/Week L	T	P	Credits C	Total Contact Hours/Week
A36210	PCC	Concepts of Ethical Hacking	3	0	0	3	3
A36212	PCC	Mobile & Wireless Security	3	0	0	3	3
A36215	PCC	Principles of Software Engineering	3	0	0	3	3
A36213	PCC	Digital Forensics	3	0	0	3	3
	PEC	Professional Elective-II	3	0	0	3	3
A36211	PCC	Concepts of Ethical Hacking Lab	0	0	3	1.5	3
A36214	PCC	Digital Forensics Lab	0	0	3	1.5	3
A30014	MC	Environmental Sciences	2	0	0	0	2
A36232	PROJ	Technical Seminar-I	2	0	0	2	2
A30560	MC	Introduction to Artificial Intelligence	2	0	0	0	2
Total			**21**	**0**	**6**	**20**	**27**

Total Credits III Year: 41

Semester –VII								
Course Code	**Category**	**Course Title**	**Hours Per Week**			**Credits**		**Total Contact Hours/week**
			L	T	P	C		
A30013	HSMC	Business Management & Financial Analysis	4	0	0	4		4
PE	PEC	Professional Elective-III	3	0	0	3		3
	PEC	Professional Elective-IV	3	0	0	3		3
	PEC	Professional Elective-V	3	0	0	3		3
OE	OEC	Open Elective-I	3	0	0	3		3
	OEC	Open Elective-II	3	0	0	3		3
A36233	PROJ	Major Project Phase-I	0	0	6	3		6
Total			**19**	**0**	**6**	**22**		**25**
A36234	MC	Mini Project-II	During Summer Vacations / Non-Credit					
A36235		Summer Internship-II						

Semester –VIII								
Course Code	**Category**	**Course Title**	**Hours / Week**			**Credits**	**Total Contact Hours /week**	
			L	T	P	C		
PE	PEC	Professional Elective-VI	3	0	0	3	3	
OE	OEC	Open Elective-III	3	0	0	3	3	
	OEC	Open Elective-IV	3	0	0	3	3	
A36236	PROJ	Technical Seminar-II	2	0	0	2	2	
A36237	PROJ	Major Project Phase- II	0	0	14	7	14	
Total			**11**	**0**	**14**	**18**	**25**	
Total Credits IV Year: 40								

SubjectCode	Name of the Subject	Category

A36216	Advanced Computer Networks	
A36217	Cyber Laws and Ethics	PEC-I
A30528	Data Warehouse and Data Mining	
A30544	Internet Of Things	
A36218	Incident Response Management	PEC-II
A36225	Virtual Reality	
A30541	Computer Vision & Image Processing	
A36219	Network Coding Theory	PEC-III
A30536	Adhoc& Sensor Networks	
A30535	Machine Learning	
A36221	Cloud Security	PEC-IV
A36220	Data Analytics for Fraud Detection	
A30534	Desing Paatterns	
A36222	Biometric Systems	PEC-V
A36223	Secure Coding	
A30543	Natural Language Processing	
A36224	OS Security	PEC-VI
A30545	Block Chain Technologies	

Open Electives		
Sl.No	Subject Code	Name of the Subject

1	A30554	Java Programming
2	A30531	Python Programming
3	A30555	Introduction to Database Management Systems
4	A30537	Data Analytics with R
5	A30557	Web Programming
6	A30542	Cloud Computing/Cloud Arichecture and Security
7	A30538	Deep Learning
8	A30559	Introduction to Data Science
9	A30471	Principles of Electronic Communications
10	A30472	Basic Electronics Engineering
11	A30383	Fundamentals of Engineering Materials
12	A30377	Basics of Thermodynamics
13	A30258	Basics of Power Electronics & Drives
14	A30252	Power Generation Systems
15	A30160	Disaster Management and Mitigation
16	A30161	Remote Sensing and GIS
17	C30161	Logistics and Supply Chain Management
18	C30162	Knowledge Management
19	A30473	Image Processing
20	A30474	Digital Marketing and Security / Disaster Recovery & Risk Management
21	A30357	Fundamentals of Manufacturing Processes
22	A30379	Fundamentals of Automobile Engineering
23	A30259	Electrical & Hybrid Vehicles
24	A30260	Electrical Safety
25	A30162	Green Buildings
26	A30163	Air Pollution and Control
27	C30163	Management of Industrial Relations
28	C30164	Entrepreneurship
29	A30475	Data Communications

30	A30476	Microcontrollers & Applications
31	A30382	Fundamentals of Mechanical Engineering
32	A30378	Waste to Energy
33	A30253	Fuel Cell Technology
34	A30255	Energy Efficiency in Electrical Utilities
35	A30164	BasicSof Civil Engineering
36	A30165	Sustainability Concepts in Civil Engineering
37	C30165	Basics of Insurance & Taxation
38	C30166	Business Ethics & Corporate Governance
39	A30477	Fundamentals of Embedded Systems
40	A30478	Sensors & Transducers
41	A30358	Industrial Safety Engineering
42	A30360	Work System Design
43	A30256	Energy Audit & Conservation
44	A30257	Nano Technology
45	A30166	Environmental Protection and Management
46	A30167	Alternate Building Materials
47	C30167	Marketing Management
48	C30168	Intellectual Property Rights

Composition Table

Semester	BS	ES	HS&M	PC	PE	OE	Project	Total Credits
I	9.5	8	1					**18.5**
II	10	6	3.5					**19.5**
III				21				**21**
IV	4	4.5	1	10.5				**20**
V			1.5	16.5	3			**21**
VI				15	3		2	**20**
VII			4		9	6	3	**22**
VIII					3	6	9	**18**
Total	23.5	18.5	11	63	18	12	14	160
%C	*15%*	*12%*	*7%*	*39%*	*11%*	*8%*	*9%*	
AICTE Credits	25	24	12	48	18	18	15	

BS: Basic Sciences
ES: Enginerring Sciences
HS&M: Humnaities, Sciemces & Management
PC: Professional Core
PE: Professional   Elective
OE: Open Elective

(A30004) LINEAR ALGEBRA AND CALCULUS
(Common to all branches)

B. Tech (CSE) I Semester

$\underline{L}$	$\underline{T}$	$\underline{P}$	$\underline{C}$
3	**1**	**0**	**4**

UNIT-I
Matrices: Types of matrices, Symmetric, Hermitian, Skew-symmetric, Skew-Hermitian, Orthogonal matrices, Unitary matrices, Rank of a matrix by echelon form and normal form, Inverse of non-singular matrices by Gauss-Jordan method, System of linear equations - solving system of homogeneous and non-homogeneous equations, Gauss elimination method, Gauss-Seidel iteration method.

UNIT -II
Eigen values and Eigen vectors: Eigen values, Eigen vectors and their properties, Diagonalization of a square matrix, Cayley-Hamilton theorem (without proof) - Inverse and power of a matrix by Cayley-Hamilton theorem, Quadratic forms and nature of the quadratic forms, Reduction of quadratic form to canonical form by linear and orthogonal transformations.

UNIT -III
Sequences &Series:
Sequence: Definition of a sequence, Limit, Convergent, Divergent and oscillatory sequences.
Series: Definition of a series, Convergent, Divergent and Oscillatory Series, Series of positive terms, Comparison test, P-test, D-Alembert's ratio test, Raabe's test, Cauchy's integral test, Cauchy's root test, Logarithmic test. **Alternating series:** Leibnitz test, Alternating convergent series, Absolute and conditionally convergence.

UNIT -IV
Calculus:
Mean value theorems: Rolle's theorem, Lagrange's mean value theorem with their geometrical interpretation and applications, Cauchy's mean value theorem, Taylor's series, Applications of definite integrals to evaluate surface areas and volumes of revolutions of curves (only in Cartesian coordinates),
Improper Integral: Beta, Gamma functions and their applications.

UNIT -V

Multivariable calculus (Partial Differentiation and applications): Definitions of Limit and continuity, Partial differentiation, Euler's Theorem, Total derivative, Jacobian, Functional dependence & independence, Maxima and minima of functions of two variables and three variables using method of Lagrange multipliers.

TEXT BOOKS:
1. Higher Engineering Mathematics, (36th Edition), B.S. Grewal, Khanna Publishers, 2010
2. Advanced Engineering Mathematics, (9th Edition), Erwin kreyszig, John Wiley & Sons,2006.

REFERENCE BOOKS:
1. Advanced Engineering Mathematics (3rd edition) by R.K. Jain & S.R.K. Iyengar, Narosa Publishing House, Delhi.
2. Calculus and Analytic geometry, (9th Edition), G.B. Thomas and R.L. Finney, Pearson, Reprint, 2002.
3. A text book of Engineering Mathematics, N.P. Bali and Manish Goyal, Laxmi Publications, Reprint, 2008.
4. Higher Engineering Mathematics, (11th Reprint), Ramana B.V., Tata McGraw Hill New Delhi, 2010.
5. Engineering Mathematics – I, T.K.V. Iyengar, B. Krishna Gandhi &Others, EditionS. Chand 2013 Yr.
6. Applied Mathematics for Engineers & Physicists (3rd edition) by Pipes &Harvill, McGraw Hill Internation Book company.

COURSE OUTCOMES:
On completion of the course students will be able to
1. Solve linear system represented by matrices.
2. Obtain eigen values, eigen vectors and diagonalization of a square matrix.
3. Analyse the nature of sequence and series.
4. Verify mean value theorems & evaluation of improper integrals by using Beta and Gamma functions
5. Find maxima & minima of functions of several variables.

END

(A30009)   APPLIED   PHYSICS
(ECE, EEE, CSE)

B. Tech (CSE-CS) I Semester

L	T	P	C
3	1	0	4

UNIT-I

Principles of Quantum and Statistical Mechanics: Waves and particles, de-Broglie hypothesis-Matterwaves, Davisson and Germer's Experiment, Heisenberg's Uncertainty principle, Physical significance of the wave function- (qualitative treatment) Schrödinger's time dependent and time independent wave equations, Particle in a one dimensional potential box- equations for energy and wave function,Concept of electron gas,Maxwell-Boltzmann, Bose –Einstein and Fermi–Dirac statistics(qualitative treatment). Density of energy states, Estimation of Fermi energy.

UNIT-II

Semiconductor Physics: Classification of materials into Conductors, Semiconductors &Insulators.Intrinsic Semiconductors-Concentration of electrons in the conduction band &concentration of holes in the valance band, Fermi level in intrinsic semiconductors, Law of mass action, Extrinsic semiconductors, N-Type semiconductor, Carrier concentration in N-Type semiconductors, P-Type semiconductors, Carrier concentration in P-Type semiconductors, drift and diffusion current, Hall effect.

UNIT-III

Physics of Semiconductor Devices: Formation of PN junction, Open circuit PN junction, Energy diagram of PN diode, I-V Characteristics of PN junction diode, Zener diode –breakdown mechanism and characteristics.
Radiative and Non-Radiative recombination, LED, Photo diode &Solar cell-working principle & Applications, Semiconductor photo detectors- PIN and Avalanche structure and their characteristics.

UNIT-IV

Lasers: Characteristics of lasers, Absorption, spontaneous and stimulated emission of radiation, Einstein's coefficients and relation between them, Population inversion, Lasing action, Ruby laser, Helium-Neon laser, Semiconductor diode laser, Applications of lasers.

Fiber Optics: Principle of Optical fiber, Construction of optical fiber, acceptance angle and acceptance cone, Numerical Aperture, Types of optical fibers: Single and Multimode fibers, Step Index optical fibers& Pulse dispersion (qualitative treatment) Graded index optical fibers & Pulse dispersion (qualitative treatment), Attenuation in optical fibers, optical fiber communication, optical fiber sensors.

UNIT-V
Dielectric Properties: Electric dipole, Dipole moment, Relative permittivity, Polarization and polarizability, Electric susceptibility, Displacement vector, Electronic and Ionic polarization, Orientation polarization (qualitative treatment), Internal fields in solids, Clausius–Mossottiequation, Piezo electric and Pyro-electric materials, Ferro electric materials.
Magnetic Properties: Permeability, Field intensity, Magnetic field induction, Magnetization, Magnetic Permeability &Susceptibility, Classification of Dia, Para, Ferro, Ferri and Anti-Ferro magnetic materials on the basis of magnetic moment (qualitative treatment), Explanation of Hysteresis curveon the basis of Domain theory of Ferro magnetism.
Superconductivity: Introduction, Critical field, Meissner effect, Effect of Magnetic field, Type-I and Type-II Superconductors, Cooper pair, BCS Theory of superconductivity (Qualitative treatment), Applications of Superconductors

TEXT BOOKS
1. Engineering Physics by <u>B.K. Pandey,S. Chaturvedi</u>- Cengage Learning India Pvt. Ltd.,1st Edition, 2012.
2. Engineering Physics by PK Palanisamy , SciTech Publications,3rd edition, 2015.

REFERENCES
1. Fundamentals of Physics by Halliday, R. Resnick and J. Walker,John Wiley and Sons,6th edition, 2001.
2. Introduction to Quantum PhysicsbyEisberg and Resnick, John Wiley & Sons, 2nd edition, 1985.
3. Quantum mechanics by D.J Griffiths, Cambridge University press,2nd edition, 2017.
4. Principles of Lasers by O.Svelto, Plenum publishing Corporation,4th edition,1998.
5. Physics of Semiconductor devices by Simon.MSze and Kwok K . Ng, Wiley Student Edition,3rd edition,2006.

COURSE OUTCOMES

On completion of the course students will be able to

1. Explain the basic concepts of quantum & statistical mechanics.
2. Describe the classification of solids and the properties of semiconductors.
3. Illustrate different semiconductor devices.
4. Interpret the basic properties of lasers and characteristics of optical fibers.
5. Classify various polarization processes in solids & different dielectric materials
6. Describe different types of magnetic materials &illustrate the basic principles of superconductivity.
7. Illustrate the basic principles of superconductivity.

END

(A30501) PROGRAMMING FOR PROBLEM SOLVING
(Common to all branches)

B. Tech (CSE-CS) I Semester

L	T	P	C
3	0	0	3

UNIT -I

Introductory Concepts: Introduction to Computers, Computer Characteristics, Modes of Operation, Types of Programming Languages.
Idea of Algorithm: Steps to solve logical and numerical problems.
Representation of Algorithm: Flowchart/ Pseudo code with examples.
Algorithms to programs: Source code, variables (with data types), variables and memory locations, Syntax and Logical Errors in compilation, object and executable code
Introduction to C: Some Simple C Programs, Desirable Program Characteristics.
C Fundamentals: The C Character Set, Identifiers and Keywords, Data Types, Constants Variables and Arrays Declarations, Expressions, Statements, Symbolic Constants.
Preparing and Running a Complete C Program: Planning a C Program, writing a C Program, Entering the Program into the Computer, Compiling and Executing the Program, Error Diagnostics, Debugging Techniques.
Operators and Expressions: Unary Operators, Arithmetic Operators, Relational and Logical Operators, Bitwise Operators, Conditional Operator, Assignment Operators, Special Operators, Precedence & Associativity of Operators, Evaluation of Expressions.
Data Input and Output: Preliminaries, Single Character Input- The getchar Function, Single Character Output- The putchar Function, Entering Input Data- The scanf Function, More About the scanf Function, Writing Output Data- The printf Function, More About the printf Function, The gets and puts Functions.

UNIT -II

Control Statements: Preliminaries, Branching: The if-else Statements, looping: The while Statement, the do while Statement, the for Statement, Nested Control Structures, the switch Statement, the break Statement, the continue Statement, the goto Statement.
Arrays: Defining an Array, Processing an Array, Multidimensional Arrays.

UNIT -III

Functions: A Brief Overview, defining a Function, accessing a Function, Function Prototypes, Passing Arguments to a Function, Recursion, Passing Arrays to Functions.

Program Structure: Storage Classes- Automatic Variables, External Variables, Static Variables and Register Variables, Multi files Programs, More about Library Functions.
Strings: String Handling Functions, Sample C Programs without using library functions.

UNIT -IV

Pointers: Fundamentals Pointer Declarations, Passing Pointers to Functions, Pointers and One-Dimensional Arrays, Dynamic Memory Allocation, Operations on Pointers, Pointers and Multidimensional Arrays, Arrays of Pointers, Passing Functions to other Functions, More about Pointer Declarations.
Structures and Unions: Defining a Structure, processing a Structure, User Defined Data Types- typedef & Enumerations, Structures and Pointers, Passing Structures to Functions, Bit fields, Self-Referential Structures and Unions.

UNIT -V

Data Files: Opening and Closing a Data File, creating a Data File, Processing a Data File, Unformatted Data Files and Command Line Parameters.
Searching and Sorting: Linear and Binary Search, Bubble Sort, Selection Sort and Insertion Sort.

Text Books
1. Byron Gottfried, Schaum's Outline series, "Programming with C", McGraw-Hill.
2. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition)

Reference Books:
1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.
2. R.G. Dromey, How to solve it by Computer, Pearson (16th Impression).
3. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
4. Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th Edition.

Course Outcomes

The student shall be able

1. Write algorithms and to draw flowcharts for solving problems.
2. Convert the algorithms/flowcharts to C programs.
3. Code and test a given logic in C programming language.
4. Decompose a problem into functions and to develop modular reusable code.
5. Write C programs using arrays, pointers, strings and structures and perform searching and sorting the data.

END

(A30313) ENGINEERING DRAWING

B. Tech (CSE-CS) I Semester

L	T	P	C
1	0	3	2.5

Unit – I
Introduction to Engineering Drawing: Principles of Engineering Drawing and their Significance; Conic Sections (Using eccentricity method only) Cycloid, Epi cycloid and Hypocycloid.

Unit – II
Orthographic Projections: Principles of Orthographic Projections – Conventions – Projections of Points and Lines (Excluding traces of lines) Projections of Plane regular geometric figures. (Excluding Auxiliary Planes and traces of planes)

Unit – III
Projections of Solids: Projection of regular solids- cube, Cylinder, prisms, pyramids, cone (Excluding Auxiliary Planes).

Unit-IV
Isometric Projections: Principles of Isometric Projection – Isometric Scale – Isometric Views – Conventions – Isometric Views of Lines, Plane Figures, Solids and Compound Solids – Isometric Projection of objects having non- isometric lines. Isometric Projection of Spherical Parts and combinations

Unit-V
Transformation of Projections: Conversion of Isometric Views to Orthographic Views and Vice-versa.

Text Books:
1. Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House
2. Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education.

Reference Books:
1. Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication
2. Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers

Course Outcomes

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

1. Understand and apply the use of engineering curves in tracing the part of different machine components.
2. Evaluate the concepts of projections and acquire knowledge of visualization skills and convert it into pictorial representation.
3. Create and analyze the 3-D objects of machine components in real world.
4. Explore and evaluate the internal architecture of product by section and development of surfaces.
5. Create and imagine the solid and real objects in real world with axonometric projection.

END

(A30023) APPLIED PHYSICS LAB

B. Tech (CSE) I Semester

L	T	P	C
0	0	3	1.5

(Any 8 experiments are to be performed)

1. Energy gap of P-N junction diode: To determine the energy gap of a semiconductor diode.
2. Solar Cell: To study the V-I Characteristics of solar cell.
3. Light emitting diode: Plot V-I and P-I characteristics of light emitting diode.
4. Stewart – Gee's experiment: Determination of magnetic field along the axis of a current carrying coil.
5. Hall effect: To determine Hall co-efficient of a given semiconductor.
6. Photoelectric effect: To determine work function of a given material.
7. LASER: To study the characteristics of LASER sources.
8. Optical fibre: To determine the Numerical aperture of a given fibre and bending losses of Optical fibres.
9. LCR Circuit: To determine the Quality factor of LCR Circuit.
10. Diffraction grating: Determination of wavelength of a source (LASER).
11. Determination of Planck's constant using LED.
12. R-C Circuit: To determine the time constant of R-C circuit.

LABORATORY MANUAL:

1. Laboratory Manual of Engineering Physics by Dr.Y. Aparna&Dr.K. VenkateswaraRao (V.G.S Publishers).
2. Laboratory Manual of Engineering, Published by CMR College of Engineering & Technology

COURSE OUTCOMES

On completion of the course students will be able to

1. Explain the concept of oscillations and resonance.
2. Determine energy gap of a semiconductor diode, Planck's constant and magnetic fields.
3. Describe the characteristics of semiconductor devices
4. Design new experiments in engineering.
5. Evaluate the basic properties of lasers and optical fibers.

END

(A30502) C PROGRAMMING LAB
(Common to all branches)

	L	T	P	C
B. Tech (CSE-CS) I Semester	0	0	3	1.5

Lab 1: Familiarization with programming environment
  i. Write a simple C program to display "Hello, World!" on the screen
  ii Identify various parts in C program.
  iii. Compile & Run the C- Program using various Compilers.
  iv. Identify Syntax Errors and correct them.

Lab 2: Simple computational problems using arithmetic expressions
i.Write a C program to find the roots of a quadraticequation.
ii.Write a C program to convert centigrade toFahrenheit.

Lab 3:
i.Write a C program to find maximum of given threenumbers.
ii.Write a C program to find the factorial of a positiveinteger.

Lab 4:
i.Write a C program to determine if the given number is a prime number or not.
ii.A Fibonacci sequence is defined as follows:
the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to print the Fibonacci sequence up to n^{th}term.

Lab 5:
i.Write a C program to generate all the prime numbers between 1 and n, where n is avalue supplied by the user using Sieve of Eratosthenesalgorithm.
ii.Write a C program to convert a positive integer to a roman numeral. Ex. 11 isconverted toXI.

Lab 6:

i. Write a C program to print the Pascal trianglespyramid

ii. Write a C program to calculate the followingseries

      a) Sin(x)   b) Cos(x)   c)log(x)

Lab 7:

i. Write a C program that reads two matrices and uses functions to perform the following:

a) Addition of two matrices b) Multiplication of two matrices c) Transpose of a Matrix.

ii. Define four pointer variables, one each of type char, short, int, float. Fill these pointers by allocate memory of required size by calling malloc () function. Read data from the user and fill in the memory (allocated using malloc ()). Finally display the data

Lab 8:

Write a C program to read N students data (Rollo, Name, Marks1, Marks2, Marks3)and find the topper (Use array of structures and implement usingfunctions).

Lab 9:

i. Write a C program that reads 15 names each of up to 30 characters, stores them in an array and use an array of pointers to display them in ascending (ie. alphabetical) order.

ii. Two's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2's complement of 11100 is 00100. Write a C program to find the 2's complement of a binarynumber.

Lab 10:

i. Write a C program to display the contents of a file to standard outputdevice.

ii. Write a C program which copies one file to another, replacing all lowercase characters with their uppercaseequivalents

Lab 11:

i. Write a C program that uses non-recursive functions to count the number of palindromes in a givenstring.

ii. Write a C program to replace a substring with another in a given line oftext.

Lab 12:

i. Write C programs for implementing the followingmethods
a) BubbleSort   b) Selection Sort   c) BinarySearch

Additional Programs:

1. Write a C program that implements the Insertion sort method to sort a given list of integers in ascendingorder.
2. Write a C program that uses functions to perform the following operations:
   To insert a sub-string into a given main string from a givenposition.
   To delete n characters from a given position in a givenstring.
3. Write a C program to compare two files, printing the first line where theydiffer.
4. Write a C program to reverse the first n characters in a file.
   The file name and nare specified on the command line. Use fseek ()
   function
5. Write a C program to merge two files into a third file (i.e., the contents of
the firstfile Followed by those of the second are put in the third file)

REFERENCE BOOKS:

1. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
2. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, CengageLearning, (3rdEdition)
3. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
4. R.G. Dromey, How to solve it by Computer, Pearson (16thImpression)
5. Programming in C, Stephen G. Kochan, Fourth Edition, PearsonEducation.
6. Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4thEdition

CMR College of Engineering & Technology

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Course outcomes

The student shall be able

1. To test and execute the programs and correct syntax and logical errors.
2. To implement conditional branching, iteration and recursion.
3. To use arrays and structures to formulate algorithms and programs.
4. To apply programming to solve matrix addition and multiplication problems and searching and sorting problems.
5. Create, read and write to and from simple text and binary files and verifythrough execution.

END

(A30505) BASIC INTERNET OF THINGS LAB
(Common to all branches)

	L	T	P	C
B. Tech (CSE-CS) I Semester	**0**	**0**	**2**	**1**

Lab Requirements:

Raspberry Pi3 single board Computer, Android SDK, Eclipse IDE, JDK1.8.

Week 1: Introduction to IoT
- Definition of IoT
- History of IoT
- IoT Architecture
- Enabling Technologies for IoT
- Fundamental characteristics of IoT
- Benefits and Applications of IoT
- Introduction to Basic Components

Basic Components				
Jumper wires	LEDs (Light Emitting Diodes)	Resistors	Potentiometer	Diode,
Photo resistor	Buzzer	Temperature Sensor	DC Motor	Push Button
RC Servo	Relays	Breadboard		

Week 2: Programming in python
- Introduction to Python
- Python Installation
- Understanding Python Basics
- Using Arithmetic in your programs
- Learning about Loops

Week 3: Platform Based Development – Raspberry Pi
Introduction to Raspberry Pi
- Why Raspberry Pi?
- Setting up the Raspberry Pi
- Python on Raspberry Pi

Week 4: Basic Experiments Level-1
Demonstration of the following Experiments
Experiment 1: Your First Circuit – To Blink an LED (Light Emitting Diode)
Experiment 2: To Blink an RGB LED

Additional Experiments (optional)

Experiment 1: To read the temperature and display the same in serial monitor. (use LM35 Temperature sensor)
Experiment 2: To make an LED glow when controller detects a button pressed.

Week 5: Basic Experiments Level -2
Demonstration of the following Experiment

Experiment 1: To control an LED according to the range of analog input sensed using photo resistor. (use Light DependantResistor (LDR))

Additional Experiments (optional)

Experiment 1: To interface the Liquid Crystal Display (LCD) with the Raspberry Pi3 to display the characters on the LCD.

Week 6: Basic Experiments Level -3
Demonstration of the following Experiment

Experiment1: To interface the Ultrasonic Sensor with the Raspberry Pi3 to determine the distance of an object from the sensor.

Additional Experiments (optional)

Experiment1: To interface the Infrared sensor with the Raspberry Pi3 to sense the path is clear/indicate the presence of any obstacles.

Week 7: Introduction to Android
- Introduction to Android
- Explain the structure of Android App.

Experiment 1: Create Hello World application with Android.

Week 8

Experiment 1: Create Application to change the Background Color and Background Image

Experiment 2: Explain simple User interface components in Android and create simple Application

Week 9

Experiment 1: Create an application that display color or image as background when selected the radio buttons or checkboxes

Experiment 2: Create an Application to perform addition, Subtraction, multiplication, division.

Week 10

Explain what is activity, intent and its functions.

Experiment 1: Create an application with Android intent.

Week 11

Experiment 1: Create a simple android application with the following event

handlers.

a) On Click
b) On Key Down
c) On Focus changed

Week 12

Experiment 1: Explain about Toast, Create Application with User defined Toast Notifications.
Additional Experiment: Create login page by using login activity

Reference Books:
1. ArshdeepBahga, VijayMadisetti, Internet of Things: A Hands-On Approach, Orient Blackswan Private Limited - New Delhi; First edition (2015)
2. John Horton, Android Programming for Beginners, PACKT publications.

Course Outcomes
At the end of the course the student will be able to:
1. Identify and differentiate various components used in IoT Architecture.
2. Write & execute programs in python programming language
3. Use Python programming language to interface with Raspberry
4. Demonstrate the various real time applications using Raspberry Pi
5. Create and Deploy Mobile applications using Android

END

(A30005) ODEs AND MULTIVARIABLE CALCULUS
(Common to all branches)

B. Tech (CSE) II Semester

L	T	P	C
3	1	0	4

UNIT-I
First Order ODE: Exact, Linear and Bernoulli's differential equations, Applications, Newton's law of cooling, Law of natural growth and decay.
Equations not of first degree: Equations solvable for p, Equations solvable for y, Equations solvable for x and Clairaut's type.

UNIT -II
Ordinary Differential Equations of Higher Order: Second and higher order linear differential equations with constant coefficients, Non-Homogeneous terms of the type $e^{ax}, \sin ax, \cos ax,$ polynomials in x, $e^{ax}V(x)$ and $x\,V(x)$, Method of variation of parameters, Equations reducible to linear ODE with constant coefficients, Legendre's equation, Cauchy-Euler equation.

UNIT -III
Multivariable Calculus (Integration): Evaluation of Double Integrals (Cartesian and polar coordinates), Change of order of integration (only Cartesian form), Evaluation of Triple Integrals, Change of variables (Cartesian to polar) for double and (Cartesian to Spherical and Cylindrical polar coordinates) for triple integrals, **Applications:** Areas (by double integrals) and volumes (by double integrals and triple integrals).

UNIT -IV
Vector Differentiation: Vector point functions and scalar point functions, Gradient, Divergence and Curl. Directional derivatives, Tangent plane and normal line, Vector Identities, Scalar potential functions, Solenoidal and Irrotational vectors.

UNIT -V
Vector Integration: Line, Surface and volume Integrals. Theorems of Green's, Gauss and Stoke's(without proofs) and their applications.

TEXT BOOKS :
1. Higher Engineering Mathematics, (36th Edition), B.S. Grewal, Khanna Publishers, 2010
2. Advanced Engineering Mathematics, (9th Edition), Erwin kreyszig, John Wiley & Sons,2006.

REFERENCE BOOKS:
1. Advanced Engineering Mathematics (3rd edition) by R.K. Jain & S.R.K. Iyengar, Narosa Publishing House, Delhi.
2. Differential Equations with Applications & Historical Notes(2ndEdi) by George F Simmons, Tata Mc. graw Hill Publishing Co Ltd.
3. Advanced Engineering Mathematics(8thEdition) by Kreyszig, John Wiley & Sons Publishers
4. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry(9thEdition), Pearson, Reprint, 2002
5. Mathematics for Engineering and Scientists (6th Edi), by. Alan Jeffrey, 2013, Chapman & Hall / CRC
6. Engineering Mathematics – I by T.K.V. Iyengar, B. Krishna Gandhi & Others, 2012 Yr. Edition S. Chand.
7. Differential Equations (3rd Ed), S. L. Ross Wiley India, 1984.

COURSE OUTCOMES:
On completion of the course students will be able to
1. Determine first order differential equations and obtain solutions.
2. Solve higher order linear differential equations using various methods.
3. Evaluate areas and volumes using multiple integrals.
4. Evaluate Gradient, Divergence, Curl and directional derivatives.
5. Evaluate integrals by converting line to surface integral and surface to volume integrals.

END

(A30001) ENGLISH

	L	T	P	C
B. Tech (CSE-CS) II Semester	**2**	**0**	**0**	**2**

UNIT-I:
Reading: On the Conduct of Life: William Hazlittfrom "Language and Life: A Skills Approach" Published by Orient Black Swan, Hyderabad.
Grammar: Prepositions
Vocabulary: Word Formation I: Introduction to Word Formation
Writing: Clauses and Sentences

UNIT-II:
Reading: The Brook: Alfred Tennyson from "Language and Life: A Skills Approach" Published by Orient Black Swan, Hyderabad**.**
Grammar: Articles
Vocabulary: Word Formation II: Root Words from Other Languages
Writing: Punctuation
Life Skills: Self Improvement- 'How I Became a Public Speaker': George Bernard Shah

UNIT-III:
Grammar: Noun-Pronoun Agreement, Subject-Verb Agreement
Vocabulary: Word Formation III: Prefixes and Suffixes from Other Languages
Writing: Principles of Good Writing
Life Skills: Time Management- 'On Saving Time': *Seneca*

UNIT-IV:
Grammar: Misplaced Modifiers
Vocabulary: Synonyms and Antonyms
Writing: Essay Writing
Life Skills: Innovation- Muhammad Yunus – A biography

UNIT –V:
Reading: Politics and English Language: George Orwell from "Language and Life: A Skills Approach" Published by Orient Black Swan, Hyderabad.
Grammar: Clichés, Redundancies
Vocabulary: Common Abbreviations
Writing: Writing a Summary

TEXTBOOKS:
1. A Text book entitled **"Language and Life: A Skills Approach"** Published by Orient Black Swan, Hyderabad. ISBN:978-93-5287-422-4

REFERENCES:
1. Practical English Usage. Michael Swan. OUP. 1995
2. Remedial English Grammar. F.T. Wood. Macmillan.2007
3. On Writing Well. William Zinsser. Harper Resource Book. 2001
4. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.
5. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press. 2011.
6. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press

COURSE OUTCOME:
At the end of the course the student will be able to:
1. Apply the Noun-Pronoun Agreement, Subject-Verb Agreement in sentence formation.
2. Identify the Root Words from other Languages.
3. Describe the word formation in English language.
4. Employ Synonyms, Antonyms, Affixation and Acronyms in writing and speaking correct English.
5. Compose essays and summaries in English.
6. Apply the time management skills to make best use of time effectively.
7. Apply the public speaking skills in giving presentations and speeches in English.

END

(A30011) ENGINEERING CHEMISTRY

B. Tech (CSE-CS) II Semester	L	T	P	C
	3	0	0	3

UNIT-I

Molecular Structure and Theories of Bonding:

Introduction, Concept of atomic and molecular orbitals, Linear combination of atomic orbitals (LCAO), Molecular orbitals of diatomic molecules, Molecular orbital energy level diagrams of diatomic molecules- N_2, O_2 and F_2, molecular orbitals of butadiene and benzene.

Crystal Field Theory (CFT):

Salient features of CFT, Crystal field splitting patterns of transition metal ion d-orbitals- tetrahedral, octahedral and square planar complexes.

UNIT-II

Electrochemistry:

Introduction**,** Conductance- Specific conductance, Equivalentconductance, Molar conductance and their inter relationship, Numerical problems, Electrochemical cell, Electrode potential, Standard electrode potential and E.M.Fof the cell, Nerns't equation- derivation and applications, Types of electrodes- Quinhydrone electrode, Calomel electrode and Glass electrode. Electro chemical series and its applications. Concept of concentration cells, Electrolytic concentration cell and numerical problems, Batteries- primary (Lithium cell), secondary (Lead acid storage battery and Lithium ion battery) and Fuel cells(H_2-$O_2$and methanol-oxygen).

Corrosion:

Causes and effects of corrosion, Theories of chemical and electrochemical corrosion, Mechanism of electrochemical corrosion, Pilling-Bedworth rule, Types of corrosion- Galvanic, Waterline and Pitting corrosion, Factors affecting rate of corrosion, Corrosion control methods- Cathodic protection, Sacrificial anode and Impressed current cathodic methods, Surface coatings- Metallic coatings, hot dipping, galvanizing and tinning,Electroplating- Copper plating andelectrolessplating - Nickel plating.

UNIT –III
Spectroscopic Techniques and Applications:

Principles of spectroscopy and selection rules, Applications of UV-Visible spectroscopy, Vibrational and rotational spectroscopy (IRspectroscopy)-Applications, Nuclear magnetic resonance-Chemical shift, Splitting pattern and Integration, Introduction to magnetic resonance imaging.

UNIT-IV
Water Technology:
Sources of water, Impurities in water, Hardness of water, Temporary and permanent hardness, Units of hardness, Estimation of temporary and permanent hardness of water, EDTA method, Numerical problems, Potable water treatment-Specifications, Steps involved in treatment-Sedimentation, Coagulation, Filtration, Sterilization, Desalination of Brackish Water, Reverse Osmosis and Electro dialysis.

Industrial water treatment, Boiler Troubles-Scales andsludges, Caustic embrittlement, Boiler corrosion, Priming and foaming. Hot lime and cold lime soda process-Numerical problems, Zeolite process and Ion exchange process. Internal conditioning methods like Phosphate, Carbonate, Calgon and Colloidal conditioning.

UNIT-V
Stereochemistry:
Representations of three-dimensional structures, Structural isomers and stereoisomers, Configurations and symmetry, Chirality- Enantiomers, Diastereomers, Optical activity, Absolute configurations and conformational analysis of n-butane.

Organic Reaction Mechanisms and Synthesis of a Drug Molecule:

Introduction, Substitution reactions- Nucleophilic substitution reactions (Mechanisms of SN^1 and SN^2 reactions, Addition Reactions-Electrophilic and nucleophilic addition reactions, Addition of HBr to propene, Mar kownikoff and anti markownikoff'sadditions, Grignard additions on carbonyl compounds, Elimination reactions- Dehydrohalogenation of Alkyl halides, Shetzeff rule.
Oxidation reactions- Oxidation of Alcohols using $KMnO_4$ and chromic acid, Reduction reactions-reduction of carbonyl compounds using $LiAlH_4$, $NaBH_4$, Synthesis of a commonly used drug molecules (Paracetamoland Ibuprofen).

Text Books:

1. "Engineering Chemistry", P.C Jain and Jain Monika,DhanpatRai Publication Company, 16th Edition, 2015.
2. Text Book of Engineering Chemistry by A.Jaya Shree, Wiley India Pvt. Ltd, New Delhi.

Reference Books:

1. University chemistry, by B. H. Mahan, Narosa Publication.1998.
2. Chemistry: Principles and Applications, by M. J. Sienko and R.A. Plane, McGraw-Hill, 3rd edition, 1980.
3. Fundamentals of Molecular Spectroscopy, by C. N. Banwell, McGraw-Hill, 3rdrevised edition, 1983.
4. Engineering Chemistry (NPTEL Web-book), by B. L. Tembe, Kamaluddin and M. S.Krishnan.
5. Physical Chemistry, by P. W. Atkins, W.H. Freeman and Company, 5th Edition, 1994.
6. "Text Book of Engineering Chemistry", B.Rama Devi, Ch. VenkataRamana Reddy and PrasanthRath,Cengage Learning 2017.
7. "Organic Chemistry", Morison and Boyd, Pearson publications, 7th Edition 2011.
8. Organic Chemistry: Structure and Function by K.P.C.Volhardt and N.E.Schore,5thEdition
   http://bcs.whfreeman.com/vollhardtschore5e/default.asp

Course Outcomes:

After completion of the course students will be able to

1. Explain the benefits of treated water as source in steam generation in industrial applications.
2. Describe how electrochemical concepts can be used in various practical applications, like batteries, fuel cells etc.
3. Apply knowledge of corrosion science to problems in materials engineering.
4. Explain various methods of prevention of corrosion of metals.
5. Explain the chemical applications of electricity.
6. Analyze microscopic chemistry in terms of atomic and molecular orbitals.
7. List major chemical reactions that are used in the synthesis of drugs.

END

(A30503) DATA STRUCTURES & ALGORITHMS
(Common to ECE, CSE, EEE, IT)

B. Tech (CSE) II Semester	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

UNIT - I
Data Structures: Introduction, classification of Data structures, ADT and applications, Over view of List and its operations.
Linked Lists: Representation in memory, Operations of Singly Linked List: Traversing, Searching, Insertion, Deletion and Reverse, Doubly Linked List and its Operations, Circular Linked Lists and its Operations.

UNIT - II
Stacks: Stack ADT and its implementations, Applications of Stacks: Infix to Postfix Conversion and Postfix evaluation – Corresponding algorithms.
Queues: Queue ADT and its implementations, Types of Queue: Simple Queue, Circular Queue, Priority Queue; Operations on each type of Queues-Corresponding Algorithms.

UNIT - III
Trees: Basic Tree Terminologies, Representations, types of Binary Trees: Threaded Binary Tree, Binary Search Tree, AVL Tree and their operations: Insertion Deletion, Traversal.

UNIT – IV
Graphs: Basic Terminologies, Representations, Graph traversal algorithms.
Dictionaries: Dictionary as a linear list and its operations-Insertion, Deletion, Searching, Hash tables, Hash Functions, Collision Resolution Techniques-Linear Probing, Quadratic Probing, and Double Hashing.

UNIT V
Sorting: Quick Sort, Merge Sort, Heap Sort, comparison of techniques.
Pattern Matching Algorithms: Brute-Force Algorithm and Knuth-Morris-Pratt Algorithm.

Text books:
1. Ellis Horowitz, Sartaj Sahni, Fundamentals of Data Structures in C, Second Edition Universities Press.
2. Thomas H. Cormen Charles E. Leiserson, Introduction to Algorithms, PHI Learning Pvt. Ltd. Third edition.

Reference books:

1. Algorithms, Data Structures, and Problem Solving with C++", Illustrated Edition by Mark Allen Weiss, Addison-Wesley Publishing Company
2. E.Balagurusamy Data Structures Using C, McGraw Hill Education; First edition

Course Outcomes:

On completion of the course students will be able to

1. Use data structure concepts for realistic problems.
2. Identify appropriate data structure for solving computing problems in respective language.
3. Develop algorithms, operations on queues, stacks and Linked Lists.
4. Demonstrate the representation and traversal techniques of graphs and their applications
5. Implement basic operations on binary trees.

END

(A30002) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

	L	T	P	C
B. Tech (CSE) II Semester	0	0	3	1.5

English Language Communication Skills Labshall have **two** parts
   A. **Computer Assisted Language Learning (CALL) Lab**
   B. **Interactive Communication Skills (ICS) Lab**

INTRODUCTION:
The Language Lab focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.

EXERCISE – I
CALL Lab: Introduction to Phonetics – Speech Sounds – Vowels and Consonants
ICS Lab: Ice-Breaking activity and JAM session

EXERCISE – II
CALL Lab: Structure of Syllables - Past Tense Marker and Plural Marker – Weak Forms and Strong Forms - Consonant Clusters.
ICS Lab: Situational Dialogues – Role-Play- Expressions in Various Situations – Self-introduction and Introducing Others – Greetings – Apologies – Requests – Social and Professional Etiquette - Telephone Etiquette.

EXERCISE – III
CALL Lab: Minimal Pairs- Word accent and Stress Shifts.
ICS Lab: Descriptions – Place, Person, Object

EXERCISE – IV
CALL Lab: Intonation and Common errors in Pronunciation.
ICS Lab: Extempore- Public Speaking

EXERCISE – V
CALL Lab: Neutralization of Mother Tongue Influence and Conversation Practice
ICS Lab: Giving Directions

COURSE OUTCOMES:

At the end of the lab session, learner comprehends, acquaints and adopts the following.

1. Illustrates How to Work in Teams
2. Demonstrates Soft Skills and Communications Skills well and Exhibits Decorum with ease
3. Minimizes the usage of Mother Tongue and Apprises Neutral Accent
4. Prepares for employability skills
5. Speaks English Confidently and does Presentations with self-confidence
6. Distinguishes between Sympathy and Empathy
7. Demonstrates the art of persuasion

END

(A30012) ENGINEERING CHEMISTRY LAB

B. Tech (CSE-CS) II semester

L	T	P	C
0	0	3	1.5

1. Estimation of Hardness of water by EDTA method.
2. Estimation of Alkalinity of water.
3. Estimation of Copper by Colorimetric Method.
4. Conductometric Titration of a strong acid vs a strong base.
5. Conductometric Titration of a week acid vs a week base.
6. Potentiometric Titration of a strong acid vs a strong base.
7. Potentiometric Titration of week acid vs a week base.
8. Preparation of Paracetmol and Asprin.
9. Determination of Viscosity of a Liquid.
10. Determination of Surface Tension of a liquid.
11. Adsorption of acetic acid on Activated charcoal.
12. Estimation of iodine in table salt.
13. Thin Layer Chromatography (Ortho-Nitro phenol &Para-Nitro phenol).
14. Determination of rate constant of acid catalyzed hydrolysis of methyl acetate.

Course outcomes:
At the end of the course the student will be able to
1. Predict the extent of hardness range present in water sample and its consequences in industrial operations
2. Prepare drugs like Aspirin and Paracetmol
3. Estimate the strength of solutions, pH of various solutions
4. Evaluate the viscosity and surface tension of liquids
5. Employ the conductometric and potentiometric titrations
6. Describe the principlesof adsorption phenomenon.

REFERENCES:
1.Engineering Chemistry Lab Manual, Glaze Publishers 2018.
2.Engineering chemistry by B. Rama Devi & Ch. VenkataRamana Reddy; Cengage Learning, 2012.
3.A Textbook of Engineering Chemistry, SashiChawla, DhanapathRai& Sons.

END

(A30504) DATA STRUCTURES & ALGORITHMS LAB
(Common to ECE, CSE, EEE, IT)

	L	T	P	C
B. Tech (CSE) II Semester	0	0	3	1.5

Lab 1: Write a C program to perform the following operations on the givenarray
> (i) insert element in specific position in toarray
> (ii) Delete random element fromarray
> (iii) Reverse the arrayelements

Lab 2: A) Write a C program to implement Single linkedlist
> i) Insertion   ii) Deletion   iii) Display
>
> B) Write a C program to implement Circular linkedlist
> i) Insertion   ii) Deletion.   iii)Display

Lab 3: A) Write a C program to implement Doubly linkedlist
> i) Insertion   ii) Deletion.   iii)Display
> B) Write C programs to implement Stack ADTusing
> i)Array   ii) LinkedList

Lab 4:
> A.   Write a C program that uses stack operations to convert a given infix expression in to its postfix equivalent. (Display the role ofstack).
> B.   Write a C program for Evaluation of postfixexpression.
> .

Lab 5: Write C programs to implement Queue ADT using
i) Array ii) Linked List

Lab 6: Write a C program to implement Binary search tree
i) Insertionii) deletioniii) Traversals

Lab 7:
Write a C program to implement binary search tree Non - recursively traversals
i) Pre- Order   ii) Post –Order   iii) In-Order

Lab 8:
(A) Write a C Program to Check if a Given Binary Tree is an AVL Tree or Not
(B) Write a C program to find height of a Binary tree
(C) Write a C program to count the number of leaf nodes in a tree.

Lab 9:
Write a C program for implementing Graph traversal
i) DFS   ii) BFS

Lab 10:
A) Write a C program to implement different hash methods
B) Write a C program to implement the following collisionresolving
i) Quadratic probing. ii) Linear Probing

Lab 11:
Write C programs for implementing the following Sorting methods and display the important steps.
i) Quick Sort   ii) Heap sort

Lab 12:
Write a C program for implementing pattern matching algorithms
i) Knuth-Morris-Pratt   ii) Brute Force

Additional
1. Implement the priority queue using Heap
2. Write a C Program to Implement Merge sort
3. Write a C program to implement AVL tree
   i) Creation   ii) Deletion   iii) Traversals
4. Write a function to reverse the nodes of a linked list
5. Write a C program to implement 2-3-4 tree operations
6. Write a C program to implement B tree operations
7. Write a C program to implement B+ tree operations

Reference Books:

1. Ellis Horowitz, Sartaj Sahni, Fundamentals of Data Structures in C, Second Edition Universities Press.
2. Thomas H. Cormen Charles E. Leiserson, Introduction to Algorithms, PHI Learning Pvt. Ltd. Third edition.
3. Algorithms, Data Structures, and Problem Solving with C++", Illustrated Edition by Mark Allen Weiss, Addison-Wesley Publishing Company
4. E.Balagurusamy Data Structures Using C, McGraw Hill Education; First edition

Course Outcomes

At the end of the course the student will be able to

1. Write and execute C-programs to implement Linked List Data Structures
2. Evaluate postfix expressions by implementing in C-language
3. Implement Non- linear Data Structures in C-language
4. Implement various sorting techniques in C-language
5. Test various pattern matching algorithms by implementing in C-language.

(A30314) ENGINEERING WORKSHOP

B. Tech (CSE-CS) II Semester

L	T	P	C
0	0	3	1.5

I Trade for Exercise:

(Two experiments each from any six trades of the following)

1. Carpentry
2. Fitting
3. Tin-smithy
4. House-wiring
5. Foundry
6. Plumbing
7. Welding
8. Black smithy

II Trades for Demonstration and Exposure:

1. Power tools
2. Machine Tools- Turning on Lathe and other Operations on Lathe.,

TEXT BOOK:

1. Workshop Manual, Second edition/ P Kannaiahand K L Narayana/ Scitech publishers

Course Outcomes

On completion of the course students will be able to

1. Create the different patterns with desired shape and size by using wood.
2. Align and assemble different components to create a product by fitting operations.
3. Fabricate the given material to desired product in a particular pattern by tin smithy.
4. Understand the basic principles of electrical systems in day-to-day applications.
5. Mould the component to desire pattern and shape by black smithy.
6. Create the object by casting process using molten metal.
7. Assemble the components with permanent joint by welding process.
8. Understand the process, transfer of fluid or gases from one place to another place by connecting set of pipes with different requirements in plumbing process

END

(A30019) ENGINEERING EXPLORATION & PRACTICE

(Common to all branches)

B. Tech (CSE) II Semester	L	T	P	C
	0	0	3	1.5

Module 1
Introduction to Engineering and Engineering Study: Introduction to Engineering and Engineering Study: Difference between science and engineering, scientist and engineer needs and wants, various disciplines of engineering, some misconceptions of engineering, Expectation for the 21st century engineer.

Module 2
Engineering Design: Engineering Design Process, Multidisciplinary facet of design, Importance of analysis in engineering design, general analysis procedure, Pair wise comparison chart, Introduction to mechatronics system, generation of multiple solution, decision matrix, Concepts of reverse engineering

Module 3
Mechanisms: Basic Components of a Mechanism, Degrees of Freedom or Mobility of a Mechanism, 4 Bar Chain, Crank Rocker Mechanism, Slider Crank Mechanism.

Module 4
Platform based development: Introduction to various platform-based development, programming and its essentials, Introduction to transducers and actuators and its interfacing. Concepts of reverse engineering

Data Acquisition and Analysis: Types of Data, Descriptive Statistics techniques as applicable to different types of data, Types of graphs as applicable to different types of data, Usage of data acquisition tools for descriptive statistics, Data Acquisition, Exporting acquired data to analysis using visual representation

Module 5

Project Management: Introduction, Significance of teamwork, Importance of communication in engineering profession, Project management tools: Checklist, Timeline, Gantt Chart, Significance of documentation

Sustainability: Introduction to sustainability, Sustainability leadership, Life cycle assessment, carbon footprint

References:

1. Engineering Fundamentals: An Introduction to Engineering (MindTap Course List) 5th Edition by Saeed Moaveni
2. Software Project Management (SIE), (Fifth Edition); Bob Hughes,MikeCotterell,Rajib Mall; Published by Tata McGraw-Hill Education Pvt. Ltd (2011) ; ISBN 10: 0071072748 ISBN 13: 9780071072748
3. A Ghosh and AK Malik: Theory of Mechanism and Machine; East West Press (Pvt) Ltd., New Delhi.
4. Arduino Cookbook, 2nd Edition by Michael Margolis: O'Reilly Media
5. Data Acquisition and Analysis - Building an Excel Budget Forecast Workbook by Andrew Greaney (Kindle Edition)ISBN: 1521903468
6. Concepts in Engineering Design – 2016; by Sumesh Krishnan (Author), Dr. Mukul Shukla (Author), Publisher: Notion Press

Course Outcomes:

On Completion of the course, the students will be able to

1. Explain the role of an Engineer as a problem solver.
2. Identify multi-disciplinary approach required in solving an engineering problem
3. Analyse a given problem using process of engineering problem analysis.
4. Build simple systems using engineering design process.
5. Analyse engineering solutions from sustainability perspectives.
6. Use basics of engineering project management skills in doing projects.
7. Demonstrate data acquisition and analysis skills using a tool.

END

(A30506) DISCRETE MATHEMATICS

B. Tech (CSE) III Semester

L	T	P	C
3	0	0	3

Unit-I

Sets, Relations and Functions: Operations and Laws of Sets, Cartesian Products, Binary Relation, Partial Ordering Relation, Equivalence Relation, Image of a Set, Sum and Product of Functions, Bijective functions, Inverse and Composite Function, Size of a Set, Finite and infinite Sets, Countable and uncountable Sets, Cantor's diagonal argument and The Power Set theorem, Schroeder-Bernstein theorem.

Unit-II

Principles of Mathematical Induction: The Well-Ordering Principle, Recursive definition, The Division algorithm: Prime Numbers, The Greatest Common Divisor: Euclidean Algorithm, The Fundamental Theorem of Arithmetic. Basic counting techniques-inclusion and exclusion, pigeon-hole principle, permutation and combination.

Unit-III

Propositional Logic: Syntax, Semantics, Validity and Satisfiability, Basic Connectives and Truth Tables, Logical Equivalence: The Laws of Logic, Logical Implication, Rules of Inference, The use of Quantifiers. Proof Techniques: Some Terminology, Proof Methods and Strategies, Forward Proof, Proof by Contradiction, Proof by Contraposition, Proof of Necessity and Sufficiency.

Unit-IV

Algebraic Structures and Morphism: Algebraic Structures with one Binary Operation, Semi Groups, Monoids, Groups, Congruence Relation and Quotient Structures, Free and Cyclic Monoids and Groups, Permutation Groups, Substructures, Normal Subgroups, Algebraic Structures with two Binary Operation, Rings, Integral Domain and Fields. Boolean Algebra and Boolean Ring, Identities of Boolean Algebra, Duality, Representation of Boolean Function, Disjunctive and Conjunctive Normal Form

Unit-V

Graphs and Trees: Graphs and their properties, Degree, Connectivity, Path, Cycle, Sub Graph, Isomorphism, Eulerian and Hamiltonian Walks, Graph Coloring, Coloring maps and Planar Graphs, Coloring Vertices, Coloring Edges, List Coloring, Perfect Graph, definition properties and Example, rooted trees, trees and sorting, weighted trees and prefix codes, Bi-connected component and Articulation Points, Shortest distances.

Text books:

1. Kenneth H. Rosen, Discrete Mathematics and its Applications, 7ᵗʰEdition, Tata McGraw – Hill
2. Susanna S. Epp, Discrete Mathematics with Applications,4th edition, Wadsworth
   Publishing Co. Inc.
3. C L Liu and D P Mohapatra, Elements of Discrete Mathematics A Computer OrientedApproach, 3rd Edition by, Tata McGraw – Hill.

Reference books:

1. J.P. Tremblay and R. Manohar, Discrete Mathematical Structure and It's Application toComputer Science", TMG Edition, TataMcgraw-Hill
2. Norman L. Biggs, Discrete Mathematics, 2nd Edition, Oxford University Press. Schaum's Outlines Series, Seymour Lipschutz, Marc Lipson,
3. Discrete Mathematics, Tata McGraw – Hill

Course Outcomes

On completion of the course students will be able to

1. Identify various types of Sets, Relations and Functions.
2. Apply Principle of Inclusion and Exclusion technique.
3. Describe various methods of Proving a logical statement.
4. Classify various Algebraic Structures.
5. State the properties of Graphs & Trees.

END

(A30511) DESIGN AND ANALYSIS OF ALGORITHMS

	L	T	P	C
B.Tech (CSE-CS) III Semester	**3**	**1**	**0**	**4**

Unit-I
Introduction: Characteristics of algorithm, Analysis of algorithm: Asymptotic analysis of complexity bounds – best, average and worst-case behavior; Performance measurements of Algorithm, Time and space trade-offs, Analysis of recursive algorithms through recurrence relations: Substitution method, Recursion tree method and Masters' theorem.

Unit-II
Fundamental Algorithmic Strategies – I: Divide and Conquer, Greedy, and Dynamic Programming, methodologies for the design of algorithms; Illustrations of these techniques for Problem-Solving, Strassen's Matrix Multiplication, Bin Packing, job sequencing with deadlines, Huffman codes, Knapsack, OBST, Matrix chain multiplication, TSP.

Unit-III
Fundamental Algorithmic Strategies – II: Branch and Bound and Backtracking methodologies for the design of algorithms; Illustrations of these techniques for Problem-Solving, N-Queens, 0/1 Knapsack, TSP, Sum of sub sets, Graph coloring, Hamiltonian cycle.

Unit-IV
Graph and Tree Algorithms: Traversal algorithms: Depth First Search (DFS) and Breadth First Search (BFS); Shortest path algorithms, Transitive closure, Minimum Spanning Tree, Topological sorting, Network Flow Algorithm.

Unit-V
Tractable and Intractable Problems: Computability of Algorithms, Computability classes – P, NP, NP-complete and NP-hard. Game tree, min-max search Standard NP-complete problems and Reduction techniques.

Text books:
1. Fundamentals of Algorithms – E. Horowitz et al.
2. Introduction to Algorithms, 4TH Edition, Thomas H Cormen, Charles E Lieserson, Ronald L Rivest and Clifford Stein, MIT Press/McGraw-Hill.

Reference books:

1. Algorithm Design, 1ST Edition, Jon Kleinberg and ÉvaTardos, Pearson.
2. Algorithm Design: Foundations, Analysis, and Internet Examples, Second Edition, Michael T Goodrich and Roberto Tamassia, Wiley.
3. Algorithms -- A Creative Approach, 3RD Edition, UdiManber, Addison-Wesley, Reading, MA.

Course Outcomes

On completion of the course students will be able to

1. Explain various asymptotic notations to measures the performance of an algorithm
2. Discuss algorithms design strategies
3. Apply Graph & Tree algorithms for real world applications
4. Describe various computability Classes
5. Illustrate P & NP –Type Problems

END

(A30513) COMPUTER ORGANIZATION & ARCHITECTURE

	L	T	P	C
B. Tech (CSE-CS) III Semester	**3**	**1**	**0**	**4**

Unit-1
Functional blocks of a computer: CPU, memory, input-output subsystems, control unit. Instruction set architecture of a CPU – registers, instruction execution cycle, RTL interpretation of instructions, addressing modes, instruction set. Case study – instruction sets of some common CPUs

Unit-II
Data representation: signed number representation, fixed and floating-point representations, character representation. Computer arithmetic – integer addition and subtraction, ripple carry adder, carry look-ahead adder, etc. multiplication – shift-and-add, Booth multiplier, carry save multiplier, etc. Division restoring and non-restoring techniques, floating point arithmetic.

Unit-III
Introduction to x86 architecture. CPU control unit design: hardwired and micro-programmed design approaches, Peripheral devices and their characteristics: Input-output subsystems, I/O device interface, I/O transfers – program controlled, interrupt driven and DMA, privileged and non-privileged instructions, software interrupts and exceptions. Programs and processes – role of interrupts in process state transitions, I/O device interfaces – SCII, USB

Unit-IV
Pipelining: Basic concepts of pipelining, throughput and speedup, pipeline hazards. Parallel Processors: Introduction to parallel processors, Concurrent access to memory and cache coherency

Unit-V
Memory organization: Memory interleaving, concept of hierarchical memory organization, cache memory, cache size vs. block size, mapping functions, replacement algorithms, write policies.

Text books:
1. "Computer Organization and Design: The Hardware/Software Interface", 5th Edition by David A. Patterson and John L. Hennessy, Elsevier.
2. "Computer Organization and Embedded Systems", 6th Edition by CarlHamacher, McGraw Hill Higher Education.

Reference books:
1. "Computer Architecture and Organization", 3rd Edition by John P. Hayes, WCB/McGraw- Hill
2. "Computer Organization and Architecture: Designing for Performance", 10th Edition by William Stallings, Pearson Education.
3. "Computer System Design and Architecture", 2nd Edition by Vincent P. Heuring and Harry F. Jordan, Pearson Education.

Course Outcomes

On completion of the course students will be able to
1. Describe basic computer organization
2. Explain the design of Control Unit.
3. Illustrate Data representation in computer's memory
4. Describe Input-Output, Memory Organization.
5. Distinguish between RISC and CISC Instruction Set.

END

(A36201) OBJECT ORIENTED PROGRAMMING

B. Tech (CSE) III Semester

L	T	P	C
3	0	0	3

Unit-I

Introduction to Object Oriented Programming: Need for Object Oriented Programming - Characteristics of Object-Oriented Languages, Objects, Overloading, Overriding Functions and Object Polymorphism, Inheritance, Abstraction, Interfaces, java introduction & language fundamentals
Packages: Defining, Creating and Accessing a Package, Understanding Class path, Importing Packages

Unit-II

Inner Classes: Use of Inner Classes, Local Inner Classes, Anonymous Inner Classes, Static Inner Classes, Example.
Exception Handling: Dealing with Errors, Benefits of Exception Handling, The Classification of Exceptions, Exception Hierarchy, Checked Exceptions and Unchecked Exception, Usage of Try, Catch, Throw, Throws, and Finally, Re-Throwing Exceptions, Exception Specification, Built in Exceptions, Creating Own Exception Sub Classes.

Unit-III

Multithreading: Difference Between Multiple Processes and Multiple Threads, Thread States, Creating Threads, Interrupting Threads, Thread Priorities, Synchronizing Threads, Inter-Thread Communication, Producer Consumer Pattern.
File I/O: Streams-Byte Streams, Character Streams, Text Input /Output, Binary Input/output, File Management using File Class

Unit-IV

Collection Framework in Java: Introduction to Java Collections, Overview of Java Collection Frame Work, Generics, Commonly used Collection Classes-Array List, Vector, Hash Table, Stack, Enumeration, Iterator, String Tokenizer, Random, Scanner, Calendar and Properties.
Connecting to Database: JDBC Type I To IV Drivers, connecting to a Database, querying a Database and Processing the Results, Updating Data With JDBC.

Unit-V

GUI Programming with Java: Introduction to Scala and Swing, Hierarchy for Swing and Scala Components, ContainersJFrame, JApplet, JDialog, JPanel, Overview of Some Swing Components, JButton, JLabel, JTextfield, JTextarea, Simple Swing Applications, Layout Management- Layout Manager Types- Border Grid and Flow. Event Handling: Events, Event Sources, Event Classes, Event Listeners, Relationship Between Event Sources and Listeners, Delegation Event Model, Examples: Handling a Button Click, Handling Mouse Events, Adapter Classes.

Textbooks
1. Java Fundamentals: A Comprehensive Introduction, Herbert Schildt and Dale Skrien, TMH.
2. Programming Development in Java, BarbaraLiskov, Addison-Wesley

References
1. Data Abstraction and Problem Solving with Java: Walls and Mirrors by Frank M. Carrano and Janet J. Prichard
2. Java for Programming, P.J. Dietel Pearson Education
3. Object Oriented Programming through Java, P. Radha Krishna, and Universities Press.
4. Thinking in Java, Bruce Eckel, Pearson Education
5. Programming in Java, S. Malhotra and S. Choudhary, Oxford University Press

Course Outcomes

On completion of the course students will be able to

1. Describe the characteristics of Object-Oriented Programming Languages.
2. Illustrate Java Exception Handling Mechanism
3. Develop applications using Java Multi-Thread Concept.
4. Use Java Collection Framework
5. Design GUI applications using Java Swings.

END

(A30509) DATABASE MANAGEMENT SYSTEMS

B. Tech (CSE) III Semester	**L**	**T**	**P**	**C**
	3	**1**	**0**	**4**

Unit-1:

Database System Applications: Database 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 users and administrator, transaction management, database system structure, storage manager, the query processor, data base design and ER diagrams, beyond ER design entities, attributes and entity sets, relationships and relationship sets, additional features of ER model, concept design with the ER Model

Unit-2:
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.
Form of basic SQL query, examples of basic SQL queries, introduction to nested queries, correlated nested queries, set comparison operators, aggregation operators, NULL values, comparison using null values, logical connectivity's, AND, OR and NOT, impact on SQL constructs, outer joins, disallowing NULL values

Unit-3:
Relational Algebra: Selection and projection, set operations, renaming, Joins, Division, Examples of Algebra overviews, Relational calculus, Tuple relational Calculus, Domain relational calculus, Expressive Power of Algebra and calculus. Schema refinement: Problems caused by redundancy, decompositions, problems related to decomposition, reasoning about functional dependencies, FIRST, SECOND, THIRD normal forms, BCNF, lossless join decomposition, dependency preserving decomposition, schema refinement in database design, multi valued dependencies, FOURTH normal form, FIFTH normal form.

Unit-4:
Transactions: 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.

Unit-5:

Storage: 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, Indexes and Performance Tuning, Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM), B+ Trees: A Dynamic Index Structure.

Text Books:

1. "Database System Concepts", 6th Edition by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill.
2. " Database Management Systems",3rd Edition by Johannes Gehrke and Raghu Ramakrishnan, McGraw-Hill.

Reference Books:

1 "Principles of Database and Knowledge – Base Systems", Vol 1 by J. D. Ullman,
Computer Science press.
2 "Fundamentals of Database Systems", 5th Edition by R. Elmasri and S. Navathe, Pearson Education.
3 "Foundations of Databases", Reprint by Serge Abiteboul, Richard Hull, Victor Vianu, Addison-Wesley.

Course Outcomes

On completion of the course students will be able to

1. Explain the significance of Database Management Systems.
2. Write SQL queries to interact with RDBMs
3. Describe various Normal Forms of Relations.
4. Evaluate various concurrency control protocols
5. Classify Indexing Techniques based on prime attributes.

END

(A36202) JAVA LAB
(Common to CSE-CS, CSE-AI&ML)

B. Tech (CSE) III Semester	**L**	**T**	**P**	**C**
	0	**0**	**3**	**1.5**

Week 1:

1. Write a java program that works as a simple calculator for the +,-,*,/,% operations using classes and objects in java.
2. Write a java program to find result of a given arithmetic expression?
(EX: if you given   arithmetic expression like 10+20-24*4/2-4.5= it should print 7.5)

Week 2:

3. Write a program to demonstrate the following
i) Super, Final ii) Single inheritance iii) Multi –level inheritance
4. Write a program to demonstrate the usage of method overriding, calling super class constructor in derived class.

Week 3:
5. Write a java program to create an abstract class named **shape** that contains two integers and an empty method named printarea (). Provide three classes named Rectangle, Triangle and Circle such that each one of these classes extends the class Shape. Each one of the classes contains only the method printarea () that prints the area of the given shape.

Week 4:
6. Write a program to demonstrate method overloading and constructor overloading.
7. Write a program to demonstrate polymorphism using interface (interface in package P1 and class in package P2)

Week 5: Exception handling in java
8. Implement pre-defined exceptions
9. Implement user defined exceptions

Week 6:
10. Develop a scala and swing component in java that displays a simple message.

11. Write a java program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, num1 and Num2. The division of Num1 and Num2 is displayed in the result fields when the division button is clicked. If Num1 or Num2 were not an integer, the program should throw a Number Format Exception. If Num2 were Zero the program should throw an Arithmetic Exception. Display the exception in a message dialog box.

Week 7:
12. Write a java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second. if the generated value is even, second thread computes the square of the number and prints. If the generated value is odd, the third thread will print the value of cube of the number

Week 8:
13. Write a java program to demonstrate Generic class and generic methods
14. Write a java to perform string operations using sting buffer class and its methods.

Week 9:
15. Write a java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button, an appropriate message with ―Stop‖ or ―ready‖ or ―Go‖ should appear above the buttons in selected color initially, there is no message shown.

Week 10:
16. Write a java program that loads names and phone numbers from a text file where the data is organized as one line per record and each field in a record are separated by a tab(\t). it takes a name or phone number as input and prints the corresponding other value from the hash table (hint: use hash tables).

Week 11:
17. Write a java program that connects to a data base using JDBC and does add, delete, modify and retrieve operations.

Week12
18. Implement the week 10 program with database instead of a text file.
19. Write a java program that takes tab separated data (one record per line) from a text file and inserts them into a database.

Textbooks
1. Java Fundamentals- A Comprehensive introduction, Herbert schildt and Dale skrien, TMH.
2. Programming Development in Java, Barbara Liskov, Addison-Wesley

References
1. Java for programming, P.J. Dietel Pearson education (OR) Java: How to Program P.J. Dietel and H.M. Dietel, PHI
2. Data Abstraction and Problem Solving with Java: Walls and Mirrors by Frank M. Carrano and Janet J. Prichard
3. Object Oriented Programming through java, P. Radha Krishna, Universities Press.
4. Thinking in Java, Bruce Eckel, Pearson Education
5. Programming in Java, S. Malhotra and S. Choudhary, Oxford University Press

Course Outcomes

On completion of the course students will be able to

1. Write & execute programs using JAVA Programming Language Syntax
2. Use Java API functions to write and execute programs for problem solving.
3. Demonstrate the usage of Java Exception handling mechanisms.
4. Write and execute Java applications using Java String Buffer Class
5. Design Java Applications using JAVA GUI components and test them by execution.

END

(A30510) DATABASE MANAGEMENT SYSTEMS LAB

B. Tech (CSE-CS) III Semester	L	T	P	C
	0	0	3	1.5

Week-1: Working with DDL, DML, DCL and Key Constraints
(Creation, Altering and Dropping of Tables and Inserting Rows into a Table (Use Constraints While Creating Tables) Examples Using Select Command.)

Week-2: Working with Queries and Nested QUERIES
(Queries (along with sub-Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints)

Week-3: Working with Queries USING Aggregate Operators & views
Queries using Aggregate Functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and Dropping of Views

Week-4: Working with Conversion Functions & String Functions
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)

Week-5: Working with Triggers using PL/SQL
Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers

Week-6: Working with PL/SQL Procedures
Programs Development using Creation of Procedures, Passing Parameters IN and OUT of PROCEDURES.

Week-7: Working with LOOPS using PL/SQL and Exception Handling
Program Development using WHILE LOOPS, Numeric FOR LOOPS, Nested Loops using ERROR Handling, BUILT-IN Exceptions, USE Defined Exceptions, RAISE- APPLICATION ERROR

Week-8: Working with Functions Using PL/SQL
Program Development using Creation of Stored Functions, Invoke Functions in SQL Statements and Write Complex Function

Week-9: Working with CURSORS

Develop Programs using Features Parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of Clause and CURSOR Variables

Week-10: Working with PL/SQL Packages

Program development using Packages.

Week-11: Case Study-I

Design & Implementation of Library Management System

Week-12: Case Study-II

Design & Implementation of Hospital Management System

Reference books:

1. Oracle PL/SQL by Example, Benjamin Rosenzweig, Elena Silvestrova, Pearson Education 3rd Edition
2. Oracle Database LogG PL/SQL Programming, Scott Urman, Tata Mc-Graw Hill.
3. SQL and PL/SQL for Oracle 10g, Black Book, Dr .P.S. Deshpande.

Course Outcomes
On completion of the course students will be able to

1. Demonstrate the usage of SQL statements for the creation, manipulation of data in the Database.
2. Write & execute queries on the given Database
3. Write & Execute PL/SQL programs for a given application
4. Develop & Demonstrate the usage of Cursors in PL/SQL
5. Design & Implement a given Enterprise Database

END

(A30016) GENDER SENSITIZATION

B. Tech (CSE) III Semester

L	T	P	C
0	0	2	0

UNIT-I:
Understanding Gender

Lesson 1 – Gender: Why should we study it?
Lesson 2 – Socialization: Making Women, Making Men
Lesson 12 – Just Relationships: Being together as Equals

UNIT-II:
Gender and Biology

Lesson 4 – Missing Women: Sex selection and its consequences
Lesson 10 – Gender Spectrum: Beyond the Binary
Lesson 13 – Additional Reading: Our Bodies, Our Health

UNIT-III:
Gender and Labour

Lesson 3 – Housework: The Invisible Labour
Lesson 7 – Women's Work: Its Politics and Economics

UNIT-IV:
Issues of Violence

Lesson 6 – Sexual Harassment: Say No!
Lesson 8 – Domestic Violence: Speaking Out
Lesson 11 – Thinking about Sexual Violence

UNIT-V:
Gender Studies

Lesson 5 – Knowledge: Through the Lens of Gender
Lesson 9 – Who's History? Questions for Historians and Others.

COURSE OUTCOMES

1. Learners identify realities of gender discrimination prevalent in the society at all levels.
2. Learners infer and discuss historical evidences, historical perspective and historical voices of discrimination against women in all societies and civilizations.
3. Learners recognize their bodies and value its health. Learners demonstrate their rights regarding their bodies.
4. Learners can identify, protest and overcome the evils of body shaming.
5. Learners analyze discrimination and exploitation of women labour in domestic as well as social sphere. Learners can infer women's rights, women's wage disparities, women's issues and demonstrate these grievances through law.
6. Learners identify different types of sexual exploitation; sexual violence and marital violence show empathy towards victims of such violence and generate public opinion in face of any exploitation.

END

(A36203) CYBER SECURITY

B. Tech (CSE-CS) IV Sem

L	T	P	C
3	0	0	3

Unit-I
Introduction to Cyber Security: Basic Cyber Security Concepts, layers of security, Vulnerability, threat, Harmful acts, Internet Governance – Challenges and Constraints, Computer Criminals, CIATriad, Assets and Threat, motive of attackers, active attacks, passive attacks, Software attacks, hardware attacks, Spectrum of attacks, Taxonomy of various attacks, IP spoofing, Methods of defense, Security Models, risk management, Cyber Threats-Cyber Warfare, Cyber Crime, Cyber terrorism, Cyber Espionage, etc., Comprehensive Cyber Security Policy.

Unit-II
Cyberspace and the Law & Cyber Forensics: Introduction, Cyber Security Regulations, Roles of International Law. The INDIAN Cyberspace, National Cyber Security Policy. Introduction, Historical background of Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber Forensics and Digital evidence, Forensics Analysis of Email, Digital Forensics Lifecycle, Forensics Investigation, Challenges in Computer Forensics, Special Techniques for Forensics Auditing.

Unit-III
Cybercrime: Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones, Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile, Organizational Security Policies and Measures in Mobile Computing Era, Laptops.

Unit-IV
Cyber Security: Organizational Implications: Introduction, cost of cybercrimes and IPR issues, web threats for organizations, security and privacy implications, social media marketing: security risks and perils for organizations, social computing and the associated challenges for organizations.

Unit-V

Cybercrime and Cyber terrorism: Introduction, intellectual property in the cyberspace, the ethical dimension of cybercrimes the psychology, mindset and skills of hackers and other cyber criminals.

Privacy Issues: Basic Data Privacy Concepts: Fundamental Concepts, Data Privacy Attacks, Data linking and profiling, privacy policies and their specifications, privacy policy languages, privacy in different domains- medical, financial, etc.

TEXT BOOK:

1.Nina Godbole and Sunit Belpure, Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Wiley

2. B. B. Gupta, D. P. Agrawal, Haoxiang Wang, Computer and Cyber Security: Principles, Algorithm, Applications, and Perspectives, CRC Press, ISBN 9780815371335, 2018.

REFERENCES:

1. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.

2. Introduction to Cyber Security, Chwan-Hwa(john) Wu,J. David Irwin, CRC Press T&F Group.

Course Outcomes

After completion of this course, the students shall be able to:

1.Understand, appreciate, employ, design and implement appropriate security technologies and policies to protect computers and digital information.

2.Identify & Evaluate Information Security threats and vulnerabilities in Information Systems and apply security measures to real time scenarios

3.Identify common trade-offs and compromises that are made in the design and development process of Information Systems

4.Demonstrate the use of standards and cyber laws to enhance information security in the development process and infrastructure protection

END

(A30514) COMPUTER NETWORKS

B. Tech (CSE) IV Semester

L	T	P	C
3	0	0	3

UNIT -I
Introduction: Network hardware, Network software, OSI, TCP/IP Reference models, Example Networks: ARPANET, Internet.
Physical Layer: Guided Transmission media: twisted pairs, coaxial cable, fiber optics, Wireless transmission.

UNIT –II
Data link layer: Design issues, framing, Error detection and correction.
Elementary data link protocols: simplex protocol, A simplex stop and wait protocol for an error-free channel, A simplex stop and wait protocol for noisy channel.
Sliding Window protocols: A one-bit sliding window protocol, A protocol using Go-Back-N, A protocol using Selective Repeat, Example data link protocols.
Medium Access sub layer: The channel allocation problem, Multiple access protocols: ALOHA, Carrier sense multiple access protocols, collision free protocols. Wireless LANs, Data link layer switching.

UNIT –III
Network Layer: Design issues, Routing algorithms: shortest path routing, Flooding, Hierarchical routing, Broadcast, Multicast, distance vector routing, Congestion Control Algorithms, Quality of Service, Internetworking, The Network layer in the internet.

UNIT –IV
Transport Layer: Transport Services, Elements of Transport protocols, Connection management, TCP and UDP protocols.

UNIT -V
Application Layer–Domain name system, SNMP, Electronic Mail; the World WEB, HTTP, Streaming audio and video.

Text Books:

1. Computer Networks, Andrew S Tanenbaum, David. j. Wetherall, 5th Edition. Pearson Education/PHI

Reference Books:
1. An Engineering Approach to Computer Networks, S. Keshav, 2nd Edition, Pearson Education
2. Data Communications and Networking – Behrouz A. Forouzan. 3rd Edition, TMH.

Course Outcomes
The student shall be able
1. Describe the functions of each layer in OSI and TCP/IP model and explain the types of transmission media with real time applications
2. Describe the functions of data link layer and explain the protocols
3. Classify the routing protocols and analyze how to assign the IP addresses for the given network
4. Describe the Transport layer services.
5. Explain the functions of Application layer Protocols

END

(A30007) NUMERICAL TECHNIQUES & PROBABILITY DISTRIBUTIONS
(Common to CE, ME, CSE, IT)

B. Tech (CSE) IV Semester

L	T	P	C
3	1	0	4

UNIT-I: NUMERICAL METHODS-I

Solution of polynomial and transcendental equations: Bisection method, Iteration method, Newton-Raphson method and Regula-False method.

Interpolation: Finite differences, Forward differences, Backward differences, Central differences, Symbolic relations and separation of symbols, Interpolation using Newton's forward and backward difference formulae. Central difference interpolation, Gauss's forward and backward formulae, Lagrange's method of interpolation.

UNIT-II: NUMERICAL METHODS-II

Numerical integration: Trapezoidal rule, Simpson's 1/3rd and 3/8 rules.
Numerical Solutions of Ordinary Differential Equations -Taylor's series, Picard's method, Euler and modified Euler's methods, Runge-Kutta method of fourth order.

UNIT-III: LAPLACE TRANSFORMS

Laplace transform of standard functions, First shifting theorem, Laplace transforms of functions when they are multiplied and divided by't'. Laplace transforms of derivatives and integrals of function, Evaluation of integrals by Laplace transforms, Laplace transforms of special functions, Laplace transform of periodic functions. Inverse Laplace transform by different methods, Convolution theorem (without Proof), Solving ODEs by Laplace transform method.

UNIT- IV:
RANDOM VARIABLES & DISTRIBUTIONS

Random Variables: Discrete and continuous random variables.
Distributions: Binomial distribution, Poisson distribution and their Properties, Normal distribution, Sampling distribution of means (σ known and unknown).

UNIT- V:TEST OF HYPOTHESIS

Test of hypothesis, Null hypothesis, Alternative hypothesis, Type-I & II errors, Critical region, Confidential interval for the mean & proportions. Test of

hypothesis ~~for large samples, Single mean, Difference between the means, Single~~ proportion and difference between the proportions. Test of hypothesis for Small samples, Confidence interval for the t- distribution, Tests of hypothesis t -test, F-test, $\chi 2$- test, goodness of fit.

TEXT BOOKS:
1. Higher Engineering Mathematics (36th edition) by B.S. Grewal, Khanna Publishers.
2. Fundamentals of Mathematical Statistics (11th Edition) by S.C. Gupta& VK Kapoor, Sultan Chand & Sons.

REFERENCE BOOKS:
1. Advanced Engineering Mathematics (3rd edition) by R.K. Jain & S.R.K. Iyengar, Narosa Publishing House, Delhi.
2. Introductory Methods of Numerical Analysis, S.S. Sastry, 4h Edition, Prentce Hall of India Pvt. Ltd.
3. Advanced Engineering Mathematics (9th edition) by Erwin Kreyszig John Wiley & Sons Publishers.
4. Probability & Statistics by T.K.V. Iyengar, B. Krishna Gandhi & Others, 2015 Yr. Edition S. Chand.
5. Applied Mathematics for Engineers & Physicists (3rd edition) by Pipes & Harvill, McGraw Hill Internation Book company.

COURSEOUTCOMES:
On completion of the course students will be able to
1.Find the root of given equation and estimate unknown value using interpolation.
2.Find numerical solutions of ordinary differential equations.
3.Solve ordinary differential equations using Laplace transform.
4.Analyse random variables involved in probability models.
5.Test hypothesis for large and small samples.

END

(A30516) OPERATING SYSTEMS

B. Tech (CSE-CS) IV Semester

L	T	P	C
3	**0**	**0**	**3**

UNIT-I
Operating System Introduction, Structures - Simple Batch, Multi-programmed, Time-shared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, System components, Operating System services, System Calls.

UNIT –II
Process and CPU Scheduling- Process concepts and scheduling, Operations on processes, Cooperating Processes, Threads, and Interposes Communication, Scheduling Criteria, Scheduling Algorithms, Multiple -Processor Scheduling.
System call interface for process management-fork, exit, wait, waitpid, exec

UNIT –III
Deadlocks - System Model, Deadlocks Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock.
Process Management and Synchronization- The Critical Section Problem, Synchronization Hardware, Semaphores, and Classical Problems of Synchronization, Critical Regions, Monitors. Inter process Communication Mechanisms: IPC between processes on a single computer system, IPC
between processes on different systems, using pipes, FIFOs, message queues, shared memory.

UNIT –IV
Memory Management and Virtual Memory- Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with Paging, Demand Paging, Page Replacement, Page Replacement Algorithms.

UNIT -V
File System Interface and Operations-Access methods, Directory Structure, Protection, File System Structure, Allocation methods, Free-space Management.
usage of open, create, read, write, close, lseek, stat, ioctl, system calls

Text Books:

1. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne7th Edition, John Wiley
2. Advanced programming in the Unix environment, W.R. Stevens, Pearson education.

Reference Books:

1. Operating Systems – Internals and Design Principles, Stallings, 5th Edition, Pearson Education/PHI,2005.
2. Operating System A Design Approach-Crowley, TMH.
3. Modern Operating Systems, Andrew S Tanenbaum 2nd edition, Pearson/PHI.
4. Unix programming environment, Kernighan and Pike, PHI. / Pearson Education
5. Unix Internals the New Frontiers, U. Vahalia, Pearson Education.

Course Outcomes

Students shall be able to

1. Describe the components of computer and their respective roles in computing.
2. Explain process concepts and CPU Scheduling Algorithms
3. Demonstrate the Mutual exclusion, deadlock detection and Inter Process Communications.
4. Analyze various memory management and allocation methods.
5. Discuss File System Interface and Operations.

END

(A30228) BASIC ELECTRICAL ENGINEERING

B. Tech (CSE-CS) IV Semester

L	T	P	C
3	0	0	3

UNIT-1
DC Circuits: Circuit Concept–R-L-C parameters–Voltage and Current sources Ohm's law, Kirchhoff's laws, types of sources, source transformations, V-I relation for passive elements ,series parallel circuits, star- delta and delta –star transformations, mesh and nodal analysis, network theorems –super position, thevenin's, maximum power transfer theorem, simple problems.

UNIT-2
AC Circuits: Representation of sinusoidal waveforms, waveforms and basic definitions, RMS and Average values of the alternating quantity, form factor and peak factor, phasor representation of alternating quantities, the 'j' operator and phasor algebra, Analysis of AC circuits with single basic network elements. Single phase series circuits. Three phase circuits –phase sequence, star and delta connection, relation between line and phase voltage and currents in a balanced system.

UNIT-3
DC Machines:
DC Generators -Principle and operation, constructional details, types, EMF equation, DC Motor- Principle and operation, Principle and operation, types, Torque equation, Losses and Efficiencyin DC Generators and Motors, Speed control of DC Motors

UNIT-4
Transformer:
Single phase transformer-Principle and operation, construction details, Ideal transformer andpractical transformer, equivalent circuit, losses, OC and SC Test, Efficiency and Regulation, simple problems. Three phase transformer-Classification.

UNIT-5
AC Machines:
Three phase induction Motor: Generation of rotating magnetic field, Principle and operation, constructional details, types, Concept of slip, significance of torque slip

characteristic, problemson slip, rotor frequency, rotor EMF and Torque. Principle and operation of Alternator, Singlephase induction motors – Classification.

TEXT BOOKS:
1. Basic concepts of Electrical Engineering, PS Subramanyam, BS Publications.
2. Basic Electrical Engineering, S.N. Singh, PHI.

REFERENCE BOOKS:
1. Basic Electrical Engineering, Abhijit Chakrabarthi, Sudiptanath, Chandrakumar Chanda, Tata-McGraw- Hill.
2. Principles of Electrical Engineering, V. K Mehta, Rohit Mehta, S. Chand Publications.
3. Basic Electrical Engineering, T.K. Nagasarkar and M.S. Sukhija, Oxford University Press.
4. Fundamentals of Electrical Engineering, RajendraPrasad, PHI.
5. Basic Electrical Engineering by D.P. Kothari, I.J. Nagrath, McGraw-Hill.

Course Outcomes

On completion of the course, students will be able to

1. Apply Kirchoff 's Laws & network reduction techniques.
2. Explain AC fundamentals of single & three phase circuits,
3. Categorize DC machines, operation and its characteristics, with the help of tests and speed control methods.
4. Acquire the knowledge of operation and performance Analysis of transformers
5. Analyze three phase induction motor operation with their characteristics & acquire the knowledge of alternators and single-phase Induction motors.

END

(A30229) BASIC ELECTRICAL ENGINEERING LAB

	L	T	P	C
B. Tech (CSE) IV Semester	0	0	3	1.5

PART A:
1. Verification of KCL and KVL.
2. Verification of Superposition theorem
3. Verification of Maximum power transfer theorem.
4. Verification of Thevenin 's theorem.
5. Time Response of First Order RC/RL Network for periodic, non-sinusoidal inputs- timeconstant and steady state error determination

PART B:
1. Magnetization characteristics of D.C. Shunt generator.
2. Speed control of DC motor.
3. Swinburne 's Test on DC shunt machine.
4. Brake test on DC shunt motor.
5. OC and SC tests on Single-phase transformer.
6. Brake test on 3-phase Induction motor.
7. Load Test on single phase Transformer

Note: Any 10 of the above experiments are to be conducted.

Course Outcomes

On Completion of the course, students will be able to

1. Verify KCL & KVL.
2. Verify different theorems.
3. Analyze time response of RC/RL networks.
4. Acquire the knowledge of different tests conducted on DC machines
5. Acquire the knowledge of performance of single-phase transformers and Three PhaseInduction Motors

END

(A36204) OPERATING SYSTEMS & COMPUTER NETWORKS LAB

B. Tech (CSE) IV Semester

L	T	P	C
0	0	3	1.5

PART-A

1. Implement the data link layer framing methods such as character, character-stuffing and bit stuffing.
2. Write a program to compute CRC code for the polynomials CRC-12, CRC-16 and CRC, CCIP
3. Develop a simple data link layer that performs the flow control using the sliding window protocol, and loss recovery using the Go-Back-N mechanism.
4. Implement Dijsktra's algorithm to compute the shortest path through a network
5. Take an example subnet of hosts and obtain a broadcast tree for the subnet.
6. Implement distance vector routing algorithm for obtaining routing tables at each node.

PART-B

1. Simulate the following CPU Scheduling Algorithms
a). FCFS b). SJF c). Priority d). Round Robin
2. Simulate Banker's Algorithm for Deadlock Avoidance.
3. Simulate Memory Management Technique.
a) Paging b) Segmentation
4. Simulate the following Page Replacement Algorithms
a). FIFO b). LRU c). OPTIMAL
5. Simulate the following File Allocation Strategies
a). Sequential b). Indexed c. Linked
6. Simulate the following disk scheduling algorithms
a). SCAN b). CSCAN c). SSTF

END

(A30021) SOCIAL INNOVATION IN PRACTICE
(Common for all branches)

B. Tech (CSE) IV Semester

L	T	P	C
0	0	2	1

UNIT 1
Identify community issues to be addressed, Requirements Analysis: Extensive User requirements analysis, Generating effective System Requirement document.

UNIT 2
Social Innovation – Case Studies
Presentation of the case studies with a focus on impact and vision on society.

UNIT 3
Process of Social Innovation
Prompts – identifying needs, Proposals – generating ideas, Prototyping – testing the idea in practice,

UNIT 4
Sustaining-developing a business model, Scaling and diffusion-growing social innovations, Systematic change.

UNIT 5
Report writing, Documentation and Panel presentation

Reference Books:
1. Requirements Analysis: From Business Views to Architecture; David C. Hay; Prentice Hall Professional
2. Social Enterprises: An Organizational Perspective edited; Benjamin Gidron, YeheskelHasenfeld; Palgrave Macmillan
3. Social Enterprise Law: Trust, Public Benefit and Capital Markets By Dana Brakman Reiser & Steven A. Dean

Course Outcomes:
On Completion of the course, the students will be able to

1. Summing up several social issues to be addressed
2. Analyse the feasibility and economical factors
3. Develop a scalable business model.

END

(A30015) SOFT SKILLS & PROFESSIONAL ETHICS

	L	T	P	C
B. Tech (CSE-CS) IV Semester	**0**	**0**	**2**	**0**

UNIT-I:
Business Communication Skills:
English Language Enhancement the Art of Communication.

UNIT-II:
Intrapersonal & Interpersonal Relationship Skills:
- Intrapersonal Relationships
- Interpersonal Relationships – To be an Effective Team Player

UNIT-III:
Campus to Company:
- Corporate Dressing
- Corporate Grooming
- Business Etiquette
- Communication Media Etiquette

UNIT-IV:
Group Discussions, Interviews and Presentations:
- Group Discussions
- Interviews
- Presentations

UNIT-V:
Entrepreneurial Skills Development:
- Goal Setting
- Entrepreneurial Skills – Awareness and Development

REFERENCES
1. UNLEASH the power within Soft Skills – Training Manual (Infosys Campus Connect)

Course Outcomes

At the end of the course, the students will be able to
1. Express themselves with proper pronunciations and sentence construction
2. Demonstrate a strong teamwork and be a team player
3. Develop a strong personal etiquette
4. Demonstrate good leadership qualities
5. Recognize and identify basic English grammar

END

(A36205) CRYPTOGRAPHY & NETWORK SECURITY

B. Tech (CSE-Cyber Security) – V Semester

L	T	P	C
3	0	0	3

UNIT- I

Introduction to Security: Security Attacks, Security Services, Security Mechanisms, Fundamental Security Design Principles, Attack Surfaces and Attack Trees, a Model for Network Security **Mathematics of Cryptography:** Algebraic Structures (Groups, Rings, Fields and Galois Fields), Divisibility and the Division Algorithm, The Euclidean Algorithm, Modular Arithmetic, Prime Numbers, Fermat's and Euler's Theorems, Testing for Primality, The Chinese Remainder Theorem, Discrete Logarithms.

UNIT- II

Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Rotor Machines, Steganography **Block Ciphers:** Traditional Block Cipher Structure, The Data Encryption Standard, The Strength of DES, Block Cipher Design Principles, Advanced Encryption Standard, AES Structure, AES Transformation Functions, AES Key Expansion, Multiple Encryption and Triple DES, Block Cipher Modes of Operation.

UNIT- III

Public-Key Cryptography: Principles of Public-Key Cryptosystems, The RSA Algorithm, DiffieHellman Key Exchange, Elgamal Cryptographic System, Elliptic Curve Cryptography Cryptographic Hash Functions: Applications of Cryptographic Hash Functions, Requirements and Security, Secure Hash Algorithm (SHA) **Message Authentication Codes:** Requirements for Message Authentication Codes, HMAC, CMAC

UNIT- IV

Digital Signatures: Digital Signatures, Elgamal Digital Signature Scheme, Schnorr Digital Signature Scheme, NIST Digital Signature Algorithm, Elliptic Curve Digital Signature Algorithm **Key Management and Distribution:** Symmetric Key Distribution Using Symmetric Encryption, Symmetric Key

Distribution Using Asymmetric Encryption, Distribution of Public Keys, X.509 Certificates, ~~Public-Key Infrastructure~~ **User Authentication:** ~~Remote User-~~ Authentication Principles, Remote User-Authentication Using Symmetric Encryption, Kerberos, Remote User-Authentication Using Asymmetric Encryption

UNIT -V
Transport-Level Security: Web Security Considerations, Transport Layer Security, Secure Shell (SSH) Electronic **Mail Security:** S/MIME, Pretty Good Privacy **IP Security:** IP Security Overview, Encapsulating Security Payload, Combining Security Associations, Internet Key Exchange.

TEXT BOOK:
1. Cryptography and Network Security, William Stallings, 8th Edition, Pearson Education.
REFERENCES:
1. Cryptography, Network Security and Cyber Laws, Bernard L. Menezes, Ravinder Kumar, Cengage Learning.
2. Cryptography and Network Security, Behrouz A Forouzan, DebdeepMukhopadhyaya, 3rd Edition, Mc-GrawHill.
3. Network Security Illustrated, Jason Albanese, Wes Sonnenreich, McGrawHill.
COURSE OUTCOMES:
1. Identify information security goals and acquire fundamental knowledge on the concepts of finite fields   and number theory
2. Compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication
3.Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes.
 4. Apply different digital signature algorithms to achieve authentication and create secure applications
 5. Apply network security basics, analyze different attacks on networks and evaluate the performance of security protocols like SSL, IPSec, and PGP.
END

(A30523)WEB TECHNOLOGIES

B. Tech (CSE-Cyber Security) – V Semester	L	T	P	C
	3	0	0	3

UNIT -I

Introduction to PHP: Declaring variables, data types, arrays, strings, operators, expressions, control structures, functions, reading data from web form controls like text boxes, radio buttons, lists etc.

Handling File Uploads. Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies. File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. on text and binary files, listing directories.

UNIT –II

HTML Common tags: List, Tables, images, forms, Frames; Cascading Style sheets;

XML: Introduction to XML, Defining XML tags, their attributes and values, Document Type Definition Schemes, Document Object Model, XHTML Parsing XML Data – DOM and SAX Parsers in java.

UNIT –III

Introduction to Servlets: Common Gateway Interface (CGt), Life cycle of a Servlet, deploying a servlet, The Servlet API, Reading Servlet parameters, Reading Initialization parameters, Handling Http Request & Responses, Using Cookies and Sessions, connecting to a database using JDBC.

UNIT –IV

Introduction to JSP: The Anatomy of a JSP Page, JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Using Beans in JSP Pages, Using Cookies and session for session tracking, connecting to database in JSP

UNIT –V

Client-side Scripting: Introduction to Javascript, Javascript language – declaring variables, scope of variables, functions. event handlers (onclick, onsubmit etc.), Document Object Model, Form validation.

TEXT BOOKS:

1. Web Technologies, Uttam K Roy, Oxford University Press
2. The Complete Reference PHP — Steven Holzner, Tata McGraw-Hill

REFERENCE BOOKS:

1. Web Programming, building internet applications, Chris Bates, 2nd Edition, Wiley Dreamtech
2. Java Server Pages, Hans Bergsten, SPD O'Reilly,
3. Java Script, D. Flanagan, 6th Edition, O'Reilly Media.
4. Beginning Web Programming-Jon Duckett WROX.
5. Programming world wide web, R.W. Sebesta, 4th Edition, Pearson.
6. Internet and World Wide Web — How to program, Dietel and Nieto, Pearson.

COURSE OUTCOMES:

1. Differentiate a program & script, and explain python basics
2. Write applications using python data structures and functions
3. Explain OOPs in python and Build User defined modules
4. Develop programs using fundamentals of perl
5. Design applications using advanced perl

END

(A36207) AUTOMATA AND COMPILER DESIGN

B. Tech (CSE-Cyber Security) – V Semester	L	T	P	C
	3	0	0	3

UNIT - I

Formal Language and Regular Expressions: Languages, Definition Languages regular expressions, Finite Automata – DFA, NFA. Conversion of regular expression to NFA, NFA to DFA. Applications of Finite Automata to lexical analysis, lex tools.

Context Free grammars and parsing : Context free grammars, derivation, parse trees, ambiguity LL(K) grammars and LL(1) parsing

UNIT - II

Bottom up parsing: handle pruning LR Grammar Parsing, LALR parsing, parsing ambiguous grammars, YACC programming specification.

Semantics : Syntax directed translation, S-attributed and L-attributed grammars, Intermediate code – abstract syntax tree, translation of simple statements and control flow statements.

UNIT - III

Context Sensitive features: Chomsky hierarchy of languages and recognizers. Type checking, type conversions, equivalence of type expressions, overloading of functions and operations.

UNIT - IV

Run time storage: Storage organization, storage allocation strategies scope access to now local names, parameters, language facilities for dynamics storage allocation.

Code optimization: Principal sources of optimization, optimization of basic blocks, peephole optimization, flow graphs, Data flow analysis of flow graphs.

UNIT - V

Code generation: Machine dependent code generation, object code forms, generic code generation algorithm, Register allocation and assignment. Using DAG representation of Block.

TEXT BOOKS:

1.Introduction to Theory of computation.Sipser, 2nd Edition, Thomson.
2.Compilers Principles, Techniques and Tools Aho, Ullman, Ravisethi, Pearson
Education.

REFERENCES BOOKS:
1. Modern Compiler Construction in C , Andrew W.Appel Cambridge
University Press.
2. Compiler Construction, LOUDEN, Thomson.
3. Elements of Compiler Design, A. Meduna, Auerbach Publications, Taylor and
Francis Group.
4. Principles of Compiler Design, V. Raghavan, TMH.
5. Engineering a Compiler, K. D. Cooper, L. Torczon, ELSEVIER.
6. Introduction to Formal Languages and Automata Theory and Computation -
Kamala Krithivasan and Rama R, Pearson.
7. Modern Compiler Design, D. Grune and others, Wiley-India.
8. A Text book on Automata Theory, S. F. B. Nasir, P. K. Srimani, Cambridge
Univ. Press.
9. Automata and Language, A. Meduna, Springer.

COURSE OUTCOMES:
1. Graduate should be able to understand the concept of abstract machines and
their power to recognize the languages.
2. Attainsthe knowledge of language classes & grammars relationship among
them with the help of chomsky hierarchy.
3. Ability to understand the design of a compiler given features of the languages.
4. Ability to implement practical aspects of automata theory.
5. Gain knowledge of powerful compiler generation tools.

END

(A36209) INTRUSION DETECTION & PREVENTION SYSTEMS

B. Tech (CSE-Cyber Security) – V Semester   **L   T   P   C**

                                                        3   0   0   3

UNIT- I

Introduction: Understanding Intrusion Detection – Intrusion detection and prevention basics – IDS
and IPS analysis schemes, Attacks, Detection approaches –Misuse detection – anamoly detection –
specification-based detection – hybrid detection **Theoretical Foundations of Detection:** Taxonomy of anomaly detection system – fuzzy logic – Bayes theory – Artificial Neural networks – Support vector machine – Evolutionary computation – Association rules – Clustering

UNIT- II

Architecture and Implementation: Centralized – Distributed – Cooperative Intrusion Detection -
Tiered architecture

UNIT- III

Justifying Intrusion Detection: Intrusion detection in security – Threat Briefing – Quantifying risk –
Return on Investment (ROI)

UNIT- IV

Applications and Tools: Tool Selection and Acquisition Process - Bro Intrusion Detection – Prelude
Intrusion Detection - Cisco Security IDS - Snorts Intrusion Detection – NFR security

UNIT- V

Legal Issues and Organizations Standards: Law Enforcement / Criminal Prosecutions – Standard
of Due Care – Evidentiary Issues, Organizations and Standardizations.

TEXT BOOKS:

1. Ali A. Ghorbani, Wei Lu, "Network Intrusion Detection and Prevention: Concepts and
Techniques", Springer, 2010.
2. Carl Enrolf, Eugene Schultz, Jim Mellander, "Intrusion detection and Prevention", McGraw
Hill, 2004

REFERENCES BOOKS:

1. Paul E. Proctor, "The Practical Intrusion Detection Handbook ", Prentice Hall, 2001.
2. Ankit Fadia and Mnu Zacharia, "Intrusiion Alert", Vikas Publishing house Pvt., Ltd, 2007.
3. Earl Carter, Jonathan Hogue, "Intrusion Prevention Fundamentals", Pearson Education, 2006.

COURSE OBJECTIVES:

1. To understand about the intruders.
2. To understand about different Architectures and Implementations
3. To know the intrusion detection and prevention policies
4. To know Applications and Tools of IDS
5. To know the Legal Issues and Organizations Standards

END

(A36216) Advanced Computer Networks
(Professional Elective-I)

B. Tech (CSE-Cyber Security) – V Semester   **L T P C**

3 0 0 3

UNIT I

IP Addressing: Address Space, Notations, Classfull addressing, Classless addressing, Network Address translation (NAT).**Internet Protocol (IP):** Datagram Format, Fragmentation, Options.
ICMPv4: Messages, Debugging Tools, ICMP Checksum. **Mobile IP**: Addressing, Agents, Three Phases. Inefficiency in Mobile IP. **Virtual Private Networks** VPN Technology.

UNIT -II

Next Generation IP: IPv6 Addressing, Representation, address space, address space allocation, Auto configuration, Renumbering. **Transition from IPv4 to IPv6**: Dual Stack, Tunneling, Header Translation. **IPv6 Protocol**: Packet format, Extension Header.

UNIT -III

Unicast and Multicast Routing Protocols: Introduction, Inter-domain, Intra-domain Routing**. Routing Algorithms**: Distance Vector Routing, Bellman—Ford algorithm, Link State Routing, 'Path Vector Routing. **Unicast Routing Protocols**: Internet Structure, Routing Information Protocol (RIP), Open Shortest Path First (OSPF), Border Gateway Protocol Version 4 (BGP4). Unicast, Multicast and Broadcast**. Multicast Protocols**: Multicast Distance Vector (DVMRP), Multicast Link State (MOSPF), Protocol Independent Multicast (PIM).

UNIT IV

User Datagram Protocol: User Datagram, UDP Services, UDP Applications.
Transmission Control Protocol: TCP Services, TCP features, Segment, A TCP Connection, State Transition Diagram, Windows in TCP, Flow Control, Error Control, TCP Congestion Control, TCP Tlmers, Options.
SCTP: SCTP Services, SCTP Features, Packet Format, An SCTP Association, Flow Control, Error Control.

UNIT-V

World Wide Web and HTTP , File Tiansfel", FTP and TFTP, Web-Based Mail, Email Security, SMTP, POP, IMAP and MIME, SNMP, DNS — Concept o1"Domain name space, DNS operation. DHCP — Static and Dynamic Allocation, DHCP Operation. Remote Login: TELNET and SSH

TEXT BOOKS:

1. Computer Networks, Andrew S Tanenbaum, David. j. Wetherall, 5th Edition. Pearson Education/PHI

REFERENCE BOOKS:

1. An Engineering Approach to Computer Networks, S. Keshav, 2nd Edition Pearson Education
2. Data Communications and Networking – Behrouz A. Forouzan. 3rd Edition, TMH.

COURSE OUTCOMES:

1. Describe the functions of each layer in OSI and TCP/IP model and explain the types of   transmission
    media with real time applications
2. Describe the functions of data link layer and explain the protocols
3. Classify the routing protocols and analyze how to assign the IP addresses for the given network
4. Describe the Transport layer services.
5. Explain the functions of Application layer Protocols

END

(A36217) CYBER LAWS AND ETHICS
(Professional Elective-I)

B. Tech (CSE-Cyber Security) – V Semester	L	T	P	C
	3	0	0	3

UNIT-I

Evolution of the IT Act: Genesis and Necessity

Salient features of the IT Act, 2000, various authorities under IT Act and their powers. ; Penalties & Offences, amendments.

UNIT-II

Impact on other related Acts (Amendments) : (a) Amendments to Indian Penal Code.(b) Amendments to Indian Evidence Act. (c) Amendments to Bankers Book Evidence Act. (d) Amendments to Reserve Bank of India Act.

Cyber Space Jurisdiction :(a) Jurisdiction issues under IT Act, 2000, (b) Traditional principals of Jurisdiction ,(c) Extra terrestrial Jurisdiction ,(d) Case Laws on Cyber Space Jurisdiction

UNIT-III

E – commerce and Laws in India:(a) Digital / Electronic Signature in Indian Laws ,(b) E – Commerce; Issues and provisions in Indian Law, (c) E – Governance; concept and practicality in India ,(d) E – Taxation issues in Cyberspace ,(e) E – Contracts and its validity in India ,(f) Cyber Tribunal & Appellate Tribunal, (g) Cyber Regulations

UNIT-IV

Intellectual Property Rights, Domain Names and Trademark Disputes: (a) Concept of Trademarks in Internet Era, (b) Cyber Squatting,(c) Reverse Hijacking, (d) Jurisdiction in Trademark Disputes,(e) Copyright in the Digital Medium,(f) Copyright in Computer Programmes,(g) Copyright and WIPO Treaties, (h) Concept of Patent Right,(i) Relevant Provisions of Patent Act 1970

Sensitive Personal Data or Information (SPDI) in Cyber Law: (a) SPDI Definition and Reasonable Security Practices in India,(b) Reasonable Security Practices – International perspective

UNIT-V

Cloud Computing & Law : International Perspective, (a) EDI: Concept and legal Issues. (b) UNCITRAL Model Law. (c) Electronic Signature Law's of Major Countries,(d) Cryptography Laws, (e) Cyber Law's of Major Countries ,(f) EU Convention on Cyber Crime

TEXT BOOKS:

1. Cyber Law & Cyber Crimes By Advocat Prashant Mali; Snow White publications, Mumbai
2. Cyber Law in India by Farooq Ahmad; Pioneer Books

REFERENCE BOOKS:

1. Information Technology Law and Practice by Vakul Sharma; Universal Law Publishing Co. Pvt. Ltd. 2. The Indian Cyber Law by Suresh T. Vishwanathan; Bharat Law House New Delhi

COURSE OUTCOMES:

1. To Understand about IT Act

2. To know about Cyber Space Jurisdiction

3. To know about E – commerce and Laws

4. To Understand about Intellectual Property Rights

5. To know about cyber laws

END

(A30528) DATA WAREHOUSING AND DATA MINING
(Professional Elective-I)

B. Tech (CSE-Cyber Security) – V Semester | L T P C

3 0 0 3

UNIT-I

Data Warehousing: Introduction to Data warehouse, differences between operational Database Systems and warehouses, Data Warehouse Architecture and its components , Data Warehouse Characteristics, ETL, Multi-Dimensional data model, Schema Design-Star-Snowflake-Galaxy Schema, Fact Table, Types of fact tables, Dimension Table characteristics, OLAP Cube and Operations, OLAP Server Architecture-ROLAP,MOLAP,HOLAP.

UNIT –II

Introduction to Data Mining: Introduction, what is data mining, Definition, KDD process, issues in Data Mining, Data mining Tasks.
Data Preprocessing: Cleaning, Missing Data, Dimensionality Reduction, Feature Subset Selection, Data transformation, Discretization, Concepts Hierarchy Generation, Measures of Similarity and Dissimilarity-Basics

UNIT –III

Association Rule Mining: Problem Definition, Frequent Item Set Generation, The Apriori principle, Support and Confidence measure, Association Rules Generation: Apriori Algorithm, FP-Growth Algorithms, Compact Representation of Frequent Item Set (Maximal and Closed Frequent Item sets)

UNIT –IV

Classification: Problem definition, General approaches to solve Classification problems, Evaluation of a Classifier, Classification techniques, Decision Tree - Decision tree construction, Methods for Expressing attribute test condition, Measures for selecting the Best Split, Algorithm for Decision tree Induction, Naive Bayes Classifiers, Bayesian Belief Networks, K -Nearest neighbor classification algorithm & characteristics.

UNIT –V

Cluster Analysis: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, K-Means Clustering, K-Means additional Issues, PAM Algorithm, Hierarchical Clustering Agglomerative methods and divisive methods, Basic Agglomerative Hierarchical clustering algorithms, Specific techniques, Key issues in Hierarchical Clustering, Strengths and Weakness, Outlier Detection.

TEXT BOOKS:

1. Data Mining – Concepts and Techniques - Jiawei Han & Micheline Kamber Harcourt India.
2. Introduction to Data Mining –Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson Education

REFERENCE BOOKS:

1. Data Mining Techniques – Arun K Pujari, University Press.
2. Data Warehousing in the Real World – Sam Anahory& Dennis Murray. Pearson Edn Asia.
3. Data Warehousing Fundamentals – PaulrajPonnaiah Wiley Student Edition

COURSE OUTCOMES:

1. Explain why the data warehouse in addition to database systems.
2. Perform the pre-processing of data and apply mining techniques on it.
3. Identify the association rules, classification and clusters in large data sets.
4. Solve real world problems in business and scientific information using data mining.
5.Compare and Contrast various Clustering Algorithms.

END

(A30524) WEB TECHNOLOGIES LAB

B. Tech (CSE-Cyber Security) – V Semester   **L   T   P   C**

                                                        0   0   3   1.5

1. Write a PHP script to print prime numbers between 1-50.

2. PHP script to

    a. Find the length of a string.
    b.Count no of words in a string.
    c.Reverse a string.
    d.Search for a specific string.

3. Write a PHP script to merge two arrays and sort them as numbers, in descending order.

4. Write a PHP script that reads data from one file and write into another file.

5. Develop static pages (using Only HTML) of an online book store. The pages should resemble: **www.amazon.com**. The website should consist the following pages.

    a.   Home page
    b.   Registration and user Login
    c.   User Profile Page
    d.   Books catalog
    e.   Shopping Cart
    f.   Payment By credit card
    g.   Order Conformation

6. Validate the Registration, user login, user profile and payment by credit card pages using JavaScript.

7.Create and save an XML document on the server, which contains 10 user's information. Write a program, which takes User Id as an input and returns the user details by taking the user information from the XML document.

8. Install TOMCAT web server. Convert the static web pages of assignments 2 into dynamic web pages using servlets and cookies. Hint: Users information (user id, password, credit card number) would be stored in web.xml. Each user should have a separate Shopping Cart.

9. Redo the previous task using JSP by converting the static web pages of assignments 2 into dynamic web pages. Create a database with user information and books information. The books catalogue shouldbe dynamically loaded from the database. Follow the MVC architecture while doing the website.

TEXT BOOKS:

1. WEB TECHNOLOGIES: A Computer Science Perspective, Jeffrey C. Jackson,Pearson Education

REFERENCES:
1. Deitel H.M. and Deitel P.J., "Internet and World Wide Web How to program", Pearson International, 2012, 4th Edition.
2. J2EE: The complete Reference by James Keogh, McGraw-Hill
3. Bai and Ekedhi, The Web Warrior Guide to Web Programming, Thomson
4. Web technologies, Black Book, Dreamtech press.
5. Gopalan N.P. and Akilandeswari J., "Web Technology", Prentice Hall of India

COURSE OUTCOMES:
1. Develop simple web application using PHP, JavaScript and MySql
2. Configure Tomcat webserver.
3. Read from XML documents.

END

(A36208) AUTOMATA AND COMPILER DESIGN LAB

B. Tech (CSE-Cyber Security) – V Semester

L	T	P	C
0	0	3	1.5

List of Experiments

1. Write a C/C++ -- program to Implement Lexical Analyzer.
2. Write a Program to Implement the Lexical Analyzer Using LEX Tool.
3. Write a Program to Compute FIRST of Non-Terminals.
4. Write a Program to compute FOLLOW of Non-Terminals.
5. Write a Program to implement Top Down Parsing for a given Grammar.
6. Write a Program to implement LL (1) parser for a given Grammar.
7. Write a Program to implement the LALR grammar for a given Grammar.
8. Write a Program to Convert Infix Expression to Post Expression.
9. Write a Program to Construct the Predictive Parser for a Given Grammar.
10. Write a Program to Construct the Shift-Reduce Parser for a given Grammar.
11. Write a Program to Construct the LALR Parser for a Given Grammar.
12. Generate the Three Address Code for a Given Expression
13. Generate the Optimized Three Address Code for a Given Expression.

COURSE OUTCOMES :

1. Design appliction to demonstatre the working deterministic finite automata
2. Develop applications using LEX tool
3. Apply predictive parsing algorithms to generate parse Trees .
4. Create YACC programs to parse Strings
5. Develop applications to convert a Source code to machine Code

END

(A36206) CRYPTOGRAPHY & NETWORK SECURITY LAB

B. Tech (CSE-Cyber Security) – V Semester	L	T	P	C
	0	0	3	1.5

List of Experiments

1. Implement the following ciphers using C programming:
a) Caesar Cipher b) Playfair Cipher c) Hill Cipher d) Vigenere Cipher e) Rail fence – row & Column Transformation
2. Observe the working of following algorithms using Cryptool:
a) DES b) Triple DES c) AES d) RSA e) Diffie-Hellman f) ECC g) ElGamal h) MD5 i) SHA-1 Digital   Signature
3. Using C programs implement shared key generation on two hosts using Diffie-Hellman key exchange. 4. Using hmac and hashlib modules implement a Python program for computing message digest for a given file and validate it.
5. Using bWapp tool, demonstrate SQL injection and Cross Site Scripting vulnerability exploitation.
6. Usingpacket sniffers extract a 5-minute log of traffic in the network, and give a statistical report on it.
7. Using secrets module, develop a Python program that generates a strong password. Find quality of the generated password using Cryptool.

TEXT BOOKS:
1. Cryptography and Network Security - Principles and Practice: William Stallings, Pearson Education, 6th Edition
2. Cryptography and Network Security: Atul Kahate, Mc Graw Hill, 3rd Edition

REFERENCES BOOKS:
1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
2. Cryptography and Network Security:Forouzan Mukhopadhyay, Mc Graw Hill, 3 rd Edition
3. Information Security, Principles, and Practice: Mark Stamp, Wiley India.
4. Principles of Computer Security: WM. Arthur Conklin, Greg White, TMH

COURSE OUTCOMES:

1. Student will be able to understand basic cryptographic algorithms, message and web authentication and security issues.

2. Ability to identify information system requirements for both of them such as client and server.

3. Ability to understand the current legal issues towards information security.

4. Understanding about Encrypt and decrypt messages using block ciphers.

5. Determination computer and network security fundamental concepts and principles.

END

(A30003) ADVANCED ENGLISH COMMUNICATION SKILLS LAB

B. Tech (CSE-Cyber Security) – V Semester	L	T	P	C
	0	0	3	1.5

INTRODUCTION

The introduction of the English Language Lab is considered essential at 3rd year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

UNIT-I
Functional English: Starting a conversation, responding appropriately and relevantly, using the right body language, Role play in Different Situations.

UNIT-II
Vocabulary Building: Synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, analogy, idioms and phrasal verbs.

UNIT-III
Group Discussion: Dynamics of group discussion, intervention, summarizing, modulation of voice, body languagea, relevance, fluency and coherence.

UNIT-IV
Interview Skills: Concept and process, pre-interview planning, opening strategies, answering strategies, Interview through tale and video- conferencing.

UNIT-V
Resume` and Technical Report Writing: Structure and presentation, planning, defining the career objective, projecting one's strengths and skill-sets, summary, formats and styles, Letter-writing. Reading Comprehension: Reading for facts, guessing meanings from context, scanning, skimming, inferring meaning and critical reading.

COURSE OUTCOMES :

1. Explain the rules of formal and informal situational dialogues and develop verbal & non-verbal communication skills.
2. Build academic vocabulary, use a variety of accurate sentence structures and utilize digital literacy tools to develop writing and grammar skills.
3. Express thoughts with clarity and hold discussions with everyone to develop analytical thinking. 4. Develop the skills required for attending different types of interviews.
5. Illustrate the report writing and summarize the main ideas of report; apply key elements of structure and style in drafting loner documents and read an increasing range of text.

END

(A30017) INDIAN CONSTITUTION
(MANDATORY COURSE)

B. Tech (CSE-Cyber Security)-V Semester

L	T	P	C
2	0	0	0

UNIT-I

Introduction to Indian Constitution: Constitution' meaning of the term, Indian Constitution- Sources and constitutional history, Features- Citizenship, Preamble, Fundamental Rights and Duties, Directive Principles of State Policy

UNIT-II
Union Government and its Administration Structure of the Indian Union: Federalism, Centre- State relationship, President: Role, power and position, PM and Council of ministers, Cabinet and Central Secretariat, Lok Sabha, Rajya Sabha, The Supreme Court and High Court: Powers and Functions; State Government and its Administration Governor: Role and Position, CM and Council of ministers, State **Secretariat:** Organization, Structure and Functions

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

UNIT-IV
Concept and Development of Human Rights: Meaning Scope and Development of Human Rights, United Nations and Human Rights – UNHCR, UDHR 1948, ICCPR 1996 and ICESCR 1966, Human Rights in India: Protection of Human Rights Act, 1993 (NHRC and SHRC), First, Second and Third Generation Human Rights, Judicial Activism and Human Rights.

UNIT-V

Election Commission: Election Commission- Role and Functioning, Chief Election Commissioner and Election Commissioners, State Election Commission: Role and Functioning, Institute and Bodies for the welfare of SC/ST/OBC and women

REFERENCE BOOKS:

Durga Das Basu, Introduction to the Constitution of India, Prentice – Hall of India Pvt. Ltd. NewDelhi

SubashKashyap, Indian Constitution, National BookTrust

J.A. Siwach, Dynamics of Indian Government &Politics

D.C. Gupta, Indian Government andPolitics

H.M.Sreevai, Constitutional Law of India, 4th edition in 3 volumes (Universal Law Publication)

J.C. Johari, Indian Government and PoliticsHans

E-RESOURCES:

nptel.ac.in/courses/109104074/8

nptel.ac.in/courses/109104045/

nptel.ac.in/courses/101104065/

www.hss.iitb.ac.in/en/lecture-details

www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indian-constitution

COURSE OUTCOMES:

1. Know the sources, features and principles of Indian Constitution.
2. Learn about Union Government, State government and itsadministration.
3. Get acquainted with Local administration and Pachayati Raj.
4. Be aware of basic concepts and developments of HumanRights.
5. Gain knowledge on roles and functioning of ElectionCommission.

END

(A30018) ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE
(MANDATORY COURSE)

B. Tech (CSE-Cyber Security) -V Semester	**L**	**T**	**P**	**C**
	2	**0**	**0**	**0**

UNIT - I

Introduction to traditional knowledge: Define traditional knowledge, nature and characteristics, scope and importance, kinds of traditional knowledge, the physical and social contexts in which traditional knowledge develop, the historical impact of social change on traditional knowledge systems. Indigenous Knowledge (IK), characteristics, traditional knowledge vis-à-vis indigenous knowledge, traditional knowledge Vs western knowledge traditional knowledge vis-à-vis formal knowledge

UNIT - II

Protection of traditional knowledge: the need for protecting traditional knowledge Significance of TK Protection, value of TK in global economy, Role of Government to harness TK.

UNIT - III

Legal frame work and TK:

A: The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, Plant Varieties Protection and Farmer's Rights Act, 2001 (PPVFR Act);

B: The Biological Diversity Act 2002 and Rules 2004, the protection of traditional knowledge bill, 2016. Geographical indicators act 2003.

UNIT -IV

Traditional knowledge and intellectual property:

Systems of traditional knowledge protection, Legal concepts for the protection of traditional knowledge, Certain non IPR mechanisms of traditional knowledge protection, Patents and traditional knowledge, Strategies to increase protection of

traditional knowledge, global legal FORA for increasing protection of Indian Traditional Knowledge.

UNIT - V

Traditional knowledge in different sectors: Traditional knowledge and engineering, Traditional medicine system, TK and biotechnology, TK in agriculture, Traditional societies depend on it for their food and healthcare needs, Importance of conservation and sustainable development of environment, Management of biodiversity, Food security of the country and protection of TK.

REFERENCE BOOKS

Traditional Knowledge System in India, by Amit Jha,2009.
Traditional Knowledge System and Technology in India by Basanta Kumar Mohanta and Vipin Kumar Singh, Pratibha Prakashan2012.
Traditional Knowledge System in India by Amit Jha Atlantic publishers,2002

E-RESOURCES

https://www.youtube.com/watch?v=LZP1StpYEPM
http://nptel.ac.in/courses/121106003/

COURSE OUTCOMES:

1. Understand the concept of Traditional knowledge and its importance
2. Know the need and importance of protecting traditional knowledge.
3. Know the various enactments related to the protection of traditional knowledge.
4. Understand the concepts of Intellectual property to protect the traditional knowledge.

(A36210) CONCEPTS OF ETHICAL HACKING

B. Tech (CSE-Cyber Security) –VI Semester	L	T	P	C
	3	0	0	3

UNIT- I

Introduction: Hacking Impacts, The Hacker

Framework: Planning the test, Sound Operations, Reconnaissance, Enumeration, Vulnerability Analysis, Exploitation, Final Analysis, Deliverable, Integration

Information Security Models: Computer Security, Network Security, Service Security, Application Security, Security Architecture

Information Security Program: The Process of Information Security, Component Parts of Information Security Program, Risk Analysis and Ethical Hacking.

UNIT - II

The Business Perspective: Business Objectives, Security Policy, Previous Test Results, Business Challenges

Planning for a Controlled Attack: Inherent Limitations, Imposed Limitations, timing is Everything, Attack Type, Source Point, Required Knowledge, Multi-Phased Attacks, Teaming and Attack Structure, Engagement Planner, The Right Security Consultant, The Tester, Logistics, Intermediates, Law Enforcement.

UNIT - III

Preparing for a Hack: Technical Preparation, Managing the Engagement

Reconnaissance: Social Engineering, Physical Security, Internet Reconnaissance

UNIT - IV

Enumeration: Enumeration Techniques, Soft Objective, Looking Around or Attack, Elements of Enumeration, Preparing for the Next Phase

Exploitation: Intutive Testing, Evasion, Threads and Groups, Operating Systems, Password Crackers, RootKits, applications, Wardialing, Network, Services and Areas of Concern

UNIT - V

Deliverable: The Deliverable, The Document, Overall Structure, Aligning Findings, Presentation **Integration**: Integrating the Results, Integration Summary, Mitigation, Defense Planning, Incident Management, Security Policy, Conclusion.

TEXT BOOK:

1. James S. Tiller, "The Ethical Hack: A Framework for Business Value Penetration Testing", Auerbach Publications, CRC Press

REFERENCE BOOKS:

1. EC-Council, "Ethical Hacking and Countermeasures Attack Phases", Cengage Learning
2. Michael Simpson, Kent Backman, James Corley, "Hands-On Ethical Hacking and Network Defense", Cengage Learning.

COURSE OUTCOMES:

1. Gain the knowledge of the use and availability of tools to support an ethical hack
2. Gain the knowledge of interpreting the results of a controlled attack
3. Understand the role of politics, inherent and imposed limitations and metrics for planning of a test
4. Comprehend the dangers associated with penetration testing.
5. Understand the defence planning and incident management

END

(A36212) MOBILE & WIRELESS SECURITY

B. Tech (CSE-Cyber Security) – VI Semester	L	T	P	C
	3	0	0	3

UNIT- I
Security in General Wireless/Mobile Networks: High Performance Elliptic Curve Cryptographic Co-processor, An Adaptive Encryption Protocol in MobileComputing

UNIT- II
Security in Wireless LANs: Cross Domain Mobility Adaptive Authentication, AAA Architecture and Authentication for wireless LAN Roaming, Experimental Study on Security Protocols in WLANs

UNIT-III
Security in Ad Hoc Networks: Pre-authentication and authentication models in Ad Hoc Networks, Promoting Identity-based key management, attacks and countermeasures, Secure and resilient data aggregation, Secure routing in MANET, Intrusion Detection System in MANET

UNIT- IV
Security in Mobile Cellular Networks: Security issues in GSM, 3G and 4G networks, Authentication and encryption, Security concerns in 5G networks.

UNIT- V
Security in Sensor Networks and IoT: Security Issues, Key Management Schemes, Secure Routing in Sensor Networks, Energy-aware security mechanisms, Security and privacy issues in IoT, Identity and access management, Data Integrity, Best practices for IoT security.

TEXT BOOKS:
1. Lei Chen, JiahuangJi, Zihong Zhang, Wireless Network Security, Springer Science &Business Media
2. W. Stallings. Cryptography & Network Security: Principles and Practice, Prentice Hall

Noureddine Boudriga, Security of Mobile Communications, CRC Press

REFERENCE BOOKS:

1. Levente Buttyán and Jean-Pierre Hubaux, Security and Cooperation in Wireless Networks,
Cambridge University Press

2. James Kempf, Wireless Internet Security: Architectures and Protocols, Cambridge UniversityPress

3. Patrick Traynor, Patrick McDaniel, and Thomas La Porta, Security for Telecommunications
Networks, Springer

4.Frank Adelstein, Sandeep K.S. Gupta, Golden G. Richard III, and Loren Schwiebert, Fundamentals of Mobile and Pervasive Computing, McGraw-Hill Professional

COURSE OUTCOMES:

1. Understanding the modern concept and foundation of Mobile security.

2. Understand and classify various next generation networks

3. Identity various sources of vulnerabilities from Mobile.

4. Analyse network security attacks and its countermeasures.

5. Understanding the key management schemes

***END**

(A36215) PRINCIPLES OF SOFTWARE ENGINEERING

B. Tech (CSE-Cyber Security) –VI Semester	L	T	P	C
	3	0	0	3

UNIT - I

Introduction to Software Engineering: The 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.

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. System models: Context models, behavioral models, data models, object models, structured methods.

UNIT - III

Design Engineering: Design process and design quality, design concepts, the design model. Creating an architectural design: software architecture, data design, architectural styles and patterns, architectural design, conceptual model of UML, basic structural modeling, class diagrams, sequence diagrams, collaboration diagrams, use case diagrams, component diagrams.

UNIT - IV

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. Product metrics: Software quality, metrics

for analysis model, metrics for design model, metrics for source code, metrics for testing, metrics for maintenance.

UNIT - V

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.
Quality Management: Quality concepts, software quality assurance, software reviews, formal technical reviews, statistical software quality assurance, software reliability, the ISO 9000 quality standards.
TEXT BOOKS:
1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, Mc Graw Hill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson Education.
3. The unified modeling language user guide Grady Booch, James Rambaugh, Ivar Jacobson, Pearson Education.
REFERENCE BOOKS:

1. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiley.
2. Software Engineering principles and practice- Waman S Jawadekar, The Mc Graw-Hill Companies.
3. Fundamentals of object-oriented design using UML Meiler page-Jones: Pearson Education.
COURSE OUTCOMES:
1. Ability to translate end-user requirements into system and software requirements, using e.g. UML
   Structure the requirements in a Software Requirements Document (SRD).
2. Identify and apply appropriate software architectures
3. Understand the patterns to carry out high level design of a system and be able to critically compare
   alternative choices.
4. Will have experience and/or awareness of testing problems
5. Able to develop a simple testing report

END

(A36213) DIGITAL FORENSICS

B. Tech (CSE-Cyber Security) –VI Semester	L	T	P	C
	3	0	0	3

UNIT - I

Digital Forensics Science: Forensics science, computer forensics, and digital forensics. Computer Crime: Criminalistics as it relates to the investigative process, analysis of cyber-criminalistics area, holistic approach to cyber-forensics.

UNIT - II

Cyber Crime Scene Analysis: Discuss the various court orders etc., methods to search and seizure electronic evidence, retrieved and un-retrieved communications, Discuss the importance of understanding what court documents would be required for a criminal investigation.

UNIT - III

Evidence Management & Presentation: Create and manage shared folders using operating system, importance of the forensic mindset, define the workload of law enforcement, Explain what the normal case would look like, Define who should be notified of a crime, parts of gathering evidence, define and apply probable cause.

UNIT - IV

Computer Forensics: Prepare a case, Begin an investigation, Understand computer forensics workstations and software, Conduct an investigation, Complete a case, Critique a case. Network Forensics: open-source security tools for network forensic analysis, requirements for preservation of network data

UNIT - V

Mobile Forensics: mobile forensics techniques, mobile forensics tools. Legal Aspects of Digital Forensics: IT Act 2000, amendment of IT Act 2008. Recent trends in mobile forensic technique and methods to search and seizure electronic evidence

TEXT BOOKS:

1.B. Nelson, A. Phillips, and C. Steuart, Guide to Computer Forensics and Investigations, 4th Edition, Course Technology, 2010

REFERENCE BOOKS:
1. John Sammons, The Basics of Digital Forensics, 2nd Edition, Elsevier, 2014
2. John Vacca, Computer Forensics: Computer Crime Scene Investigation, 2nd Edition, Laxmi Publications, 2005.

COURSE OUTCOMES:
1. Understand relevant legislation and codes of ethics.
2. Investigate computer forensics and digital detective and various processes, policies and procedures data
   acquisition and validation, e-discovery tools.
3. Analyze E-discovery, guidelines and standards, E-evidence, tools and environment.
4. Apply the underlying principles of Email, web and network forensics to handle real life problems
5. Use IT Acts and apply mobile forensics techniques.

END

(A30544) INTERNET OF THINGS
(Professional Elective-II)

B. Tech (CSE-Cyber Security) VI Semester   **L   T   P   C**
                                                  3   0   0   3

UNIT-I
Introduction to IoT Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models & APIs. IoT & M2M Machine to Machine, Difference between IoT and M2M, Software define Network

UNIT–II
Network & Communication aspects Wireless medium access issues, MAC protocol survey, Survey routing protocols, Sensor deployment & Node discovery, Data aggregation & dissemination.

UNIT–III
Challenges in IoT Design challenges, Development challenges, Security challenges, Other challenges.

UNIT-IV
Domain specific applications of IoT Home automation, Industry applications, Surveillance applications, Other IoT applications.

UNIT–V
Developing IoTs Introduction to Python, Introduction to different IoT tools, developing applications through IoT tools, developing sensor-based application through embedded system platform, Implementing IoT concepts with python.

TEXT BOOKS:
1. Vijay Madisetti, ArshdeepBahga, Ïnternet of Things, "A Hands-on Approach", University Press
2. WaltenegusDargie, ChristianPoellabauer, "Fundamentals of Wireless Sensor Networks: Theory and
   Practice, Wiley-Blackwell;

REFERENCE BOOKS:

1. Dr. SRN Reddy, RachitThukral and Manasi Mishra, "Introduction to Internet of Things: Apractical
   Approach", ETI Labs

2.Pethuru Raj and Anupama C. Raman, "The Internet of Things: Enabling Technologies, Platforms, and
   Use Cases", CRC Press

3. Jeeva Jose, "Internet of Things", Khanna Publishing House, Delhi

4. Adrian McEwen, "Designing the Internet of Things", Wiley

5. Raj Kamal, "Internet of Things: Architecture and Design", McGraw Hill

6. Cuno Pfister, "Getting Started with the Internet of Things", O Reilly Media

COURSE OUTCOMES:

1. Describe internet of Things and its hardware and software components

2. Interface I/O devices, sensors & communication modules

3. Remotely monitor data and control devices

4. Develop real life IoT based projects

5. Develop application using IoT tools with python

END

(A36218) INCIDENT RESPONSE MANAGEMENT
(Professional Elective-II)

B. Tech (CSE-Cyber Security) VI Semester

L	T	P	C
3	0	0	3

UNIT - I

Real-World Incidents: What Constitutes an Incident?, What Is Incident Response?, Where We Are Now, Why Should You Care About Incident Response?, Concept of the Attack Lifecycle, IR Management Handbook: What Is a Computer Security Incident?, What Are the Goals of Incident Response?, Who Is Involved in the IR Process?, The Incident Response Process: Initial Response, Investigation, Remediation, Tracking of Significant Investigative Information, Reporting.

UNIT - II

Pre-Incident Preparation: Preparing the Organization for Incident Response, Identifying Risk, Policies That Promote a Successful IR, Working with Outsourced IT, Thoughts on Global Infrastructure Issues, Educating Users on Host-Based Security, Preparing the IR Team, Preparing the Infrastructure for Incident Response, Computing Device Configuration, Network Configuration.

UNIT - III

Incident Detection and Characterization: Collecting Initial Facts, Checklists, Maintenance of Case Notes, Building an Attack Timeline, Understanding Investigative Priorities, What Are Elements of Proof?, Setting Expectations with Management, Initial Development of Leads, Defining Leads of Value, Acting on Leads, Turning Leads into Indicators, The Lifecycle of Indicator Generation, Resolving Internal Leads, Resolving External Leads.

UNIT - IV

Data Collection: Live Data Collection, When to Perform a Live Response, Selecting a Live Response Tool, What to Collect, Live Data Collection on Microsoft Windows Systems, Prebuilt Toolkits, Do It Yourself, Memory

Collection, Live Data Collection on Unix-Based Systems, Live Response Toolkits, Memory Collection

UNIT - V
Forensic Duplication: Forensic Image Formats, Complete Disk Image, Partition Image, Logical Image, Image Integrity, Traditional Duplication, Hardware Write Blockers, Image Creation Tools, Live System Duplication, Duplication of Enterprise Assets, Duplication of Virtual Machines.

TEXT BOOKS:
1. " Incident Response and Computer Forensics", Kevin Mandia, Mathew Pepe, Jason Luttgens, 3rd Edition, McGraw-Hill Osborne Media, 2014.

REFERENCE BOOKS:
1. "Handbook Computer Crime Investigation's Forensic Tools and Technology", Eoghan Casey, Academic Press.
2. "A Step-by-Step Guide to Computer Attacks and Effective Defenses", Skoudis. E., Perlman. R. Counter Hack, Prentice Hall Professional Technical Reference.
3. "Disk Detective: Secret You Must Know to Recover Information From a Computer", Norbert Zaenglein, Paladin Press.
4. "Guide to computer forensics and investigations", Bill Nelson, Amelia Philips and Christopher Steuart, Cengage Learning.

COURSE OUTCOMES:
1. To know the real world incidents
2. To make a pre incident preparation
3. To understand about incident detection and characterization
4. Able to understand data collection
5. To understand about forensic duplication

END

(A36225) VIRTUAL REALITY
(Professional Elective-II)

B. Tech (CSE-Cyber Security) VI Semester   **L   T   P   C**

                                                 3   0   0   3

UNIT- I
INTRODUCTION TO VIRTUAL REALITY: Virtual Reality & Virtual Environment : Introduction – Computer graphics – Real time computer graphics –Flight Simulation – Virtual environments –requirement – benefits of virtual reality.

UNIT -II
GEOMETRIC MODELLING: Geometric Modeling: Introduction – From 2D to 3D – 3D space curves – 3D boundary representation - Geometrical Transformations: Introduction – Frames of reference – Modeling transformations – Instances –Picking – Flying – Scaling the VE – Collision detection.

UNIT -III
VIRTUAL ENVIRONMENT: Animating the Virtual Environment, The dynamics of numbers – Linear and Non-linear interpolation - The animation of objects – linear and non-linear translation - shape & object inbetweening – free from deformation – particle system- Physical Simulation.

UNIT- IV
VR HARDWARES & SOFTWARES: Human factors : Introduction – the eye - the ear- the somatic senses - VR Hardware : Introduction – sensor hardware – Head-coupled displays –Acoustic hardware – Integrated VR systems-VR Software: Introduction –Modeling virtual world –Physical simulation- VR toolkits – Introduction to VRML.

UNIT -V

VR APPLICATION: Virtual Reality Applications: Introduction – Engineering – Entertainment – Science – Training – The Future: Introduction – Virtual Environments – Mode of Interaction.

TEXT BOOKS:

1. John Vince, "Virtual Reality Systems ", Pearson Education Asia, 2007.

2. Adams, Visualizations of Virtual Reality ", Tata McGraw Hill, 2000.

3. Grogore C, Burdea and Philippe Coiffet, "Virtual Reality Technology" , Wiley Inter Science, Second Edition, 2006.

REFERENCE BOOKS:

1. Virtual Reality, Steven M. LaValle, Cambridge University Press, 2016

2. Understanding Virtual Reality: Interface, Application and Design, William R Sherman and

    Alan B Craig, (The Morgan Kaufmann Series in Computer Graphics)". Morgan Kaufmann

   Publishers, San Francisco, CA, 2002

3. Developing Virtual Reality Applications: Foundations of Effective Design, Alan B Craig,

   William R Sherman and Jeffrey D Will, Morgan Kaufmann, 2009.

COURSE OUTCOMES:

1. Able to understand Virtual Reality & Virtual Environment

2. To know about Geometric Modeling

3. To know about Animation

4. To learn about Human factors

5. To know about applications of VR

(A36211)CONCEPTS OF ETHICAL HACKING LAB

B. Tech (CSE-Cyber Security)-VI Semester	L	T	P	C
	0	0	3	1.5

List of Experiments:

1. Setup a honey pot and monitor the honey pot on network
2. Write a script or code to demonstrate SQL injection attacks
3. Create a social networking website login page using phishing techniques
4. Write a code to demonstrate DoS attacks
5. Install rootkits and study variety of options
6. Study of Techniques uses for Web Based Password Capturing.
7. Install jcrypt tool (or any other equivalent) and demonstrate Asymmetric Crypto algorithm,

   Hash and Digital/PKI signatures studied in theory Cryptography & Network Security
8. Install jcrypt tool (or any other equivalent) and demonstrate Symmetric Crypto algorithm,

   Hash and Digital/PKI signatures studied in theory Cryptography & Network Security
9. Implement passive scanning using Burp suit tool
10. Implement active scanning using Burp suit tool
11. Implement session hijacking using Burp suit tool
12. Implement cookies extraction using Burp suit tool

COURSE OUTCOMES:

1. Gain the knowledge of the use and availability of tools to support an ethical hack
2. Gain the knowledge of interpreting the results of a controlled attack
3. Able to understand and run algorithms on crypto tool
4. Understanding about passive and active scanning
5. To learn about session hijacking and cookies

<p align="center">***END***</p>

(A36214) DIGITAL FORENSICS LAB

B. Tech (CSE-Cyber Security) –VI Semester	**L**	**T**	**P**	**C**
	0	**0**	**3**	**1.5**

List of Experiments

Week 1:

Performing Forensic Imaging of the evidence using the following
i) Sleuthkit (autopsy) Imaging ii) Encase Imaging iii) Helix Imaging iii) Win hex Imaging iv) Write Blockers

Week 2:

Performing Forensic Analysis of the evidence using the following
i) Configuring the tool ii) Analysis, using Sleuthkit(autopsy)

iii) Analysis using Encase iv) Recovering files

Week 3:

Performing Forensic Analysis of the evidence using the following
i) Bookmarking evidence ii) Keyword searching iii) password cracking

Week 4:

Usage and perform analysis on
i) Steganography

Week 5:

Perform the following in Networking
i) DoS Attacks ii) SQL injection

Week 6:

Perform the following in Networking
  i) Web defacement ii) Shell / backdoors

Week 7:

Finding the Email Crimes by using Email Tracing Tool
  i) Email Tracer

Week 8:

Investigating Network and logs using
  i) IPS/IDS ii) Snorting iii) Gathering logs

Week 9:

Investigating Network and logs using
  i) Investigating logs ii) Investigating wireless access point iii) Auditing

Week 10:

 Perform Mobile Forensics on
  i) Blackberry forensics ii) Android forensics

Week 11:

Perform Mobile Forensics on
  ii) iPhone Forensics ii) iPod Forensics

Week 12:

Perform the Forensic Report Writing
 i) Report Samples Report   ii) writing skills
 iii) Common mistakes in report iv) Report submission

REFERENCE BOOKS:

1. Kevin Mandia, Chris Prosise, "Incident Response and computer forensics", Tata McGrawHill, 2006
2. Nilakshi Jain, D. R. Kalbande, "Digital Forensic: The Fascinating World of Digital Evidences",   Wiley publications,2016.
3. Peter Stephenson, "Investigating Computer Crime: A Handbook for Corporate Investigations",   Sept 1999.
4. Eoghan Casey, "Handbook Computer Crime Investigation's Forensic Tools and Technology",   Academic Press, 1st Edition, 2001
5. Skoudis. E., Perlman. R. Counter Hack: A Step-by-Step Guide to Computer Attacks and Effective Defenses.Prentice Hall Professional Technical Reference. 2001.
6. Norbert Zaenglein, "Disk Detective: Secret You Must Know to Recover Information From a   Computer", Paladin Press, 2000
7. Bill Nelson, Amelia Philips and Christopher Steuart, "Guide to computer forensics investigation   "Course technology, 4th edition
8. SoufianeTahiri, "Mastering Mobile Forensics", Packt Publishing,2016.

COURSE OUTCOMES:

1. Student should be able to Analyze E-discovery, guidelines and standards E-evidence, tools and environment.
2. Student should be able Apply the underlying principles of Email, web and network forensics to handle real life problems
3. To investigate the networks and logs
4. Understanding about the steganography
5. Student able to write Forensic Report

END

(A30014) ENVIRONMENTAL SCIENCES
(MANDATORY COURSE)

B. Tech. (CSE) VI-Semester

L	T	P	C
2	0	0	0

UNIT-I

Introduction, Definition, scope and importance, Ecosystems: Introduction, types, characteristic features, structure and functions of ecosystems. Bio geo chemical cycle, Classification of Eco system.

UNIT-II

Natural Resources, Classification of Resources, Land resources, Land as resource, Common property resources, Land degradation, Soil erosion and desertification, Effects of modern agriculture, fertilizer –pesticide problems, Forest resources, Use and over-exploitation.Mining and dams – their effects on forest and tribal people, Water resources, Use and over- utilization of surface and groundwater, Floods, droughts, Water logging and salinity, Dams –benefits and costs, Conflicts over Water, Energy resources.

UNIT-III

Bio-diversity and its conservation, Value of bio-diversity -consumptive and productive use, social, ethical, aesthetic and option values, Bio-geographical classification of India – India as a mega diversity habitat, Threats to bio-diversity –Hot-spots, habitat loss, poaching of wild life, loss of species, seeds, etc. Conservation of bio-diversity – Insitu and Ex-situ conservation.

UNIT-IV

Environmental Pollution –Local and Global Issues, Nature of thermal pollution and nuclear hazards, Global warming, Acid rain, Ozone depletion. Environmental case studies.

UNIT-V

Environmental Problems in India, Drinking water, sanitation and public health, Effects of the activities on the quality of environment, Water scarcity and groundwater depletion, Controversies on major dams – resettlement and rehabilitation of people: problems and concerns, Rain water harvesting, cloud

seeding and watershed management. Economy and Environment, The economy and environment interaction, Economics of development, preservation and conservation, Sustainability: theory and practices, Limits to growth, Equitableuse of resources for sustainable life styles, Environmental Impact Assessment.

TEXT BOOKS:
1. Environmental Science - Y. Anjaneyulu, B S Publications.
2. Environmental studies-Deekshadave, Cengage learning India Pvt. Ltd.,
3. Environmental sciences and Engineering - P. Venugopal Rao, PHI learning Pvt. Ltd.,
4. Environmental Science and Technology by M. Anji Reddy, B S Publications.

REFERENCE BOOKS:
1. Clark, R.S., Marine Pollution, Clanderson Press, Oxford, 2002.
2. Cunningham, W.P., et al. Environmental Encyclopedia, Jaico Publishing House, Mumbai, 2003.

COURSE OUTCOMES:
1. Acquire the knowledge on environment
2. Acquire the knowledge of various Natural Resources
3. Develop skills in understanding of various environmental problems
4. Develop skills to protect the Environment

END

(A30560)INTRODUCTION TOARTIFICIAL INTELLIGENCE(MANDATORY COURSE)

B. Tech (CSE-Cyber Security) –VI Semester

L	T	P	C
3	0	0	0

UNIT-I

Introduction: AI problems, Agents and Environments, Structure of Agents, Problem Solving Agents Basic Search Strategies: Problem Spaces, Uninformed Search (Breadth-First, Depth-First Search, Depth-first with Iterative Deepening), Heuristic Search (Hill Climbing, Generic Best-First, A*) **UNIT-II**

Advanced Search: Constructing Search Trees, Stochastic Search, A* Search Implementation, Minimax Search, Alpha-Beta Pruning.

Basic Knowledge Representation and Reasoning: Propositional Logic, First-Order Logic, Forward Chaining and Backward Chaining.

UNIT-III

Advanced Knowledge Representation and Reasoning: Knowledge Representation Issues, Nonmonotonic Reasoning, Other Knowledge Representation Schemes.

UNIT-IV

Reasoning Under Uncertainty: Basic probability, Acting Under Uncertainty, Bayes' Rule, Representing Knowledge in an Uncertain Domain, Bayesian Networks.

UNIT-V

Learning: What Is Learning? Rote Learning, Learning by Taking Advice, Learning in Problem Solving, Learning from Examples, Winston's Learning Program, Decision Trees.

TEXT BOOK:

1. Russell, S. And Norvig, P, Artificial Intelligence: A Modern Approach, Third Edition, Prentice Hall, 2010.**REFERENCE BOOKS:**1. Artificial Intelligence, Elaine Rich, Kevin Knight, Shivasankar B. Nair, The McGraw Hill publications,

Third Edition, 2009. 2. George F. Luger, Artificial Intelligence: Structures and Strategies for Complex Problem Solving, Pearson Education, 6th ed., 2009.

COURSE OUTCOMES:

1. Build intelligent agents for search and games
2. Solve AI problems through programming with Python
3. Learning optimization and inference algorithms for model learning
4. Design and develop programs for an agent to learn and act in a structured environment.
5. Understand about Bayesian Networks

END

(A30013) BUSINESS MANAGEMENT & FINANCIAL ANALYSIS

	L	T	P	C
B. Tech (CSE-Cyber Security) - VII Semester	**4**	**0**	**0**	**4**

UNIT - I

Introduction of Management Concepts: Concept, Origin, Growth, Nature, Characteristics, Scope and Principles of Management. Functions of Management: Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting. Scientific Management- FW Taylor Contributions to Management Modern Management- Henry Fayol Contributions to Management Human Relations Approach to Management: Theories of Motivation and Leadership

UNIT - II

Functional areas of Management: Production Management: Systems of Production, PPC functions & Plant Layout. Financial Management: Objectives, Goals, & Functions of Financial Management. Marketing Management: Recent Trends in Marketing & Marketing Mix. Human Resources Management: Nature, Objectives, Scope & Functions of HR Management

UNIT - III

Introduction to Managerial Economics & Business Environment: Definition, Nature, Scope and Functions Managerial Economics, Difference between Micro & Macro Economics Internal & External Scanning of Business Environment, Importance of National Income, Inflation, Deflation, Stagflation, Business Cycle & Product Life Cycle Concepts. Concept & Law of Demand, Factors Influencing and Limitations. Concept of Elasticity of Demand, Types of Elasticity, Methods of Measuring Elasticity. Introduction to Demand Forecasting, Objectives, Scope, Types and Methods.

UNIT- IV

Theory of Production, Cost, Price & Markets: Production Function, Assumptions, Limitations & Types Cost Concepts, Cost-Output Relationship, Break Even Analysis Assumptions, Limitations & Applications (Simple Problems). Theory of Pricing, Objectives, Situations & Types. Introductions Markets, Demand-Supply Schedule for Equilibrium Price, Nature & Types of Competition.

UNIT - V

Introduction to Financial Statement Analysis: Types & Objectives of Business Enterprises, Conventional & Non-Conventional Sources of Financing Business Enterprise. Identification of Financial Statement Formats-Manufacturing A/c, Trading A/c, Profit & Loss A/c, Balance Sheet. Techniques of Analyzing Financial Statements: Analysis & Interpretation through Liquidity, Leverage, Coverage, Activity, Turnover, Profitability Ratios-Simple Problems on Liquidity, Leverage and Activity Ratios

TEXT BOOKS:

1.Varshney, Maheswari (2003), Managerial Economics, Sultan Chand, New Delhi, India.
2. Stoner, Freeman, Gilbert, Management, 6th Ed, Pearson Education, New Delhi,
2004.

REFERENCE BOOKS:
1. Kotler Philip & Keller Kevin Lane: Marketing Mangement 12/e, PHI, 2005
2. Koontz &Weihrich: Essentials of Management, 6/e, TMH, 2005 Thomas N. Duening& John M. Ivancevich Management—Principles and Guidelines, Biztantra, 2003.
3. Ambrish Gupta (2004), Financial Accounting for Management, Pearson Education, New Delhi, India.
4. Domnick Salvatore (2011), Managerial Economics in a Global Economy, 7th edition, Oxford University Press, United States of America.
5. Narayanaswamy (2005), Financial Accounting, A Managerial Perspective, Prentice Hall of India private Ltd, New Delhi, India.
6. Aryasri (2005), Managerial Economics and Financial Analysis, 2nd edition, Tata McGraw Hill, New
   Delhi, India

COURSE OUTCOMES:
1. Float different forms of business enterprises and generate capital from various sources.

2. Analyze financial stability of an enterprise in view of cut-throat competition from rivals.

3. Tune Enterprise in accordance with changes in surround economic environment.

4. Forecast demand, production, cost, capital, price under different market situations for variousproducts of business enterprise in general.

5. Employ various functions of management in different functional areas of enterprise.

END

(A30541) COMPUTER VISION & IMAGE PROCESSING
(PROFESSIONAL ELECTIVE-III)

B. Tech (CSE-Cyber Security) VII Semester

L	T	P	C
3	0	0	3

UNIT-I
Introduction: Image Formation and Coordinate Transformations, Camera Matrix, Motion/Stereo Pin-hole model, Human eye cognitive aspects of colour and 3D space; illumination; Sampling and Quantization, Coordinate transformations and camera parameter, 3D transformations problem, Introduction to OpenCV : Image Data Structure, Coding format.

UNIT–II
Image Processing & Motion Estimation: Image Processing - Noise Removal, Blurring, Edge Detection: Canny, Gaussian, Gabor, Texture Edges, Curvature, Corner Detection. Motion Estimation: Horn-Schunk Optical Flow Formulation, Euler-Lagrange formulation: Calculus of variations theory. Structure Recovery from Motion [Kanade]

UNIT–III
Segmentation: Concept of Figure vs. Ground, Watershed, Change Detection, Background Subtraction, Texture Segmentation Gaussian Mixture Models - Applications in Color/Motion based Image Segmentation, Background Modeling and Shape Clustering

UNIT-IV
Machine Learning techniques in Vision & Object Tracking: Bayesian Classification, Maximum Likelihood Methods, Neural Networks; Non-parametric models; Manifold estimation, Support Vector Machines; Temporal sequence learning
Object Tracking: Exhaustive vs. Stochastic Search, Shapes, Contours, and Appearance Models. Mean-shift tracking; Contour-based models

UNIT–V

Object Modeling & Detection: Exhaustive vs. Stochastic Search Shapes, Contours, and Appearance Models. Mean-shift tracking: Contour-based models, Fundamental matrix / Epipolar geometry Adaboost approaches: Face Detection / Recognition Large Datasets; Attention models. Applications: Surveillance, Object detection, etc.

TEXT BOOKS:
1. David Forsyth and Jean Ponce, Computer Vision: A modern Approach, Prentice Hall India 2004:
2. Christopher Bishop, Pattern Recognition and Machine Learning, Springer, 2008

REFERENCE BOOKS:
1. E.R. Davies, Machine Vision, Theory Algorithms Practicalities, Elsevier 2005
2. Milan Sonka, Vaclav Hlavac and Roger Boyle, Image Processing, Analysis, and Machine Vision. Brooks/Cole / Thomson 1999
3. Russell and Norvig: AI: A modern Approach, Prentice Hall 2000.
4. Richard Hartley and Andrew Zisserman, Multiple View Geometry in Computer Vision, Cambridge Univ Press 2000
5. Richard O. Duda, Peter E. Hart, and David G. Stork, Pattern Classification, 2nd ed., Wiley Asia, 2002. 6. Rafael C. Gonzalez and Richard E. Woods "Digital Image Processing", Pearson
7. Rafael C. Gonzalez, Richard E. Woods and Steven L. Eddins "Digital Image Processing Using MATLAB", McGraw Hill Education

COURSE OUTCOMES:
1.Explain Sampling, Quantization, techniques
2.Describe Edge detection techniques
3.Apply Machine learning techniques for object tracking
4.Perform Object Modelling
5.Explain Contour based models

END
(A36219)NETWORK CODING THEORY

(Professional Elective - III)

B. Tech (CSE-Cyber Security) VII Semester	L	T	P	C
	3	0	0	3

UNIT - I

Introduction: A historical Perspective, Network Coding; Network Coding Benefits: Throughput,
Robustness, Complexity, Security; Network Model.Main Theorem of Network
Multicast: The Min-Cut Max-flow Theorem, The Main network coding Theorem, Theoretical Framework for Network Coding: A Network Multicast Model, algebraic Framework, Combinatorial Framework, Information-Theoretic Framework, Types of Routing and coding.

UNIT - II

Throughput Benefits of Network Coding: Throughput Measures, Linear Programming Approach, Configurations with Large Network Coding Benefits, Configurations with Small Network Coding Benefits,
Undirected Graphs.Networks with Delay and Cycles: Dealing with Delay, Optimizing for Delay, Dealing with Cycles.Resources for Network Coding: Bounds on Code Alphabet Size, Bounds on the Number of Coding Points, Coding with Limited Resources.

UNIT - III

Network Code Design Methods For Multicasting: Common initial procedure, centralized algorithms, decentralized algorithms, scalability to network changes.
Single-Source Linear Network Coding: Acyclic Networks: Acyclic Networks, Linear network code, Desirable properties of a linear network code, Existence and construction, Algorithm refinement for multicast.Cyclic Networks: Delay-Free Cyclic Code, Non-equivalence between local and global descriptions, Convolutional network code, decoding of convolutional network code.

UNIT - IV

Inter-Session Network Coding: Scalar and vector linear network coding, Fractional coding problem formulation, Insufficiency of linear network coding.
Information theoretic approaches: Multiple unicast networks;
Constructive approaches: Pairwise XOR coding in wireline networks, XOR coding in wireless networks. Network Coding in Lossy Networks: Random linear network coding, Coding theorems: Unicast connections, Multicast connections, Error exponents for Poisson traffic with i.i.d. losses. Subgraph Selection:
Flow-based approaches: Intra-session coding, Computation-constrained coding, Inter-session coding; Queue-Length-Based approaches: Intra-session network coding for multicast sessions, Inter-session coding.

UNIT - V
Multiple Sources Network Coding: Superposition coding and max-flow bound; Network Codes for Acyclic Networks: Achievable information rate region, Inner bound Rin, Outer bound Rout, RLP – An explicit outer bound. Security against adversarial
Errors: Error correction: Error Correcting bounds for centralized network coding, Distributed random network coding and polynomial-complexity error correction; Detection of adversarial errors: Model and problem formulation, Detection probability.

TEXT BOOKS:
1. Raymond W. Yeung, Shuo-Yen Robert Li, Ning Cai, Zhen Zhang, "Network Coding Theory",
   now publishers Inc, 2006, ISBN: 1-933019-24-7.
2. Christina Fragouli, Emina Soljanin, "Network Coding Fundamentals", now publishers Inc,
   2007, ISBN: 978-1-60198-032-8.

REFERENCE BOOKS:
1. Tracey Ho, Desmond Lun, "Network Coding: An Introduction", Cambridge University Press,   2008, ISBN: 978-0-521-87310-9.

2. Muriel Medard, Alex Sprintson, "Network Coding: Fundamentals and Applications", 1st Edition, 2012, Academic Press, Elsevier, ISBN: 978-0-12-380918-6.

COURSE OUTCOMES:
1. Demonstrate knowledge and understanding of the fundamentals of Network Coding Theory.
2. Summarize all the performance parameters and resources for network coding.
3. Construct the network code for different networks.
4. Deal with different approaches of Network Coding in lossy and lossless networks.
5. Deal with multiple sources network coding and detect adversarial errors.

END

(A30536) ADHOC & SENSOR NETWORKS
(PROFESSIONAL ELECTIVE-III)

B. Tech (CSE-Cyber Security) VII Semester	L	T	P	C
	3	0	0	3

UNIT-I

Introduction to Ad Hoc Networks - Characteristics of MANETs, Applications of MANETs and Challenges of MANETs. Routing in MANETs - Criteria for classification, Taxonomy of MANET routing algorithms, Topology based routing algorithms-Proactive: DSDV; Reactive: DSR, AODV; Hybrid: ZRP; Positionbased routing algorithms-Location Services-DREAM, Quorum-based; ; Forwarding Strategies: Greedy Packet, Restricted Directional Flooding-DREAM, LAR..

UNIT–II

Data Transmission - Broadcast Storm Problem, Rebroadcasting SchemesSimple-flooding, Probability based Methods, Area-based Methods, Neighbor Knowledge-based: SBA, Multipoint Relaying, AHBP. Multicasting: Tree-based: AMRIS, MAODV; Mesh-based: ODMRP, CAMP; Hybrid: AMRoute, MCEDAR.

UNIT–III

Geocasting: Data-transmission Oriented-LBM; Route Creation Oriented GeoTORA, MGR.TCP over Ad Hoc TCP protocol overview, TCP and MANETs, Solutions for TCP over Ad hoc.

UNIT-IV

Basics of Wireless, Sensors and Lower Layer Issues
Applications, Classification of sensor networks, Architecture of sensor network, Physical layer, MAC layer, Link layer, Routing Layer.

UNIT–V

Upper Layer Issues of WSN

Transport layer, High-level application layer support, Adapting to the inherent dynamic nature of WSNs, Sensor Networks and mobile robots.

TEXT BOOKS:

1. Ad Hoc and Sensor Networks – Theory and Applications, Carlos Corderio Dharma P. Aggarwal,

   World Scientific Publications, March 2006.

REFERENCE BOOKS:

1. Wireless Sensor Networks: An Information Processing Approach, Feng Zhao, Leonidas Guibas,

    Elsevier Science.

2.Wirelss Communications & Networks 2/e, William Stallings, PEA , 2007.

3.Handbook of Wireless Networks and Mobile Computing, Ivan Stojmenovic, Wiley, 2007.

COURSE OUTCOMES:

1. Appraise the importance of Adhoc networks such as MANET

2. Explain the design considerations for deploying the wireless network infrastructure.

3. Describe the state-of-the-art research in the emerging subject of Ad Hoc and Wireless Sensor Networks

4. Solve the issues in real-time application development based on ASN.

5. Conduct further research in the domain of ASN

END

(A30535) MACHINE LEARNING
(PROFESSIONAL ELECTIVE-IV)

B. Tech (CSE-Cyber Security) VII Semester   L   T   P   C
                                                        3   0   0   3

UNIT - I

Introduction: Well-posed learning problems, designing a learning system, Perspectives and issues in machine learning Concept learning and the general to specific ordering – introduction, a concept learning task, concept learning as search, find-S: finding a maximally specific hypothesis, version spaces and the candidate elimination algorithm, remarks on version spaces and candidate elimination, inductive bias.

Decision Tree Learning: Introduction, decision tree representation, appropriate problems for decision tree learning, the basic decision tree learning algorithm, hypothesis space search in decision tree learning, inductive bias in decision tree learning, issues in decision tree learning.

UNIT - II

Artificial Neural Networks-1: Introduction, neural network representation, appropriate problems for neural network learning, perceptions, multilayer networks and the back-propagation algorithm.

Artificial Neural Networks-2: Remarks on the Back-Propagation algorithm, An illustrative example: face recognition, advanced topics in artificial neural networks.

Evaluation Hypotheses: Motivation, estimation hypothesis accuracy, basics of sampling theory, a general approach for deriving confidence intervals, difference in error of two hypotheses, comparing learning algorithms.

UNIT - III

Bayesian learning: Introduction, Bayes theorem, Bayes theorem and concept learning, Maximum Likelihood and least squared error hypotheses, maximum likelihood hypotheses for predicting probabilities, minimum description length principle, Bayes optimal classifier, Gibs algorithm, Naïve Bayes classifier, an

example: learning to classify text, Bayesian belief networks, the EM algorithm.
Computational learning theory: Introduction, probably learning an approximately correct hypothesis, sample complexity for finite hypothesis space, sample complexity for infinite hypothesis spaces, the mistake bound model of learning.

Instance-Based Learning: Introduction, k-nearest neighbor algorithm, locally weighted regression, radial basis functions, case-based reasoning, remarks on lazy and eager learning.

UNIT - IV

Genetic Algorithms: Motivation, Genetic algorithms, an illustrative example, hypothesis space search, genetic programming, models of evolution and learning, parallelizing genetic algorithms.

Learning Sets of Rule: Introduction, sequential covering algorithms, learning rule sets: summary, learning First-Order rules, learning sets of First-Order rules: FOIL, Induction as inverted deduction, inverting resolution.

Reinforcement Learning: Introduction, the learning task, Q–learning, nondeterministic, rewards and actions, temporal difference learning, generalizing from examples, relationship to dynamic programming.

UNIT –V

Analytical Learning-1: Introduction, learning with perfect domain theories: PROLOG-EBG, remarks on explanation-based learning, explanation-based learning of search control knowledge.

Analytical Learning-2: Using prior knowledge to alter the search objective, using prior knowledge to augment search operators.

Combining Inductive and Analytical Learning: Motivation, inductive-analytical approaches to learning, using prior knowledge to initialize the hypothesis.

TEXT BOOKS:

1. Tom M. Mitchell, Machine Learning, Mc Graw Hill,1997.

REFERENCE BOOKS:

1.Machine Learning: An Algorithmic Perspective, Stephen Marshland, Taylor & Francis

COURSE OUTCOMES:

1.Apply Decision Tree Learning.

2.Represent neural networks and explain the properties of neural networks

3.Apply machine learning techniques to address the real time problems in differentAreas.

4.Describe Neural Networks and its usage in machine learning application.

5.Explain Genetic Algorithms, Genetic Programming, Reinforcement Learning techniques.

END

(A36221) CLOUD SECURITY
(Professional Elective - IV)

B. Tech (CSE-Cyber Security) VII Semester   **L   T   P   C**
                                                        3   0   0   3

UNIT - I
Cloud Computing Fundamentals: Cloud Computing definition, private, public and hybrid cloud. Cloud types; IaaS, PaaS, SaaS. Benefits and challenges of cloud computing, public vs private clouds, role of virtualization in enabling the cloud; Business Agility: Benefits and challenges to Cloud architecture.

UNIT - II
Cloud Applications: Technologies and the processes required when deploying web servicesDeploying a web service from inside and outside a cloud architecture, advantages and disadvantages- Development environments for service development; Amazon, Azure, Google App.

UNIT – III
Securing The Cloud: Security Concepts - Confidentiality, privacy, integrity, authentication, nonrepudiation, availability, access control, defence in depth, least privilege- how these concepts apply in the cloud and their importance in PaaS, IaaS and SaaS. e.g. User authentication in the cloud

UNIT - IV
Virtualization Security: Multi-tenancy Issues: Isolation of users/VMs from each other- How the cloud provider can provide this- Virtualization System Security Issues: e.g. ESX and ESXi Security, ESX file system security- storage considerations, backup and recovery- Virtualization System Vulnerabilities.

UNIT - V

Cloud Security Management: Security management in the cloud – security management ~~standardsSaaS, PaaS, IaaS availability management- access control-~~ Data security and storage in cloud.

TEXT BOOKS:

1. Gautam Shroff, "Enterprise Cloud Computing Technology Architecture Applications",   Cambridge University Press; 1 edition [ISBN: 978-0521137355], 2010.

2. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach",   Tata McGraw-Hill Osborne Media; 1 edition 22, [ISBN: 0071626948], 2009.

REFERENCE BOOKS :

1. Tim Mather, Subra Kumaraswamy, Shahed Latif, "Cloud Security and Privacy: An Enterprise   Perspective on Risks and Compliance", O'Reilly Media; 1 edition, [ISBN: 0596802765], 2009.

2. Ronald L. Krutz, Russell Dean Vines, "Cloud Security", Wiley [ISBN: 0470589876], , 2010.

COURSE OUTCOMES:

1.Understand the fundamentals of cloud computing.

2.Understand the requirements for an application to be deployed in a cloud.

3. Become knowledgeable in the methods to secure cloud.

4. Able to understand about cloud security

5. Able to understand about cloud security

END

(A36220) DATA ANALYTICS FOR FRAUD DETECTION
(Professional Elective - IV)

B. Tech (CSE-Cyber Security) VII Semester	L	T	P	C
	3	0	0	3

UNIT - I
Introduction: Defining Fraud, Anomalies versus, Fraud, Types of Fraud, Assess the Risk of Fraud, Fraud Detection, Recognizing Fraud, Data Mining versus Data Analysis and Analytics, Data Analytical Software, Anomalies versus Fraud within Data, Fraudulent Data Inclusions and Deletions

UNIT - II
The Data Analysis Cycle, Evaluation and Analysis, Obtaining Data Files, Performing the Audit, File Format Types, Preparation for Data Analysis, Arranging and Organizing Data, Statistics and Sampling, Descriptive Statistics, Inferential Statistics

UNIT - III
Data Analytical Tests, Benford's Law, Number Duplication Test , Z-Score, Relative Size Factor Test, Same-Same-Same Test , Same-Same-Different Test

UNIT - IV
Advanced Data Analytical Tests Correlation, Trend Analysis, , GEL-1 and GEL-2 , Skimming and Cash Larceny, Billing schemes : and Data Familiarization, , Benford's Law Tests, Relative Size Factor Test , Match Employee Address to Supplier data

UNIT - V
Payroll Fraud, Expense Reimbursement Schemes, Register disbursement schemes

TEXT BOOK:
1.Fraud and Fraud Detection: A Data Analytics Approach by Sunder Gee, Wiley

REFERENCE BOOK:

1. David Dietrich, Barry Heller and Beibei Yang, ―Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data‖, EMC Education Services,

COURSE OUTCOMES:

1. Formulate reasons for using data analysis to detect fraud.

2. Explain characteristics and components of the data and assess its completeness.

3. Identify known fraud symptoms and use digital analysis to identify unknown fraud symptoms.

4. Automate the detection process.

5. Verify results and understand how to prosecute fraud.

END

(A30534) DESIGN PATTERNS
(PROFESSIONAL ELECTIVE-V)

B. Tech (CSE-Cyber Security) VII Semester	L	T	P	C
	3	0	0	3

UNIT-I

Introduction: What is a design pattern? design patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

UNIT–II

Designing a Document Editor: Design Problems, Document Structure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation, Summary.

UNIT–III

Creational Patterns: Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT-IV

Structural Pattern: Adapter, Bridge, Composite, Decorator, Facade, Flyweight, Proxy.

UNIT–V

Behavioral Patterns: Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy, Template Method, Visitor.

TEXT BOOK:
1. Design Patterns, Erich Gamma, Pearson Education

REFERENCE BOOKS:

1. Pattern's in Java, Vol –I, Mark Grand, Wiley DreamTech.
2. Pattern's in Java, Vol-II, Mark Grand, Wiley DreamTech.
3. Java Enterprise Design Patterns Vol-III, Mark Grand, Wiley DreamTech.
4. Head First Design Patterns, Eric Freeman, O'reily publications

COURSE OUTCOMES:
1. Explain Object-Oriented concepts for creating truly OOP programs
2. Use creational design patterns in software design for class instantiation
3. Describe structural design patterns for better class and object composition
4. Use behavioral patterns for better organization and communication between the
     objects
5. Use refactoring to compose the methods for proper code packaging

END

(A36222) BIOMETRIC SYSTEMS
(PROFESSIONAL ELECTIVE-V)

B. Tech (CSE-Cyber Security) VII Semester   L   T   P   C

                                                                3   0   0   3

UNIT- I

Introduction -:Biometric fundamentals – Biometric technologies – Biometrics vs. traditional techniques – Characteristics of a good biometric system – Benefits of biometrics – Key biometric processes: verification, identification and biometric matching – Performance measures in biometric systems.

UNIT - II

Physiological Biometrics: Leading technologies: Finger-scan – Facial-scan – Irisscan – Voice- scan – components, working principles, competing technologies, strengths, and weaknesses – Other physiological biometrics: Hand-scan, Retinascan – components, working principles, competing technologies, strengths, and weaknesses – Automated fingerprint identification systems. Behavioural Biometrics: Leading technologies: Signature-scan – Keystrokescan – components, working principles, strengths, and weaknesses.

UNIT - III

Standards in Biometrics: Assessing the Privacy Risks of Biometrics – Designing Privacy - Sympathetic Biometric Systems – Need for standards – different biometric standards - Categorizing biometric applications.

UNIT - IV

Multi Biometrics: Multi-sensor systems, Multi-algorithm systems, Multi-instance systems, Multi-sample systems, Multimodalsystems, Acquisition and Processing Architecture, Fusion Levels.

UNIT - V

Security Of Biometric Systems: Adversary Attacks, Insider attacks, Infrastructure attacks, Attacks at the User Interface, Impersonation, Obfuscation,

Spoofing, Countermeasure: spoof detection, Attacks on Biometric Processing, Attacks on the system modules, Attacks at the interconnections, Attacks on the Template Database.

TEXT BOOKS:

1. Anil K. Jain, Patrick Flynn, and Arun A. Ross, "Handbook of Biometrics," Springer, 2008.
2. Jain, A. K., Ross, A. A., & Nandakumar, K. (2011). Introduction to biometrics. Springer Science & Business Media.

REFERENCE BOOKS:

1. Paul Reid, Samir Nanavati, Michael Thieme and Raj Nanavati, "Biometrics – Identity Verification in a
   Networked World," Wiley-Dream Tech India Private Limited, New Delhi, 2003.
2. John R. Vacca, "Biometric Technologies and Verification Systems," Elsevier Inc, 2007.

COURSE OUTCOMES:

1.Identify the various Biometric technologies.
2.Design of biometric recognition for the organization.
3.Develop simple applications for privacy.
4. Understand the research on biometric techniques.
5.Understand the need for biometric in society.

(A36223) SECURE CODING
(PROFESSIONAL ELECTIVE-V)

B. Tech (CSE-Cyber Security) VII Semester

L	T	P	C
3	0	0	3

Unit -I

Introduction: Security, CIA Triad, Viruses, Trojans, and Worms In a Nutshell, Security Concepts- exploit, threat, vulnerability, risk, attack. Malware Terminology: Rootkits, Trapdoors,Botnets, Key loggers, Honeypots. Active and Passive Security Attacks. IP Spoofing, Tear drop,DoS, DDoS,XSS, SQL injection, Smurf, Man in middle, Format String attack. Types of Security Vulnerabilities- buffer overflows, Invalidated input, race conditions, access-control problems, weaknesses in authentication, authorization, or cryptographic practices. Access Control Problems.

Unit-II

Need for secure systems: Proactive Security development process, Secure Software Development Cycle (S-SDLC) , Security issues while writing SRS, Design phase security, Development Phase, Test Phase, Maintenance Phase, Writing Secure Code – Best Practices SD3 (Secure by design, default and deployment), Security principles and Secure Product Development Timeline. Threat modelling process and its benefits: Identifying the Threats by Using Attack Trees and rating threats using DREAD, Risk Mitigation Techniques and Security Best Practices. Security techniques, authentication, authorization. Defence in Depth and Principle of Least Privilege.

Unit -III

Secure Coding Techniques: Protection against DoS attacks, Application Failure Attacks, CPU Starvation Attacks, Insecure Coding Practices In Java Technology. ARP Spoofing and its countermeasures. Buffer Overrun- Stack overrun, Heap Overrun, Array Indexing Errors,FormatString Bugs. Security Issues in C Language: String Handling, Avoiding Integer Overflows and Underflows and Type Conversion Issues- Memory Management Issues, Code Injection Attacks,Canary based countermeasures using StackGuard and Propolice. Socket Security, Avoiding Server Hijacking, Securing RPC, ActiveX and DCOM

Unit -IV

Database and Web-specific issues: SQL Injection Techniques and Remedies,Race conditions, Time of Check Versus Time of Use and its protection mechanisms. Validating Input and Interprocess Communication, Securing Signal Handlers and File Operations. XSS scripting attack and its types – Persistent and Non persistent attack XSS Countermeasures and Bypassing the XSS Filters.

Unit-V

Testing Secure Applications: Security code overview, secure software installation. The Role of the Security Tester, Building the Security Test Plan. Testing HTTP-Based Applications, Testing File-Based Applications, Testing Clients with Rogue Servers

TEXT BOOKS:
1. Writing Secure Code, Michael Howard and David LeBlanc,Microsoft Press, 2nd Edition, 2004
2. Buffer Overflow Attacks: Detect, Exploit, Prevent by Jason Deckar,Syngress,1st Edition, 2005

REFERENCE BOOK:
1. Threat Modeling, Frank Swiderski and Window Snyder,Microsoft Professional, 1st Edition,
2004.

COURSE OUTCOMES:
1.To implement security as a culture and show mistakes that make applications vulnerable   to attacks.
2.To understand various attacks like DoS, buffer overflow, web specific, database specific, Web-spoofing attacks.
3.To demonstrate skills needed to deal with common programming errors that lead to most Security problems and to learn how to develop secure applications.
4.To identify the nature of the threats to software and incorporate secure coding practices throughout the planning and development of the product.
5.Able to properly handle application faults, implement secure authentication, authorization and data validation controls used to prevent common vulnerabilities.

(A30543) NATURAL LANGUAGE PROCESSING
(PROFESSIONAL ELECTIVE-VI)

B. Tech (CSE-Cyber Security) VIII Semester　　　　**L　T　P　C**
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　3　0　0　3

UNIT -I

Finding the Structure of Words: Words and Their Components, Issues and Challenges, Morphological Models. Finding the Structure of Documents: Introduction, Methods, Complexity of the Approaches, Performances of the Approaches.

UNIT –II

Syntax Analysis: Parsing Natural Language, Treebanks: A Data-Driven Approach to Syntax, Representation of Syntactic Structure, Parsing Algorithms, Models for Ambiguity Resolution in Parsing, Multilingual Issues

UNIT –III

Semantic Parsing: Introduction, Semantic Interpretation, System Paradigms, Word Sense Systems, Software.

UNIT –IV

Predicate-Argument Structure, Meaning Representation Systems, Software.

UNIT –V

Discourse Processing: Cohension, Reference Resolution, Discourse Cohension and Structure Language Modeling: Introduction, N-Gram Models, Language Model Evaluation, Parameter Estimation, Language Model Adaptation, Types of Language Models, Language-Specific Modeling Problems, Multilingual and Cross lingual Language Modeling.

TEXT BOOKS:

1. Multilingual natural Language Processing Applications: From Theory to Practice, Daniel M. Bikel and ImedZitouni, Pearson Publication

2. Natural Language Processing and Information Retrieval, Tanvier Siddiqui, U.S. Tiwary.

REFERENCE BOOK:

1. Speech and Natural Language Processing, Daniel Jurafsky& James H Martin, Pearson Publications.

COURSE OUTCOMES

1.Infer knowledge about model and functional Units of Artificial Neural Networks

2. Illustrate different types of Feedforward Networks

3. Apply different Deep Neural Networks in real world problems

4. Apply different Convolutional Neural Networks in real world problems

5. Illustrate different types of Recurrent Neural Networks

END

(A36224)OS SECURITY
(PROFESSIONAL ELECTIVE-VI)

B. Tech (CSE-Cyber Security) VIII Semester	L	T	P	C
	3	0	0	3

Unit-I

Processes: Processes, Threads, Inter Process Communications (IPC) , Synchronization –Semaphores, Monitors, Scheduling, Classical IPC problems, Case study – Process in Linux, User and Kernel threads,

Unit-II

Memory Management : Memory abstraction, Virtual memory, Page replacement algorithms, Design issues for paging system, Segmentation.

Unit-III

File Systems: Files, Directories, File System Management and Optimization. Virtualization Techniques.

Unit-IV

Introduction to OS Security: .Linux Kernel Modules.Linux Security Modules, SELinux.Malwares. Introduction to Kernel exploitation – User space vs. Kernel space Attacks, Kernel Stack Vulnerabilities. Case study – Linux kernel

TEXT BOOKS:

1.Andrew S. Tanenbaum, "Modern Operating Systems", Third Edition, Prentice Hall, 2009.

2.Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts with Java", Ninth Edition, Wiley, 2012.

3.Trent Jaeger ,"Operating System Security", Morgan and Claypool, 2008

4.Enrico Perla, MassimilianoOldani, "A Guide to Kernel Exploitation – Attacking the Core", VElsevier, Syngress, 2011

REFERENCE BOOKS:

1.Wolfgang Mauerer, "Professional Linux Kernel Architecture", Wiley, 2008.

2.Daniel P. Bovet and Marco Cesati, "Understanding the Linux Kernel", Third Edition,O'Reilly, 2006.

3.W. Richard Stevens, Stephen A. Rago, "Advanced Programming in the Unix Environment", Third Edition, 2013.

COURSE OUTCOMES :
1.To Understand about Operating Systems Fundamentals
2.To Known about Popular Operating Systems
3. To gain knowledge about page replacement algorithms
4. Installing and Upgrading Operating Systems
5. Understand about security of OS

END

(A30545) BLOCK CHAIN TECHNOLOGIES
(PROFESSIONAL ELECTIVE-VI)

B. Tech (CSE-Cyber Security) VIII Semester	L	T	P	C
	3	0	0	3

UNIT-I

Introduction: Overview of Block chain, Public Ledgers, Bitcoin, Smart Contracts, Block in a Block chain, Transactions, Distributed Consensus, Public vs Private Block chain, Understanding Crypto currency to Block chain, Permissioned Model of Block chain, Overview of Security aspects of Block chain Basic Crypto Primitives: Cryptographic Hash Function, Properties of a hash function, Hash pointer and Merkle tree, Digital Signature, Public Key Cryptography, A basic cryptocurrency.

UNIT–II

Bitcoin and Block chain: Creation of coins, Payments and double spending, Transaction in Bitcoin Network, Block Mining. Working with Consensus in Bitcoin: Distributed consensus in open environments, Consensus in a Bitcoin network, Proof of Work (PoW) – basic introduction, HashcashPoW, Bitcoin PoW, Proof of Stake, Proof of Burn and Proof of Elapsed Time, The life of a Bitcoin Miner, Mining Difficulty, Mining Pool.

UNIT–III

Enterprise application of Block chain: Cross border payments, Know Your Customer (KYC), Food Security, Block chain enabled Trade, We Trade – Trade Finance Network, Supply Chain Financing, and Identity on Block chain.

UNIT-IV

Attacking the Blockchain with a Framework Approach: Technical Challenges, Market/Business Challenges, Legal /Regulatory Barriers and Behavioral/Educational Challenges, Blockchain in Financial Services: Blockchain Applications in Financial Services, Strategic Questions for Financial Services.

UNIT–V

Hyperledger ~~Fabric~~ Architecture, Identities and Policies, Membership and Access Control, Transaction Validation, Bitcoin Security, Limitations and How to Overcome Blockchains, Reinventing the Blockchain, The Ten Rules to Never Break on the Blockchain.

TEXT BOOKS:

1. Melanie Swan, "Block Chain: Blueprint for a New Economy", O'Reilly, 2015
2. Josh Thompsons, "Block Chain: The Block Chain for Beginners- Guide to Block chain Technology and Leveraging Block Chain Programming"
3. Daniel Drescher, "Block Chain Basics", Apress; 1stedition, 2017
4. Anshul Kaushik, "Block Chain and Crypto Currencies", Khanna Publishing House, Delhi.

REFERENCE BOOKS:

1. Blockchain for Dummies by Manav Gupta, John Wiley & Sons publication
2. Mastering Bitcoin Unlocking Digital Crypto currencies‖, by Andreas M. Antonopoulos, O 'Reilly Publication, 1st Edition.
3. Ritesh Modi, "Solidity Programming Essentials: A Beginner's Guide to Build Smart Contracts for Ethereum and Block Chain", Packt Publishing
4. Imran Bashir, "Mastering Block Chain: Distributed Ledger Technology, Decentralization and Smart Contracts Explained", Packt Publishing
5. Salman Baset, Luc Desrosiers, Nitin Gaur, Petr Novotny, Anthony O'Dowd, Venkatraman Ramakrishna, "Hands-On Block Chain with Hyperledger: Building Decentralized Applications with Hyperledger Fabric and Composer", Import, 2018.

COURSE OUTCOMES:

1. Describe Block chain Technology.
2. Explain Block chain with Crypto currency
3. Build and deploy block chain applications
4. List the obstacles, challenges of Blockchain
5. Analyze hashing applications in real time scenarios

END

(A30554) JAVA PROGRAMMING
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT-I

Introduction: Java Essentials, JVM, Java Features, Creation and Execution of Programs, Data Types, Type Conversion, Casting, Conditional Statements, Loops, Branching Mechanism, Classes, Objects, Class Declaration, Creating Objects, Method Declaration and Invocation, Method Overloading, Constructors– Parameterized Constructors, Constructor Overloading, Cleaning-up unused Objects, Class Variables & Methods-static Keyword, this Keyword.

UNIT–II

Arrays: One-Dimensional Arrays, Two-Dimensional Arrays, Command-Line Arguments, Inner Class. **Inheritance**: Introduction, Types of Inheritance, extends Keyword, Examples, Method Overriding, super, final Keywords, Abstract classes, Interfaces, Abstract Classes Verses Interfaces.

UNIT–III

Packages–Creating and Using Packages, Access Protection, Wrapper Classes, String Class, StringBuffer Class. **Exception**: Introduction, Types, Exception Handling Techniques, User-Defined Exception.

UNIT-IV

Multithreading: Introduction, Main Thread, Creation of New Threads – By Inheriting the Thread Class or Implementing the Runnable Interface, Thread Lifecycle, Thread Priority, Synchronization.

UNIT–V

java.io Package, File Class, FileInputStream Class, FileOutputStream Class, Scanner Class, BufferedInputStream Class, BufferedOutputStream Class, RandomAccessFile Class.

TEXT BOOK:
1.Sachin Malhotra, Saurabh Choudhary, Programming in Java (2e),
Oxford publications.

REFERENCE BOOKS:

1.Herbert Schildt, Java: The Complete Reference (9e), McGraw Hill Education;

2. C. Thomas Wu, An introduction to object-oriented programming with Java (5e), McGraw-Hill

   Education;

COURSE OUTCOMES:

1. Explain the OOPs concepts.

2. Describe various types of Inheritance in Java.

3. Develop robust Java applications using Packages, Exceptions.

4. Implement Java applications using Java Threads.

5. Design Java applications with various modes of Input and output

END

(A30531) PYTHON PROGRAMMING
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT-I

Introduction to Python, Installing Python. How a Program Works, Using Python, Program Development Cycle, Input, Processing, and Output, Displaying Output with the Print Function, Comments, Variables, Reading Input from the Keyboard, Performing Calculations, Operators. Type conversions, Expressions, More about Data Output. Decision Structures and Boolean Logic: if, if-else, if-elif-else Statements, Nested Decision Structures, Comparing Strings, Logical Operators, Boolean Variables. Repetition Structures: Introduction, while loop, for loop, Calculating a Running Total, Input Validation Loops, Nested Loops.
Data types and Expressions: Strings, Assignment and Comments, Numeric Data Types and Character Sets, Expressions, Functions and Modules.

UNIT–II

Control Statements: Definite Iteration, Formatting Text for Output, Selection, Conditional Iteration. File and Exceptions: Introduction to File Input and Output, Using Loops to Process Files, Processing Records, Exceptions. Functions: Introduction, Defining and Calling a Void Function, designing a Program to Use Functions, Local Variables, Passing Arguments to Functions, Global Variables and Global Constants, Value-Returning Functions-Generating Random Numbers, the math Module, Storing Functions in Modules.

UNIT–III

Python Data structures: Accessing Characters and Substrings in a String, Strings and Number System, String Methods, Basic String Operations, String Slicing, Testing, Searching, and Manipulating Strings. Text Files, Data Encryption, Lists, Introduction to Lists, List slicing, Finding Items in Lists with the in Operator, List Methods and Useful Built-in Functions, Copying Lists, Processing Lists, Two-Dimensional Lists, Tuples Sequences, Tuples. Dictionaries and Sets: Dictionaries, Sets, Serializing Objects. Recursion: Introduction, Problem Solving with Recursion, Examples of Recursive Algorithms

UNIT-IV

Design with Classes: Classes and Objects, Classes and Functions, Classes and Methods, Working with Instances, Inheritance and Polymorphism. Object-

Oriented Programming: Procedural and Object-Oriented Programming, Classes, techniques for Designing Classes

UNIT–V

Graphical User Interfaces: Behavior of terminal-based programs and GUI-based programs, Coding simple GUI-based programs, other useful GUI resources. GUI Programming: Graphical User Interfaces, Using the tkinter Module, Display text with Label Widgets, Organizing Widgets with Frames, Button Widgets and Info Dialog Boxes, Getting Input with Entry Widget, Using Labels as Output Fields, Radio Buttons, Check Buttons.

Simple Graphics and Image Processing: Overview of Turtle Graphics, Two dimensional Shapes, Colors and RBG System, Image Processing.

TEXT BOOKS:

1. Kenneth A. Lambert, The Fundamentals of Python: First Programs, 2011, Cengage Learning.
2. Think Python First Edition, by Allen B. Downey, Orielly publishing

REFERENCE BOOKS:

1. Introduction to Computation and Programming Using Python. John V. Guttag, The MIT Press.
2. James Payne, Beginning Python using Python 2.6 and Python 3, Wroxpublishing
3. Paul Gries, Practical Programming: An Introduction to Computer Science using Python 3, The Pragmatic Bookshelf, 2nd edition

COURSE OUTCOMES:

1. Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python

2. Express different Decision-Making statements and Functions

3. Interpret Object oriented programming in Python

4. summarize different File handling operations

5. Explain how to design GUI Applications in Python and evaluate different database Operations.

<div align="center">**END****</div>

(A30555) INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS (OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT-I

Introduction to Databases: Introduction, Traditional File-Based Systems, Database Approach, Roles in the Database Environment, Advantages and Disadvantages of DBMS, The Three-Level ANSI-SPARC Architecture, Database Languages, Data Models, Functions of a DBMS, Components of DBMS. Relational Model: Introduction, Terminology, Integrity Constraints, Views. The Relational Algebra: Unary Operations, Set Operations, Join Operations, Division Operation, Aggregation and Grouping Operations.

UNIT–II

SQL: The ISO SQL Data Types, Integrity Enhancement Feature–Domain Constraints, Entity Integrity, Referential Integrity, General Constraints, Data Definition–Creating a Database, creating a Table, Changing a Table Definition, removing a Table, Creating an Index, Removing an Index, Views–Creating a View, Removing a View, View Resolution, Restrictions on Views, View Updatability 'WITH CHECK OPTION', Advantages and Disadvantages of Views, View Materialization.

UNIT–III

SQL: Introduction, Data Manipulation–Simple Queries, Sorting Results, Using the SQL Aggregate Functions, Grouping Results, Sub-queries, ANY and ALL, Multi-table Queries, EXISTS and NOT EXIST, Combining Result Tables, Database Updates.

UNIT-IV

Advanced SQL: The SQL Programming Language–Declarations, Assignments, Control Statements, Exceptions, Cursors, Subprograms, Stored Procedures, Functions, and Packages, Triggers, Recursion.

UNIT–V

Normalization: The Purpose of Normalization, How Normalization Supports Database Design, Data Redundancy and Update Anomalies, Functional Dependencies in brief, The Process of Normalization,1NF, 2NF, 3NF, BCNF.

TEXT BOOKS:
1.Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems, McGraw-Hill Education, 2003
2. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts, McGraw-Hill Education

REFERENCE BOOKS:
1.Thomas M. Connolly, Carolyn E. Begg, Database Systems–A Practical Approach to Design, Implementation, and Management (6e), Pearson publisher
2. RamezElmasri, Shamkant B. Navathe, Fundamentals of Database Systems, Pearson publisher

COURSE OUTCOMES:
1.Describe Database Management System Architecture.
2.Create, update, modify Relational Database Objects.
3.Manipulate data in Relational Database
4.Develop PL/SQL programs using Cursors, Subprograms, Stored Procedures, Functions, and Packages, Triggers.
5.Explain the purpose of normalization and types Normal forms.

END

(A30537) DATA ANALYTICS WITH R
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)	L	T	P	C
	3	0	0	3

UNIT -I

Introduction, how to run R, R Sessions and Functions, Basic Math, Variables, Data Types, Vectors, Conclusion, Advanced Data Structures, Data Frames, Lists, Matrices, Arrays, Classes. R Programming Structures, Control Statements, Loops, - Looping Over Non-Vector Sets, - If-Else, Arithmetic and Boolean Operators and values, Default Values for Argument, Return Values, Deciding Whether to explicitly call return- Returning Complex Objects, Functions are Objective, No Pointers in R, Recursion

UNIT –II

Introduction of Data Science, Basic Data Analytics using R, R Graphical User Interfaces Data Import and Export, Attribute and Data Types, Descriptive Statistics, Exploratory Data Analysis, Visualization Before Analysis, Dirty Data, visualizing a Single Variable, Examining Multiple Variables, Data Exploration Versus Presentation

UNIT –III

Doing Math and Simulation in R, Math Function, Extended Example Calculating Probability- Cumulative Sums and Products-Minima and Maxima- Calculus, Functions Fir Statistical Distribution, Sorting, Linear Algebra Operation on Vectors and Matrices, Extended Example: Vector cross Product- Extended Example: Finding Stationary Distribution of Markov Chains

UNIT –IV

Discover R's packages to do graphics and create own data visualizations. Graphics, Creating Graphs, The Workhorse of R Base Graphics, the plot () Function, Customizing Graphs, Saving Graphs to Files. Probability Distributions,

Normal Distribution- Binomial Distribution- Poisson Distributions Other Distribution, ~~Basic Statistics, Correlation and Covariance, T-Tests, ANOVA~~ Linear Models, Simple Linear Regression, -Multiple Regression Generalized Linear Models, Logistic Regression, - Poisson Regression- other Generalized Linear Models-Survival Analysis, Nonlinear Models, Splines- Decision- Random Forests,

UNIT –V
Overview of Clustering, K-means, Use Cases, Overview of the Method, Perform K-means Analysis using R. Classification, Decision Trees, Overview of a Decision Tree, Decision Tree Algorithms, Evaluating a Decision Tree. Decision Tree in R, Bayes 'Theorem, Naïve Bayes Classifier, Smoothing, Naïve Bayes in R

TEXT BOOKS:

1. The Art of R Programming, Norman Matloff, Cengage Learning
2. David Dietrich, Barry Heller and Beibei Yang, ―Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data‖, EMC Education Services,

REFERENCE BOOK:
1. R in Action, Rob Kabacoff, Manning Nathan Marz, James Warren, ―Big Data‐ Principles and best practices of scalable real-time data systems‖, Edition 2015,Dreamtech Press,

COURSE OUTCOMES:
1. Explain Data Science concepts.
2. Explore data and analyze it using R.
3. Implement classification, clustering and feature selection methods with R.
4. Understand Regression Generalized Linear Models.
5. Perform K-means Analysis using R.

END

(A30557)WEB PROGRAMMING

(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT-I

Structuring Documents for the Web: Introducing HTML and XHTML, Basic Text Formatting, Presentational Elements, Phrase Elements, Lists, Editing Text, Core Elements and Attributes, Attribute Groups Links and Navigation: Basic Links, Creating Links with the **< a>** Element, Advanced E- mail Links. Images, Audio, and Video: Adding Images Using the **<img>** Element, Using Images as Links Image Maps, Choosing the Right Image Format, Adding Flash, Video and Audio to your web pages. Tables: Introducing Tables, Grouping Section of a Table, Nested Tables, Accessing Tables Forms: Introducing Forms, Form Controls, Sending Form Data to the Server Frames: Introducing Frameset, <frame>Element, Creating Links Between Frames, Setting a Default Target Frame Using **<base>**Element, Nested Framesets, Inline or Floating Frames with **<iframe>**. Changing font size, color of text using <font> Element, scrolling text/image using <marquee> Element

UNIT-II
Cascading Style Sheets: Introducing CSS, where you can Add CSS Rules. **CSS Properties**: Controlling Text, Text Formatting, Text Pseudo Classes, Selectors, Lengths, Introducing the Box Model. **More Cascading Style Sheets:** Links, Lists, Tables, Outlines, the: focus and: activate Pseudo classes Generated Content, Miscellaneous Properties, Additional Rules, Positioning and Layout with CSS, **Page Layout**: Understating the Site's Audience, Page Size, Designing Pages, Coding your Design, Developing for Mobile Devices. **Design Issues:** Typography, Navigation, Tables, Forms.

UNIT-III

Learning JavaScript: How to Add Script to Your Pages, the Document Object Model, Variables, Operators, Functions, Control Statements, Looping, Events, Built- In Objects, Working with JavaScript: Practical Tips for Writing Scripts, Form Validation, Form Enhancements, JavaScript Libraries. Putting Your site on the web: Meta tags, testing your site, Taking the Leap to Live, Telling the World about your site, Understanding your visitors.

UNIT-IV

XML - Introduction, XML Basics, Structuring Data, XML Namespaces, Document Type Definitions (DTDs), W3C XML Schema Documents, XML Vocabularies, Extensible Style sheet Language and XSL Transformations, Document Object Model (DOM).

UNIT-V

Ajax-Enabled Rich Internet Applications: introduction, history of Ajax, traditional web applications Vs Ajax Applications, RIAs with Ajax, Ajax example using XML HttpRequest object, XML and DOM, creating full scale Ajax-enabled application, Dojo Toolkit.

TEXT BOOK:

1.Jon Duckett, Beginning HTML, XTML, CSS and JavaScript
2.Dietel and Dietel : "Internet and World Wide Web - How to Program", 5th Edition, PHI/Pearson Education, 2011.

REFERENCE BOOKS:

1.Chris Bates, Web Programming
2.M. Srinivasan, Web Technology: Theory and Practice
3.Achyut S. Godbole, AtulKahate, Web Technologies
4.Kogent Learning Solutions Inc, Web Technologies Black Book
5.Ralph Moseley and M. T. Savaliya, Developing Web Applications

COURSE OUTCOMES

1.write well-structured, easily maintained, standards-compliant, accessible HTML code.

2.write well-structured, easily maintained, standards-compliant CSS code to present HTML pages in different way

3.use JavaScript to add dynamic content to pages.

4.effectively debug JavaScript code, making use of good practice and debugging tools.

5.use JavaScript to access and use web services for dynamic content (AJAX, JSON, etc.)

END

(A30542) CLOUD COMPUTING
(OPEN ELECTIVE)

L	T	P	C
3	0	0	3

B. Tech (CSE-Cyber Security)

UNIT -I
Computing Paradigms: High-Performance Computing, Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing, Bio computing, Mobile Computing, Quantum Computing, Optical Computing, Nano computing.

UNIT –II
Cloud Computing Fundamentals: Motivation for Cloud Computing, The Need for Cloud Computing, Defining Cloud Computing, Definition of Cloud computing, Cloud Computing Is a Service, Cloud Computing Is a Platform, Principles of Cloud computing, Five Essential Characteristics, Four Cloud Deployment Models.

UNIT –III
Cloud Computing Architecture and Management: Cloud architecture, Layer, Anatomy of the Cloud, Network Connectivity in Cloud Computing, Applications, on the Cloud, Managing the Cloud, Managing the Cloud Infrastructure Managing the Cloud application, Migrating Application to Cloud, Phases of Cloud Migration Approaches for Cloud Migration.

UNIT –IV
Cloud Service Models: Infrastructure as a Service, Characteristics of IaaS. Suitability of IaaS, Pros and Cons of IaaS, Summary of IaaS Providers, Platform as a Service, Characteristics of PaaS, Suitability of PaaS, Pros and Cons of PaaS, Summary of PaaS Providers, Software as a Service, Characteristics of SaaS, Suitability of SaaS, Pros and Cons of SaaS, Summary of SaaS Providers, Other Cloud Service Models.

UNIT –V
Cloud Service Providers: EMC, EMC IT, Captiva Cloud Toolkit, Google, Cloud Platform, Cloud Storage, Google Cloud Connect, Google Cloud Print, Google App Engine, Amazon Web Services, Amazon Elastic Compute Cloud, Amazon Simple Storage Service, Amazon Simple Queue, service, Microsoft,

WindowsAzure, Microsoft Assessment and Planning Toolkit, SharePoint, IBM, Cloud Models, IBM Smart Cloud SAP Labs, SAP HANA Cloud Platform, Virtualization Services Provided by SAP, Sales force, Sales Cloud, Service Cloud: Knowledge as a Service, Rack space, VMware, Manjra soft, Aneka Platform.

TEXT BOOKS:
1. Essentials of cloud Computing: K. Chandrasekhran, CRC press, 2014

REFERENCE BOOKS:
1. Cloud Computing: Principles and Paradigms by Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, Wiley, 2011.
2. Distributed and Cloud Computing, Kai Hwang, Geoffery C. Fox, Jack   J. Dongarra, Elsevier, 2012.
3. Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Kumaraswamy, Shahed Latif, O'Reilly, SPD, rp2011.

COURSE OUTCOMES:
1. Explain various service delivery models of a cloud computing architecture.
2. Explain the ways in which the cloud can be programmed and deployed.
3. State cloud service providers.
4. To know about different service models
5. understand the architecture and its management

END

(A30538) DEEP LEARNING
(OPEN ELECTIVE)

L	T	P	C
3	**0**	**0**	**3**

CMR College of Engineering & Technology

B. Tech (CSE-Cyber Security)

UNIT -I

Introduction to Deep Learning, Historical Trends in Deep learning, Deep Feed - forward networks, Gradient-Based learning, Hidden Units, Architecture Design, Back-Propagation and Other Differentiation Algorithms.

UNIT –II

Regularization for Deep Learning Parameter Norm Penalties, Norm Penalties as Constrained Optimization, Regularization and Under Constrained Problems, Dataset Augmentation, Noise Robustness, Semi-Supervised learning, Multi-task learning, Early Stopping, Parameter Typing and Parameter Sharing, Sparse Representations, Bagging and other Ensemble Methods, Dropout, Adversarial Training, Tangent Distance, tangent Prop and Manifold, Tangent Classifier.

UNIT –III

Optimization for Training Deep Models:

How Learning Differs from Pure Optimization, Challenges in Neural Network Optimization, Basic Algorithms, Parameter Initialization Strategies, Algorithms with Adaptive Learning Rates, Approximate Second-Order Methods, Optimization Strategies and Meta-Algorithms.

UNIT –IV

Convolutional Networks

The Convolution Operation, Pooling, Convolution and Pooling as an Infinitely Strong Prior, Variants of the Basic Convolution Function, Structured Outputs, Data Types, Efficient Convolution Algorithms, Random or Unsupervised Features, The Neuroscientific Basis for Convolutional Networks, Convolutional Networks and the History of Deep Learning.

UNIT –V

Applications: Large-Scale Deep Learning, Computer Vision, Speech recognition, Natural Language Processing, Other Applications

TEXT BOOKS:

1. Deep Learning, Ian Goodfellow, YoshuaBengio and Aaron Courville, In Preparation for MIT Press.
2. Artificial Neural Networks. Yegnanarayana, Prentice- Hall of India, 1999

REFERENCE BOOKS:

1. Neural Networks and Learning Machines. Haykin, Prentice Hall of India, 2010
2. Pattern Recognition and Machine Learning, C.M. Bishop, Springer, 2006

COURSE OUTCOMES:

1.Explain Deep Feed-forward networks, Gradient-Based learning,
2.Describe regularization techniques for Deep learning
3.Differentiate learning and optimization in Deep learning.
4.State the significance of Convolutional Networks
5.State the applications of Deep Learning.

END

(A30559)INTRODUCTION TO DATA SCIENCE
(OPEN ELECTIVE)

B.Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT-I

Introduction to Data Science: Concept of Data Science, Traits of Big data, Web Scraping, Analysis vs Reporting.

Introduction to Programming Tools for Data Science: Toolkits using Python-Matplotlib, NumPy, Scikit-learn, NLTK.

UNIT-II

Visualizing Data- Bar Charts, Line Charts, Scatterplots. **Working with data-** Reading Files, Scraping the Web, Using APIs (Example: Using the Twitter APIs), Cleaning and Munging, Manipulating Data, Rescaling, Dimensionality Reduction

UNIT-III

Overview of Machine learning concepts – Over fitting and train/test splits, Types of Machine learning – Supervised, Unsupervised, Reinforced learning, Introduction to Bayes Theorem, Linear Regression- model assumptions, regularization (lasso, ridge, elastic net), **Classification and Regression algorithms-** Naïve Bayes, K-Nearest Neighbors, logistic regression, support vector machines (SVM).

UNIT-IV

Decision trees, and random forest, Classification Errors, Analysis of Time Series- Linear Systems Analysis, Nonlinear Dynamics, Rule Induction, Neural Networks- Learning & Generalization, Overview of Deep Learning.

UNIT-V

Case Studies of Data Science Application: Weather forecasting, Stock market prediction, Object recognition, Real Time Sentiment Analysis.

TEXT BOOK:

1. Joel Grus, "Data Science from Scratch: First Principles with Python", O'Reilly Media
2. AurélienGéron, "Hands-On Machine Learning with Scikit-Learn and Tensor Flow: Concepts, Tools, and Techniques to Build Intelligent Systems", 1st Edition, O'Reilly Media
3. Jain V.K., "Data Sciences", Khanna Publishing House, Delhi.
4. Jain V.K., "Big Data and Hadoop", Khanna Publishing House, Delhi.
5. Jeeva Jose, "Machine Learning", Khanna Publishing House, Delhi.

REFERENCE BOOKS:

1 Chopra Rajiv, "Machine Learning", Khanna Publishing House, Delhi.
2.Ian Goodfellow, YoshuaBengio and Aaron Courville, "Deep Learning", MIT Presshttp://www.deeplearningbook.org
3. Jiawei Han and Jian Pei, "Data Mining Concepts and Techniques", Third Edition, MorganKaufmann Publisher**s**

COURSE OUTCOMES:

1. Demonstrate understanding of the mathematical foundations needed for data science.
2. Collect, explore, clean, munge and manipulate data.
3. Implement models such as k-nearest Neighbors, Naive Bayes, linear and logistic regression, decision trees, neural networks and clustering.
4. Build data science applications using Python based toolkits.
5. To Implement the different case studies.

END

(A30471) PRINCIPLES OF ELECTRONIC COMMUNICATIONS

(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)	L	T	P	C
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UNIT- I

Introduction to Communication System: Block diagram of Communication system, Radio communication: Types of communications, Analog, Pulse, and Digital, Types of Signals, Fourier Transform for various signals, Fourier Spectrum, Power spectral density, Correlation, Convolution, Time Division Multiplexing, Frequency Division Multiplexing.

UNIT- II

Amplitude Modulation: Need for modulation, Types of Amplitude modulation: AM, DSBSC, SSBSC, Power and BW requirements, Generation of AM, DSBSC, SSBSC, Demodulation of AM: Diode detector, Coherent detection of DSBSC& SSBSC.

UNIT- III

Angle Modulation: Frequency & Phase Modulation, Advantages of FM over AM, Bandwidth consideration, Narrow band FM, Wide band FM, Comparison of FM and PM.
Pulse Modulation: Sampling, Sampling Theorem for Band limited signals, Types of Pulse modulation: PAM, PWM, PPM, Generation and demodulation of PAM, PWM, and PPM.

UNIT- IV

Digital communication: Advantage, Block diagram of PCM, Quantization error, DPCM, Adaptive DPCM, DM and Comparison.
Digital Modulation: ASK, FSK, PSK, DPSK, QPSK, coherent and Non-coherent reception.

UNIT- V:

Information Theory: Concept of Information, Rate of Information and entropy, Source coding for optimum rate of information, Coding efficiency, Shannon Fano coding, Huffman Coding.

Error Control Coding: Introduction, Error detection and Correction codes, Block codes, Convolution codes.

TEXTBOOKS:

1.Communication Systems Analog and Digital–R. P. Singh, SD Sapre, TMH, 20th reprint, 2004.

2.Principles of Communication Systems – H Taub& D. Schilling, GautamSahe, TMH, 3rd Edition, 2007.

Communication Systems – B.P. Lathi, BS Publication, 2004.

REFERENCE BOOKS:

1.Analog and Digital Communication – K. Sam Shanmugam, Willey, 2005.

2.Electronics & Communication System – George Kennedy and Bernard Davis, TMH 2004.

3.Digital Communications- John G. Proakis, MasoudSalehi- 5th Edition, Mcgarw-Hill,2008.

COURSE OUTCOMES:

1. Understand the concept of Communication systems.
2. Describe the concept of AM and FM transmission and Reception.
3. Analyze the concepts of digital communication systems.
4. Compare the different digital modulation techniques.
5. Discuss about different error detecting and error correcting codes like block codes, cyclic codes and convolution codes.

END

(A30472) BASIC ELECTRONICS ENGINEERING

(OPEN ELECTIVE)

B.Tech (CSE-Cyber Security)
UNIT-I:

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P-N Junction Diode: Basics of semiconductor materials, P-N junction as a Diode, Diode Equation, Volt-Ampere Characteristics, Temperature dependence of V-I characteristics, Ideal versus Practical- Resistance levels (Static and Dynamic). Breakdown Mechanisms in Semiconductor Diodes, Zener Diode Characteristics, Voltage Regulation using Zener diode.

UNIT- II:
Rectifiers and Filters: The P-N junction as a Rectifier, Half wave Rectifier, Full wave Rectifier, Bridge Rectifier, Harmonic components in a Rectifier Circuit, Inductor Filters, Capacitor Filters, L- Section Filters, Pi- Section Filters, Comparison of Filters,

UNIT –III:
Bipolar Junction Transistor:The Junction Transistor, Transistor Current Components, Transistor as an Amplifier, transistorConstruction, BJTOperation, symbol, Common base, Common Emitter and Common Collector Configurations, Limits of operation, BJT Specifications, BJT Hybrid model, Determination of H parameters from Transistor characteristics, Comparison of CB, CE, and CC configurations.

UNIT- IV:
Transistor Biasing and Stabilization: Operating Point, The DC and AC Load lines, Need for Biasing, Fixed Bias, Collector to base bias Feedback, Voltage Divider Bias, Bias Stability, Stabilization Factors, Stabilization against variations in V_{BE} and β, Bias Compensation using Diodes and Transistors, Thermal Runaway, Thermal Stability.

UNIT- V:

Field Effect Transistor: The Junction Field Effect Transistor (Construction, principle of operation, Symbol)- Pinch-off Voltage-Volt-Ampere characteristics, The JFET small signal model, MOSFET(Construction, principle of operation, Symbol), MOSFET Characteristics in Enhancement and Depletion modes.

TEXT BOOKS:

1. Millman's Electronic Devices & Circuits-J. Millman, C.C. Halkais&SatyabrataJit, 2 Ed., 1998, TMH.
2. Electronic Devices & Circuits- Mohammad Rashid, Cengage Learning, 2013
3. Electronic Devices & Circuits- David A. Bell, 5 Ed, Oxford

REFERENCE BOOKS:

1. Integrated Electronics- J. Millman and Christos C. Halkais, 1991 Ed., 2008, TMH.

2. Electronic Devices and Circuits- R.L. Boylstad and Louis Nashelsky, 9 Ed., 2006, PEI/PHI

3. Electronic Devices and Circuits- B. P. Singh, Rekha Singh, Pearson, 2 Ed,2013.

4. Electronic Devices and Circuits- K. Lal Kishore, 2 Ed., 2005, BSP.

5. Electronic Devices and Circuits- Anil K. Maini, Varsha Agarwal, 1 Ed., 2009, Wiley India Pvt Ltd.

6. Electronic Devices and Circuits- S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, 2 ed., 2008, TMH.

COURSE OUTCOMES:

1.Understand and analyze the different types of diodes and its characteristics.

2.Construct various rectifiers and filters.

3.Analyze the characteristics of BJT & FET.

4.Design the DC bias circuitry of BJT and FET.

END

(A30383) FUNDAMENTALS OF ENGINEERING MATERIALS
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
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UNIT – I

Structure of Metals: Crystallography, Miller's indices, Packing Efficiency, Density calculations. Grains and Grain Boundaries. Effect of grain size on the properties. Determination of grain size by different methods. Constitution of Alloys: Necessity of alloying, Types of solid solutions, Hume - Rothery rules, Intermediate alloy phases.

UNIT –II

Phase Diagrams: Construction and interpretation of phase diagrams, Phase rule. Lever rule. Binary phase Diagrams, Isomorphous, Eutectic and Eutectoid transformations with examples.

UNIT – III

Steels: Iron-Carbon Phase Diagram and Heat Treatment: Study of Fe-Fe3C phase diagram. Construction of TTT diagrams. Annealing, Normalizing, Hardening and Tempering of steels, Hardenability. Alloy steels.

UNIT – IV

Cast Irons: Structure and properties of White Cast iron, Malleable Cast iron, Grey cast iron. Engineering Materials-III: Non-ferrous Metals and Alloys: Structure and properties of copper and its alloys, Aluminium and its alloys, Al-Cu phase diagram, Titanium and its alloys.

UNIT – V

Ceramics, Polymers and Composites: Crystalline ceramics, glasses, cermets: structure, properties and applications. Classification, properties and applications of composites. Classification, Properties and applications of Polymers.

TEXT BOOKS:

1.Material Science and Metallurgy/ Kodgire

2.Essentials of Materials Science and engineering / Donald R. Askeland / Thomson.

REFERENCE BOOKS:
1.Introduction to Physical Metallurgy / Sidney H. Avner.
2.Materials Science and engineering / William and callister.
3 Elements of Material science / V. Rahghavan
COURSE OUTCOMES:

1. Identify the crystalline structure of steel.
2. Understand the theory of time temperature and transformation
3. Determine of different uses of heat treatment in steel.
4. Distinguish between the various forms of steel.
5. Understand the properties of non-ferrous alloys and uses of composite materials.

END

(A30377) BASICS OF THERMODYNAMICS
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT – I

Introduction: Basic Concepts: System, Control Volume, Surrounding, Boundaries, universe, Types of Systems, Macroscopic and Microscopic viewpoints, Concept of Continuum, Thermodynamic Equilibrium, State, Property, Process, Exact & Inexact Differentials, Cycle, Reversibility – Quasi – static Process, Irreversible Process, Causes of Irreversibility.

UNIT - II

Types, Displacement & Other forms of Work, Heat, Point and Path functions, Zeroth Law of Thermodynamics – Concept of Temperature – Principles of Thermometry – Reference Points – Const. Volume gas Thermometer – Scales of Temperature, Ideal Gas Scale.

UNIT – III

First and Second Laws of Thermodynamics: First Law: Cycle and Process, Specific Heats (cpand cv), Heat interactions in a Closed System for various processes, Limitations of First Law,Concept of Heat Engine (H.E.) and Reversed H.E. (Heat Pump and Refrigerator), Efficiency/COP, Second Law: Kelvin-Planck and Clausius Statements, Carnot Cycle, Carnot Efficiency, Statement of Clausius Inequality, Property of Entropy, T-S and P-V Diagrams

UNIT - IV

Mixtures of perfect Gases – Mole Fraction, Mass friction Gravimetric and volumetric Analysis – Dalton's Law of partial pressure, Avogadro's Laws of additive volumes – Mole fraction, Volume fraction and partial pressure, Equivalent Gas const.

Atmospheric air - Psychrometric Properties – Dry bulb Temperature, Wet BulbTemperature, Dew point Temperature, , Specific Humidity, Relative

Humidity, saturated Air, Vapour pressure, Degree of saturation – Adiabatic Saturation ,Psychrometric chart

UNIT - V
Power Cycles: Otto, Diesel cycles - Description and representation on P–V and T-S diagram, Thermal Efficiency, Mean Effective Pressures on Air standard basis
Refrigeration Cycles: Bell-Coleman cycle, Vapour compression cycle-performance Evaluation.

TEXT BOOKS:
1. Basic Engineering Thermodynamics / PK Nag / Mc Graw Hill
2. Engineering Thermodynamics / chattopadhyay/ Oxford

REFERENCE BOOKS:
1. Thermodynamics for Engineers / Kenneth A. Kroos, Merle C. Potter/ Cengage
2. Thermodynamics /G.C. Gupta /Pearson

COURSE OUTCOMES:
1.Apply energy balance to systems and control volumes, in situations involving heat and work interactions.
2.Evaluate changes in thermometric properties of substances.
3.Apply the laws of thermodynamics to different systems.
4.Understand the psychrometric properties of air
5.Compare different air standard cycles.

END

(A30258) BASICS OF POWER ELECTRONICS & DRIVES
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT I: POWER SEMICONDUCTOR DEVICES

Power Semiconductor Devices Construction and Characteristics of Power diodes, Power Transistors, Power MOSFET, Insulated Gate Bipolar transistors (IGBTs) Introduction to Thyristor family: SCR, DIACs, TRIACs.

UNIT II: PHASE CONTROLLED (AC TO DC) CONVERTERS

Principle of phase-controlled converter operation; Operation of 1-phase half wave converter with R, RL and RLE load; 1- phase full wave converter, Bridge Configuration; Operation with R, RL, RLE load; Operation of 1-phase Semi-converter/ Half controlled converter:

UNIT III: THREE -PHASE CONVERTERS

Operation of half wave converter; Full wave fully controlled converters: Semi-controlled converter; Dual Converter: Principle and operation; Applications of AC-DC converters

UNIT IV: DC TO DC CONVERTERS

The chopper, Basic principle of DC chopper, Classification of DC choppers, Control strategies Basic DC-DC converter (switch regulator) topologies: Principle, operation Step-down (Buck), Step-up (Boost), Step up/down (Buck-Boost), Continuous conduction and Discontinuous conduction operation, Two zone operation, Four quadrant operation (Operating modes),

UNIT V: POWER CONVERTERS FED DRIVES

Single phase separately excited drives: Half Wave converter, Semiconverter and Fully Controlled converter based drives; Braking operation of separately excited drive Semi-converter and Fully Controlled converter based drives 3-phase separately excited drives: Half Wave converter, Semi-converter and Fully

Controlled converter based drives; Principle of power control (motoring control) of separately ~~excited and series motor with DC-DC Converter;~~

TEXT BOOKS:

1.M D Singh and K B Khanchandani, "Power electronics", TMH, New Delhi, 2nd ed., 2007.
2.P.S. Bimbhra, "Power Electronics", Khanna Publishers, New Delhi, 2012..
3.Muhammad H. Rashid, "Power Electronics - Circuits, Devices and Applications", Prentice Hall of India, 3rd ed., 2003.

REFERENCE BOOKS:

1. VedamSubramanyam, "Power Electronics – Devices, Converters and Applications", New Age International Publishers Pvt. Ltd., Bangalore, 2nd ed. 2006.
2. Ned Mohan, Undeland and Robbins, "Power Electronics – Converters, Applications and Design", John Willey & sons, Inc., 3rd ed., 2003.
3.V.R.Moorthi, "Power Electronics", Oxford University press, 2005.
4. G..K. Dubey, S.R. Doradla, A. Joshi, and R.M.K. Sinha, "Thyristorised Power Controllers", New Age International Ltd. Publishers, 1986 (Reprint 2008).
5. P.T. Krein, "Elements of Power Electronics", Oxford University Press, 1998.
6. G..K. Dubey, " Fundamentals of Electrical Drives", Narosa Publishing House, New Delhi, 2nd ed. 2001

COURSE OUTCOME:

1. Explain the construction and characteristics of Power semiconductor devices
2. Analyze the operation of single phase and three phase ac-to-dc converters.
3. Compare the various types of dc-to-dc converters.
4. Apply the knowledge of power electronic converter for various applications.

END

(A30252) POWER GENERATION SYSTEMS
(OPEN ELECTIVE)

L	T	P	C
3	0	0	3

B. Tech (CSE-Cyber Security)

UNIT I: THERMAL POWER PLANTS
Rankine cycle - improvisations, Layout of modern coal power plant, Super Critical Boilers, FBCBoilers, Turbines, Condensers, Steam & Heat rate, Subsystems of thermal power plants - Fuel and ash handling, Draught system, Feed water treatment. Binary Cycles and Cogenerationsystems.

UNIT II: NUCLEAR POWER PLANTS
Basics of Nuclear Engineering, Layout and subsystems of Nuclear Power Plants, Working of Nuclear Reactors: Boiling Water Reactor (BWR), Pressurized Water Reactor (PWR), CANada-Deuterium- Uranium reactor (CANDU), Breeder, Gas Cooled and Liquid Metal Cooled Reactors.Safety measures for Nuclear Power plants.

UNIT III: SOLAR ENERGY
Principles of solar radiation: Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power, physics of the sun, the solar constant, instruments for measuring solar radiation and sun shine, solar radiation data. Photo-voltaic energy conversion.
Solar energy collection: Flat plate and concentrating collectors,
Storage and applications: solar ponds. Solar Applications - solar heating/cooling technique, solar distillation and drying.

UNIT-IV: WIND&BIO-MASS ENERGY:
Wind: Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Betz criteria
Bio-mass: Principles of Bio-Conversion, Anaerobic/aerobic digestion, types of Bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, I.C. Engine operation and economic aspects.

UNIT-V: GEOTHERMAL &OCEAN ENERGY:
Geothermal Energy: Resources, types of wells, methods of harnessing the energy, potential in India.

Ocean Energy: OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants, and their economics.

TEXT BOOK:

1. Nag. P.K., "Power Plant Engineering", Third Edition, Tata McGraw – Hill Publishing   Company Ltd., 2008.
2. Non-Conventional Energy Sources /G.D. Rai
3. Renewable Energy Technologies /Ramesh & Kumar /Narosa

REFERENCE BOOKS:
1. El-Wakil. M.M., "Power Plant Technology", Tata McGraw – Hill Publishing Company Ltd.,2010.

2. Godfrey Boyle, "Renewable energy", Open University, Oxford University Press in association with the Open University, 2004.
3. Thomas C. Elliott, Kao Chen and Robert C. Swanekamp, "Power Plant Engineering", Second Edition, Standard Handbook of McGraw – Hill, 1998
4. Renewable energy resources/ Tiwari and Ghosal/ Narosa.
5. Non-Conventional Energy / Ashok V Desai /Wiley Eastern.
6. Solar Energy /Sukhame

COURSE OUTCOMES:
1. Explain the construction and operation of thermal power plants
2. Analyze the operation of diesel, gas turbine and combined cycle power plants.
3. Illustrate the construction, operation and safety aspects of nuclear power plants.
4. Compare the power derived from renewable energy sources
5. Identify the economic aspects of power plants

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(A30160) DISASTER MANAGEMENT AND MITIGATION
(OPEN ELECTIVE)

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B. Tech (CSE-Cyber Security)

UNIT - I
Environmental Hazards & Disasters: Meaning of Environmental hazards, Environmental Disasters and Environmental stress. Concept of Environmental Hazards, Environmental stress & Environmental Disasters. Different approaches & relation with human Ecology - Landscape Approach - Ecosystem Approach - Perception approach - Human ecology & its application in geographical reserches.

UNIT - II
Types of Environmental hazards & Disasters: Natural hazards and Disasters - Man indeced hazards & Disasters - Natural Hazards - Planetary Hazards / Disasters - Extra Planetary Hazards / disasters - Planetary Hazards - Endongenous Hazards - Exogenous Hazards

UNIT - III
Endogenous Hazards - Volcanic eruption - Earthquakes - landslides - Volcanic Hazards / Disasters - Causes and distribution of Volcanoes - Hazardous effects of volcanic eruptions - Environmental impacts of volcanic eruptions - Earthquake Hazards / disasters - Causes of Earthquakes - Distribution of earthquakes - Hazardous effects of - earthquakes - Earthquake Hazards in India - Human adjusment, perception & mitigation of earthquake.

UNIT - IV
Exogenous hazards / disasters - Infrequent events - Cumulative atmospheric hazards / disasters
Infrequent events: Cyclones - Lightning - Hailstorms
Cyclones: Tropical cyclones & Local stroms - Destruction by tropical cyclones & local stroms (causes, distribution human adjustment, perception & mitigation) Cumulative atmospheric hazards/ disasters :- Floods - Droughts - Cold waves - Heal waves Floods :- Causes of floods - Flood hazards India - Flood control

measures (Human adjustment, perception & mitigation) Droughts :- Impacts of droughts - Drought hazards in India - Drought control measures - Extra Planetary Hazards / Disasters - man induced Hazards / Disasters - Physical hazards / Disasters - Soil erosion

Soil Erosion: Mechanics & forms of Soil Erosion - Factors 7 causes of Soil Erosion - Conservation measures of Soil Erosion.

Chemical hazards / disasters: Release of toxic chemicals, nuclear explosion - Sedimentation processes Sedimentation processes: - Global Sedimentation problems - Regional Sedimentation problems - Sedimentation & Environmental problems - Corrective measures of Erosion & Sedimentation

Biological hazards / disasters: Population Explosion.

UNIT - V:
Emerging approaches in Disaster Management - Three stages

Pre-disaster Stage (preparedness)

1. Emergency Stage

2. Post Disaster stage - Rehabilitation

TEXT BOOKS:
1. Manual on Disaster Management, National Disaster Management, Agency Govt of India.
2. Disaster Management by Mrinalini Pandey Wiley 2014.
3. Disaster Science and Management by T. Bhattacharya, McGraw Hill Education (India) Pvt Ltd Wiley 2015

REFERENCE BOOKS:
1. Earth and Atmospheric Disasters Management, N. Pandharinath, CK Rajan, BS Publications 2009.
2. National Disaster Management Plan, Ministry of Home affairs, Government of India (http://www.ndma.gov.in/images/policyplan/dmplan/draftndmp.pdf)

(A30161) REMOTE SENSING AND GIS
(OPEN ELECTIVE)

	L	T	P	C
B. Tech (CSE-Cyber Security)	3	0	0	3

UNIT – I

Introduction to Photogrammetric: Principles& types of aerial photograph, geometry of vertical aerial photograph, Scale & Height measurement on single vertical aerial photograph, Height measurement based on relief displacement, Fundamentals of stereoscopy, fiducial points, parallax measurement using fiducial line.

UNIT – II

Remote Sensing: Basic concept of remote sensing, Data and Information, Remote sensing data Collection, Remote sensing advantages & Limitations, Remote Sensing process. Electro-magnetic Spectrum, Energy interactions with atmosphere and with earth surface features (soil, water, vegetation), Indian Satellites and Sensors characteristics, Resolution, Map and Image and False color composite, introduction to digital data, elements of visual interpretation techniques.

UNIT – III

Geographic Information Systems: Introduction to GIS; Components of a GIS; Geospatial Data: Spatial Data-Attribute data – Joining Spatial and Attribute data; GIS Operations: Spatial Data Input- Attribute data Management –Data display-Data Exploration- Data Analysis. COORDINATE SYSTEMS: Geographic Coordinate System: Approximation of the Earth, Datum; Map Projections: Types of Map Projections-Map projection parameters commonly used Map Projections - Projected coordinate Systems

UNIT – IV

Vector Data Model: Representation of simple features- Topology and its importance; coverage and its data structure, Shape file; Data models for composite features Object Based Vector Data Model; Classes and their Relationship; The geo-base data model; Geometric representation of Spatial Feature and data structure, Topology rules

UNIT – V

Raster Data Model: Elements of the Raster data model, Types of Raster Data, Raster Data
Structure, Data Conversion, Integration of Raster and Vector data.

Data Input: Metadata, Conversion of Existing data, creating new data; Remote Sensing data, Field data, Text data, Digitizing, Scanning, on screen digitizing, importance of source map, Data Editing.

TEXT BOOKS:

1. Remote Sensing and GIS Lillesand and Kiefer, John Willey 2008.
2. Remote Sensing and GIS B. Bhatta by Oxford Publishers 2015.
3. Introduction to Geographic Information System – Kang-Tsung Chang, McGraw-Hill-2015

REFERENCES:

1. Concepts & Techniques of GIS by C. P. Lo Albert, K.W. Yonng, Prentice Hall (India)Publications.
2. Principals of Geo physical Information Systems – Peter A Burragh and Rachael
A.Mc Donnell, Oxford Publishers 2004.
3. Basics of Remote sensing & GIS by S. Kumar, Laxmi Publications.

COURSE OUTCOMES:

1.Retrieve the information content of remotely sensed data

2.Analyze the energy interactions in the atmosphere and earth surface features

3.Interpret the images for preparation of thematic maps

4.Apply problem specific remote sensing data for engineering applications

5.Analyze spatial and attribute data for solving spatial problems

6.Create GIS and cartographic outputs for presentation

END

(A30161) LOGISTICS AND SUPPLY CHAIN MANAGEMENT
(OPEN ELECTIVE)

L   T   P   C

3   0   0   3

B. Tech (CSE-Cyber Security)

UNIT I

Understanding the Supply Chain: Objective and Importance of Supply Chain Process View of Supply Chain. Competitive and Supply Chain Strategies, Achieving Strategic Fit, Expanding Strategic Scope. Logistics: The Logistical value preposition, The Work of Logistics, Logistical operations, Logistical operating arrangements, Supply chain Synchronization, Supply Chain Drivers and Metrics: Drivers for Supply Chain Performance, Framework for Structuring drivers. Facilities, inventory, transportation, information, sourcing and pricing. Obstacles to Achieving fit, Supply chain performance in India. Case studies.

UNIT II

Designing the Supply Chain Network : Role of distribution in the Supply Chain, Factors influencing Distribution network design, Design options for Distribution network, The role of network design in the Supply Chain, Frame work for Network design decisions, Models for facility location and capacity allocation, Planning Demand and Supply in a Supply Chain: Demand Forecasting in Supply Chain: Components of forecast and forecasting methods, Aggregate Planning in Supply Chain: Role of aggregate planning, Aggregate planning Strategies , Inventory planning and economic theory aberrations. Case studies

UNIT III

Planning and Managing inventories in Supply Chain: Managing Economies of Scale in Supply Chain, Managing Uncertainty in a Supply Chain, Determining optimal level of product inventory. Designing and Planning Transportation Networks: Transportation in a Supply Chain. Case studies

UNIT IV

Managing Cross Functional Drivers in a Supply Chain: Sourcing decisions in a Supply Chain and procurement strategies, Pricing and Revenue Management in a Supply Chain, Information Technology and Coordination in a Supply chain. Case studies

UNIT V

Logistics and Supply chain relationships: Identifying logistics performance indicators –Channel structure – Economics of distribution –channel relationships –logistics servicealliances. Managing Global logistics and Global supply chains: Logistics in a global economy – views of global logistics- global operating levels – interlinked global economy - The Global supply chains, Supply Chain Management in Global environment–Global strategy – Global purchasing – Global logistics–Global alliances –Issues and Challenges in Global supply chain Management – Case studies

REFERENCE BOOKS

1. Sunil Chopra and Peter Meindl: Supply chain Management: Strategy, Planning and Operation, Third edition, Pearson, 2009.
2. Donald J. Bowersox and David J. Closs: Logistical Management: The Integrated Supply Chain Process, TMH, 2006.
3. Rajasekhar &Acharyulu: Logistics and Supply Chain Management, Excel, 2009.
4. Sridhara Bhat: Logistics and supply chain management, Himalaya, 2009.
5. John T Mentzer: Supply Chain Management, Sage Publications, 2008
6. Donal Waters: Global Logistics, Kogan Page, 2009
7. Christain schuh et al: The purchasing chess board, Springer link,2009.
8. Philip B.Schary, TageSkjott-Larsen: Managing the Global Supply Chain, Viva, 2008.

9. Joel D wisner, Keong Leong, KeahChoon Tan: Principles of Supply Chain Management- A Balanced approach, Cengage Learning, 2008

10. Rahul V Altekar: Supply Chain Management, Concepts and Cases, PHI, 2008

11. J.L. Gattorna and D.W. Walters: Managing the Supply Chain, Macmillan, 2008

12. Rangaraj: Supply chain Management for competitive advantage, TMH, 2009

13. Kachru: Logistics and Supply Chain Management, Excel, 2009

14. Shah: Supply Chain Management, Pearson, 2009

COURSE OUTCOMES :

1. Analyse importance of managing and handling Logistical operation in an organization.
2. Develop the knowledge of supply chain strategies formulation and implementation
3. Develop, implement and evaluate transportation networks
4. Design and develop effective procurement and pricing strategies
5. Manage effective relationship with the national and international channel members.

END

(A30162) KNOWLEDGE MANAGEMENT
(OPEN ELECTIVE)

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B. Tech (CSE-Cyber Security)

UNIT I

The Knowledge Economy: Leveraging Knowledge, Data-Information-knowledge-Wisdom relationship, organizational knowledge, characteristics and components of organizational knowledge –Building knowledge societies-Measures for meeting the challenges of implementing KM programmes.

UNIT II

Knowledge Management and Information Technology: Role Information Technology in Knowledge Management Systems, Knowledge Management tools, Creative effective Knowledge Management Systems through Information Technology, ERP and BPR, Data Warehousing and Data Mining.

UNIT III

Future of Knowledge Management and Industry perspective: Companies on the road to knowledge management, Knowledge Management in Manufacturing and service industry, challenges and future of Knowledge Management.

UNIT IV

The Knowledge Process: Universal appeal, Stages of KM Process, Knowledge Capital vs physical capital, Customer Relationship Management, Business Ethics And KM, The Promise of Internet and the Imperatives of the new age.

UNIT V

Implementation of Knowledge Management: Discussion on Roadblocks to success,10-step KM Road Map of Amrit Tiwana, Business Intelligence and Internet platforms, web Portals, Information Architecture: A three-way Balancing Act, KM, the Indian experience, Net Banking in India. –Role of

knowledge Management in Organisational Restructuring. -The Mystique of a Learning Organisation.

REFERENCES BOOKS:
1. Mattison: Web Warehousing & Knowledge Management, Tata McGraw-Hill,2009
2. Becerra Fernandez: Knowledge management: An Evolutionary view, PHI, 2009
3. Fernando: Knowledge Management, Pearson, 2009
4. B. Rathan Reddy: Knowledge management, Himalaya, 2009
5. Tapan K Panda: Knowledge Management, Excel, 2009.
6. Barnes: Knowledge Management systems, Cengage, 2009.
7. Tiwana: The Knowledge Management tool kit, 2/e, Pearson Education, 2009.
8. Warier: Knowledge Management, Vikas Publishing House, 2009
9. Sislop: Knowledge Management, Oxford University Press, New Delhi, 2009
10. Debowski: Knowledge Management, Wiley Student Edition, Wiley India, 2007

COURSE OUTCOMES:

1.Understanding the key theories and models in knowledge management.
2.Critically apply theory to organizations in order to identify and justify effective knowledge management strategies and activities.
3.Access and evaluate information research findings relating to knowledge management.
4.Communicate clearly and effectively incorporating various knowledge management formats and technologies.
5.mplementing the ethical implications in managing knowledge.

END

(A30473) IMAGE PROCESSING
(OPEN ELECTIVE)

	L	T	P	C
	3	0	0	3

B. Tech (CSE-Cyber Security)

UNIT- I: DIGITAL IMAGE FUNDAMENTALS
Digital Image fundamentals, Components of Digital Image Processing, Sampling andQuantization, Relationship between pixels.
Image Transforms: 2-D FFT, Properties, Walsh transform, Hadamard Transform, Discrete Cosine Transform, Haar Transform.

UNIT-II: IMAGE ENHANCEMENT (SPATIAL DOMAIN)
Introduction, Image Enhancement in Spatial domain, Enhancement through point Processing, Types of pointProcessing, Histogram manipulation, Linear and nonlinear gray level Transformation, Local or neighborhood operation, Median filter, image Smoothing & Sharpening
Image Enhancement (Frequency Domain)
Filtering in Frequency domain, low pass filter (smoothing) and high pass filter (Sharpining), image Smoothing&Sharpening.

UNIT- III: IMAGE RESTORATION
Degradation model, Algebraic approach to restoration, Inverse filtering, least mean square filters, Constrained Least Squares Restoration.

UNIT- IV: IMAGE SEGMENTATION
Detection of discontinuities, Edge linking and boundary detection, Thresholding, Region oriented segmentation.
Morphological Image Processing: Dilation and Erosion, Structuring Element Decomposition, Opening and Closing, the Hit or Miss Transformation.

UNIT- V: IMAGE COMPRESSION
Redundancies and their removal methods, Fidelity criteria, Image compression models, Huffman and Arithmetic Coding, Error free compression, Lossy

compression, Lossy and Lossless Predictive Coding, Transform based Compression, JPEG 2000 Standards

TEXT BOOKS:

1.Digital Image Processing – Rafael C. Gonzalez, Rechard E. Woods, 3rd edition. Pearson, 2008

2.Digital Image Processing – S. Jayaraman, S Esakkirajan, T Veerakumar- TMH, 2010

REFERENCE BOOKS:

1. Digital Image Processing using MATLAB – Rafael C. Gonzalez, Richard E woods and Steven L. Eddings, 2nd Edition, TMH, 2010.
2. Fundamentals of Digital Image Processing – A. K. Jain, PHI, 1989.
3. Digital Image processing and Computer vision – Somka, Hlavac, Boyle Cengage learning (Indian edition) 2008.
4. Introductory Computer vision Imaging Techniques and Solutions – Adrian low, 2008, 2nd Edition.
5. Introduction to Image Processing & Analysis – John C. Russ, J. Christian Russ, CRC press, 2010.

COURSE OUTCOMES:

1.Describe the fundamentals of digital image processing.

2.Distinguish between spatial domain enhancement and frequency domain enhancement.

3.Analyze the image restoration and segmentation methods.

4.Discriminate between lossless and lossy compression techniques

END

(A30474) DIGITAL ELECTRONICS
(OPEN ELECTIVE)

L	T	P	C
3	0	0	3

B. Tech (CSE-Cyber Security)

UNIT I: NUMBER SYSTEM AND BOOLEAN ALGEBRA AND SWITCHING FUNCTIONS

Number Systems, Base Conversion Methods, Complements of numbers, Codes – binary codes, Binary Coded Decimal code and its properties, unit Distance Codes, Alpha Numeric Codes, Error Detecting and Correcting Codes.

Boolean Algebra: Basic theorems and properties - Switching Functions, Canonical and Standard Forms-Algebraic simplification Digital Logic Gates, Properties of XOR gates &Universal Gates-Multilevel NAND/NOR realizations.

UNIT-II:MINIMIZATION AND DESIGN OF COMBINATIONAL CIRCUITS:

Introduction, The Minimization methods with Theorem, The Karnaugh Map Method, Five and Six Variable Maps, Prime and Essential Implicants, Don't Care Map Entries, Minimization using tabular method, Partially Specified Expressions Multi Output minimization and combinational design, ArithmeticCircuits, Comparator, Multiplexer, Code-converters.

UNIT-III:FUNDAMENTALS OF SEQUENTIAL MACHINES:

Introduction, Basic Architectural Distinctions between combinational and sequential circuits. The Binary Cell, Fundamentals of Sequential Machine Operations, The Flip-flop, D-Latch &Flip-flop, the clocked T-flip-flop, the clocked J-K flip-flop, Design of a clocked flip-flop. Conversion from one type of Flip-Flop to another, Timing and Triggering Consideration.

UNIT-IV:SEQUENTIAL CIRCUIT DESIGN AND ANALYSIS

Introduction, State Diagram, Analysis of synchronous Sequential Circuits, Approaches to the Design of Synchronous Sequential Finite State Machines, Design Aspects, State Reduction, Design Steps, Realization using Flip-Flops.

Counters –Design of single mode counter, Ripple counter, Ring counter, Shift register, Shift register sequences, Ring counter using Shift register.

UNIT-V:

FSM Charts: Finitestate machine-capabilities and limitations, Mealy and Moore models-minimization of completely specified and incompletely specified sequential machines, Partition techniques and Merger chart methods-concept of minimal cover table.

TEXT BOOKS:

1. Switching& Finite Automata theory – ZviKohavi, &Niraj K. Jha, 3rd Edition, Cambridge.
2. Digital Design -Morris Mano, PHI, 3rd Edition, 2006.

REFERENCE BOOKS:

1 Introduction to switching design and logic design _ Fredriac J. Hill, Gerald R. Peterson, 3rd ED, John Wiley & Sons Inc
2. Digital fundamentals – A Systems approach-Thomas L. Floyd, Pearson, 2013.
3. Digital logic design- Ye Brian and Holds Worth, Elsevier.
4. Fundamentals of Logic Design - Charles H. Roth, Thomson Publications, 5th Edition, 2004.
5. Digital Logic Applications and Design - John M. Yarbrough, Thomson Publications, 2006.
6. Digital Logic and state machine design – Comer, 3rd, oxford, 2013.

COURSE OUTCOMES:

1. Understand the various number systems and conversions.
2. Solve the Boolean expressions using Boolean laws and minimization techniques.
3. Design and analyze the combinational circuits.
4. Design and analyze the sequential circuits.

END

(A30357) FUNDAMENTALS OF MANUFACTURING PROCESSES (OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT – I

Casting: Steps involved in making a casting – Advantage of casting and its applications; Patterns - Pattern making, Types, Materials used for patterns, pattern allowances and their construction; Properties of moulding sands. Methods of Melting - Crucible melting and cupola operation – Defects in castings; Casting processes – Types – Sand moulding, Centrifugal casting, die-casting, Investment casting, shell moulding; Principles of Gating – Requirements – Types of gates, Design of gating systems – Riser – Function, types of Riser and Riser design.

UNIT – II

Welding: Classification – Types of welds and welded joints; Gas welding - Types, oxy-fuel gas cutting. Arc welding, forge welding, submerged arc welding, Resistance welding, Thermit welding. Inert Gas Welding - TIG Welding, MIG welding, explosive welding, Laser Welding; Soldering and Brazing; Heat affected zone in welding. Welding defects – causes and remedies; destructive and non- destructive testing of welds.

UNIT – III

Hot working, cold working, strain hardening, recovery, recrystallisation, and grain growth. Stamping, forming, and other cold working processes. Blanking and piercing – Bending and forming – Drawing and its types – wire drawing and Tube drawing – coining – Hot and cold spinning. Types of presses and press tools. Forces and power requirement in the above operations.

UNIT – IV

Extrusion of Metals: Basic extrusion process and its characteristics. Hot extrusion and cold extrusion - Forward extrusion and backward extrusion –

Impact extrusion – Extruding equipment – Tube extrusion and pipe making, Hydrostatic extrusion. Forces in extrusion

UNIT – V

Forging Processes: Forging operations and principles – Tools – Forging methods – Smith forging, Drop Forging – Roll forging – Forging hammers: Rotary forging – forging defects –cold forging, swaging, Forces in forging operations.

TEXT BOOKS:
1. Manufacturing Technology / P.N. Rao / Mc Graw Hill
2. Manufacturing Engineering and Technology/Kalpakjin S/ Pearson.

REFERENCE BOOKS:
1. Metal Casting / T.V Ramana Rao / New Age
2. Métal Fabrication Technology/ Mukherjee/PHI

COURSE OUTCOMES:
1. Understand the idea for selecting materials for patterns.

2. Learn different types and allowances of patterns used in casting and analyze the components of moulds.

3. Design core, core print and gating system in metal casting processes Understand arc, gas, solid state and resistance welding processes.

4. Develop process-maps for metal forming processes using plasticity principles.

5. Identify the effect of process variables to manufacture defect free products.

END

(A30379) FUNDAMENTALS OF AUTOMOBILE ENGINEERING (OPEN ELECTIVE)

L	T	P	C
3	0	0	3

B. Tech (CSE-Cyber Security)

UNIT I

Introduction: Components of four-wheeler automobile – chassis and body – power unit – power transmission rear wheel drive, front wheel drive, 4-wheel drive – types of automobile engines, engine construction – engine lubrication, splash and pressure lubrication systems, oil filters, oil pumps – crank case ventilation – engine service, re boring, decarburization

UNIT II

Fuel System: S.I. Engine: Fuel supply systems, Mechanical and electrical fuel pumps – Carburetor – types – air filters – petrol injection.

C.I. Engines: Requirements of diesel injection systems, types of injection systems, fuel pump, nozzle, Alternative fuels for Automobiles-injection, Classification, Properties, Hybrid vehicles injection timing, testing of fuel, pumps.

Cooling System: Cooling Requirements, Air Cooling, Liquid Cooling and Forced Circulation System – Radiators – Types – Cooling Fan - water pump, thermostat, evaporating cooling – pressure sealed cooling – antifreeze solutions.

UNIT III

Electrical System: Charging circuit, generator, current – voltage regulator – starting system, bendix drive mechanism solenoid switch, lighting systems, Horn, wiper, fuel gauge – oil pressure gauge, engine temperature indicator etc.

Ignition System: Function of an ignition system, battery ignition system, constructional features of storage battery, auto transformer, contact breaker points, condenser and spark plug – Magneto coil ignition system, electronic ignition system using contact breaker, electronic ignition using contact triggers – spark advance and retard mechanism.

UNIT IV

Transmission System: Clutches, principle, types- cone clutch, single plate clutch, multi plate clutch, magnetic and centrifugal clutches, fluid fly wheel –

Gear boxes, types, sliding mesh, construct mesh, synchro mesh gear boxes, epicyclic gear box, over drive torque converter.

Propeller shaft – Hoatch – Kiss drive, Torque tube drive universal joint, differential rear axles – types – wheels and tyres.

Steering System: Types of steering mechanism – Ackerman steering mechanism, Davis steering mechanism

UNIT V

Suspension System: Objects of suspension systems – rigid axle suspension system, torsion bar, shock absorber, Independent suspension system.

Braking System: Mechanical brake system, Hydraulic brake system, Master cylinder, wheel cylinder tandem master cylinder Requirement of brake fluid, Pneumatic and vacuum brakes.

TEXT BOOKS

1. Automobile Engineering, Vol. 1 & Vol. 2/ Kripal Singh
2. Automobile Engineering, Vol. 1 & Vol. 2 ,by K.M Gupta,Umesh publication

REFERENCE BOOKS

1. A System approach to Automotive Technology by Jack Erjavec YesDee publishing Pvt Ltd.
2. Automobile Engineering / William Crouse
3. Automotive Mechanics / Heitner
4. Alternative fuels of Automobiles by P. Rami Reddy, Frontline publications.

COURSE OUTCOMES:

1. Identify power generation, transmission and control mechanisms in an automobile
2. Manipulate the chemical, thermal, mechanical and electrical energies in an automobile
3. Infer the interaction between subsystems
4. Analyze how transmission system works
5. Learn different components of suspension systems.

END

(A30259) ELECTRICAL & HYBRID VEHICLES
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT I: INTRODUCTION TO HEV

Configuration of Electric Vehicles, Performance of Electric Vehicles, Traction motor characteristics, Tractive effort and Transmission requirement, Vehicle performance, Tractive effort in normal driving, Energy consumption Concept of Hybrid Electric Drive Trains, Architecture of Hybrid Electric Drive Trains, Series Hybrid Electric Drive Trains, Parallel hybrid electric drive trains

UNIT II: ENERGY STORAGE FOR EV AND HEV

Energy storage requirements, Battery parameters, Types of Batteries, Modelling of Battery, Fuel Cell basic principle and operation, Types of Fuel Cells, PEMFC and its operation, Modelling of PEMFC, Super Capacitors

UNIT III: ELECTRIC PROPULSION

EV consideration, DC motor drives and speed control, Induction motor drives, Permanent Magnet Motor Drives, Switch Reluctance Motor Drive for Electric Vehicles, Configuration and control of Drives.

UNIT IV: DESIGN OF ELECTRIC AND HYBRID ELECTRIC VEHICLES

Series Hybrid Electric Drive Train Design: Operating patterns, control strategies, Sizing of major components, power rating of traction motor, power rating of engine/generator, design of PPS Parallel Hybrid Electric Drive Train Design: Control strategies of parallel hybrid drive train, design of engine power capacity, design of electric motor drive capacity, transmission design, energy storage design

UNIT V: POWER ELECTRONIC CONVERTER FOR BATTERY CHARGING

Charging methods for battery, Termination methods, charging from grid, The Z-converter, Isolated bidirectional DC-DC converter, Design of Z converter for battery charging, High-frequency transformer based isolated charger topology, Transformer less topology

TEXT BOOKS:

1. M. Ehsani, Y. Gao, S. Gay and Ali Emadi, Modern Electric, Hybrid Electric, and Fuel Cell Vehicles: Fundamentals, Theory, and Design, CRC Press, 2005
2. Iqbal Husain, Electric and Hybrid Vehicles: Design Fundamentals, CRC Press, 2003

REFERENCE BOOKS:

1. Sheldon S. Williamson, Energy Management Strategies for Electric and Plug-in Hybrid Electric Vehicles, Springer, 2013.
2. C.C. Chan and K.T. Chau, Modern Electric Vehicle Technology, OXFORD University Press, 2001.
3. Chris Mi, M. Abul Masrur, David Wenzhong Gao, Hybrid Electric Vehicles Principles and Applications with Practical Perspectives, Wiley Publication, 2011.

COURSE OUTCOME:

1. Demonstrate the working of Electric Vehicles and recent trends
2. Analyze different power converter topology used for electric vehicle application
3. Develop the electric propulsion unit and its control for application of electric vehicles

END

(A30260) ELECTRICAL SAFETY
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT I:CONCEPTS AND STATUTORY REQUIREMENTS

Introduction – electrostatics, electro magnetism, stored energy, energy radiation and electromagnetic interference – Working principles of electrical equipment-Indian electricity act and rules-statutory requirements from electrical inspectorate-international standards on electrical safety – first aid-cardio pulmonary resuscitation (CPR).

UNIT II: ELECTRICAL HAZARDS

Primary and secondary hazards-shocks, burns, scalds, falls-human safety in the use of electricity. Energy leakage-clearances and insulation-classes of insulation-voltage classifications-excess energy current surges-Safety in handling of war equipments-over current and short circuit current-heating effects of current-electromagnetic forces-corona effect-static electricity –definition, sources, hazardous conditions, control, electrical causes of fire and explosion-ionization, spark and arc ignition energy-national electrical safety code ANSI. Lightning, hazards, lightning arrestor, installation – earthing, specifications, earth resistance, earth pit maintenance.

UNIT III: PROTECTION SYSTEMS

Fuse, circuit breakers and overload relays – protection against over voltage and under voltage – safe limits of amperage – voltage –safe distance from lines-capacity and protection of conductor-joints-and connections, overload and short circuit protection-no load protection-earth fault protection. FRLS insulation-insulation and continuity test-system grounding-equipment grounding-earth leakage circuit breaker (ELCB)-cable wires-maintenance of ground-ground fault circuit interrupter-use of low voltage-electrical guards-Personal protective equipment – safety in handling hand held electrical appliances tools and medical equipments.

UNIT IV: SELECTION, INSTALLATION, OPERATION AND MAINTENANCE

Role of environment in selection-safety aspects in application - protection and interlock-self diagnostic features and fail-safe concepts-lock out and work permit system-discharge rod and earthing devices safety in the use of portable tools-cabling and cable joints-preventive maintenance.

UNIT V: HAZARDOUS ZONES

Classification of hazardous zones-intrinsically safe and explosion proof electrical apparatus-increase safe equipment-their selection for different zones-temperature classification-grouping of gases-use of barriers and isolators-equipment certifying agencies.

REFERENCE BOOKS

1." Accident prevention manual for industrial operations", N.S.C., Chicago, 1982.
2. Indian Electricity Act and Rules, Government of India.
3. Power Engineers – Handbook of TNEB, Chennai, 1989.
4. Martin Glov Electrostatic Hazards in powder handling, Research Studies Pvt. Ltd., England1988.
5. Fordham Cooper, W., "Electrical Safety Engineering" Butterworth and Company, London, 1986.

COURSE OUTCOMES:

1. Illustrate the concept and necessity of electrical safety
2. Explain the possibilities of electrical hazards and its preventive measures
3. Identify the appropriate protective system to be adopted against various electrical hazards
4. Demonstrate the selection, installation, operation of various protective equipments.
5. Compare various hazardous zone and to identify the appropriate protective equipment for those zones

END

(A30162) GREEN BUILDINGS

(OPEN ELECTIVE)

	L	T	P	C
B. Tech (CSE-Cyber Security)	**3**	**0**	**0**	**3**

UNIT I - INTRODUCTION

A historical perspective. General premises and strategies for sustainable and green design, objectives and basis. Bio-mimicry as a design tool based on ecosystem analogy.

UNIT II - GREEN CONSTRUCTION AND ENVIRONMENTAL QUALITY

Sustainable architecture and Green Building: Definition, Green building evaluation systems; LEED Certification; Green Globe Certification; Case studies which look at the environmental approach; Renewable Energy; Controlling the water cycle, Impact of materials on environment; Optimizing construction; Site management; Environmental management of buildings.

UNIT III - PASSIVE DESIGN IN MATERIALS

Passive Design and Material Choice – Traditional Building Materials – Importance of envelopematerial in internal temperature control – Specification for walls and roofs in different climate –Material and Humidity Control.

UNIT IV - ECO HOUSE

The form of the house, the building as an analogy. Building concepts: energy loss, insulation, passive solar gain, active solar gain, health benefits, and sustainable materials. Small scale wind and hydro power systems. Case study of eco house.

UNIT V - SUSTAINABLE AND GREEN BUILDING DESIGN STUDIO

This studio will explore collaborative learning to explore, investigate and apply various parameters of sustainability for design development of projected building/ urban scenarios.

REFERENCE BOOKS

1. Ken Yeang: Eco Design- A manual for Ecological design; Wiley Academy, 2006.
2. Sue Roaf et all: Ecohouse, A design guide; Elsevier Architectural Press, 2007.
3. Thomas E Glavinich: Green Building Construction; Wiley, 2008.
4. Brenda and Robert Vale: Green Architecture, Design for a Sustainable Future; Thamesand Hudson, 1996.

COURSE OUTCOMES:

1. An understanding on sustainability.

2. Knowledge on renewable energy conservation through material usage.

3. A thorough understanding on designing green buildings.

END

(A30163) AIR POLLUTION AND CONTROL
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT I

Introduction: Definition, Sources, classification and characterization of air pollutants. Effects of air pollution on health, vegetation & materials. Types of inversion, photochemical smog.

UNIT II

Meteorology: Temperature lapse rate & stability, wind velocity & turbulence, plume behavior, measurement of meteorological variables, wind rose diagrams, Plume Rise, estimation of effective stack height and mixing depths.

UNIT III

Sampling: Sampling of particulate and gaseous pollutants (Stack, Ambient & indoor air pollution), Monitoring and analysis of air pollutants (PM2.5, PM10, SOX, NOX, CO, NH3). Development of air quality models-Gaussian dispersion model-Including Numerical problems.

UNIT – IV

Control Techniques: Particulate matter and gaseous pollutants- settling chambers, cyclone separators, scrubbers, filters & ESP - Including Numerical problems. Site selection for industrial plant location.

UNIT – V

Air pollution due to automobiles, standards and control methods. Noise pollution- causes, effects and control, noise standards. Environmental issues, global episodes. Environmental laws and acts.

TEXTBOOKS:
1. M. N. Rao and H V N Rao, "Air pollution", Tata Mc-G raw Hill Publication.
2. H. C. Perkins, "Air pollution". Tata McGraw Hill Publication.
3. Mackenzie Davis and David Cornwell, "Introduction t o Environmental Engineering" McGraw-Hill Co.

REFERENCE BOOKS:1. Noel De Nevers, "Air Pollution Control Engineering", Waveland Pr Inc.
2. Anjaneyulu Y, "Text book of Air Pollution and Control Technologies", Allied Publishers.

COURSE OUTCOMES:
1. Identify the major sources of air pollution and understand their effects on health and environment.
2. Evaluate the dispersion of air pollutants in the atmosphere and to develop air quality models.
3. Ascertain and evaluate sampling techniques for atmospheric and stack pollutants.
4. Choose and design control techniques for particulate and gaseous emissions.

END

**(A30163) MANAGEMENT OF INDUSTRIAL RELATIONS
(OPEN ELECTIVE)**

	L	T	P	C
B. Tech (CSE-Cyber Security)	3	0	0	3

UNIT I

Industrial Relations: Introduction, concepts, importance of Industrial relations, scope and aspects of industrial relations, the management, the government factors affecting industrial relations, evolution of industrial relations policy, the industrial policy resolution 1991.

UNIT II

Anatomy of Industrial disputes and resolutions-I: industrial disputes, classification, causes, tripotisim, bipotism Tripartite and Bipartite Bodies, Standing orders and Grievance Procedure.

UNIT III

Anatomy of Industrial disputes and resolutions-II: Collective Bargaining, Conciliation, Arbitration, Adjudication, The Industrial Dispute Act 1947, Labour Welfare work, Labour Welfare officer, Worker's Participation.

UNIT IV

Industrial relations legislation-I: Wage Policy and Wage Regulation Machinery, Wage Legislation, Payment of Wages Act 1936, The Payment of Bonus Act,1965, Minimum wages Act-1948.

UNIT V

Industrial relations legislation-II: The Factories Act 1948, Mines Act 1952, Industrial Relations and Technological Change.

REFERENCE BOOKS:

1. Mamoria, Mamoria, Gankar "Dynamics of Industrial Relations" Himalaya Publishing House.2012.

2. Dr K S Anandram "Cases in Personnel Management Industrial Relations and Trade Relations" Everest, 2012.

3. Arun Monappa, Ranjeet Nambudiri, Selvaraj "Industrial Relations and Labour Laws", TMH,2012.

4. A.M. Sharma "Industrial Relations and Labour Laws", Himalaya Publishing House,2013.

5. Ratna Sen "Industrial Relations-Text and cases "Macmillan Publishers,2011.

6. Kubendran.V, Kodeeswari.K "Industrial Relations and Labour Laws "Himalaya Publishing House,2011.

7. Punekar S.D, Deodhar S.B, SaraswathiSankaren" LabourWelfare, Trade Unionism and Industrial Relations, "Himalaya Publishing House,2012.

8. B.D. Singh "Industrial Relations" Excel Books 2008.

9. S C Srivastava "Industrial Relations and Labor Laws" Vikas, 2012.

10. Padhi"Labour and Industrial Relations" PHI, 2012.

11. Venkata Ratnam "Industrial Relations" Oxford, 2012.

COURSE OUTCOMES:

1. Access the concept and Scope of Industrial Relations and its resolution.

2. Outline the knowledge towards Trade unions, Industrial disputes and Grievance Procedure.

3. Identify various Laws on Wages, Welfare and Social Security.

4. Illustrate rules and regulations of working conditions.

5. Enlighten on quality standards in industry.

END

(A30164) ENTREPRENEURSHIP
(OPEN ELECTIVE)

L	T	P	C
3	0	0	3

B. Tech (CSE-Cyber Security)

UNIT I:
Understanding Entrepreneurial Mindset- The revolution impact of entrepreneurship- The evolution of entrepreneurship- Approaches to entrepreneurship- Process approach- Twenty first centaury trends in entrepreneurship.

UNIT II:
The individual entrepreneurial mind-set and Personality- The entrepreneurial journey- Stress and the entrepreneur- the entrepreneurial ego- Entrepreneurial motivations. Corporate Entrepreneurial Mindset- the nature of corporate entrepreneur- conceptualization of corporate entrepreneurship Strategy-sustaining corporate entrepreneurship.

UNIT III:
Launching Entrepreneurial Ventures- opportunities identification-entrepreneurial Imagination and Creativity- the nature of the creativity process-Innovation and entrepreneurship. Methods to initiate Ventures- Creating new ventures-Acquiring an Established entrepreneurial venture- Franchising-hybrid-disadvantage of Franchising.

UNIT IV:
Legal challenges of Entrepreneurship-Intellectual property protection-Patents, Copyrights-Trade marks and Trade Secrets-Avoiding trademark pitfalls. Formulation of the entrepreneurial Plan- The challenges of new venture start-ups, Poor financial Understanding-Critical factors for new venture development-The Evaluation Process-Feasibility criteria approach.

UNIT V:
Strategic perspectives in entrepreneurship- Strategic Planning-Strategic actions- strategic positioning-Business stabilization- Building the adaptive firms-

Understanding the growth stage-Unique managerial concern of growing ventures.

REFERENCE BOOKS:

1. D F Kuratko and T V Rao "Entrepreneurship- A South-Asian Perspective "Cengage Learning, 2012.
2. Vasant Desai "Small Scale industries and entrepreneurship" Himalaya publishing 2012.
3. Rajeev Roy "Entrepreneurship" 2e, Oxford, 2012.
4. B. Janakiram and M. Rizwana" Entrepreneurship Development: Text & Cases, Excel Books,2011.
5. Stuart Read, Effectual Entrepreneurship, Routledge, 2013.
6. Robert Hisrich et al "Entrepreneurship" 6th e, TMH, 2012.
7. Nandan H, Fundamentals of Entrepreneurship, PHI, 2013
8. Shejwalkar, Entrepreneurship Development, Everest, 2011
9. Khanka, Entrepreneurship Development, S. Chand, 2012

COURSE OUTCOMES:

1. Identify the Qualities, requirements, Risk & Ethical issues to become an Entrepreneur.

2. Analyzeand develop the conceptualization of corporate Entrepreneurship.

3. Explore different possibilities to start an Enterprise for young Entrepreneurs.

4. Outline challenging benchmarks for formulation of Entrepreneurship.

5. Evaluate the application of Strategic action for growing ventures.

END

(A30475) DATA COMMUNICATIONS

(OPEN ELECTIVE)

	L	T	P	C
B. Tech (CSE-Cyber Security)	3	0	0	3

UNIT I

Introduction to data communications, networking, signals, noise, modulation and demodulation. Data communication network architecture, layered network architecture, open systems interconnection, data communications circuits, serial and parallel data transmission, data communications circuit arrangements, data communication networks, alternate protocol suites. Information capacity, bits, bit rate, baud, and M-ARY encoding.

UNIT II

Metallic cable transmission media & optical fiber transmission media: metallic transmission lines, transverse electromagnetic waves, characteristics of electromagnetic waves, transmission line classifications, metallic transmission line types, metallic transmission line equivalent circuit, wave propagation on metallic transmission lines, metallic transmission line losses, block diagram of an optical fiber communications system, optical fiber versus metallic cable facilities.

UNIT III

 Digital transmission & multiplexing and t-carriers digital transmission: pulse modulation, pulse code modulation, dynamic range, signal–to-quantization noise voltage Ratio, linear versus nonlinear PCM codes
Multiplexing: Time- division multiplexing, t1 digital carrier system, north American digital multiplexing hierarchy, digital line encoding, t carrier systems, European digital carrier system, statistical time – division multiplexing, frame synchronization, frequency- division multiplexing, wavelength- division multiplexing, synchronous optical network

UNIT IV

Telephone instruments and signals: The subscriber loop, standard telephone set, basic telephone call procedures, call progress tones and signals, cordless telephones, caller id, electronic telephones, paging systems.

The telephone circuit: The local subscriber loop, telephone message- channel noise and noise weighting, units of powers measurement, transmission parameters and private-line circuits, voice-frequency circuit arrangements, crosstalk.

UNIT V

Data communication codes, bar codes, error control, error detection, error correction, data formats, data communications hardware, character synchronization.

TEXT BOOKS:

1.Introduction to Data Communications and Networking, Wayne Tomasi, Pearson Education.

REFERENCE BOOKS:

1.Data Communications and Networking, Behrouz A Forouzan, Fourth Edition.Tmh.

2.Computer Communications and Networking Technologies, Gallow, Secondedition Thomson

3.Computer Networking and Internet, Fred Halsll, Lingana Gouda Kulkarni, Fifth Edition, Pearson Education

COURSE OUTCOMES:

1. Attain the knowledge on basic concepts of data communication systems.
2. Explain the elements of data communications systems, different types of transmission medias and different digital modulation techniques
3. Attain the knowledge on different telephone instruments, signal and circuits
4. Describe different error detecting and correcting codes.

END

(A30476) MICROCONTROLLERS & APPLICATIONS
(OPEN ELECTIVE)

	L	T	P	C
B. Tech (CSE-Cyber Security)	3	0	0	3

UNIT-I

Introduction to Microprocessors and Microcontrollers: Introduction to Microprocessor and Micro Controller, Number system and Binary arithmetic. Microprocessor Architecture (8085 and 8086) and Microcomputer System, memory map and addressing, memory classification, review of logic device for Interfacing, Memory Interfacing, Overview of 8086 Instruction Set, stacks and Interrupts.

UNIT-II

The 8051 Architecture: 8051 Microcontroller hardware, Program Counter and Data Pointer, A and B CPU registers, Flags and Program Status Word (PSW),Internal Memory : Internal RAM – Stack and Stack Pointer, Special Function Registers, Internal ROM, Input / Output Pins, ports and Circuits, External Memory, Timers and Counters, Serial data Input/ Output, interrupts.

UNIT-III

8051 Instruction set: Assembly Language Programming Process, Addressing Modes, Assembler Directives, Data Transfer, Arithmetic, Logical and Branch Instructions, Decimal Arithmetic, Interrupt Programming, Serial Data Communication.
8051 Programming: Basic Assembly Language Programming, Input/ Output Port Programming, 8051 Timer / Counter Programming, 8051 Serial Communication Programming, 8051 Interrupt Programming.

UNIT-IV

8051 Applications: Introduction, Interfacing Keyboards, Key pads, Interfacing Displays (Seven Segment Displays and LCD's), Interfacing A/D Convertors, Interfacing D/A Convertors, Interfacing Hardware Circuits for Multiple Interrupts, 8051 Interfacing with 8255, Interfacing Eternal Memory with 8051.

UNIT-V

Introduction to Advanced Architectures: ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded System: Bus protocols, I2 bus and Can bus; Internet-Enabled Systems, Design Example-elevator Controller.

TEXT BOOKS:

1. K.J. Ayala "The 8051 Micro controller, Architecture, Programming 8- Applications "Thomson Delmar Learning
2. RS Gaonkar, "Microprocessors Architecture, Programming and Applications "Penram International.
3. M. A. Mazidi& J.G Mazidi." The 8051 Micro controller 8- Embedded System "Pearson Education.

REFERENCE BOOKS:

1. B. Ram "Fundamentals of Microprocessors and Microcomputers "DhanpatRai and Sons.
2. 'Computers as Components- Principles of Embedded Computing System Design', Wayne Wolf, Elsevier (2nd Edition)
3. Advanced µp & peripherals- A.K. Raj & KM Bhardhadi, TMF 2nd Edition

COURSE OUTCOMES:

1. Describe the architecture of 8085 and 8086 microprocessors and 8051 microcontrollers.
2. Describe various addressing modes, assembler directives and assembly level instructions of 8051 micro controller.
3. Write assembly language programs for interfacing various I/O devices and memories with 8051 micro controllers.
4. Describe architectures of various advanced processors.

END

(A30382) FUNDAMENTALS OF MECHANICAL ENGINEERING (OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT - I

Introduction: Prime movers and its types, Concept of Force, Pressure, Energy, Work, Power, System, Heat, Temperature, Specific heat capacity, Change of state, Path, Process, Cycle, Internal energy, Enthalpy, Statements of Zeroth Law and First law.

Energy: Introduction and applications of Energy sources like Fossil fuels, Nuclear fuels, Hydel, Solar, wind, and bio-fuels, Environmental issues like Global warming and Ozone depletion.

UNIT - II

Properties of gases: Gas laws, Boyle's law, Charle's law, Combined gas law, Gas constant, Relation between Cp and Cv, Various non-flow processes like constant volume process, constant pressure process, Isothermal process, Adiabatic process, Poly-tropic process

Properties of Steam: Steam formation, Types of Steam, Enthalpy, Specific volume, Internal energy and dryness fraction of steam, use of Steam tables, steam calorimeters.

Steam Boilers: Introduction, Classification, Cochran, Lancashire and Babcock and Wilcox boiler, functioning of different mountings and accessories.

UNIT - III

Heat Engines: Heat Engine cycle and Heat Engine, working substances, Classification of heat engines, Description and thermal efficiency of Carnot; Rankine; Otto cycle and Diesel cycles.

Internal Combustion Engines: Introduction, Classification, Engine details, four- stroke/ two-stroke cycle Petrol/Diesel engines, indicated power, Brake Power, Efficiencies.

UNIT - IV

Pumps: Types and operation of Reciprocating, Rotary and Centrifugal pumps, Priming Air <u>Compressors: Types and operation of Reciprocating and Rotary air</u> compressors, significance of Multistage.

Refrigeration & Air Conditioning: Refrigerant, Vapor compression refrigeration system, vapor absorption refrigeration system, Domestic Refrigerator, Window and split air conditioners.

UNIT - V

Couplings, Clutches and Brakes: Construction and applications of Couplings (Box; Flange; Pin type flexible; Universal and Oldham), Clutches (Disc and Centrifugal), and Brakes (Block; Shoe; Band and Disc).

Transmission of Motion and Power: Shaft and axle, Belt drive, Chain drive, Friction drive, Gear drive.

TEXT BOOKS:

1.Basic Mechanical Engineering / Pravin Kumar/ Pearson 2. Introduction to Engineering Materials / B.K. Agrawal/ Mc Graw Hill

REFERENCE BOOKS:

1. Fundamental of Mechanical Engineering/ G.S. Sawhney/PHI
2. Thermal Science and Engineering / Dr. D.S. Kumar/ Kataria

COURSE OUTCOMES:

1. Understand different types of fuels.
2. Explain properties of steam
3. Understand the working Principle of IC Engines.
4. Explain the operations of types of pumps.
5. Know the application of mechanical drives in Transmission of Power.

END

(A30378) WASTE TO ENERGY
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)	L	T	P	C
	3	0	0	3

Unit-I:

Introduction to Energy from Waste: Classification of waste as fuel – Agro based, Forest residue, Industrial waste - MSW – Conversion devices – Incinerators, gasifiers, digestors

Unit-II:

Biomass Pyrolysis: Pyrolysis – Types, slow fast – Manufacture of charcoal – Methods – Yields and application – Manufacture of pyrolytic oils and gases, yields and applications.

Unit-III:

Biomass Gasification: Gasifiers – Fixed bed system – Downdraft and updraft gasifiers –Fluidized bed gasifiers – Design, construction and operation – Gasifier burner arrangement for thermal heating – Gasifier engine arrangement and electrical power – Equilibrium and kinetic consideration in gasifier operation.

Unit-IV:

Biomass Combustion: Biomass stoves – Improved chullahs, types, some exotic designs, Fixed bed combustors, Types, inclined grate combustors, Fluidized bed combustors, Design, construction and operation - Operation of all the above biomass combustors.

Unit-V:

Biogas: Properties of biogas (Calorific value and composition) - Biogas plant technology and status - Bio energy system - Design and constructional features - Biomass resources and their classification - Biomass conversion processes - Thermo chemical conversion - Direct combustion - biomass gasification - pyrolysis and liquefaction - biochemical conversion - anaerobic digestion –

Types of biogas Plants – Applications - Alcohol production from biomass - Bio diesel production - Urban waste to energy conversion - Biomass energy programme in India.

TEXT BOOKS:

1. Non-Conventional Energy, Desai, Ashok V., Wiley Eastern Ltd., 1990.
2. Biogas Technology - A Practical Hand Book - Khandelwal, K. C. and Mahdi, S. S., Vol. I & II, Tata McGraw Hill Publishing Co. Ltd., 1983.

REFERENCE BOOKS:

1. Food, Feed and Fuel from Biomass, Challal, D. S., IBH Publishing Co. Pvt. Ltd., 1991.
2. Biomass Conversion and Technology, C. Y. WereKo-Brobby and E. B. Hagan, John Wiley & Sons,1996.

COURSE OUTCOMES:

1. Understand different Conversion Devices.
2. Explain Biomass Pyrolysis.
3. Understand the working Principle of biomass gasification
4. Explain Biomass Combustion.
5. Know the application of Bio Gas.

END

(A30253) FUEL CELL TECHNOLOGY
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT I: INTRODUCTION TO FUEL CELLS

Introduction – working and types of fuel cell – low, medium and high temperature fuel cell, liquid and methanol types, proton exchange membrane fuel cell solid oxide, hydrogen fuel cells – thermodynamics and electrochemical kinetics of fuel cells

UNIT II: FUEL CELLS FOR AUTOMOTIVE APPLICATIONS

Fuel cells for automotive applications – technology advances in fuel cell vehicle systems – onboard hydrogen storage – liquid hydrogen and compressed hydrogen – metal hydrides, fuel cell control system – alkaline fuel cell – road map to market.

UNIT III:
FUEL CELL COMPONENTS AND THEIR IMPACT ON PERFORMANCE

Fuel cell performance characteristics – current/voltage, voltage efficiency and power density, ohmic resistance, kinetic performance, mass transfer effects – membrane electrode assembly components, fuel cell stack, bi-polar plate, humidifiers and cooling plates.

UNIT IV: HYDROGEN STORAGE TECHNOLOGY

Hydrogen storage technology – pressure cylinders, liquid hydrogen, metal hydrides, carbon fibers – reformer technology – steam reforming, partial oxidation, auto thermal reforming – CO removal, fuel cell technology based on removal like bio-mass.

UNIT V: FUEL CYCLE ANALYSIS

Fuel Cycle Analysis – application to fuel cell and other competing technologies like battery powered vehicles, SI engine fueled by natural gas and hydrogen and hybrid electric vehicle.

REFERENCEBOOKS:

1. Fuel Cells for automotive applications – professional engineering publishing UK. ISBN 1- 86058 4233, 2004.
2. Fuel Cell Technology Handbook SAE International GregorHoogers CRC Press ISBN 0-8493-0877-1-2003.

COURSE OUTCOME:

1. Demonstrate the working of various types of fuel cells.
2. Make use of the fuel cell for automotive applications.
3. Compare the fuel cell performance characteristics.
4. Explain the concept of hydrogen storage systems
5. Analyze the fuel cycle

END

(A30255) ENERGY EFFICIENCY IN ELECTRICAL UTILITIES (OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT I: ELECTRICAL SYSTEMS & ELECTRIC MOTORS

Introduction of Electrical systems, Tariff and economic considerations; T & D losses, Electrical load management; Maximum demand management, Role of Power factor and its improvement- Electric Power systems analysis -Energy Efficient Technologies in Electrical Systems - Motor Types, Characteristics, Efficiency - Energy Efficient Motors - Factors affecting Energy efficiency of a motor - Soft starters, Variable speed drives

UNIT II: COMPRESSED AIR SYSTEMS &HVAC

Introduction, Compressor types and performance; Compressed air systems components;efficient operation of compressed air systems, Systems capacity assessmentEnergy conservation opportunities

UNIT III: REFRIGERATION SYSTEMS.

Introduction: Types of Refrigeration systems; Common Refrigerant and Properties compressor types and applications
Performance assessment of Refrigeration plants -
Energy conservation opportunities

UNIT IV: FANS, PUMPING SYSTEMS AND COOLING TOWERS

Types, Performance evaluation, efficient system operation, Capacity selections - Performance assessment of fans and blowers - Energy conservation opportunities Types, Performance evaluation, efficient system operation - Energy conservation opportunities in pumping systems - Introduction to cooling towers; cooling tower performance, efficient system operation- Energy conservation opportunities in cooling towers.

UNIT V: LIGHTING SYSTEMS

Basic terms of lighting systems; Lamp and Luminaries types, recommended illumination level-Methodology of lighting systems energy efficiency study - Cast study, Energy conservation opportunities

TEXT BOOKS

1. Capehart, Turner, Kennedy. Guide to Energy Management. Fifth Ed. The Fairmount Press, 2006.
2. Thumann, Younger. Handbook of Energy Audit. Sixth Ed. The Fairmount Press, 2003.
3.

    Thumann, Mehta. Handbook of Energy Engineering. Fifth Ed. The Fairmount Press, 2001

REFERENCES BOOKS

1. General Aspect of Energy Management and Energy Audit, 2010, BEE Guide book
2. Energy Efficiency in Thermal Utilities, 2010, BEE guide book
3. Energy Efficiency in Electrical Utilities, 2010, BEE guide book
4. Turner WC. Energy Management Handbook, 5th Edition, The Fairmont Press, 2005

COURSE OUTCOMES:

1. Explain the energy efficient technologies meant for electrical systems
2. Choose the appropriate energy efficient method for lighting, fanning, pumping, cooling, compressed air and refrigeration systems.

(A30164) BASICS OF CIVIL ENGINEERING
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

UNIT – I
General introduction to Civil Engineering - Introduction to types of buildings, Components of a residential building, Introduction to industrial buildings; Introduction to planning of residential buildings - Simple building plans;

UNIT – II
Introduction to the various building area terms; Setting out of a building; Surveying – Principles, Objectives, Horizontal measurements with tapes, Ranging;

UNIT – III
Levelling – Instruments, Reduction of levels; Modern surveying instruments; Building materials – Bricks, cement blocks, Cement, Cement mortar, Steel;

UNIT – IV
Building construction – Foundations, Brick masonry, Roofs, Floors, Decorative finishes, Plastering, Paints and Painting;

UNIT – V
Basic infrastructure and services – Elevators, Escalators, Ramps, Air conditioning, Sound proofing, Towers, Chimneys, Water Tanks; Intelligent buildings.

REFERENCES BOOKS:
1.Chudley, R., Construction Technology, Vol. I to IV, Longman Group, England
2.Chudley, R. and Greeno, R., Building Construction Handbook, Addison Wesley, Longman Group, England
3.Gopi, S., Basic Civil Engineering, Pearson Publishers
4.Kandya, A. A., Elements of Civil Engineering, Charotar Publishing house

5.Mamlouk, M. S., and Zaniewski, J. P., Materials for Civil and Construction Engineering, Pearson Publishers.

COURSE OUTCOMES:

1.The students will be able to illustrate the fundamental aspects of Civil
   Engineering.

2. The students will be able to plan and set out a building.

3. Students will be able to explain the concepts of surveying for making horizontal
   and vertical measurements.

4. They will able to illustrate the uses of various building materials and explain the
   method of construction of different components of a building.

5. Students will be able to discuss about various services in a building.

END

(A30165) SUSTAINABILITY CONCEPTS IN CIVIL ENGINEERING (OPEN ELECTIVE)

L	T	P	C
3	0	0	3

B. Tech (CSE)

UNIT – I

Introduction: Sustainability - Introduction, Need and concept of sustainability, Social-environmental and economic sustainability concepts. Sustainable development, Nexus between Technology and Sustainable development, Challenges for Sustainable Development. Multilateral environmental agreements and Protocols - Clean Development Mechanism (CDM), Environmental legislations in India - Water Act, Air Act.

UNIT – II

Global Environmental Issue: Resource d

egradation, Climate change, Regional and Local Environmental Issues. Carbon credits and carbon trading, carbon foot print Carbon sequestration – Carbon capture and storage (CCS). Environmental management standards, ISO 14000 series, Life Cycle Analysis (LCA) - Scope and Goal, Bio-mimicking.

UNIT – III

Sustainable Design: Basic concepts of sustainable habitat, Green buildings, green materials for building construction, material selection for sustainable design, green building certification- GRIHA & IGBC Certification for buildings, Energy efficient building design- Passive solar design technique, Thermal storage, Cooling strategies, high performance insulation. Sustainable cities, Sustainable transport.

UNIT – IV

Clean Technology and Energy: Energy sources: Basic Concepts-Conventional and non-conventional, solar energy, Fuel cells, Wind energy, Small hydro plants,

bio-fuels, Energy derived from oceans, Geothermal energy. Rainwater harvesting.

UNIT – V

Green Engineering: Green Engineering concepts, Sustainable Urbanization, industrialization and poverty reduction; Social and technological change, Industrial Processes: Material selection, Pollution Prevention, Industrial Ecology, Industrial symbiosis.

TEXTBOOKS:

1. Allen, D.T. and S honnard, D. R., Sustainability Engineering: Concepts, Design and Case Studies, Prentice Hall.
2. Bradley. A.S; Adebayo, A. O., Maria, P. Engineering applications in sustainable design and development, Cengage learning.

REFERENCE BOOKS:

1. Mackenthun, K. M. Basic Concepts in Environmental Management, Lewis Publication.
2. ECBC Code 2007, Bureau of Energy Efficiency, New Delhi Bureau of Energy Efficiency PublicationsRating System, TERI Publications - GRIHA Rating System.
3. Ni bin Chang, Systems Analysis for Sustainable Engineering: Theory and Applications, McGraw-Hill Professional.
4. Twidell, J. W. and Weir, A. D., Renewable Energy Resources, English Language Book Society (ELBS).
5. Malcolm Dowden, Climate Change and Sustainable Development: Law, Policy and Practice.
6. Daniel A. Vallero and Chris Brasier, "Sustainable Design: The Science of Sustainability and Green Engineering", Wiley-Blackwell.
7. Sustainable Engineering Practice: An Introduction, Committee on Sustainability,
   American Society of Civil Engineers.

COURSE OUTCOMES:

1.Learn the sustainability concepts; understand the role and responsibility of engineers in ~~sustainable~~

  development.

2.Quantify sustainability, and resource availability, Rationalize the sustainability based on scientific

  merits.

3.Understand and apply sustainability concepts in construction practices, designs, product developments

  and processes across various engineering disciplines.

4.Make a decision in applying green engineering concepts and become a lifelong advocate of

  sustainabilityin society.

END

(A30165) BASICS OF INSURANCE & TAXATION
(OPEN ELECTIVE)

L	T	P	C
3	0	0	3

B. Tech (CSE-Cyber Security)

UNIT I

Introduction to Life Insurance and General Insurance: Introduction to Life Insurance - Principles of Life Insurance - Life insurance products, pensions and annuities, Introduction to General Insurance. Principles of General Insurance. Types of General Insurance - Personal general insurance products (Fire, Personal Liability, Motors, Miscellaneous Insurance). Terminology, clauses and covers.

Unit II

Claim Management & Re-Insurance: Claim Management - Claim Settlement - Legal Framework - Third party Administration, Insurance ombudsman - Consumer Protection Act - Re-Insurance in Life Insurance - Retention Limits - Methods of Re-insurance.

UNIT III

General Perspectives and Income Tax rate Structure: Historical background of Taxation Laws in India, Fundamental Principles of Income Tax and concepts, Government Financial Policies regarding Taxation. Tax structure and its Role in Indian Economy, Residential Status, Non-Resident persons & Non-Ordinary Resident, Previous year and Assessment year Tax: Fees and cess, Capital Expenditure and Capital Income. Revenue Expenditure and Revenue Income, Tax Evasion and Tax Avoidance, Direct and Indirect Taxes.

UNIT IV

Heads and Sources of Income and Exemptions & Deductions under the Income Tax: Salary and Fringe Benefit Tax, Income from House Property, Income from Business; Profession or Vocation, Capital Gains, Income from

other sources. (Theory only), Exemptions & Deductions under the Income Tax Act, Income ~~exempt u/s 10 of the I.T. Act, Permissible deductions under Chapter~~ VI of I.T. Act, Relief, Double Taxation Relief.

UNIT V

Assessment Procedures: PAN AND TAN, Filing of return and e-filling, Advance payment of Tax, Tax deduction at source, Tax Collection at Source, Refund of Tax, and Types of Assessment. Computation of Income in Individuals

REFERENCE BOOKS:

1. Mishra M.N: Insurance Principles and Practice; S.Chand and Co. New Delhi.
2. Principles of Life Insurance: Dr.Shrikrishan Laxman Karve, Himalaya
3. Insurance: Theory & Practice: Tripathy& Pal, PHI
4. Taxation: H.Prem raja - Sri Hamsrala publications
5. Direct Taxes &Practice :Dr. V K Singhania, Taxman Publications.
6. Gour and Narang - Income Tax Law and Practice, Kalyani Publication
7. Practicals in Taxation: H.Prem raja - Sri Hamsrala publications.
8. Income Tax: B.B. Lal, Pearson Education
9. Taxation: R.G. Saha, Himalaya Publishing House Pvt. Ltd
10. Income Tax: Johar, McGraw Hill Education
11. Taxation Law and Practice: Balachandran &Thothadri, PHI Learning.

COURSE OUTCOMES:

1. Explain the basic legal concepts and general principles of Insurance & Tax.
2. Implement claim management and settlement.
3. Prepare tax assessments, computation of individual Incomes
4. Analyse tax exemptions and deductions of income tax.
5. Explain the procedure for filing e-filing Tax, ITDS, PAN & TAN.

END

(A30166) BUSINESS ETHICS & CORPORATE GOVERNANCE
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

UNIT I

Business Ethics The Changing Environment: Business Ethics-why does it matter?; Levels of Business Ethics-Five Myths about Business Ethics- Can Business Ethics be Taught and Trained?; stages of Moral development, Kohlberg's study- Carol Gilligan's Theory-Principles of Ethics.

UNIT II

Professional Ethics. Introduction to Professional Ethics- Ethics in Production and Product Management-Ethics of Marketing Professionals-Ethics in HRM-Ethics of Finance and Accounting Professionals-Ethics of Advertisement-Ethics of Media Reporting-Ethics of Healthcare Services. Ethical Dilemma. Introduction, Dilemma and Ethical Dilemma-Mounting Scandals-Ethical Issues-Preparatory Ethics: Proactive steps-The software challenge.

UNIT III

Cyber crimes and cyber Terrorism-social,Political, ethical and psycological , dimensitional , Intellectual properrty in the cyberspace,Ethical dimenstions of cyber crimes-the psycology, mindset & Skills of Hackers & Other cyber criminals, Sociology of cyber criminals, inforamtion Warfare.

UNIT IV

Corporate Governance I: Does Good Governance Really matters to Corporations?-Importance of corporate Governance –Corporate Governance in India-Board Structures Processes and Evaluation-Director Independence –Board committees, Indian model of Corporate Governance.

UNIT V

Corporate Governance-II: Information communication and Disclosure-Irani Committee Report-OECD Principles of Corporate Governance –Risk, Internal Control and Assurance-Banks and Corporate Governance.

REFERENCE BOOKS:

1. SK Mandal: Ethics in Business and Corporate Governance, TMH, 2/e, 2012. Journal of Human Values: IIM Calcutta. SAGE.

2. Archie. B Carroll, Business Ethics-Brief Readings on Vital Topics, Routledge, 2013.

3. A.C.Fernando: Corporate Governance, Principles, Policies and Practices, Pearson, 2012.

4. C.S.V.Murthy: Business Ethics, Himalaya Publishing House, 2012.
5. N.Balasubramanian : Corporate Governance and Stewardship, TMH,2012.

COURSE OUTCOMES:

1. Identify the concept and principles of Business ethics

2. Analyze the importance of Professional Ethics and relate Ethical Dilemma to Business Practices

3. Outline the factors of Cybercrime and Cyber Terrorism.

4. Predict stakeholder's roles in corporate Governance.

5. Review committee Reports on development of Corporate Governance.

END

(A30477) FUNDAMENTALS OF EMBEDDED SYSTEMS
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)	**L**	**T**	**P**	**C**
	3	**0**	**0**	**3**

UNIT I INTRODUCTION TO EMBEDDED SYSTEMS
Definition of Embedded System, Embedded Systems Vs General Computing Systems, History of Embedded Systems, Classification, Major Application Areas, Purpose of Embedded Systems

UNIT-II TYPICAL EMBEDDED SYSTEM
Core of the Embedded System: General Purpose and Domain Specific Processors, Memory, ROM, RAM, Memory selection for Embedded Systems, Sensors and Actuators, Communication Interface: On-board and External Communication Interfaces.

UNIT-III EMBEDDED FIRMWARE
Reset Circuit, Brown-out Protection Circuit, Oscillator Unit, Real Time Clock, Watchdog Timer, Embedded Firmware Design Approaches and Development Languages.

UNIT – IV RTOS BASED EMBEDDED SYSTEM DESIGN
Operating System Basics, Types of Operating Systems, Tasks, Process and Threads, Multiprocessing and Multitasking, Task Scheduling.

UNIT - V TASK COMMUNICATION
Shared Memory, Message Passing, Remote Procedure Call and Sockets, Task Synchronization: Task Communication/ Synchronization issues, Task Synchronization Techniques, Device Drivers

TEXT BOOK:
1. Introduction to Embedded Systems – Shibu K.V. McGraw Hill
2. Embedded Systems – Raj Kamal, TMH

REFERENCE BOOKS:

1. Embedded System Design – Frank Vahid, Tony Givargis, John Wiley.
2. Embedded Systems – Lyla, Pearson, 2013
3. An Embedded Software Primer- David E Simon, Pearson Education

COURSE OUTCOMES:

1. Understand the basics of embedded systems and its types.
2. Study the various types of memories, sensors and Input / Output devices.
3. Discuss the embedded firmware for various applications.
4. Interpret the characteristics of Real time operating Systems.

END

(A30478) SENSORS& TRANSDUCERS
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT I
Introduction: Definition, principle of sensing & transduction, classification. **Mechanical and Electromechanical sensor:** Resistive (potentiometric type): Forms, material, resolution, accuracy, sensitivity. Strain gauge: Theory, type, materials, design consideration, sensitivity, gauge factor, variation with temperature, adhesive, rosettes. Inductive sensor: common types- Reluctance change type, Mutual inductance change type, Magnetostrictive type, material, construction and input output variable, Ferromagnetic plunger type, short analysis.

UNIT II
Capacitive sensors: variable distance-parallel plate type, variable area- parallel plate, serrated plate/teeth type and cylindrical type, variable dielectric constant type, calculation of sensitivity, Proximity sensor. Stretched diaphragm type: microphone, response characteristics. Piezoelectric element: piezoelectric effect, charge and voltage co-efficient, crystal model, materials, natural & synthetic type, their comparison, force & stress sensing, ultrasonic sensors.

UNIT III
Thermal sensors: Resistance change type: RTD materials, tip sensitive & stem sensitive type, Thermistor material, shape, ranges and accuracy specification. Thermoemf sensor: types, thermoelectric power, general consideration, Junction semiconductor type IC and PTAT type. Radiation sensors: types, characteristics and comparison, Pyro electric type.

UNIT IV
Magnetic sensors: Sensor based on Villari effect for assessment of force, torque, proximity, Wiedemann effect for yoke coil sensors, Thomson effect, Hall effect, and Hall drive, performance characteristics. Radiation sensors: LDR, Photovoltaic cells, photodiodes, photo emissive celltypes, materials, construction, response. Geiger counters, Scintillation detectors.

UNIT V

Film Sensors: Thick film and thin film types, Electroanalytic sensors – Electrochemical cell, Polarization types, and membrane electrode types.Biosensors, Smart/Intelligent sensors, Nano-sensors, Nano-tube sensors, molecular and quantum sensors.

TEXT BOOKS:

1. Sensor & transducers, D. Patranabis, 2nd edition, PHI
2. Instrument transducers, H.K.P. Neubert, Oxford University press.
3. Measurement systems: application & design, E.A. Doebelin, McGraw Hill.

REFERENCE BOOKS:

1. Sensor and Transducers, Third Edition, Ian Sinclair, Newnes.
2. Sensor Technology, Hand Book, JON S. Wilson, Newnes.ELSEVIER.
3. Sensor and Transducers, Characteristics, Applications, Instrumentation, Interfacing, Second Edition, M.J. Usher and D.A. Keating, MACMILLAN Press Ltd.

COURSE OUTCOMES:

1. Understand the basic concepts of mechanical and electromechanical sensors, their electrical characteristics.
2. Understand/Analyze various capacitor sensors, ultrasonic sensors their electrical characteristics.
3. Analyze various thermal sensors, principle of operation.
4. Distinguish various magnetic sensors based on their operations, radiation sensors and their operation.
5. Analyze various film sensors and operation of different nano sensors and their applications.

END

(A30358) INDUSTRIAL SAFETY ENGINEERING
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT I

Industrial safety: Accident, causes, types, results and control, mechanical and electrical hazards, types, causes and preventive steps/procedure, describe salient points of factories act 1948 for health and safety, wash rooms, drinking water layouts, light, cleanliness, fire, guarding, pressure vessels, etc, Safety color codes. Fire prevention and firefighting, equipment and methods.

UNIT II

Fundamentals of maintenance engineering: Definition and aim of maintenance engineering, Primary and secondary functions and responsibility of maintenance department, Types of maintenance, Types and applications of tools used for maintenance, Maintenance cost & its relation with replacement economy, Service life of equipment.

UNIT III

Wear and Corrosion and their prevention: Wear- types, causes, effects, wear reduction methods, lubricants-types and applications, Lubrication methods, general sketch, working and applications, i. Screw down grease cup, ii. Pressure grease gun, iii. Splash lubrication, iv. Gravity lubrication, v. Wick feed lubrication vi. Side feed lubrication, vii. Ring lubrication, Definition principle and factors affecting the corrosion. Types of corrosion, corrosion prevention methods.

UNIT IV

Fault tracing: Fault tracing-concept and importance, decision tree concept, need and applications, sequence of fault-finding activities, show as decision tree, draw decision tree for problems in machine tools, hydraulic, pneumatic, automotive, thermal and electrical equipment's like, I. Any one machine tool, ii. Pump iii. Air compressor, iv. Internal combustion engine, v. Boiler, vi. Electrical motors, Types of faults in machine tools and their general causes.

UNIT V

Periodic and preventive maintenance: Periodic inspection-concept and need, degreasing, cleaning and repairing schemes, overhauling of mechanical components, overhauling of electrical motor, common troubles and remedies of electric motor, repair complexities and its use, definition, need, steps and advantages of preventive maintenance. Steps/procedure for periodic and preventive maintenance of: I. Machine tools, ii. Pumps, iii. Air compressors, iv. Diesel generating (DG) sets, Program and schedule of preventive maintenance of mechanical and electrical equipment, advantages of preventive maintenance. Repair cycle concept and importance

TEXT BOOKS

1. Mobley, R. Keith, Lindley R. Higgins, and Darrin J. Wikoff. *Maintenance Engineering Handbook*. New York, NY: Mcgraw-Hill, 2008.

2. Garg, H. P. *Industrial Maintenance*. S Chand, 1976.

REFERENCE BOOKS:

1. Graham, F. D. "Audels Pumps, Hydraulics and Air Compressors. Theo." (1998).

2. Winterkorn, Hans F., and Hsai-Yang Fang. *Foundation engineering handbook*. Springer, Boston, MA, 1991.

COURSE OUTCOMES:

1. Understand various hazards and their prevention.

2. Apply maintenance techniques to various equipments.

3. Understand types of wear and corrosions and their prevention.

4. Explain fault tracing and its applications.

5. Apply periodic and preventive maintenance techniques to various equipments.

(A30360) WORK SYSTEM DESIGN
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)	L	T	P	C
	3	0	0	3

UNIT I

Work System Design: Introduction and Concept of Productivity, Measurement of Productivity, Productivity Measures, Productivity Measurement Models, Factors Influencing Productivity, Causes of Low Productivity, Productivity Measurement Models, Productivity Improvement Techniques, Numerical Problems on productivity, Case study on productivity.

UNIT II

Work Study: Basic Concept, Steps Involved in Work Study, Concept of Work Content, Techniques of Work Study, Human Aspects of Work Study.
Method Study: Basic Concept, Steps Involved in Method Study, Recording Techniques, Operation Process Charts, Operation Process Charts: Examples.
Flow Process Charts, Flow Process Charts: Examples, Two-Handed-Process Charts, Multiple Activity Charts, Flow Diagrams.

UNIT-III

String Diagrams, Principles of Motion Economy, Micro-Motion Study, Therbligs, SIMO Charts, Memo-Motion Study, Cycle graph and Chrono-Cycle Graph, Critical Examination Techniques, Development and Selection of New Method, Installation and Maintenance of Improved Methods.

UNIT-IV

Work Measurement: Basic Concept, Techniques of Work Measurement, Steps Involved in Time Study, Steps and Equipment of Time Study,

Performance Rating: Examples, Allowances, Computation of Standard Time-I, Computation of Standard Time-II, Case Study

UNIT-V
Work Sampling: Basics, Procedure of Work Sampling Study, Numerical Problems on work sampling, Introduction to Synthetic Data and PMTS, Introduction to MTM and MOST
Ergonomics: Basic Concept, Industrial Ergonomics, Anthropometry, Man-Machine System-1, Man-Machine System-2

TEXT BOOKS:
1. Introduction to Work Study: International Labor Office (ILO), Geneva.
2. Motion and Time Study Design and Measurement of Work: Ralph M. Barnes, Wiley, The University of California.
3. Industrial Engineering and Production Management: M. Telsang, S. Chand and Company Ltd.

COURSE OUTCOMES:
1. Calculate the basic work content of a specific job for employees of an organization. Thereby they will be able to calculate the production capacity of man power of an organization.

2. Analyze and calculate the level of risk in a job causing stress, fatigue and musculoskeletal disorders and design appropriate work systems.

3. Rate a worker engaged on a live job and calculate basic, allowed and standard time for the same.

4. Analyze the existing methods of working for a particular job and develop an improved method through questioning technique.

5. devise appropriate wage and incentive plan for the employees

END

(A30256) ENERGY AUDIT & CONSERVATION
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT I: BASIC PRINCIPLES OF ENERGY AUDIT

Energy audit- definitions, concept, types of audit, energy index, cost index, pie charts, Sankey diagrams, load profiles, Energy conservation schemes- Energy audit of industries- energy saving potential, energy audit of process industry, thermal power station, building energy audit.

UNIT II: ENERGY MANAGEMENT

Principles of energy management, organizing energy management program, initiating, planning, controlling, promoting, monitoring, reporting- Energy manger, Qualities and functions, language, Questionnaire – check list for top management.

UNIT III: ENERGY EFFICIENT MOTORS

Energy efficient motors, factors affecting efficiency, loss distribution, constructional details, characteristics – variable speed, variable duty cycle systems, RMS hp- voltage variation-voltage unbalance- over motoring- motor energy audit

UNIT IV: POWER FACTOR IMPROVEMENT, LIGHTING AND ENERGY INSTRUMENTS

Power factor – methods of improvement, location of capacitors, pf with non-linear loads, effect of harmonics on power factor, power factor motor controllers – Good lighting system design and practice, lighting control, lighting energy audit – Energy Instruments- wattmeter, data loggers, thermocouples, pyrometers, lux meters, tongue testers, application of PLC's.

UNIT V: ECONOMIC ASPECTS AND ANALYSIS

Economics Analysis-Depreciation Methods, time value of money, rate of return, present worth method, replacement analysis, life cycle costing analysis- Energy efficient motors- calculation of simple payback method, net present worth method- Power factor correction, lighting – Applications of life cycle costing analysis, return on investment.

TEXT BOOKS:
1. Energy management by W.R. Murphy AND G. Mckay Butter worth, Heinemann publications.
2. Energy management by Paul o' Callaghan, Mc-graw Hill Book company-1st edition, 1998

REFERENCE BOOKS:
1. Energy efficient electric motors by John.C. Andreas, Marcel Dekker Inc Ltd-2nd edition, 1995-

2. Energy management hand book by W.C. Turner, John wiley and sons

3. Energy management and good lighting practice: fuel efficiency- booklet 12-EEO

COURSE OUTCOMES:
1. Explain the various methods of energy audit.
2. Illustrate the energy management strategies.
3. Relate the energy conservation with the improvement in energy efficiency and power factor.
4. Analyze the economic aspects to be considered in energy usage

END

(A30257) NANO TECHNOLOGY
(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)

L	T	P	C
3	0	0	3

UNIT I: NTRODUCTION

History and Scope, Can Small Things Make a Big Difference? Classification of Nanostructured Materials, Fascinating Nanostructures, Applications of Nanomaterials, Nature: The Best of Nanotechnologist, Challenges, and Future Prospects.

UNIT II: UNIQUE PROPERTIES OF NANOMATERIALS

Microstructure and Defects in Nanocrystalline Materials: Dislocations, Twins, stacking faults and voids, Grain Boundaries, triple and declinations, Effect of Nano-dimensions on Materials Behavior: Elastic properties, Melting Point, Diffusivity, Grain growth characteristics, enhanced solid solubility. Magnetic Properties: Soft magnetic nano crystalline alloy, Permanent magnetic nano-crystalline materials, Giant Magnetic Resonance, Electrical Properties, Optical Properties, Thermal Properties, and Mechanical Properties.

UNIT III: SYNTHESIS ROUTES

Bottom up approaches: Physical Vapor Deposition, Inert Gas Condensation, Laser Ablation, Chemical Vapor Deposition, Molecular Beam Epitaxy, Solgel method, Self-assembly, Top down approaches: Mechanical alloying, Nano-lithography, Consolidation of Nanopowders: Shock wave consolidation, Hot isostatic pressing and Cold isostatic pressing, Spark plasma sintering.

UNIT IV: TOOLS TO CHARACTERIZE NANO MATERIALS

X-Ray Diffraction (XRD), Small Angle X-ray scattering (SAXS), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Atomic Force Microscopy (AFM), Scanning Tunneling Microscope (STM), Field Ion Microscope (FEM), Three-dimensional Atom Probe (3DAP), Nanoindentation.

UNIT V: APPLICATIONS OF NANOMATERIALS

Nano-electronics, Micro- and Nano-electromechanical systems (MEMS/NEMS), Nanosensors, Nanocatalysts, Food and Agricultural Industry, Cosmetic and Consumer Goods, Structure and Engineering, Automotive Industry, WaterTreatment and the environment, Nano-medical applications, Textiles, Paints, Energy, Défense and Space Applications, Concerns and challenges of Nanotechnology.

TEXT BOOKS:

1. Text Book of Nano Science and Nano Technology – B.S. Murthy, P. Shankar, Baldev Raj, B.B. Rath and James Munday, University Press-IIM.
2. Introduction to Nanotechnology – Charles P. Poole, Jr., and Frank J. Owens, Wley India Edition, 2012.

REFERENCES BOOKS:

1. Nano: The Essentials by T. Pradeep, Mc Graw- Hill Education.
2. Nanomaterials, Nanotechnologies and Design by Michael F. Ashby, Paulo J. Ferreira and Daniel L. Schodek.
3. Transport in Nano structures- David Ferry, Cambridge University press 2000
4. Nanofabrication towards biomedical application: Techniques, tools, Application and impact – Ed. Challa S., S. R. Kumar, J. H. Carola.
5. Carbon Nanotubes: Properties and Applications- Michael J. O'Connell.

COURSE OUTCOMES:

1. Illustrate the characteristics and properties of nano-materials.
2. Identify the synthesis routes of nano-materials
3. Make use of the tools to characterize the nano-materials.
4. Utilize the nano-materials for various applications

(A30166) ENVIRONMENTAL PROTECTION AND MANAGEMENT (OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)	L	T	P	C
	3	0	0	3

UNIT – I

Environmental Management Standards: Unique Characteristics of Environmental Problems – Systems approach to Corporate environmental management - Classification of Environmental Impact Reduction Efforts - Business Charter for Sustainable Production and Consumption – Tools, Business strategy drivers and Barriers - Evolution of Environmental Stewardship. Environmental Management Principles - National policies on environment, abatement of pollution and conservation of resources - Charter on Corporate responsibility for Environmental protection

UNIT – II

Environmental Management Objectives: Environmental quality objectives – Rationale of Environmental standards: Concentration and Mass standards, Effluent and stream standards, Emission and ambient standards, Minimum national standards, environmental performance evaluation: Indicators, benchmarking. Pollution control Vs Pollution Prevention - Opportunities and Barriers – Cleaner production and Clean technology, closing the loops, zero discharge technologies.

UNIT – III

Environmental Management System: EMAS, ISO 14000 - EMS as per ISO 14001– benefits and barriers of EMS – Concept of continual improvement and pollution prevention - environmental policy – initial environmental review – environmental aspect and impact analysis – legal and other requirements-objectives and targets – environmental management programs – structure and responsibility – training awareness and competence- communication – documentation and document control – operational control – monitoring and measurement – management review.

UNIT – IV

Environmental Audit: Environmental management system audits as per ISO 19011- – Roles and qualifications of auditors - Environmental performance indicators and their evaluation – Non conformance – Corrective and preventive actions -compliance audits – waste audits and waste minimization planning – Environmental statement (form V) - Due diligence audit.

UNIT – V

Applications: Applications of EMS, Waste Audits and Pollution Prevention Control: Textile, Sugar, Pulp & Paper, Electroplating, Tanning industry. Hazardous Wastes - Classification, characteristics Treatment and Disposal Methods, Transboundary movement, disposal.

REFERENCE BOOKS

1. Christopher Sheldon and Mark Yoxon, "Installing Environmental management Systems – a step by
   step guide" Earthscan Publications Ltd, London, 1999.
2. ISO 14001/14004: Environmental management systems – Requirements and Guidelines – International
   Organisation for Standardisation, 2004
3. ISO 19011: 2002, "Guidelines for quality and/or Environmental Management System auditing, Bureau
   of Indian Standards, New Delhi, 2002
4. Paul L Bishop „Pollution Prevention: Fundamentals and Practice, McGraw-Hill International, Boston.
5. Environmental Management Systems: An Implementation Guide for Small and Medium-Sized
     Organizations, Second Edition, NSF International, Ann Arbor, Michigan, January 2001.

COURSE OUTCOMES:

1.Appreciate the elements of Corporate Environmental Management systems complying to international environmental management system standards.

2.Lead pollution prevention assessment team and implement waste minimization options.

3. Develop, Implement, maintain and Audit Environmental Management systems for Organizations.

END

(A30167) ALTERNATE BUILDING MATERIALS

(OPEN ELECTIVE)

B. Tech (CSE-Cyber Security)	L	T	P	C
	3	0	0	3

UNIT – I

Introduction: Energy in building materials, Environmental issues concerned to building materials, Embodied energy and life-cycle energy, Global warming and construction industry, Green concepts in buildings, Green building ratings – IGBC and LEED manuals – mandatory requirements, Rainwater harvesting & solar passive architecture. Environmental friendly and cost-effective building technologies, Requirements for buildings of different climatic regions.

UNIT – II

Elements of Structural Masonry: Elements of Structural Masonry, Masonry materials, requirements of masonry units' characteristics of bricks, stones, clay blocks, concrete blocks, stone boulders, laterite Blocks, Fal- G blocks and Stabilized mud block. Manufacture of stabilized blocks.

Structural Masonry Mortars: Mortars, cementations materials, sand, natural & manufactured, types of mortars, classification of mortars as per BIS, characteristics and requirements of mortar, selection of mortar. Uses of masonry, masonry bonding, Compressive strength of masonry elements, Factors affecting compressive strength, Strength of Prisms/wallets and walls, Effect of brick bond on strength, Bond strength of masonry: Flexure and shear, Elastic properties of masonry materials and masonry, Design of masonry compression elements subjected to axial load.

UNIT – III

Alternate Building Materials: Lime, Pozzolana cements, Raw materials, Manufacturing process, Properties and uses. Fibers- metal and synthetic, Properties and applications. Fiber reinforced plastics, Matrix materials, Fibers organic and synthetic, Properties and applications. Building materials from agro and industrial wastes, Types of agro wastes, Types of industrial and mine wastes, Properties and applications. Masonry blocks using industrial wastes. Construction and demolition wastes.

UNIT – IV

Alternate Building Technologies: Use of arches in foundation, alternatives for wall constructions, composite masonry, confined masonry, cavity walls, rammed earth, Ferro cement and ferroconcrete building components, Materials and specifications, Properties, Construction methods, Applications. Top down construction, Mivan Construction Technique. Alternate Roofing Systems: Concepts, Filler slabs, Composite beam panel roofs, Masonry vaults and domes

UNIT – V

Equipment for Production of Alternate Materials: Machines for manufacture of concrete, Equipments for production of stabilized blocks, Moulds and methods of production of precast elements, Cost concepts in buildings, Cost saving techniques in planning, design and construction, Cost analysis: Case studies using alternatives.

TEXTBOOKS:

1. KS Jagadish, B V Venkatarama Reddy and K S Nanjunda Rao, "Alternative Building Materials
   andTechnologies", New Age International pub.
2. Arnold W Hendry, "Structural Masonry", Macmillan Publishers.

REFERENCE BOOKS:

1. RJS Spence and DJ Cook, "Building Materials in Developing Countries", Wiley
pub.
2. LEED India, Green Building Rating System, IGBC pub.
3. IGBC Green Homes Rating System, CII pub.
4. Relevant IS Codes.

COURSE OUTCOMES:

1. Solve the problems of Environmental issues concerned to building materials and cost-effective building
   technologies;
2. Select appropriate type of masonry unit and mortar for civil engineering constructions; also, they are

able to Design Structural Masonry Elements under Axial Compression.

3. Analyse ~~different alternative building materials which will be suitable for~~ specific climate and in an

 environmentally sustainable manner. Also capable of suggesting suitable agro and industrial wastes as a

 building material.

4. Recommend various types of alternative building materials and technologies and design an energy

 efficient building by considering local climatic condition and building material.

END

(C30167) MARKETING MANAGEMENT
(OPEN ELECTIVE)

L	T	P	C
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B. Tech (CSE-Cyber Security)

UNIT I

Understanding Marketing Management: Concepts of Marketing, Marketing Strategies & Plans, Creating long term Loyalty relationships, Marketing mix, Product Life Cycle.

UNIT II

Connecting with Customers & Building Strong Brands: Analyzing Competitors, Conducting Marketing Research, Consumer Behaviour, Identifying market segments and targets, crafting Brand Positioning.

UNIT III

New Product and Promotions: Introducing New Market Offering, Developing Pricing Strategies &Programmes, Designing & Managing Integrated Marketing Communications, Advertising & Sales Promotions, Managing Digital-Communication – Online, Social Media & Mobile, Personal Selling.

UNIT IV

Delivering Value: Managing Retailing, Wholesaling and logistics, Designing and Managing Integrated Marketing Channels.

UNIT V

Sales Management: Nature and Importance of Sales Management, Skills of Sales Manager, Sales objectives, Concepts of Sales organization, Type of Sales organization.

TEXT BOOKS:

1. Marketing Management, Philip Kotler, Kevin Lane Keller, Pearson

REFERENCE BOOKS

1. Marketing, A south Asian prospective, Lamb, Hair, Sharma, Mcdaniel, Cenage
2. Marketing Asian Edition Paul Baines Chris Fill Kelly Page, Oxford

3. Marketing Management 22e, Arun Kumar, Menakshi, Vikas Publishing

COURSE OUTCOMES:

1. Analyze the scope, concepts of Marketing and forecasting techniques in present Global Market Environment.
2. Develop conceptual knowledge on consumer behavior, Marketing Mix and Product Mix
3. Outline Segmentation, targeting and Positioning Goods and Services in Market.
4. Illustrate marketing channels of distribution and Promotional mix
5. Identify Pricing Decisions and importance of digital Marketing.

END

(C30168) INTELLECTUAL PROPERTY RIGHTS
(OPEN ELECTIVE)

	L	T	P	C
B. Tech (CSE-Cyber Security)	3	0	0	3

UNIT I : INTRODUCTION TO INTELLECTUAL PROPERTY

Introduction, types of intellectual property, international Organizations, agencies and treaties, importance of intellectual property rights.

UNIT II: TRADE MARKS

Purpose and function of trademarks, acquisition of trade mark rights, protectable matter, Selecting and evaluating trade mark, trade mark registration processes.

UNIT-III: LAW OF COPY RIGHTS:

Fundamental of copy right law, originality of material, rights of reproduction, rights to perform the workpublicly, copy right owner ship issues, copy rightregistration, notice of copy right , international copy right law. **Law of Patents:** Foundation of patent law, patent searching process, owner rights and transfer.

UNIT-IV: TRADE SECRETS:

Trade secret law, determination of trade secretes status' liability for misappropriations of trade secrets, protection for submission, trade secrete litigation.

UNFAIR COMPETITION: Misappropriation right of publicity, false advertising

UNIT-V NEW DEVELOPMENT OF INTELLECTUAL PROPERTY:

new developments in trade mark law; copy right law, patent law, intellectual property audits. International overview on intellectual property, international-trade mark law, copy right law, international patent law, and international developmentin trade secrets law.

TEXT BOOKS & REFERENCES

1. Intellectual property right, Deborah, E. Bouchoux, cengage learning.

2. Intellectual property right - Unleashing the knowledge economy, Prabuddha Ganguli, ~~Tata Mc Graw Hill Publishing Company Ltd.~~

COURSE OUTCOMES:

1. Skill to understand the concept of intellectual property rights.
2. Develops procedural knowledge to Legal System and solving the problem relating Patents.
3. Gain knowledge on development and owning of Trade Marks, Copy Rights, and Patents.
4. Develops conceptual exposure on legal aspects related to IPR
5. Knowledge on different types of competition and ethical and unethical practices of advertising.

END