PACE INSTITUTE OF TECHNOLOGY & SCIENCES, ONGOLE – 532272 (AUTONOMOUS)
R-18 REGULATIONS SYLLABUS & COURSE STRUCTURE
B.TECH-CSE(IOT & CSBT)

S.No	CODE	COURSE	L	T	P	Credits	Internal	External
I YEAR I SEMESTER								
1	P18MCT01	Induction Program	3 weeks			0	-	-
2	P18HST01	English-I	3	0	0	3	40	60
3	P18BST01	Mathematics-I	3	0	0	3	40	60
4	P18BST05	Applied Chemistry	3	0	0	3	40	60
5	P18EST01	Basic Electrical & Electronics Engineering	3	0	0	3	40	60
6	P18EST03	C-Programming For Problem Solving	3	0	0	3	40	60
7	P18BSL03	Applied Chemistry Lab	0	0	3	1.5	40	60
8	P18ESL01	Basic Electrical & Electronics Engineering Lab	0	0	3	1.5	40	60
9	P18ESL03	C-Programming For Problem Solving Lab	0	0	3	1.5	40	60
Total Periods			15	0	9	19.5	320	480

S.No	CODE	COURSE	L	T	P	Credits	Internal	External
I YEAR II SEMESTER								
1	P18HST02	English-II	3	0	0	3	40	60
2	P18BST02	Mathematics-II	3	0	0	3	40	60
3	P18BST03	Applied Physics	3	0	0	3	40	60
4	P18EST02	Engineering Graphics	1	0	3	2.5	40	60
5	P18EST05	Python Programming	3	0	0	3	40	60
6	P18MCT02	Environmental Sciences	3	0	0	0	100	--
7	P18ESL04	Python Programming Lab	0	0	3	1.5	40	60
8	P18BSL01	Applied Physics Lab	0	0	3	1.5	40	60
9	P18ESL02	Engineering Workshop	0	0	3	1.5	40	60
10	P18HSL01	English Language Communication Skills Lab	0	0	3	2	40	60
Total Periods			16	0	15	21	460	540

S.No	CODE	COURSE	L	T	P	Credits	Internal	External
		II YEAR I SEMESTER						
1	P18CBT01	Data Communications and Networking for IoT	3	0	0	3	40	60
2	P18CST02	Data Structures	3	1	0	4	40	60
3	P18CST07	Software Engineering	3	0	0	3	40	60
4	P18ECT18	Digital Logic Design	3	0	0	3	40	60
5	P18BST07	Mathematics-III	3	0	0	3	40	60
6	P18CSL02	Data Structures Lab	0	0	3	1.5	40	60
7	P18CBL01	Data Communications and Networking for IoT Lab	0	0	3	1.5	40	60
8	P18ECL11	Digital Logic Design lab	0	0	3	1.5	40	60
9	P18MCT04	Soft Skills –I	2	0	0	0	100	
	Total Periods		17	1	9	20.5	420	480

S.No	CODE	COURSE	L	T	P	Credits	Internal	External
		II YEAR II SEMESTER						
1	P18CST13	Design & Analysis of Algorithms	3	0	0	3	40	60
2	P18CST04	Computer Organization	3	0	0	3	40	60
3	P18CST03	Mathematical Foundation of Computer Science	3	0	0	4	40	60
4	P18CST06	Database Management Systems	3	1	0	4	40	60
5	P18CST01	Java Programming	3	0	3	3	40	60
6	P18ECO02	*Open Elective – I*	2	0	0	2	40	60
7	P18CSL05	Database Management Systems Lab	0	0	3	1.5	40	60
8	P18CSL01	Java Programming Lab	0	0	3	1.5	40	60
9	P18MCT05	Indian Constitution	2	0	0	0	100	-
10		Internship	0	0	0	2	100	-
	Total Periods		19	1	9	24	520	480

III YEAR I SEMESTER								
S.No	CODE	COURSE	L	T	P	Credits	Internal	External
1	P18CST12	Web Technologies	3	0	0	3	40	60
2	P18CST08	Computer Networks	3	0	0	3	40	60
3	P18CST09	Operating Systems	3	0	0	3	40	60
4	P18CBT02	IOT Devices	3	0	0	3	40	60
5	P18CBE02	Professional Elective – I	3	0	0	3	40	60
6	P18MBO03	*Open Elective-II*	2	0	0	2	40	60
7	P18CSL06	Computer Networks & Operating Systems lab	0	0	3	1.5	40	60
8	P18CSL09	Web Technologies Lab.	0	0	3	1.5	40	60
9	P18MCT08	Design Thinking	0	0	4	2	40	60
Total Periods			**17**	**0**	**10**	**22**	**360**	**540**

Professional Elective – I		
S.No	Course Code	COURSE
1		Distributed Systems
2	P18CBE02	Software Testing
3		Automata Theory and Compiler Design
4		Advanced python programming

Open Elective-II		
S.No	Course Code	COURSE
1		Full Stack Application Development
2	P18MBO03	Professional Ethics
3		Robotics
4		Wireless sensor Networks

III YEAR II SEMESTER								
S.No	CODE	COURSE	L	T	P	Credits	Internal	External
1	P18ITT07	Cryptography and Network Security	3	0	0	3	40	60
2	P18CBT03	Sensor Technology	3	0	0	3	40	60
3	P18CBT04	Wireless & Adhoc Networks	3	0	0	3	40	60
4	P18ITE11	Multimedia and Application Development.(PE.1)	3	0	0	3	40	60
5	P18CBT05	Introduction to Machine Learning	3	0	0	3	40	60
6	P18MBO04	Management Science	2	0	0	2	40	60
7	P18CBL02	*Sensor Technology Lab*	0	0	0	1.5	40	60
8	P18CBL03	IOT Lab	0	0	3	1.5	40	60
9	P18ITM01	Mini Project	0	0	2	2	40	60
Total Periods			**17**	**0**	**10**	**22**	**360**	**540**

Professional Elective – I		
S.No	Course Code	COURSE
1	P18ITE11	Multimedia and Application Development
2	P18CBE01	Programming for IOT Boards
3	P18CBE02	Middleware Technologies
4	P18CBE03	Data Analytics

Open Elective-II		
S.No	Course Code	COURSE
1	P18MBO04	Management Science
2	P18CBO01	Big Data Analytics
3	P18CBO02	Natural Language Processing
4		Operations Research

L T   P C

English-I
(Common to all Branches)

3   0   0   3

Course Code: P18HST01

Internal Marks: 40
External Marks: 60

Course Prerequisite: The students should have basic knowledge of English grammar

and LSRW skills.

Course Objectives:

1. To enable the engineering students to develop their basic communication skills in English for academic and social purposes.
2. To equip the students with appropriate oral and written communication skills.
3. To inculcate the skills of listening, reading and critical thinking.
4. To integrate English Language learning with employability skills and training.
5. To enhance the students' proficiency in reading skills enabling them meet the academic demands of their course

Course Outcomes:
   On completion of this course, the student is able to:
1. Use English Language effectively in spoken and written forms
2. Interpret the contextual meaning of words
3. Comprehend the given texts and respond appropriately
4. Recall and reproduce the theme in a given context
5. Communicate confidently in formal and informal contexts

UNIT – I   (9 Lectures)

The Happy Prince – Oscar Wilde
a. Vocabulary: Synonyms and Antonyms
(http://www.magickeys.com/books/riddles/words.html)
b. Grammar: Prepositions, Sentence structure & Types of sentences
c. Writing: Note Making and Note Taking

UNIT – II   (8 Lectures)

Technology with a Human Face – E.F.Schumacher
a. Vocabulary: One word substitutes & Idioms
b. Grammar: Subject–verb Agreement (Concord), Question tags and Modal Auxiliaries

c. Writing: Information Transfer

UNIT –III   (9 Lectures)

Presidential Address – APJ Abdul Kalam
a. Vocabulary: Word formation, Root Words
(www.englishhints.com,www.enchantedlearning.com,
www.learnenglish.de/grammar/prefixtext.html)
b. Grammar: Parts of Speech, Punctuation
c. Writing: Paragraph Writing

UNIT- IV   (9Lectures)

The Road Not Taken – Robert Frost
a. Vocabulary: Prefixes, Suffixes and Affixes
(http://www.magickeys.com/books/riddles/words.html)
b. Grammar: Articles
c. Writing: Letter Writing

UNIT – V   (10 Lectures)

Good Manners – J.C Hill
a. Vocabulary: Homonyms, Homophones and Homographs
(http://www.pinnacle.edu.in/campusfiles/1826_campusFile_1.pdf)
b. Grammar: Tenses
c. Writing: E- mail Writing

Text books:
1. New Horizons – Pearson Publishers
2. Fluency in English", A Course Book for Engg. Students, Published by Orient Black Swan, Hyderabad, 2016 print.
3. "Technical Communication- Principles and Practice", Third Edition. New Delhi: Oxford University press.

Reference Books:
1. Meenakshi raman, Sangeetha, Sharma Fundamentals of technical communication, Pg:
   119-153 Oxford University press, 2015
2. Rutherford, Andhrea. J, Communication skills for technology. Pearson, New Delhi.2001
3. Raymond Murphy, Murphy's English Grammar, Cambridge University Press 2004
4. Meenakshi raman, Sangeetha, Sharma,Technical communication: English Skills for
   Engineers, Oxford University press, 2009
5. Michael Swan, Practical English Usage, Oxford University press, 1996

Web References:

1. www.englishhints.com
2. www.enchantedlearning.com
3. www.learnenglish.de/grammar/prefixtext.html
4. http://www.magickeys.com/books/riddles/words.html
5. http://www.pinnacle.edu.in/campusfiles/1826_campusFile_1.pdf
6. http://www.yourdictionary.com
7. http://www.learnenglish.com
8. http://www.cambridge.org
9. http://www.eslcafe.com
10. http://www.eslgames.com
11. http://www.penguin.co.uk
12. http://www.edufind.com/english/practice

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MATHEMATICS-I

(Differential equations and Laplace Transforms)

(Common to All Branches)

Course code: P18BST01

Internal Marks: 40
External marks: 60

Course Prerequisite: The basic knowledge of Matrices, Trigonometry, Differentiation and Integration.

Course Objectives:
1. To learn the methods solving the differential equations of first order with their applications.
2. To learn the methods of solving differential equations of second and higher order with their applications .
3. To learn to find the Laplace transform of different functions and obtained the solution of Design.
4. To understand the concepts Partial Differential.

Course Outcomes: After learning the contents of this paper the student must be able to
1. Solve first order differential equations and their applications.
2. Usage of higher order differential equations that are applied to real world problems.
3. Find the Laplace transform of derivatives, integrals and periodic functions.
4. Use the method of Laplace transforms to solve systems of linear first-order differential equations.
5. Calculate total derivative, Jacobian, Maxima and minima of functions of two variables.

UNIT-I: (11 Lectures)

Differential equations of first order and first degree:
Linear-Bernoulli-Exact-Reducible to exact.
Applications: Newton's Law of cooling-Law of natural growth and decay-
Orthogonal trajectories.

UNIT-II: (9 Lectures)

Linear differential equations of higher order:
Non-homogeneous equations of higher order with constant coefficients with RHS

term of the type e^{ax} ,sin ax, cos ax, polynomials in x, e^{ax} V(x), xV(x)- Method of Variation of parameters.
Applications: LCR circuit.

UNIT-III: Laplace Transforms: (10 Lectures)
Laplace transforms of standard functions– First shifting Theorem, Change of scale property, Multiplication by t^n, division by t, Transforms of derivatives and integrals – Second shifting theorem– Laplace transform of Periodic functions.

UNIT IV: Inverse Laplace Transforms: (8 Lectures)
Inverse Laplace transforms – Convolution theorem.

Application of Laplace transforms to ordinary differential equations of first and second order.

UNIT V: Partial Differentiation: (10 Lectures)
Introduction- Homogeneous function-Euler's theorem-Total derivative-Chain rule-Generalized Mean value theorem for single variable (without proof)-Taylor's and Mc Laurent's series expansion of functions of two variables– Functional dependence-Jacobian.
Applications: Maxima and Minima of functions of two variables without constraints and Lagrange's method (with constraints).

Text Books:

1. B.S.Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.
2. N.P.Bali, Engineering Mathematics, Lakshmi Publications.

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India
2. Micheael Greenberg, Advanced Engineering Mathematics, 9th edition, Pearson edn
3. Dean G. Duffy, Advanced engineering mathematics with MATLAB, CRC Press
4. Peter O'neil, Advanced Engineering Mathematics, Cengage Learning.
5. Srimanta Pal, Subodh C.Bhunia, Engineering Mathematics, Oxford University Press.
6. Dass H.K., Rajnish Verma. Er., Higher Engineering Mathematics, S. Chand Co. Pvt. Ltd, Delhi.

Web References:
1. http://tutorial.math.lamar.edu/Classes/DE/DE.aspx
2. http://mathworld.wolfram.com/topics
3. http://www.nptel.ac.in/course.php

B.Tech I Year - I Semester	L	T	P	C
	3	0	0	3

C - Programming for Problem Solving

(Common to all Branches)

Course Code: P18EST03

Internal Marks: 40
External Marks: 60

Course Prerequisite: Nil

Course Objectives:

1. To impart adequate knowledge on the need of programming languages and problem solving techniques.
2. To impart problem solving skills.
3. To enable student to write programs in C and to solve the problems.

Course Outcomes:

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

1. Design algorithms and flowchart / Pseudo code for a given problem.
2. Design programs involving decision structures and loops.
3. Implement different operations on arrays and solve problems using functions.
4. Understand pointers and strings.
5. Implement structures, unions and file operations in C programming for a given application problem.

Unit-I: (8 Lectures)

Introduction to Programming: Computer hardware, Bits and Bytes, programming languages, application and system software, the software development process.

Idea of algorithm: steps to solve logical and numerical problems. Representation of algorithm: flowchart/pseudo code with examples, from algorithms to programs.

Unit-II: (9 Lectures)

Introduction to C: Overview of C, Constants, Variables and Data Types, Operators and Expressions, Managing Input and Output. Decision Making - Branching and Looping. Enumerated Data type, Renaming Data type with typedef, Type Casting.

UNIT-III   (12 Lectures)

Arrays: Definition, Declaration, Initialization, Assignment, Processing array, Passing array to a function, Two and multi dimensional array.

Functions: Defining a function, Accessing a function, Passing argument to functions, Function prototypes, Nested function call, Storage classes.

UNIT-IV   (10 Lectures)

Pointers: Definition, initialization, operations on pointers, functions and pointers, arrays and pointers, pointers to pointers, dynamic memory allocation.

Strings: C Strings, String Input / Output functions, arrays of strings, string manipulation functions.

UNIT-V   (9 Lectures)

Structures: Definition, declaration, initialization, accessing members, array of structures, arrays within structure, functions and structures, pointers to structures, nested structures, unions.

File Handling: Types, operations on files, modes, file I/O functions, Random Access Functions.

Text Books:
1. Byron S Gottfried, ―Programming with C, Schaums Outlines, Second Edition, Tata McGraw-Hill, 2006.
2. Problem Solving and Program Design in C, 4th edition, by jeri R. Hanly and Elli B.Koffman.
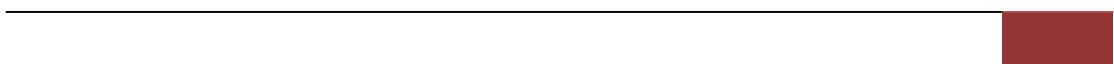3. Balagurusamy. 2011. C Programming. Tata Mc Graw Hills, New Delhi, India.

Reference Books:
1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.
2. Yashavant P. Kanetkar. ―Let Us C, BPB Publications, 2011.

Web References:
1. https://www.studytonight.com/c/
2. https://www.cprogramming.com/tutorial/c-tutorial.html
3. https://www.javatpoint.com/c-programming-language-tutorial
4. https://www.tutorialspoint.com/cprogramming/

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B.Tech. I Year I Semester   Course Structure
                                                           L   T   P   C

                                                           3   0   0   3

APPLIED PHYSICS

(Common to ECE, CSE & IT)

Internal Marks: 40

Course code: P18BST03   **External Marks: 60**

Course Prerequisites

The basics of analytical and conceptual understanding of physics.

Course Objectives
1. To study the wave nature of light through Interference and diffraction.
2. To learn the basic principles of Lasers and fiber optics.
3. To express the physics of electrostatics and electromagnetic wave concepts through Maxwell's equations.
4. To study the basic concepts of Quantum mechanics.
5. Aware of limits of classical free electron theory and apply band theory of solids.
6. Acquire the knowledge of semiconductor physics.

Course Outcomes

1   Understanding the basic concepts of optics and how to apply them for engineering applications.
2   Acquire the knowledge of fundamentals of Lasers and fiber optics enables the students to develop Laser devices to apply them in various systems like communications, Industries and medicine.
3   Set students to be exposed to Electrostatics, Maxwell's equations, electromagnetic waves and fundamental concepts of quantum mechanics.
4   Enable to learn the fundamental concepts of free electron theory and band theory of solids.
5   Develop knowledge of band theory of solids for fundamentals of Semiconductor physics enables the students to apply the knowledge to various systems like communications, solar cell, photo cells and so on.

UNIT-I
Wave Optics   (10 lectures)

Interference: Introduction, Superposition of waves, Interference of light by wave front splitting and amplitude splitting, interference in thin films, Newton's rings.

Diffraction: Introduction, differences between interference and diffraction, difference between Fraunhoffer and Fresnel diffraction, Fraunhoffer diffraction at single slit, Diffraction grating (N-slits qualitative), diffraction at circular aperture, resolving power of microscope, and telescope.

UNIT-II
LASERS AND FIBER OPTICS   (9 lectures)

Lasers: Introduction, Characteristics of laser, Absorption, spontaneous emission, stimulated emission, Einstein's coefficients, Pumping, Types of Lasers: Ruby laser, He-Ne laser.

Fiber optics: Introduction, Total internal reflection-wave propagation in optical fiber, Acceptance angle, numerical aperture.

UNIT-III   (9 lectures)

Electrostatics, Maxwell's Equations And Electromagnetic Waves
Electrostatics: Coulombs law, electric field, electric field intensity, electric flux Density, electrostatic potential, divergence of electric field, Laplace's and Poisson's equations for electrostatic potential, Gauss theorem in electrostatics.

Maxwell's equations and electromagnetic waves: Gauss theorem in magneto statics, Faraday's law of electromagnetic induction, Ampere's law, displacement current, Maxwell's equations in vacuum, electromagnetic wave equation in dielectric medium, velocity of propagation of electromagnetic wave, poynting vector and poynting theorem.

UNIT-IV   (12 lectures)

Quantum Mechanics, Free Electron Theory And Band Theory
Quantum Mechanics: Introduction to quantum physics, de-Broglie's hypothesis and properties of matter waves, Schrodinger's time independent wave equation, Particle in one dimensional box, physical significance of wave function.

Free electron theory: Free electron theory of metals assumptions and failures, Fermi Dirac distribution function- Fermi level, density of states.

Band theory of solids: Introduction, Bloch's theorem, Kronig penny model(qualitative), E-K diagram, Brillouin's zones, classification of solids into metals, semiconductors and insulators, effective mass of electron and concept of hole

UNIT-V   (8 lectures)

Semiconductor Physics
Semiconductor physics: Introduction, Intrinsic and Extrinsic semiconductors. carrier concentration in intrinsic semiconductors, carrier concentration in N-type and P-type semiconductors, Dependence of Fermi energy on carrier-concentration and temperature, diffusion and drift, Hall effect and its applications, mechanism in LED, solar cell and photo conductor

Text Books:
1. A Textbook of Engineering Physics by Dr. M. N. Avadhanulu, Dr. P.G. Kshirsagar - S. Chand.
2. Optics by Ajoy Ghatak, Tata McGraw-Hill Publishing company limited
3. Lasers and nonlinear optics by BB Laud, New age International Publishers
4. Introduction to Electrodynamics by David Griffiths, Cambridge University Press
5. Introduction to Quantum physics by Eisberg and Resnick.
6. Solid state physics by AJ Dekker.

Reference Books:
1. Applied physics by Palanisamy (Scitech publications)
2. Optics by Eugene Hecht, Pearson Education.
3. Principle of Lasers by O.Svelto
4. Electricity, magnetism and light by W. Saslow
5. Introduction to Quantum mechanics by D.J.Griffiths. Cambridge University Press
6. Quantum mechanics by Richard Robinett.
7. Quantum Chemistry by Daniel McQuarrie
8. Semiconductor Optoelectronics by J. Singh, Physics and Technology, Mc Graw-Hill inc
9. Engineering Physics by B.K. Pandey, S. Chaturvedi - Cengage Learing.
10. Physics by Halliday and Resnick

Web References:
1. http://jntuk-coeerd.in/
2. http://www.youtube.com
3. http://en.wikipedia.org
4. http://nptel.ac.in/syllabus/122106027/

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L   T   P   C

ENGINEERING GRAPHICS

1   0   3   2.5

(Common to EEE,ECE,CSE,IT Branches)

Internal Marks: 40

Course Code: P18EST02   **External Marks: 60**

Course Prerequisite: Nil

Course objectives:

1. To introduce the students to the "universal language of Engineers" for effective communication through drafting exercises.
2. To enable the students to acquire requisite knowledge, techniques and attitude required for advanced study of engineering drawing.
3. To enable the students to construct the layout development of basic solids for practical situations.
4. To enable the students to gain the ability to convert the Isometric views in to Orthographic views.
5. To enable the students to gain the ability to convert the Orthographic views in to Isometric views.

Course Outcomes:

 After completion of the course the student will be able to
1. Gain the knowledge of various Geometrical Elements used in Engineering Practice.
2. Understand concepts of all 2 D elements like polygons, Conic Sections.
3. Understand concepts of 3 D Objects like various Prisms, Cylinders, Pyramids and Cones.
4. Draw and represent the Projections of various objects.
5. Convert the 3 D views in to 2 D views and vice versa.

UNIT-I: (12 Lectures)

Introduction To Engineering Graphics
Introduction to Drawing instruments and their uses, construction of regular polygons, Conic sections- ellipse, parabola, hyperbola using general method, Scales- Diagonal scale, Vernier scale.

UNIT-II: (12 Lectures)

Projections Of Points & Lines
Principle of orthographic projection-Method of Projection – First and third angle projection methods- Projections of Points –Projection of straight lines- parallel to one plane and inclined to the other plane.

UNIT-III: (16 Lectures)

Projections of Lines & Planes
Projections of straight lines inclined to both the planes, determination of true lengths, angle of inclinations and traces.
Projections of Planes: Projections of plane figures: triangle, square, rectangle, pentagon and hexagon, circle with surfaces inclined to both the reference planes.

UNIT-IV: (12 Lectures)

Projections of Solids & Surface Development
Projections of Solids: Projections of regular solids with the axis inclined to only one reference plane.
Development of surfaces for basic solids- prisms, pyramids, cylinder and cone.

UNIT – V: (12 Lectures)

Projections Of Pictorial Views
Conversion of isometric views into orthographic views and conversion of orthographic views in to isometric views.

Text Book:
1. Engineering Drawing by N.D. Bhatt & V.M. Panchal, Charotar Publications, 2014.
2. Engineering Drawing by Basant Agrawal and C.M. Agrawal ,McGraw Hill Education Pvt. Limited, 2013.
3. Engineering Drawing by Prof.K.L.Narayana & Prof. R.K.Kannaiah, Scitech Publications, 2010.

Reference Book:

1. Engineering Graphics with AutoCAD 2002 by James D. Bethune, PHI, 2011.
2. Engineering Graphics. P I Varghese Tata McGraw Hill Education Pvt. Ltd, 2010.
3. Engineering drawing – P.J. Shah .S.Chand Publishers, 2010.
4. Engineering Drawing- Johle/Tata Macgraw Hill Book Publishers, 2010.
5. Engineering Drawing – M.B. Shah and B.C. Rana, Pearson, 2009.

Web References:

1. https://lecturenotes.in/subject/436/engineering-drawing-ed.

2. web.iitd.ac.in/~achawla/public_html/201/lectures/sp46.pdf.
3. https://www.smartzworld.com/notes/engineering-drawing-pdf-1st-year-notes-ppts
4. https://www.researchgate.net/305754529_A_Textbook_of_Engineering_Drawing
5. www.academia.edu/32510080/N_d_bhatt_engineering_drawing_pdf

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English Language Communication Skills Lab   0   0   3   1.5

(**Common to EEE,ME,ECE,CSE,IT,AME Branches)**

Internal Marks: 40
Course Code: P18HSL01   **External Marks: 60**

Course Prerequisite:

1. Basic knowledge of English grammar
2. Basic understanding of English vocabulary.
3. Ability to speak simple sentences.
4. Have interest to learn the language

Course Objectives

1. To facilitate computer assisted multimedia instructions enabling individualized and independent language learning.
2. To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm.
3. To bring about a consistence accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking.
4. To improve the fluency of students in spoken English and neutralize their mother tongue influence.
5. To train students to use language appropriately for public speaking, group discussion and interviews.

Course Outcomes

1. Better understanding of nuances of English language through audio visual experience and group activities.
2. Neutralization of accent for intelligibility.
3. Speaking skills with clarity and confidence which in turn enhances their employability skills.
4. Better understanding of the production of sounds of language.
5. Suitable body language for employability.

Scope:
The curriculum of the **ELCS Lab** is designed to focus on the production and practice of sounds of language and to familiarize the students with the use of English in everyday situations and contexts.

EXERCISE – I (3 Sessions)
- **A.** Ice – Breaking Activity, Greeting, Introducing and taking leave
- **B.** Introduction to Phonetics

  Vowel sounds – Pure Vowels & Diphthongs

  Consonant sounds

EXERCISE – II (2 Sessions)
- **A.** JAM Session, Situational Dialogues, Giving Directions & Narration
- **B.** Structure of Syllables - Plural markers & Past tense Markers

EXERCISE – III   (2 Sessions)
- **A.** Role play, Giving Information and Asking Information
- **B.** Word Stress & Listening Comprehension – Listening for General Details

EXERCISE – IV   (2 Sessions)
- **A.** Describing objects, events, places etc. & Presentation Skills – Extempore, Public

  Speaking.
- **B.** Consonant Cluster, Rules of 'r' pronunciation and Neutralization of Mother Tongue Influence

EXERCISE – V   (3 Sessions)
- **A.** Interview Skills & Group Discussion
- **B.** Intonation & Listening Comprehension – Listening for Specific Details

Textbooks:
1. Strengthen your Communication Skills - Maruthi Publication, Hyderabad 2013
2. A textbook of English Phonetics for Indian Students by T. Balasubramanian (Macmillan)

Reference Books:
1. INFOTECH English (Maruthi Publications).
2. Personality Development and Soft Skills (Oxford University Press, New Delhi)
3. Suresh Kumar, E. & Sreehari, P. 2009. A Handbook for English Language Laboratories. New Delhi: Foundation
4. Speaking English Effectively 2nd Edition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
5. Sasi Kumar, V & Dhamija, P.V. How to Prepare for Group Discussion and Interviews. Tata McGraw Hill
6. Hancock, M. 2009. English Pronunciation in Use. Intermediate. Cambridge: CUP
7. Spoken English: A Manual of Speech and Phonetics by R. K. Bansal & J. B. Harrison. 2013. Orient Blackswan. Hyderabad
8. Hewings, M. 2009. English Pronunciation in Use. Advanced. Cambridge: CUP
9. Marks, J. 2009. English Pronunciation in Use. Elementary. Cambridge: CUP
10. Nambiar, K.C. 2011. Speaking Accurately. A Course in International

Communication. New Delhi : Foundation

11. Soundararaj, Francis. 2012. Basics of Communication in English. New Delhi: Macmillan

12. Spoken English (CIEFL) in 3 volumes with 6 cassettes, OUP.

13. English Pronouncing Dictionary Daniel Jones Current Edition with CD.

Web References:

1. http://www.cambridge.org
2. http://www.edufind.com/english/practice
3. http://www.learnenglish.com
4. http://www.penguin.co.uk

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B.Tech. I Year I Semester   **L T P C**

                                                                     0   0 3 1.5

C - Programming for Problem Solving Lab
(Common to all Branches)

Course Code: **P18ESL03**   **Internal Marks: 40**
                                                       External Marks: 60

Course Prerequisite: Nil

Course Objectives:
1. To understand the various steps in program development.
2. To understand the basic concepts in C Programming Language.
3. To understand different modules that includes conditional and looping expressions.
4. To understand how to write modular and readable C Programs.
5. To write programs in C to solve problems using arrays, structures and files.

EXPERIMENT WISE PROGRAMS

Experiment-1

a) Write a simple C program to Print "Hello World"
b) Write a simple C Program to Calculate Area and Circumference of Circle
c) Write a simple C program to implement basic arithmetic operations - sum, difference, product, quotient and remainder of given numbers.

Experiment-2

Write C programs to demonstrate the following operators
a) Assignment Operator.
b) Relational and Logical Operator.
c) Increment and decrement operator.
d) Bitwise operators.
e) Ternary operator.

Experiment-3

a) Write a C programs - to find the largest and smallest of 2 numbers(if – else), to find the largest and smallest of 3 numbers(Nested if – else), roots of quadratic equation(else – if ladder).
b) The total distance travelled by vehicle in 't' seconds is given by distance=ut+1/2at2 where 'u' and 'a' are the initial velocity and acceleration. Write a c program to find the distance travelled at regular intervals of time given the Values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.
c) Write a c program, which takes two integer operands and one operator from

the user, performs the operation and the prints the result. (consider the operators +,-,*,/,% and use switch statement).

Experiment-4

a) Write a C program to find the sum of individual digits of a positive integer

b) 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 generate the first n terms of the sequence.

c) Write a c program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

Experiment-5

a) Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression:

$1+x+x^2+x^3+ \dots \dots \dots +x^n$.

b) Write a C program to generate Pascal's triangle.

c) Write a C program to construct a pyramid of numbers

Experiment-6

a) Write a c program to find both the largest and smallest number in a list of integers.

b) Write a c program that uses functions to perform the following:
   i)   Addition of Two Matrices.
   ii)   Multiplication of Two Matrices.

Experiment-7

a) Write a programs that use both recursive and non-recursive functions

b) To find the factorial of a given integer.

c) To find the GCD of two given integers.

Experiment-8

a) Write a c program that uses functions to perform the following operations:
   i)   To insert a sub-string in given main string from a given position.
   ii)   To delete n Characters from a given position in a given string.

b) Write a C program to determine if the given string is a palindrome or not.

Experiment-9

a) Write a C program that displays the position or index in the string S Where the string T begins, or - 1 if S doesn't contain T.

b) Write a C program to count the lines, words and characters in a given text .

Experiment-10

a) Write a program to print the details of a student like(Name, Rollno, marks) using nested structures.

b) Write a C Program to Calculate Difference Between Two Time Period.

Experiment-11

   a) Write a C program that uses functions to perform the following operations:

      i) Reading a complex number
      ii) Writing a complex number
      iii) Addition of two complex numbers
      iv) Multiplication of two complex numbers

      (Note: represent complex number using a structure.)

Experiment-12

   a) Write a C program which copies one file to another and display the contents of a file

   b) Write a C program to reverse the first n characters in a file.

   c) Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file)

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B.Tech. I Year I Semester   **Course Structure**
                                                                    L   T   P   C

                                                                    0   0   3   1.5

APPLIED PHYSICS LAB

(Common to ECE, CSE & IT)

                                                                    Internal Marks: 40

Course code: P18BSL01   **External Marks: 60**

Course Prerequisites:

   The basics of analytical and conceptual understanding of physics.

Course Objective:
   1   Deploy scientific method of experiments in the laboratory.
   2   Develop the procedures and observational skills for appropriate use of
       simple and   complex apparatus.
   3   Enable analytical techniques, statistical analysis and graphical analysis.
   4   Reinforce ideas and concepts covered in lecture host of experiments.
   5. Train to find the radius of curvature of a Plano-convex lens forming
       Newton's rings.

Course Outcomes:
   1   Apply the phenomenon of interference and diffraction of light waves.
   2   Implement the concept of resonance in LCR circuit and Sonometer.
   3   Analyze the SHM to determine its dependent properties.
   4   Evaluate the behavior of electronic components and its characteristics.

List of Experiments
  (Any eight of the following to be done)
   1   Determination of Radius of Curvature of Plano - Convex lens by forming
       Newton's Rings.
   2   Determination of Wavelengths of various spectral lines using diffraction
       grating with the normal incidence method.
   3   Determination of wavelength of laser radiation.
   4   Determination of Refractive index of a given prism..
   5   Study of magnetic field along the axis of a current carrying coil and to
       verify Stewart-Gee's method.
   6   Determination of energy gap of PN junction Diode.
   7   Determination of   hall coefficient and carrier concentration using Hall
       effect
   8   Study of V-I characteristics of Zener diode.
   9   Study of V-I characteristics of PN junction diode.

10 Determination of frequency of a vibrating bar or electrical tuning fork using Melde's apparatus.
11 Determination of acceleration due to gravity using compound pendulum
12 Verification of laws of transverse waves by Sonometer.
13   Determination of Velocity of sound by volume resonator.
14 Determination of rigidity modulus by Torsional Pendulum.

Text Books:
1 Madhusudhanrao, "Engineering Physics lab manual" Ist edition,Scietech Publication, 2015.
2 Ramarao Sri, Choudary Nityanand and Prasad Daruka, Lab Manual of Engineering physics 5th ed, Excell books, 2010.
3 Physics lab manual, department of physics, PACE Institute of Technology and Sciences.

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ENGINEERING WORKSHOP

(Common to EEE,ECE,CSE,IT branches)

	L	T	P	C
	0	0	3	1.5

Internal Marks: 40

Course Code: P18ESL02   **External Marks: 60**

Course Pre-requisite: Nil

Course Objectives:

1. To provide hands on experience about use of different engineering materials, tools, equipment and processes those are common in the engineering field.
2. To provide the students hands on experience to make different joints in carpentry with hand tools like jack plane, various chisels & hand saws.
3. To provide the students hands on experience to make different joints in Sheet metal work with hand tools like snips, stacks, nylon mallets etc.
4. To provide the students hands on experience to make different connections in house wiring with hand tools like cutting pliers ,tester ,lamps& lamp holders etc.
5. To develop a right attitude, team working, precision and safety at work place.

Course Outcomes:

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

1. Identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances.
2. Familiarize with the basics of tools and equipment used in Carpentry.
3. Fabricate various basic components using Sheet metal.
4. Apply basic electrical engineering knowledge for house wiring practice.
5. Gain the hands on experience to form different models in Black smithy.

LIST OF EXPERIMENTS:

Minimum two experiments should be conducted from each trade

1 **Carpentry**   **(6 Lectures)**
   a   Cross-Lap joint
   b   Dove tail joint
   c   T - Lap joint
   d   Mortise & Tenon joint

2 Fitting   **(6 Lectures)**
  a   Square fit
  b   V - Fit
  c   Half round fit
  d   Dovetail fit

3 Tin Smithy   **(6 Lectures)**
  a   Rectangular Tray
  b   Cylinder
  c   Square box without lid
  d   funnel

4 Black Smithy   **(6 Lectures)**
  a   Round rod to Square
  b   S-Hook
  c   Round Rod to Flat Ring
  d   Round Rod to Square headed bolt

5 House wiring   **(6 Lectures)**
  a   One lamp controlled by one switch
  b   Parallel and Series connections
  c   Fluorescent lamp fitting
  d   Stair case wiring

Reference Books:

1 Work shop Manual / P.Kannaiah/ K.L.Narayana/ SciTech Publishers, 2015.
2 Engineering Practices Lab Manual, Jeyapoovan, SaravanaPandian, Vikas publishers, 2009.
3 Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House, 2003.

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B.Tech. I Year II Semester   **Course Structure**
                                                              L T   P C
                          English-II   **3 0   0 3**

                        (Common to all Branches)

                                                         Internal Marks: 40
Course Code: P18HST02   **External Marks:**
60

Course Prerequisite: The students should have basic knowledge of English grammar

and LSRW skills.

Course Objectives:
  1. To enable the engineering students to develop their basic communication
     skills in English for academic and social purposes.
  2. To equip the students with appropriate oral and written communication skills.
  3. To inculcate the skills of listening, reading and critical thinking.
  4. To integrate English Language learning with employability skills and training.
  5. To enhance the students' proficiency in reading skills enabling them meet the
     academic demands of their course

Course Outcomes:
  On completion of this course, the student is able to:
     1. Use English Language effectively in spoken and written forms
     2. Interpret the contextual meaning of words
     3. Comprehend the given texts and respond appropriately
     4. Recall and reproduce the theme in a given context
     5. Communicate confidently in formal and informal contexts

UNIT – I   (8 Lectures)

My Struggle for an Education – Booker T. Washington
a. Vocabulary: Collocations
b. Grammar: Finite verbs, Non- finite verbs, Gerund, Transitive and Intransitive
   Verbs
c. Writing: Precis Writing

UNIT – II   (9 Lectures)

In London – M.K.Gandhi
a. Vocabulary: Commonly confused words
b. Grammar: Active voice and Passive voice
c. Writing: Technical Report Writing

UNIT –III   (10 Lectures)

Principles of Good Writing – L A Hill
a. Vocabulary: Commonly Misspelt Words
b. Grammar: Direct & Indirect Speech
c. Writing: Essay Writing

UNIT- IV   (9 Lectures)

The Secret of Work – Swami Vivekanada
a. Vocabulary: Technical vocabulary
b. Grammar: Degrees of Comparison
c. Writing: Curriculum vitae, Cover Letter and Resume Writing. (Functional,
   Chronological and standard Resumes)

UNIT – V   (9 Lectures)

Oh Father Dear Father – Raj Kinger
a. Vocabulary: Phrasal verbs
b. Grammar: Simple, Compound and Complex Sentences
c. Writing: Hints Development

Textbooks:
1. Board of Editors, "Sure Outcomes"– Orient Blackswan, Hyderabad, 2013
2. "Panorama" – Oxford University Press, New Delhi, 2016
3. "Fluency in English", A Course Book for Engg. Students, Published by Orient
   Black Swan, Hyderabad, 2016 print.
4. "Technical Communication- Principles and Practice", Third Edition. New
   Delhi: Oxford   University press.

Reference Books:
1. Murphy, "English Grammar with CD", Cambridge University Press, New
   Delhi, 2004.
2. Rizvi Asheaf M, "Effective Technical Communication", Tata McGraw Hill,
   New Delhi, 2008.
3. Baradwaj Kumkum, Professional Communication", I.K. International-
   Principles and Practice". Third Edition. New Delhi: Oxford University
   Press.2015.
4. Trailblazers – Board of Editors – Orient Blackswan New Delhi.

Web References:
1. www.englishhints.com,www.enchantedlearning.com,
   www.learnenglish.de/grammar/prefixtext.html
2. http://www.magickeys.com/books/riddles/words.html
3. http://www.pinnacle.edu.in/campusfiles/1826_campusFile_1.pdf
4. http://www.yourdictionary.com
5. http://www.learnenglish.com

6. http://www.cambridge.org
7. http://www.eslcafe.com
8. http://www.eslgames.com
9. http://www.penguin.co.uk
10. http://www.edufind.com/english/practice

B. Tech- I Year II Semester   **Course structure**
                                                                              L T P C

                                                                              3   0   0   3

MATHEMATICS-II

(Linear algebra and Vector calculus)
(Common to All Branches)

                                                                 Internal Marks: 40

Course code: P18BST02   **External marks: 60**

Course Prerequisite: Mathematics-I (P18BST01)

Course Objectives: To learn

1. The subject gives the knowledge about matrices and applications to solve linear equations.
2. The course intends to provide an overview of Eigen values and Eigen vectors which occur in Physical and engineering problems.
3. To integration over the regions.
4. The concepts of vector differentiation.
5. Line integral, Surface and volume integrals, Vector integral theorems.

Course Outcomes: After learning the contents of this paper the student must be able to
1. Apply this knowledge to solve linear equations.
2. Eigen values and Eigen vectors of a given matrix and solve simultaneous linear equations.
3. Determine double integral over a region and triple integral over a volume.
4. Analyze the Vector differentiation in various domains.
5. Evaluate the line, surface and volume integrals and converting them from one to another.

UNIT I: Linear systems of equations: (10 Lectures)
Rank-Echelon form-Normal form – Solution of linear systems – Gauss elimination – Gauss Jordon- Gauss Jacobi and Gauss Seidal methods.

Applications: Finding the current in electrical circuits.

UNIT II: Eigen values - Eigen vectors and Quadratic forms: (10 Lectures)
Eigen values - Eigen vectors– Properties – Cayley-Hamilton theorem - Inverse and powers of a matrix by using Cayley-Hamilton theorem- Diagonalization-

Quadratic forms-Reduction of quadratic form to canonical form – Rank - Positive, negative and semi definite - Index – Signature.

UNIT III: Multiple integrals: (9 Lectures)
Double and triple integrals – Change of variables – Change of order of integration.
Applications: Finding Areas, surface areas and Volumes.

UNIT IV: Vector Differentiation: (10 Lectures)
Gradient-Directional derivative, Divergence- Solenoidal vector, Curl –Irrotational Vector, Vector identities.

Applications: Equation of continuity, potential surfaces.

UNIT V: Vector Integration: (9 Lectures)
Line integral – Work done – Potential function – Area- Surface and volume integrals
Vector integral theorems: Greens, Stokes and Gauss Divergence theorems (without proof) and related problems.
Applications: Work done, Force.

Text Books:
1. B.S.Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.
2. N.P.Bali, Engineering Mathematics, Lakshmi Publications.

Reference Books:
1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India
2. Micheael Greenberg, Advanced Engineering Mathematics, 9th edition, Pearson edn
3. Dean G. Duffy, Advanced engineering mathematics with MATLAB, CRC Press
4. Peter O'neil, Advanced Engineering Mathematics, Cengage Learning.
5. Srimanta Pal, Subodh C.Bhunia, Engineering Mathematics, Oxford University Press.
6. Dass H.K., Rajnish Verma. Er., Higher Engineering Mathematics, S. Chand Co. Pvt. Ltd, Delhi.

Web References:
   1. http://tutorial.math.lamar.edu/Classes/DE/DE.aspx
   2. http://mathworld.wolfram.com/topics
   3. http://www.nptel.ac.in/course.php

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B.Tech I Year - II Semester   **Course structure**

                                                         L   T   P   C
                                                         3   0   0   3

PYTHON PROGRAMMING

(Common to EEE,ME,ECE,CSE,IT,AME Branches)

Course Code: P18EST04   **Internal Marks: 40**
                                                   External Marks: 60

Course Prerequisite: **Nil**

Course Objectives:

1. To read and write simple Python programs.
2. To develop Python programs with conditionals and loops.
3. To define Python functions and apply OOP concept.
4. To use Python data structures –- lists, tuples, dictionaries.
5. To develop GUI applications in Python.

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

1. Understand the basics of python programming.
2. Understand control flow and implement various data structures provided by python.
3. Implement packages, methods and functions.
4. Develop real-world applications using oops and exception handling.
5. Build GUI Applications in Python.

UNIT-I   (9 Lectures)

Introduction: History of Python, Need of Python Programming, Applications Basics of Python Programming Using the REPL(Shell), Running Python Scripts, Variables, Assignment, Keywords, Input-Output, Indentation.

UNIT-II   (10 Lectures)

Types, Operators and Expressions: Types - Integers, Strings, Booleans, Expressions and order of evaluations, Control Flow- if, if-elif-else, for, while, break, continue, pass.
Data Structures Lists - Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Sequences, Comprehensions.

UNIT III   (11 Lectures)

Functions - Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful Functions(Function Returning Values), Scope of the Variables in a Function - Global and Local Variables.

Modules: Creating modules, import statement, from. Import statement, name spacing,
Python packages: Introduction to PIP, Installing Packages via PIP, Using Python Packages

UNIT IV   (9 Lectures)

Object Oriented Programming OOP in Python: Classes, 'self variable', Methods, Constructor Method, Inheritance, Overriding Methods, Data hiding.

Error and Exceptions: Difference between an error and Exception, Handling Exception, try except block, Raising Exceptions, User Defined Exceptions.

UNIT V   (9 Lectures)

Brief Tour of the Standard Library & Files - Operating System Interface - String Pattern Matching, Mathematics, Internet Access, Dates and Times, Data Compression, Multithreading, GUI Programming, Turtle Graphics, file operations.

Text Books
1. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist'', 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016 (http://greenteapress.com/wp/thinkpython/).
2. Guido van Rossum and Fred L. Drake Jr, "An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.

Reference Books
1. John V Guttag, "Introduction to Computation and Programming Using Python'', Revised and expanded Edition, MIT Press , 2013
2. Kenneth A. Lambert, "Fundamentals of Python: First Programs", CENGAGE Learning, 2012.
3. Robert Sedgewick, Kevin Wayne, Robert Dondero, "Introduction to Programming in Python: An Inter-disciplinary Approach, Pearson India Education Services Pvt. Ltd., 2016.
4. Charles Dierbach, "Introduction to Computer Science using Python: A Computational Problem Solving Focus, Wiley India Edition, 2013.

Web References:
1. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/
2. https://www.codecademy.com/learn/learn-python
3. https://www.codementor.io/collections/learn-python-bwbc63ulz
4. http://www.diveintopython3.net/
5. https://www.python.org/3/
6. https://www.learnpython.org

B.Tech I Year II Semester   **Course Structure**

                                                          L T P C
APPLIED CHEMISTRY   **3 0 0 3**
(for ECE,CSE,IT Branches)

                                                          Internal Marks: 40

Course Code: P18BST05   **External Marks: 60**

Course Prerequisite: Basic Chemistry at Intermediate or equivalent level.

Course Objectives
1. In this course. Student will learn the concepts and applications of chemistry in engineering.
2. It aims at strengthening the students with the fundamental concepts of chemistry. Plastics are nowadays used in household appliances; also they are used as composites (FRP) in aerospace industries.
3. It enables the students to know analysis of Advanced materials and used in diverse fields.
4. It makes the students to effectively use of electro chemistry, battery technology, and corrosion science in engineering applications
5. It enables the students to Spectroscopic techniques and applications.

Course Outcomes:
  After completion of course student will be able to
1. The advantages and limitations of plastic materials and their use in design would be understood.
2. Analyze the different types of electrodes and batteries for technological applications.
3. To understand the 3D structure of the organic molecules.
4. Analyze the structure of the chemical compounds.
5. The students would aware of materials like nanomaterials, liquid crystals, green chemistry.

UNIT I: (**10 Lectures**)
High Polymers And Plastics

Polymerization: Introduction, classification, types of polymerization, Stereo regular polymers, Methods of polymerization (emulsion and suspension), Physical and mechanical properties.
Plastics as engineering materials: Advantages and limitations, Thermoplastics and Thermosetting plastics, Compounding and fabrication (4/5 techniques), Preparation, properties and applications of poly ethene, PVC, Bakelite and Teflon.

Elastomers: Natural rubber, compounding and vulcanization, Synthetic rubbers : Buna S, Buna N, Thiokol- preparation ,properties and applications, applications of elastomers. Composite materials & Fiber reinforced plastics, Conducting polymers.

UNIT II: **(10 Lectures)**
Electrochemistry And Corrosion

Introduction, Single electrode potential**,** EMF, Galvanic cell, Nernst equation and applications. Reference Electrodes-SHE, calomel electrode. Electro chemical series and uses of this series, Concentration cells
Batteries: Introduction, Types: Dry Cell, Ni-Cd Cells, Pb-acid storage cells, Li ion cells.
Corrosion: Causes Theories of Corrosion (chemical and Electro chemical), types-galvanic, differential aeration, stress corrosion, corrosion control methods– material selection and designing aspects, Cathode protection – sacrificial anodic protection and impressed current cathode. Galvanizing, Tinning, Electroplating of Copper and electro less plating of nickel.

UNIT III: (**10 Lectures**)
Stereochemistry

Representations of 3 dimensional structures, structural isomers and stereoisomers, configurations and symmetry and chirality, enantiomers, diastereomers, optical activity, absolute configurations and conformational analysis. Isomerism in transitional metal compounds.

UNIT-IV: **(10 Lectures)**
Spectroscopic Techniques And Organic Synthesis Of Drug Molecule

Principles of spectroscopy and selection rules. Electronic spectroscopy. Vibrational and rotational spectroscopy. Basic concepts of Nuclear magnetic resonance spectroscopy, chemical shift. Introduction to Magnetic resonance imaging.
Synthesis of commonly used drug molecules- Ibuprofen, Aspirin, Paracetamol.

UNIT -V: **(8 Lectures)**
Chemistry of Advanced Materials

Nano materials:- Introduction – Sol-gel method & chemical reduction method of preparation – Characterization by BET method and TEM methods - Carbon nanotubes and fullerenes: Types, preparation, properties and applications.
Liquid crystals: - Introduction, Types, Applications.

Super conductors: Introduction, Type-I & Type-II super conductors, properties and applications.
Green Chemistry: - Principles, 3or 4 methods of synthesis with examples and applications.

Text Books:

1. Engineering Chemistry by Jain and Jain; Dhanpat Rai Publication & Co.
2. Engineering Chemistry by Shikha Agarwal; Cambridge University Press.
3. Physical chemistry by K.Bahl and Tuli
4. Elementary organic spectroscopy by Y.R. Sharma, S.Chand publications
5. Spectroscopic techniques by H.Kaur. Pragati Prakashan publications

Reference Books:

1. Engineering Chemistry of Wiley India Pvt. Ltd., Vairam and others.
2. Engineering Chemistry by Prasanth Rath, Cengage Learning.
3. A text book of engineering Chemistry by S. S. Dara; S. Chand &Co Ltd.,   Latest Edition
4. Applied Chemistry by H.D. Gesser, Springer Publishers
5. Text book of Nano-science and nanotechnology by B.S. Murthy, P. Shankar and others.

Web References:

1. http://jntuk-coeerd.in/
2. http://en.wikipedia.org/wiki/title
3. http://nptel.ac.in/coures/105106/.com
4. https://en.wikipedia.org/wiki/Electrochemistry
5. https://www.youtube.com/watch?v=WLyaZbT97EI&list=PLzW3l18TEXrpqo3jRarGr9ao-61tB2184
6. http://encyclopedia.che.engin.umich.edu/Pages/Polymers/PolymerProduction/PolymerProduction.html
7. http://encyclopedia.che.engin.umich.edu/Pages/ProcessParameters/Spectrometers/Spectrometers.html

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B.Tech. I Year II Semester   **Course Structure**

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                                                                        3   0   0   3

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to ECE,CSE,IT)

Course Code: P18EST01   **Internal Marks: 40**
                                   External Marks: 60

Course Prerequisite: Physics.

Course Objective:

1. To study the concepts of passive elements, and understand the applications of network theorems for analysis of electrical networks.
2. To study the concept of magnetic coupled circuit.
3. To understand the Principle and operation of Various Electrical Machines.
4. To study the operation of PN junction diode, half wave, full wave rectifiers and OP-AMPs.
5. To learn the operation of PNP, NPN transistors and various amplifiers.

Course Outcomes:

   After completion of this course, the student is able to:

1. Able to solve various electrical networks in presence of active and passive elements and by using principles of network theorems.
2. Able to solve magnetic circuit with various dot conventions.
3. Able to understand the principle of operation and construction details of DC machines, Transformers, Alternators,3-phase Induction motor.
4. Able to analyze the operation of half wave, full wave bridge rectifiers and OP-AMPs.
5. Able to analyze operation of PNP, NPN transistors and CE amplifiers

UNIT – I   **(10 Lectures)**
   Electrical Circuits

   Basic definitions – Types of network elements- Types of sources - Ohm's Law - Kirchhoff's Laws –Inductive networks - Capacitive networks – Series - Parallel circuits- Star-delta and delta-star transformations - Source transformation - nodal analysis and mesh analysis - Super position theorem.

UNIT – II   (9 Lectures)
Ac Circuit Analysis

Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R,L, C, RL, RC, RLC combinations. Three phase balanced circuits, voltage and current relations in star and delta connections.

UNIT –III   (9 Lectures)
Magnetic Circuits And Transformers

Basic definition of Magnetic quantities - Faraday's laws of electromagnetic induction- Analogy between electrical and magnetic circuits. Concept of self and mutual inductance. Principle of operation and construction of single phase transformers–EMF equation – Applications.

UNIT- IV   (11 Lectures)
Rotating Machines

Construction and Principle of operation of DC Machines EMF equation – Torque equation –Speed control of DC Shunt Motor- power losses and efficiency - Principle of operation and construction of 3-phase Induction motor - Principle of operation and construction of alternators.

UNIT – V   (9 Lectures)
Introduction To Semiconductor Devices

PN junction diode - Diode applications -Half wave -Full wave rectifiers – Characteristics of Operational Amplifiers - Types of Transistors - PNP and NPN junction transistors, transistor as an amplifier- Frequency response of CE Amplifier.

Textbooks:

1. Engineering Circuit Analysis by William Hayt and Jack E.Kemmerley, McGraw Hill Company,6 th Edition
2. Electrical Technology by Surinder Pal Bali, Pearson Publications.
3. Electronic Devices and Circuits, R.L. Boylestad and Louis Nashelsky, 9th Edition, PEI/PHI 2006.
4. Electronic Devices and Circuits – J. Millman, C.C. Halkias, Tata Mc-Graw Hill

Reference Books:

1. Electrical Circuit Theory and Technology by John Bird, Routledge Taylor &Francis Group
2. Electrical Machines by D. P.Kothari, I .J .Nagarth, Mc Graw Hill Publications, 4th Edition
3. Electrical Machines by R.K.Rajput, Lakshmi publications, 5th Edition.
4. Basic Electrical Engineering by M.S.Naidu and S.Kamakshiah, TMH Publications
5. Electronic Devices and Circuits by David A. Bell, Oxford University Press
6. Electronic Devices and Circuits – Salivahanan, Kumar, Vallavaraj, TATA MC Graw Hill, Second Edition

Web References:
1. https://embeddedengineers.files.wordpress.com/2015/09/electronic-devices-and-circuits-by-salivahanan.pdf
2. https://electricalanswers.files.wordpress.com/2014/09/a-textbook-of-electrical-technology-volume-i-basic-electrical-engineering-b-l-theraja.pdf

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I Year - II Semester   **L   T   P   C**

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PYTHON PROGRAMMING LAB

(Common to EEE,ME,ECE,CSE,IT,AME Branches)

Course Code: P18ESL04   **Internal Marks: 40**
                                                       External Marks: 60

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. Understand File handling operations.
5. Design GUI Applications.

Exercise1 - Basics
a) Running instructions in Interactive interpreter and a Python Script
b) Write a program to purpose fully raise Indentation Error and Correct it

Exercise 2 - Operations
a) Write a program to compute distance between two points taking input from the user (Pythagorean Theorem).
b) Write a program add.py that takes 2 numbers as command line arguments and prints its sum.

Exercise 3 – Control Flow
a) Write a Program for checking whether the given number is a even number or not.
b) Using a for loop, write a program that prints out the decimal equivalents of 1/2,1/3,1/4,...,1/10.
c) Write a program using a for loop that loops over a sequence. What is sequence?
d) Write a program using a while loop that asks the user for a number, and prints a count down from that number to zero.

Exercise 4 – Control Flow-Continued
a) Find the sum of all the primes below two million. Each new term in the Fibonacci sequence is generated by adding the previous two terms. By starting with 1 and 2, the first 10 terms will be:

      1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ...
b) By considering the terms in the Fibonacci sequence whose values do not

exceed four million, find the sum of the even-valued terms.

Exercise 5 - DS
a) Write a program to count the numbers of characters in the string and store them in a dictionary data structure.
b) Write a program to use split and join methods in the string and trace a birth day with a dictionary data structure.

Exercise 6- DS-Continued
a) Write a program combine_lists that combines these lists into a dictionary.
b) Write a program to count frequency of characters in a given file. Can you use characterfrequency to tell whether the given file is a Python program file, C program file or a text file?

Exercise 7 - Files
a) Write a program to print each line of a file in reverse order.
b) Write a program to compute the number of characters, words and lines in a file.

Exercise 8 - Functions
a) Write a function dups to find all duplicates in the list.
b) Write a function unique to find all the unique elements of a list.

Exercise 9 - Functions –Problem Solving
a) Write a function cumulative_product to compute cumulative product of a list of numbers.
b) Write a function reverse to reverse a list. Without using the reverse function.
c) Write function to compute gcd, lcm of two numbers. Each function shouldn't exceed one line.

Exercise 10 – Multi - D Lists
a) Write a program to perform addition of two square matrices.
b) Write a program to perform multiplication of two square matrices.

Exercise 11 - OOP
Class variables and instance variable and illustration of the self variable
   i)Robot.
   ii)ATM Machine.

Exercise - 12 GUI, Graphics
a) Write a GUI for an Expression Calculator using tk.
b) Write a program to implement the following figures using turtle

L   T   P   C
0   0   3 1.5
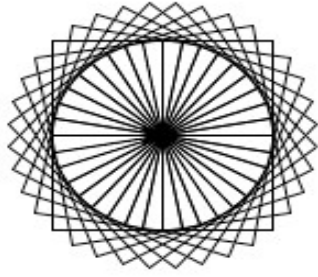
APPLIED/ENGINEERING CHEMISTRY LAB

(Common to ECE,CSE,IT)

Internal Marks: 40
Course Code: P18BSL03   **External Marks: 60**

Course Prerequisite: Basic Chemistry at Intermediate or equivalent level.

Course Objectives:

The purpose of this course to provide students with practical knowledge of quantitative analysis of materials by classical and instrumental methods for developing experimental skills in building technical competence.

Course Outcomes:

After completion of this course, the students should be able to

1. Carrying out different types of titrations for estimation of concerned in materials using comparatively more quantities of materials involved for good results.
2. Handling different types of instruments for analysis of materials using small quantities of materials involved for quick and accurate results.

List Of Experiments:

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

Volumetric Analysis:
1. Estimation of Na_2CO_3 using standard HCl solution
2. Estimation of Mohr's salt using potassium dichromate ($K_2Cr_2O_7$) solution
3. Estimation of $CuSO_4$ using sodium thio sulphate ($Na_2S_2O_3$) solution.

Water Analysis:
4. Determination of hardness of water sample by EDTA method
5. Determination of alkalinity of water sample
6. Determination of free chlorine in bleaching powder

Instrumental Titrations:
7. Conduct metric Titrations between strong acid and strong base.
8. Conduct metric Titrations between strong acid and weak base.
9. Potentio metric Titration between Ferrous iron and potassium dichromate ($K_2Cr_2O_7$) solution

Food Analysis & Separation Of Compounds:
      10. Estimation of Vitamin-c
      11. Thin layer chromatography
Preparation Of Polymeric Resin:
      12. Preparation of phenol formaldehyde resin
      13. Preparation of urea formaldehyde resin

Lab Manual: Engineering/Applied Chemistry Lab Manual, Dept. of Chemistry, Pace Institute of Technology and Science, Vallur, Prakasam Dist., Andhra Pradesh, India.

Reference Books:

1. Dr. Jyotsna Cherukuris (2012) Laboratory Manual of engineering chemistry-II,
2. VGS Techno Series 3. Chemistry Practical Manual, Lorven Publications

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BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

(Common to ECE,CSE,IT)

Internal Marks: 40
External Marks: 60

Course Code: P18ESL01

Course Prerequisite: None

Course Objective:

1. To verify and demonstrate on safety precautions and Kirchhoff laws.
2. To demonstrate various protective devices and construction of transformer and rotating machines.
3. To verify superposition theorem and control of dc shunt motor using speed control methods.
4. To analyze the characteristics of PN junction diode & transistor
5. To analyze the characteristics of CE amplifier and Half & Full wave rectifiers.
6. To analyze the characteristics of OP –Amp and CE amplifier

Course Outcomes:

   After completion of this course, the student is able to:

1. Get an exposure on safety precautions and verify Kirchhoff laws.
2. Get an exposure on construction of transformer and various protective devices.
3. Verify superposition theorem and control the speed of DC shunt motor using speed control methods.
4. Analyze the characteristics of CE amplifier and Half & Full wave rectifiers.
5. Analyze the characteristics of OP –Amp and CE amplifier

Any Ten from the following experiments are required to be conducted as compulsory experiments:

1. Basic safety precautions. Introduction and use of measuring instruments – voltmeter, ammeter, multi-meter, oscilloscope. Real-life resistors, capacitors and inductors.
2. Verification of Kirchhoff laws.
3. Demonstration of construction of Transformer and Rotating machines.
4. Demonstration on various protective devices.
5. Verification of superposition theorem
6. Speed control of D.C. Shunt motor by
       □ Armature Voltage control b) Field flux control method
7. PN junction diode characteristics

       a.   Forward bias
       b.   Reverse bias (Cut in voltage and resistance calculations)

8. Transistor CE characteristics (Input and output)
9. CE Amplifier Characteristics
10. Half Wave rectifier and Full Wave Rectifier without filters
11. Frequency Response of CE Amplifier.
12. Op-Amp Characteristics

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B.Tech II Year I Semester

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Course Structure

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3	0	0	3

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DATA COMMUNICATIONS AND NETWORKING FOR IoT

Internet of Things (Cyber Security Including Block Chain)

Internal Marks : 40

Course Code: P18CBT01　　　　　　　　　　　　**External Marks: 60**

Course Prerequisite: C Programming

Course Objectives:

1. To provide a solid foundation of the basics of data communication.
2. To prepare students to know the characteristics and designs of types of computer
3. networks and their applications
4. Learn how computer network hardware and software operate
5. To understand how sensors and embedded systems work
6. To understand how to program on embedded and mobile platforms including ESP8266 and Android

Course Outcomes:

1. To understand the overview of Data Communications and Networks.

2. To analyze the study on physical and data link layers.

3. To familiarize with frame formats of data link layer.

4. . Understands the concepts and devices of IoT.

5.Familiarizes with IoT networking basics.

UNIT-I

Introduction: Study of Data Communications-Data Communication- Networks-Protocols and Standards-Standards Organizations-Basic Concepts: Line Configuration Topology- Transmission mode Categories of Networks - Internetworks-The OSI Model: The Model- Functions of the layers-TCP/IP Protocol Suite.

UNIT-II

Transmission Media: Guided Media-Unguided Media-Transmission Impairment. Error Detection and Correction: Types of Errors-Detection- Cyclic Redundancy Check (CRC) -Checksum-Error Correction-Data Link Control: Line Discipline-Flow Control-Error control. Local Area Networks: Switching: Circuit Switching-Packet Switching-Message switching.

UNIT-III

Networking and Internetworking Devices: Repeaters - Bridges-Routers- Gateways –Otherdevices - Routing Algorithms -Distance Vector Routing-Link State Routing. Addressing-Subnetting-Other

protocols in the network layer..TCP/IP Protocol Suite: Part1: Overview of TCP/IP- TCP-UDP. Congestion Control-Leaky Bucket Algorithm-Traffic Control. TCP/IP Protocol Suite: Part 2- Application Layer: Client–Server Model-Bootstrap Protocol (bootp) and Dynamic Host-Configuration protocol (DHCP) -Domain Name System (DNS)-Telnet-File Transfer Protocol (FTP) – Simple Mail Transfer Protocol (SMTP)-Hypertext Transfer Protocol (HTTP)-World Wide Web (WWW).

UNIT-IV

Introduction to IoT :Origin of Terminology-Machine to Machine (M2M)-Characteristics -IoT Market Share-Evaluation of Connected Devices -IoT Enablers- Connectivity Layers - Baseline Technologies - IoT vs. M2M -IoT vs. WoT-Terminological Interdependence -IoT Resulting in Address Crunch - Connectivity Terminologies -IoT Network Configurations - Gateway Prefix Allotment - Impact of Mobility on Addressing - Gateways - Multi- homing .

UNIT-V

Basics of IoT Networking :Convergence of Domains - IoT Components – Functional Components of IoT - IoT Interdependencies - IoT Service Oriented Architecture - IoT Categories - IoT Gateways - IoT and Associated Technologies - Technical Deviations from Regular Web - Key Technologies for IoT - IoT Challenges - Considerations - Complexity of Networks - Wireless Networks - Scalability - Functionality-based IoT Protocol Organization - MQTT - Introduction - MQTT Methods - Communication - MQTT Topics - Applications - SMQTT - CoAP - Introduction - CoAP Position - CoAP Message Types - CoAP RequestResponse Model - Features.

TextBooks:
1. Data Communications and Networking- Behrouz A. Forouzan- 2nd Edition revised- Tata
Mcgraw- Hill Publishing Co.
2."The Internet of Things- Enabling Technologies, Platforms, and Use Cases", by Pethuru Raj and Anupama C. Raman (CRC Press)
Reference Books:
 1.Understanding Data Communications and Networks- William A Shay- 2nd Edition- Vikas Publishing House.
2.Computer Networks- Andrew S. Tanenbaum- Pearson Education- Low Price- 4th Edition.

3."Internet of Things- A Hands-on Approach", by ArshdeepBahga and Vijay Madisetti (Universities Press)

B.Tech II Year I Semester

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Course Structure
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DATA STRUCTURES
Internet of Things (Cyber Security Including Block Chain)

Internal Marks: 40

Course Code: P18CST02   **External Marks: 60**

Course Prerequisite: C Programming

Course Objectives:
1. Comprehensive knowledge of data structures and ability to implement the same in software applications.
2. Exposure to algorithmic complexities, recursive algorithms, searching techniques.
3. Exposure to sorting technique, Applying stack techniques for logical operations.
4. Applying queue techniques for logical operations, Exposure to list representation models in various types of applications.
5. Implementation of tree in various forms, Advanced understanding of other variants of trees and their operations.
6. Orientation on graphs, representation of graphs, graph traversals, spanning trees Graphs.

Course Outcomes:
1. Student will be able to choose appropriate data structure as applied to specified problem definition.
2. Implement appropriate sorting/searching technique for given problem
3. Implement operations like searching, insertion, and deletion, traversing mechanism etc. on various data structures.
4. Students will be able to implement Linear and Non-Linear data structures

UNIT-I: (12 Lectures)
Data Structure, Recursion & **Searching:** Preliminaries of algorithm, Algorithm analysis and complexity.
Data Structure: Definition, types of data structures.
Recursion: Definition, Design Methodology and Implementation of recursive algorithms, Types of recursion (Linear, binary and Tail), recursive algorithms for factorial function, GCD Computation, Fibonacci sequence.
Searching: List Searches using Linear Search, Binary Search, Fibonacci Search

UNIT-II: (12 Lectures)
Sorting Techniques: Basic Concepts, Sorting by: Insertion (Insertion Sort), Selection (heap sort), Exchange(Bubble sort, Quick Sort), distribution(Radix sort) and merging(Merge sort) Algorithms.
Stacks: Basic Stack operations, Representation of a stack using arrays, Stack Applications: Reversing list, Infix to postfix transformation.

UNIT-III: (13 Lectures)
Queues: Introduction, Representation of a Queue using arrays, Queue Operations, Applications of queues-Round Robin Algorithm, Circular Queues, Priority Queues.

Linked List: Introduction, single linked list, representation of a linked list in memory, Operations on a single linked list, Reversing a single linked list, applications: single linked list to represent polynomial expressions, Circular linked list, Double linked list.

UNIT-IV: (12 Lectures)

Trees: Basic tree concepts, Binary Trees: Properties, Representation of Binary Trees using arrays, operations on a Binary tree, Binary Tree Traversals (recursive).

Advanced Tree Concepts: Binary search tree, Basic concepts, BST operations: Searching, insertion, deletion, Balanced search trees-AVL Trees-Definition and Examples only, B-Trees Definition and Examples only.

UNIT-V: (11 Lectures)

Graphs: Basic concepts, Graph Representations- Adjacency matrix, Adjacency lists, Graph algorithms: Graph Traversals (BFS & DFS), applications: Dijkstra's shortest path, Minimum Spanning Tree using Prim's & Kruskal's Algorithm.

Text Books:
1. Data Structures, 2/e, Richard F, Gilberg , Forouzan, Cengage,2007.
2. Data Structures and Algorithms, G.A.V.Pai, TMH, 2008
3. Data Structures and Algorithms Made Easy, Narasimha Karumanchi , Second Edition, 2011.

Reference Books:
1. Data Structure with C, Seymour Lipschutz, TMH,2010.
2. Classic Data Structures, 2/e, Debasis ,Samanta,PHI,2009
3. Fundamentals of Data Structure in C, 2/e, Horowitz, Sahni, Anderson Freed, University Press.

Web References:
1. www.geeksforgeeks.org
2. www.hackr.io.
3. www.letsfindcourse.com

B.Tech II Year I Semester

SOFTWARE ENGINEERING
Internet of Things (Cyber Security Including Block Chain)
Internal Marks : 40
Course Code: P18CST07   **External Marks: 60**

Course Prerequisite: NIL

Course Objectives:
1. To understand the software life cycle models.
2. To understand the software requirements and SRS document.
3. To understand the importance of modeling and modeling languages.
4. To design and develop correct and robust software products.
5. To understand the quality control and how to ensure good quality software.
6. To understand the planning and estimation of software projects.
7. To understand the implementation issues, validation and verification procedures.
8. To understand the maintenance of software

Course Outcomes:
1. Software Engineering : A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008
2. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.
3. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
4. Software Engineering1: Abstraction and modeling, Diner Bjorner, Springer International edition, 2006.

UNIT I: (9 Lectures)
Software and Software Engineering: The Nature of Software, The Unique Nature of WebApps, Software Engineering, Software Process, Software Engineering Practice, Software
Myths.
Process Models: A Generic Process Model, Process Assessment and Improvement, Prescriptive Process Models, Specialized Process Models, The Unified Process, Personal and Team Process Models, Process Terminology, Product and Process.

UNIT II: (9 Lectures)
Requirements Analysis And Specification: Requirements Gathering and Analysis, Software
Requirement Specification (SRS), Formal System Specification.
Software Design: Overview of the Design Process, How to Characterise of a Design?, Cohesion and Coupling, Layered Arrangement of Modules, Approaches to Software Design

UNIT III: (9 Lectures)

Function-Oriented Software Design: Overview of SA/SD Methodology, Structured Analysis, Developing the DFD Model of a System, Structured Design, Detailed Design, Design Review, over view of Object Oriented design.

User Interface Design: Characteristics of Good User Interface, Basic Concepts, Types of User Interfaces, Fundamentals of Component-based GUI Development, A User Interface Design Methodology.

UNIT IV: (9 Lectures)

Coding And Testing: Coding, Code Review, Software Documentation, Testing, Unit Testing, Black-Box Testing, White-Box Testing, Debugging, Program Analysis Tool, Integration Testing, Testing Object-Oriented Programs, System Testing, Some General Issues Associated with Testing

UNIT V: (9 Lectures)

Software Reliability And Quality Management: Software Reliability, Statistical Testing, Software Quality, Software Quality Management System, ISO 9000, SEI Capability Maturity Model.

Software Maintenance: Software maintenance, Maintenance Process Models, Maintenance Cost, Software Configuration Management.

Text Books:
1. Software engineering A practitioner's Approach, Roger S. Pressman, Seventh Edition McGrawHill International Edition.
2. Fundamentals of Software Engineering, Rajib Mall, Third Edition, PHI.
3. Software Engineering, Ian Sommerville, Ninth edition, Pearson education

Reference Books:
1. Software Engineering : A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008
2. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.
3. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
4. Software Engineering1: Abstraction and modeling, Diner Bjorner, Springer International edition, 2006.

Web References:
1. https://www.tutorialspoint.com/software_engineering
2. https://nptel.ac.in/courses/106101061/1
3. http://ceit.aut.ac.ir/~91131079/SE2/SE2%20Website/Lecture%20Slides.html

B.Tech II Year I Semester

DIGITAL LOGIC DESIGN
Internet of Things (Cyber Security Including Block Chain)

Course Objectives:
1. Able to perform the conversion among different number systems.
2. Familiar with basic logic gates -- AND, OR & NOT, XOR, XNOR; independently or work in team to build simple logic circuits using basic.
3. Understand Boolean algebra and basic properties of Boolean algebra; able to simplify simple Boolean functions by using the basic Boolean properties.
4. Able to design simple combinational logics using basic gates. Able to optimize simple logic using Karnaugh maps, understand "don't care".
5. Familiar with basic sequential logic components: SR Latch, D Flip-Flop and their usage and able to analyze sequential logic circuits.

Course Outcomes:
1. Students will be aware of various number systems and conversion of number systems.
2. Students will be aware of theory of Boolean Algebra & the underlying features of various logic gates.
3. Students will be aware of designing mapping method upto 6-variables.
4. Students will be able to use the concepts of Boolean Algebra for the analysis & design of various combination logic circuits.
5. Students will be able to use the concepts of Boolean Algebra for the analysis & design of various sequential logic circuits.

UNIT- I: (9 Lectures)
Number Systems and Binary Codes: Number System, Types of Number Systems, Number base Conversions from one radix to another radix, Representation of Signed Binary Numbers, 2's complement arithmetic, 1's complement arithmetic.   Gray code, Excess-3 code, BCD code. Binary Arithmetic.

UNIT -II: (9 Lectures)
Boolean algebra: Logic gates, Laws of Boolean algebra, Principle of Duality, Principle of Complements, Reducing Boolean Expressions, Boolean Functions, Canonical and Standard Forms, M-Notations: Minterms and Maxterms,

UNIT- III: (10 Lectures)

Gate level Minimization: Map Method, Two-Variable K-Map, Three-Variable K-Map, Four Variable K-Maps. Products of Sum Simplification, Sum of Products Simplification, Don't – Care Conditions, Implementation using NAND and NOR.

UNIT- IV: (9 Lectures)

Combinational Logic Design: Introduction, Design Procedure, Adders, Subtractors, Binary Adder–Subtractor, Decoders, Encoders, Multiplexers.

UNIT- V: (8 Lectures)

Sequential Logic Design: Introduction, Storage Elements: one bit memory cell, Latches, Flip Flops, Clocked Flip Flops, Shift Registers, Asynchronous counters, Synchronous counters.

Text Books:
1. Digital Design, 5/e, M.Morris Mano, Michael D Ciletti, PEA, 2011.
2. Fundamentals of Logic Design, 5/e, Roth, Cengage, 2010.
3. A.K.Singh,Digital Logic Circuits, New Age International Publishers,

Reference Books:
1. Switching Theory and Logic Design, A.Anand Kumar, 2016.
2. Digital Electronics and Logic Design, Dr. Sanjay Sharma, 2010.
3. Modern Digital Electronics, R.P. Jain, TMH, 2010.

Web References:
1. www.researchgate.net
2. www.digital-logic-design.en.softonic.com
3. www.accessengineeringlibrary.com

B.Tech II Year I Semester

Course Structure

L	T	P	C
3	0	0	3

MATHEMATICS-III
(Internet of Things (Cyber Security Including Block Chain)

Internal Marks : 40

Course Code: P18BST07   **External Marks: 60**

Course Prerequisite: Mathematics-I, Mathematics-II (P18BST01)

Course Objectives:
1. The course is designed to equip the students with the necessary mathematical skills and techniques that are essential for an engineering course.
2. The Fourier series of a periodic function and its application to the solution of partial differential equations.
3. To calculate the Fourier transform or inverse transform of common functions including Delta, Unit-Step.
4. Learn to find Solution of One dimensional Wave, Heat equation.

Course Outcomes:
1. Calculate a root of algebraic and transcendental equations. Explain relation between the finite difference operators.
2. Solve ordinary differential equations numerically using Euler's and RK method.
3. Analyze the spectral characteristics of signals using Fourier analysis. Classify systems based on their properties and determine the response
4. Find Fourier series and Fourier transforms for certain functions.
5. Identify/classify and solve the different types of partial differential equations.

UNIT-I: (9 Lectures)
Solution of Algebraic and Transcendental Equations and Interpolation: Introduction- Bisection method – Method of false position – Newton- Raphson method. Interpolation: Introduction- Forward differences- Backward differences. Newton's formula for interpolation- Lagrange's interpolation formula.

UNIT-II: (9 Lectures)
Numerical Integration and solution of Ordinary Differential equations: Trapezoidal rule- Simpson's 1/3rd and 3/8th rule. Solution of ordinary differential equations by Taylor's series- Euler's method –Modified Euler's method, Runge- Kutta method of fourth order.

UNIT-III: (9 Lectures)
Fourier Series: Introduction- Determination of Fourier coefficients – even and odd functions –change of interval– Half-range sine and cosine series.

UNIT-IV: (9 Lectures)

Fourier Transforms: Fourier integral theorem (only statement) – Fourier sine and cosine integrals - sine and cosine transforms – properties – inverse transforms – Finite Fourier Transforms.

UNIT-V: (9 Lectures)

First order Partial differential equations: Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions –solutions of first order linear (Lagrange) equation and nonlinear (standard types)equations. Method of separation of Variables- Solution of One dimensional Wave, Heat equation.

Text Books:

1. Higher Engineering Mathematics, B.S.Grewal, 43rd Edition, Khanna Publishers,2015.
2. Engineering Mathematics, N.P.Bali, Lakshmi Publications, 2011.
3. Advanced Engineering Mathematics, H.K.Dass, S.CHAND, 2007.

Reference Books:

1. Engineering Mathematics, Srimanta Pal, Subodh C.Bhunia, Oxford University Press, 2015
2. Advanced Engineering Mathematics, Erwin Kreyszig, 10th Edition, Wiley-India, 2011.
3. Higher Engineering Mathematics, Dass H.K., Rajnish Verma. Er., S. Chand Co.Pvt. Ltd, Delhi, 2011.
4. Advanced engineering mathematics with MATLAB, Dean G. Duffy, CRC Press,2003.
5. Advanced Engineering Mathematics, Peter O'neil, Cengage Learning.
6. Advanced Engineering Mathematics, Micheael Greenberg, 9th edition, Pearson edn, 2002.

Web References:

1. www.tutorial.math.lamar.edu
2. www.mathworld.wolfram.com
3. www.nptel.ac.in

B. Tech II Year I Semester

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Course Structure

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DATACOMMUNICATION AND NETWORKING FOR IoT LAB
Internet of Things (Cyber Security Including Block Chain)

Internal Marks : 40

Course Code: P18CBL01   **External Marks: 60**

Course Prerequisites: C Programming and Object-Oriented Concepts.

Course Objectives:

1. Build an understanding of the fundamental concepts of computer networking.
2. Preparing the student for Advanced courses in computer networking. 3. Allow the students to gain expertise in some specific tools of
3. **Course Outcomes:**

1. Learns the importance of Dialup networking and HyperTerminal.
2. Ability to grasp the knowledge for different network configurations using star Topology

Exercises :-

1. THIN ETHERNET LAN WITH STAR TOPOLOGY with a minimum of two systems Windows Peer-to-Peer Network.

2. THIN ETHERNET LAN WITH STAR TOPOLOGY with a minimum of two systems Windows NT Client-Server Network.

3. THIN ETHERNET LAN WITH STAR TOPOLOGY with a minimum of two systems Novell Client-Server Network.

4.Familiarization with Aurdino/Raspberry Pi and perform necessary software installation.

5.To Interface LED/Buizzer with Aurdino/Raspberry Pi and write a program to turn ON LED for 1 sec after every 2 seconds.

6.To interface push button/Digital Sensor with Aurdino/Raspberry Pi and write a program to turn ON LED when push button is pressed.

7.To interface DHT11 sensor with Aurdino/Raspberry Pi and write a program write a program to print temperature and humidity readings.

B.Tech II Year I Semester

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Course Structure

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DATA STRUCTURES LAB
Internet of Things (Cyber Security Including Block Chain)

Internal Marks : 40

Course Code: P18CSL02   **External Marks: 60**

Course Prerequisites: C- Programming

Course Objectives:
1. To choose the appropriate data structure and algorithm design method for a specified application.
2. To solve problems using data structures such as linear lists, stacks, queues, hash tables, binary trees, heaps binary search trees, and graphs and writing programs for these solutions.

Course Outcomes:
1. Analyze worst-case running times of algorithms using asymptotic analysis and implement various data structures like linked lists.
2. Understand and implement stacks and queues using arrays and linked lists.
3. Analyze and implement various searching and sorting algorithms.
4. Design and implement appropriate hash function and collision-resolution algorithms

Exercise 1:
Write recursive program for the following
> a) Write recursive C program for calculation of Factorial of an integer
>
> b) Write recursive C program for calculation of GCD (n, m)
>
> c) Write recursive program which computes the nth Fibonacci number

Exercise 2:
> a) Write recursive C program for functions to perform Linear search for a Key value in a given list.
>
> b) Write recursive C program for functions to perform Binary search for a Key value in a given list.
>
> c) Write recursive C program for functions to perform Fibonacci search for a Key value in a given list.

Exercise 3:
> a) Write C program that implement Bubble sort, to sort a given list of integers in ascending order.
>
> b) Write C program that implement Quick sort, to sort a given list of integers in ascending order
>
> c) Write C program that implement Insertion sort, to sort a given list of integers in ascending order

Exercise 4:

a) Write C program that implement heap sort, to sort a given list of integers in ascending order

b) Write C program that implement radix sort, to sort a given list of integers in ascending order

c) Write C program that implement merge sort, to sort a given list of integers in ascending order

Exercise 5:

a) Write C program that implement stack (its operations) using arrays

b) Write C program that implement stack (its operations) using Linked list

Exercise 6:

a) Write a C program that uses Stack operations to Convert infix expression into postfix expression

b) Write C program that implement Queue (its operations) using arrays.

c) Write C program that implement Queue (its operations) using linked lists

Exercise 7:

a) Write a C program that uses functions to create a singly linked list

b) Write a C program that uses functions to perform insertion operation on a singly linked list

c) Write a C program that uses functions to perform deletion operation on a singly linked list.

Exercise 8:

a) Write a C program to Create a Binary Tree of integers

b) Write a recursive C program for Traversing a binary tree in preorder, inorder and postorder.

Exercise 9:

Write a C program for BST operations (insertion, deletion)

Exercise 10:

a) Write a C program for finding minimum spanning tree in a graph by using Prim's algorithm.

b) Write a C program for finding minimum spanning tree in a graph by using Kruskal's algorithm.

Course Structure

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0	0	3	1.5

DIGITAL ELECTRONICS LAB
Internet of Things (Cyber Security Including Block Chain)

Internal Marks : 40

Course Code: P18ECL11   **External Marks: 60**

Course Prerequisites: NIL

Course Objectives:
1. Understand concept of various components
2. Understand concepts that underpin the disciplines of Analog and digital electronic logic circuits
3. Describe Various Number system and Boolean algebra
4. Design and implementation of combinational circuits
5. Design and implementation of sequential circuits
6. Describe Hardware description language

Course Outcomes:
1. Achieve Knowledge and Awareness of various components to design stable analog circuits.
2. Represent numbers and perform arithmetic operations.
3. Minimize the Boolean expression using Boolean algebra and design it using logic gates
4. Analyse and design combinational circuit.
5. Design and develop sequential circuits
6. Translate real world problems into digital logic formulations using VHDL.Laboratory Objectives and outcomes for Digital Design

Experiments:
1. Verification of Logic gates.
2. Implementation all individual gates with Universal gates NAND & NOR.
3. Design a circuit for the given canonical form, draw the circuit diagram & Verify the De-Morgan laws.
4. Construct Half adder & full adder using half adder and verify truth table.
5. Design and study the Half Subtractor and verify the truth table.
6. Design a combinational logic circuit for 4x1 MUX and verify the truth table.
7. Design a combinational logic circuit for 1x4 DE-MUX and verify the truth table.
8. Design and implementation of BCD to excess-3 code converter and vice versa using logic gates.
9. Design and implementation of binary to gray code converter and vice versa using logic gates
10. Verification of the truth table of basic flip-flops with synchronous & asynchronous modes.

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

SOFT SKILLS-I
(Human Values)

Internal Marks : 100

Course Code: P18MCT04
Course Prerequisites: NIL

Course content and overview:

Course Overview: This course 'Human Values' introduces self-exploration, self-confidence, commitment to learning, improvement in human relationships, imbibing universal human values and ethical human conduct. Students learn to apply their knowledge to lead a happy and prosperous life and also to include an ethical conduct to their profession. This course provides an intensive practice of self-exploration and enables the student to have a complete understanding of their own and of the world around them. This course aims to enable a human being to live a fulfilling life, in harmony with oneself, with family, society and nature and helps them to identify values based on right understanding. This course also enables the student to form a vision for humanistic education, constitution and human conduct to lead a universal human order.

Scope and Objective of the course :This course is poised to showcase the distinct advantages of possessing self-discovery, identification of their aspirations and understanding universal human values to fulfill their aspirations in continuity and identify true human happiness, human welfare, what is of 'value' to 'oneself.'

SYLLABUS:

Competency **1: Introduction to Value Education:** Understanding Value Education, Self-exploration as the Process for Value Education, Continuous Happiness and Prosperity - The Basic Human Aspirations, Right Understanding, Relationship and Physical Facilities, Happiness and Prosperity – Current Scenario, Method to fulfill the Basic Human Aspirations.

Competency **2: Harmony in the Human Being:** Understanding the Human Being as Co-existence of Self ('I') and Body, Discriminating between the Needs of the Self and the Body, The Body as an Instrument of 'I', Understand Harmony in the Self ('I'), Harmony of the Self ('I') with the Body, Program to Ensure Sanyam and Svasthya.

Competency **3: Harmony in the Family and Society:** Harmony in the Family - the Basic Unit of Human Interaction, Values in Human-to-Human Relationships, 'Trust' – the Foundational Value in Relationships, 'Respect' – as the Right Evaluation, Understand Harmony in the Society, Vision for the Universal Human Order.

Competency **4: Harmony in the Nature (Existence)**: Understand Harmony in the Nature, Interconnectedness, Self-regulation and Mutual Fulfillment among the Four Orders of Nature, Realizing 'Existence is Co-existence' at All Levels, The Holistic Perception of Harmony in Existence.

Competency **5: Implications of the Right Understanding** – a Look at Professional Ethics: Natural Acceptance of Human Values, Definitiveness of (Ethical) Human Conduct, A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order, Competence in Professional Ethics, Holistic Technologies, Production Systems and Management Models - Typical Case Studies, Strategies for Transition towards Value-based Life and Profession.

 Competencies:

At the end of the course the student should be able to:

C 1   understands the Need, Content and the Process of Value Education.

C 2   starting to observe inside and learns Purpose, Content and process of self-exploration.

C 3   knows and develops about the Right understanding of one- self.

C 4   learn and apply about Aspirations, living with Wrong Assumptions and Need for Right understanding.

C 5   understands Harmony in the Self and lead the equilibrium with in the self.

C 6   understands Harmony with the body and maintains the co-ordination with the body

C 7   learns to maintain cordial relations by understanding Harmony in Family and Society.

C 8   develop holistic perception by understand Harmony in Nature (Existence)

C 9   applying holistic perception in Professional Ethics.

C 10   competencies in Professional Ethics

Text Book:

A Foundation Course in Human Values and Professional Ethics - R R Gaur, R Sangal and G P Bagaria, First Edition, Excel Books.

Reference Books:

1. Ivan Illich, Energy & Equity , The Trinity Press, Worcester and Harper Collins, USA.

2. E F Schumacher, 1973, small is beautiful: A study of Economics as if People Mattered, Blond & Briggs, Britain

3. Sussan George, 1976, How the Other Half Dies, Penguin press, reprinted 1986, 1991.

4. Donella H. Measows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972,

    Limits to GrowthClub of Rome's report, Universe Books.

5. P.L Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Publisher

6. A.N. Tripathy,2003, Human Values, New Age International Publishers

7. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen (Vaidik) Krishi Tantra

   Shodh, Amravati.

8. E G Seebauer & Robert L. Berry, 2000, Fundamentals of Ethics for Scientists & Engineers,

   Oxford University Press.

9. M Govindrajran, S Natrajan & V.S. Senthil Kumar, Engineering Ethics (including Human

    Values), Eastern Economy Edition, Prentice Hall of India Ltd.

10. B P Banerjee, 2005, Foundations of Ethics and Management, Excel Books

11. B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow, Reprinted 2008.

B.Tech II Year II Semester

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Course Structure

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DESIGN AND ANALYSIS OF ALGORITHMS

Internet of Things (Cyber Security Including Block Chain)

Internal Marks : 40

Course Code: P18CST13   **External Marks: 60**

Course Prerequisites: Mathematics,Data Structures

Course Objectives:
1. Analyze the asymptotic performance ofalgorithms.
2. Write rigorous correctness proofs foralgorithms.
3. Demonstrate a familiarity with major algorithms and data structures.
4. Apply important algorithmic design paradigms and methods of analysis.
5. Synthesize efficient algorithms in common engineering designsituations.

Course Outcomes:

1. Identify time, space complexities for different problems.
2. Implement Greedy Method to solve Problems.
3. Implement Dynamic Programming technique to solve Problems.
4. Able how to apply Backtracking and Branch & Bound Techniques in real-time problems.
5. Analyze the pattern-matching algorithms.

UNIT I: (12 Lectures)

Introduction: What is an Algorithm, Pseudo code Conventions Recursive Algorithm, Performance Analysis, Space Complexity, Time Complexity, Asymptotic Notations .

Dived and Conquer: General Method, Binary Search, Finding the Maximum and Minimum, Merge Sort, Quick Sort.

UNIT II: (12 Lectures)

The Greedy Method: The General Method, Knapsack Problem, Minimum-cost Spanning Trees, Prim's Algorithm, Kruskal's Algorithms, Huffman Coding, Optimal Merge Patterns, Single Source Shortest Paths.

UNIT III: (12 Lectures)

Dynamic Programming: The General Method, All Pairs Shortest Paths, Single – Source Shortest paths General Weights, String Edition, 0/1 Knapsack, Travelling Salesperson Problem.

UNIT IV: (12 Lectures)

Backtracking: The General Method, the 8-Queens Problem, Sum of Subsets, Graph Coloring, Hamiltonian Cycles.
Branch and Bound: The Method, The 15-Puzzle problem, Traveling Salesperson.

UNIT V: (12 Lectures)

NP-Hard and NP-Complete Problems: Travelling salesman problem NP complete, NP-Hard Graph Problem (Clique Decision Problem).

Pattern Matching Algorithms: Knuth-Morris-Pratt KMP String Matching Algorithm, Rabin Karp String Matching Algorithm.

Text Books:
1. Fundamentals of computer algorithms E. Horowitz, S. Sahni , UniversityPress Second Edition and year 1997.
2. Introduction to Algorithms Thomas H. CormenLearning Third edition.

References:
1. The Design and Analysis of Computer Algorithms, Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, First edition and year 2006.
2. Algorithm**Design,JonKleinberg,Pearson First edition 2008.**

Web References:

1. https://nptel.ac.in/courses/106/106/106106131/
2. https://www.tutorialspoint.com/design_and_analysis_of_algorithms/index.htm
https://slideplayer.com/slide/5877267/

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Course Structure

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COMPUTER ORGANIZATION
Internet of Things (Cyber Security Including Block Chain)

Internal Marks : 40

Course Code: P18CST04   **External Marks: 60**

Course Prerequisite: NIL

Course Objectives:
1. Understand the architecture of a modern computer with its various processing units and Performance measurement of the computer system.
2. To understand various data transfer techniques in digital computer.
3. To understand the memory management system of computer.

Course Outcomes:
1. Ability to understand basic structure of computer.
2. To perform computer arithmetic operations.
3. To understand control unit operations.
4. To design memory organization that uses banks for different word size operations.
5. Ability to understand the concept of cache mapping techniques.
6. Ability to understand the concept of I/O organization.

UNIT I: (9 Lectures)

Basic Structure of Computers: Organization and Architecture, Structure and Function, Computer Components, Computer Function, Bus Interconnection, Processor Organization, Register Organization.

Basic Computer Organization and Design: Instruction codes, Computer instructions, Memory reference instructions, Instruction Cycle.

Central Processing Unit: Stack organization, instruction formats, addressing modes, data transfer and manipulation, program control, RISC.

UNIT II: (10 Lectures)

Register Transfer and Micro Operations: Register transfer language, Register transfer, Bus and Memory transfers, Arithmetic Micro operations, Logic Micro operations, Shift Micro operations, Arithmetic Logic Shift Unit.

Micro Programmed Control: Control Memory, Address Sequencing, Micro Program examples, Design of control unit, Hardwired control..

UNIT III: (9 Lectures)

Computer Arithmetic: Data representation- Fixed point representation, Floating point representation, Addition and Subtraction, Multiplication Algorithms, Division Algorithms, Floating-point Representations, Floating-point Arithmetic Operations, Decimal Arithmetic Units, Decimal Arithmetic Operations.

UNIT IV: (8 Lectures)

Memory Organization: Memory system overview, Memory Hierarchy, Semi-conductor Main Memory, Cache Memory principle, Elements of cache design, Virtual Memory, Magnetic Disk, Optical Memory, Magnetic Tape, RAID.

Input- Output: External Devices, I/O modules, Interrupts, Programmed I/O, Interrupt-driven I/O, Direct Memory Access, I/O Channels and Processors, PCI. Asynchronous Data Transfer, Priority Interrupt, Serial Communication.

UNIT V: (9 Lectures)

Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.

Multi Processors: Multiprocessors and Multi computers, Characteristics of Multi-processors, Multiple Processor Organizations, Symmetric Multi-Processors, Cache Coherence, Clusters, Non Uniform Memory Access (NUMA).

Text Books:

1. Computer Systems Architecture, M. Moris Mano, 3rd Edition, Pearson Education, 2007.
2. Computer Organization and Architecture, William Stallings, 8th Edition, Pearson Education, 2010.
3. Computer Architecture and Organization, John P. Hayes, 3rd Edition, McGraw Hill,2012.

References:

1. Computer Systems Organization and Architecture, John D. Carpinelli, 3rd Edition, Pearson Education, 2001.
2. Computer Organization, Carl Hamacher, Zvonks Vranesic, SafeaZak , 5th Edition, TMH, 2011.

Web References:

1. www.hackr.io
2. www.nptel.ac.in
3. www.coursera.org

B.Tech II Year II Semester

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Course Structure

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MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE
Internet of Things (Cyber Security Including Block Chain)

Internal Marks : 40

Course Code: P18CST03   **External Marks: 60**

Prerequisites: Basic Mathematics.

Course Objectives:
1. To explain with examples the basic terminology of functions, relations, and sets.
2. To perform the operations associated with sets, functions, and relations.
3. To relate practical examples to the appropriate set, function, or relation model, and interpret the associated operations and terminology in context.
4. To describe the importance and limitations of predicate logic.
5. To relate the ideas of mathematical induction to recursion and recursively defined structures.
6. To use Graph Theory for solving problems.

Course Outcomes:
1. Ability to Illustrate by examples the basic terminology of functions, relations, and sets and demonstrate knowledge of their associated operations.
2. Ability to Demonstrate in practical applications the use of basic counting principles of permutations, combinations, inclusion/exclusion principle and the pigeonhole methodology.
3. Ability to represent and Apply Graph theory in solving computer science problems.

UNIT I: (9 Lectures) **Mathematical Logic :** Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers. **Predicates**: Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

UNIT II: (10 Lectures)
Relations: Basic Structures, Sets, Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram. Functions: Inverse Function Composition of functions, recursive Functions, Lattice and its Properties,
.

UNIT III: (9 Lectures)
Elementary Combinatorics: Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion. Pigeon hole principles and its application. Algebraic structures: Algebraic systems Examples and general properties, Semi groups and monads, groups sub groups' homomorphism, Isomorphism.

UNIT IV: (8 Lectures) **Discrete Probability and Advanced Counting Techniques:** An Introduction to Discrete Probability, Probability Theory, Bayes' Theorem, Expected Value and Variance **Advanced Counting Techniques:** Recurrence Relations, Solving Linear Recurrence Relations, Divide-and-Conquer Algorithms and Recurrence Relations, Generating Functions, Inclusion- Exclusion, Applications of Inclusion-Exclusion.

UNIT V: (9   Lectures)   **Graphs:**
Graphs and Graph Models, Graph Terminology and Special Types of Graphs, Representing Graphs and Graph Isomorphism, Connectivity, Euler and Hamilton Paths, Shortest-Path Problems, Planar Graphs, Graph Coloring.
Trees: Introduction to Trees, Applications of Trees, Tree Traversal, Spanning Trees, Minimum Spanning Trees.

Text Books:
1. Discrete Mathematics and its Applications with Combinatorics and Graph Theory-   Kenneth H Rosen, 7th Edition, TMH, 2012.
2. Introduction to Discrete Mathematics,M.K.Sen, B.C Chakraborty, 2012
3. Elements of DISCRETE MATHEMATICS- A computer Oriented Approach- C L Liu, D P Mohapatra. Third Edition, Tata McGraw Hill, 2008.
4. Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A. Kandel,T.P. Baker, PHI, 2008.

References Books:
1. Discrete Mathematical Structures with Applications to Computer Science-J.P. Tremblay and R. Manohar, TMH, 1988.
2. Discrete Mathematics- Richard Johnsonbaugh, 7Th Edn., Pearson Education, 2009.
3. Discrete Mathematics with Graph Theory- Edgar G. Goodaire, Michael M. Parmenter, 2nd edition,2002.
4. Discrete and Combinatorial Mathematics - an applied introduction: Ralph.P. Grimald, 5th edition, Pearson Education, 2016.

Web References:
1. www.digitaldefynd.com
2. www.mathily.org

Course Structure

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DATABASE MANAGEMENT SYSTEMS
Internet of Things (Cyber Security Including Block Chain)
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Internal Marks : 40

Course Code: P18CST06   **External Marks: 60**

Course Prerequisite: NIL

Course Objectives:
1. Provides students with theoretical knowledge
2. Practical skills in the design, use of databases and database management systems in information technology applications.

Course Outcomes:
1. Acquire knowledge in fundamentals of DBMS and identify the differences between traditional file system and DB systems.
2. Understand various DBMS models and how queries are being processed and executed in RDBMS.
3. Analyze DB design methodology and normalization process.
4. Discuss the various transaction and concurrency management techniques
5. Discuss various files indexing techniques.

UNIT I: (11 Lectures)
INTRODUCTION: Database system, Characteristics (Database Vs File System), Database Users (Actors on Scene, Workers behind the scene), Advantages of Data base systems, Database applications. Brief introduction of different Data Models; Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence; Database system structure

UNIT II: (13 Lectures)
ENTITY RELATIONSHIP MODEL: Introduction, Representation of entities, attributes, entity set, relationship, relationship set, constraints, sub classes, super class, inheritance, specialization, generalization using ER Diagrams.
RELATIONAL MODEL: Introduction to relational model, concepts of domain, attribute, tuple, relation, importance of null values, constraints and their importance.
BASIC SQL : Simple Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update), basic SQL querying (select and project) using where clause, arithmetic & logical operations, Creating tables with relationship, implementation of key and integrity constraints, nested queries, sub queries, grouping, aggregation, ordering, implementation of different types of joins, views.
UNIT III: (12 Lectures) **SCHEMA REFINEMENT (NORMALIZATION):** Problems Caused by Redundancy, Decompositions, Problems Related to Decomposition, Functional dependency, Properties of Functional dependency, Properties of

Decompositions - Lossless join decomposition and dependency preserving decomposition, Normal forms based on functional dependency - 1NF, 2NF and 3NF, concept of surrogate key, Boyce-Codd normal form(BCNF).

UNIT IV: (13   Lectures)
TRANSACTION MANAGEMENT AND CONCURRENCY CONTROL: Transaction, properties of transactions, transaction log, and transaction management with SQL using commit rollback and savepoint. Concurrency control for lost updates, uncommitted data, inconsistent retrievals and the Scheduler. Concurrency control with locking methods : lock granularity, lock types, two phase locking for ensuring serializability, deadlocks, Concurrency control with time stamp ordering : Wait/Die and Wound/Wait Schemes, Database Recovery management : Transaction recovery.

UNIT V: (11 Lectures)
OVERVIEW OF STORAGES AND INDEXING: Data on External Storage- File Organization and Indexing – Clustered Indexing – Primary and Secondary Indexes, Index Data Structures, Hash-Based Indexing – Tree-Based Indexing.

Text Books:
1. Database Management Systems, 3/e Raghuram Krishnan, Johannes Gehrke, TMH,2002.
2. Database Management System, 6/e Ramez Elmasri, Shamkant B. Navathe, PEA,2010.
3. Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning,2012.
4. Database Management Systems,Rajesh Narang,Second Edition,2018.

References:
1. Database System Concepts. 5/e Silberschatz, Korth, TMH,2002.
2. Introduction to Database Systems, 8/e C J Date, PEA,2000.
3. The Database book principles & practice using Oracle/MySql Narain Gehani, University Press,2008.

Web References:
1. www.academy.vertabelo.com
2. www.w3schools.com
3. www.codecademy.com

Course Structure

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JAVA PROGRAMMING

Internet of Things (Cyber Security Including Block Chain)

Internal Marks : 40

Course Code: P18CST01   **External Marks: 60**

Course Prerequisite: C Programming

Course Objectives:
7. To understand Object Oriented Programming concepts and basic characteristics of Java
8. To understand the principles of packages, inheritance and interfaces
9. To Implement exceptions and use I/O streams
10. To design and build simple Graphical User Interface application.

Course Outcomes:
1. Implement OOPS concepts in Java programs
2. Develop Java programs with the concepts of inheritance and interfaces
3. Design a Java applications using exceptions and I/O streams
4. Design interactive Java application using swings

UNIT-I: (9 Lectures)
OOPS-Fundamentals: Object Oriented Programming concepts - Abstraction - objects and classes - Encapsulation- Inheritance -Polymorphism- OOP in Java - Characteristics of Java-Java Source File - Structure- Compilation- Data Types - Variables and Arrays - Operators - Control Statements- Classes – Objects - Methods.

UNIT-II: (9 Lectures)
OOPS-Inheritance: Inheritance - constructors- polymorphism-Access specifier-Static members-Packages - Abstract classes- Interfaces and Inner classes-object cloning -Array Lists - Strings.

UNIT-III: (9 Lectures)
Exception Handling: Exception handling -try-catch, throw, throws, finally block, user defined exception-built-in exceptions- Stack Trace Elements-Input -Output Basics - Streams - Byte streams and Character streams - Reading and Writing Console - Reading and Writing Files.

UNIT-IV: (9 Lectures)
Concurrent Programming: Multi-threaded programming - thread life cycle- interrupting threads - thread states - thread priorities- thread synchronization- Inter-thread communication, daemon threads, thread groups- java Applets- Applet class, Applet structure, An Example Applet Program, Applet Life Cycle.

UNIT-V: (9 Lectures)

Graphics Programming: Graphics programming - Frame - Components- java.awt package, Container class, Layouts, Basics of event handling - event handlers -AWT event hierarchy - Swing Components- Text Fields, Text Areas - Buttons- Check Boxes – Radio Buttons - Lists- choices- Scrollbars - Windows -Menus - Dialog Boxes.

Text Books:
1. Java The complete reference, Herbert Schildt , 8th Edition, McGraw Hill Education, 2011.
2. Core Java Volume –I Fundamentals, Cay S. Horstmann, Gary cornell, 9th Edition,
   Prentice Hall, 2013.
3. Programming with JAVA, E.Balaguruswamy, 5th Edition, McGraw Hill Education,   2014.

References:
1. Java 2 Black book, Steven Holzner, Dreamtech press, 2011.
2 The JAVA programming language, K. Arnold and J. Gosling, Third edition, Pearson
   Education, 2000.
3. An introduction to Object-oriented programming with Java, C. Thomas Wu, Fourth
   Edition, Tata McGraw-Hill Publishing company Ltd., 2006.

Web References:
1. www.javaworld.com
2. www.ibm.com
3. www.java.sun.com

DATABASE MANAGEMENT SYSTEMS LAB
Internet of Things (Cyber Security Including Block Chain)

Internal Marks : 40

Course Code: P18CSL05   **External Marks: 60**

Course Prerequisites: Nil

Course Objectives:
1. Understand, analyze and apply SQL commands like DDL,DML,DCL to perform different Database operations
2. Understand and practice PL/SQL block, control statements and cursors.
3. Develop PL/SQL programs using, functions, procedures, packages and Triggers.

Course Outcomes:
1. Know about SQL DDL,DML,DCL,TCL commands
2. Know how to write SQL Quires using set operators
3. Know about how to implement PL/SQL programs using conditional ,loops statements
4. Know about implementing of triggers, cursors and exceptions
5. Know about implementing procedures, functions and packages

PROGRAMS LIST
1. Creation, altering and droping of tables and inserting rows into a table (use constraints while creating tables).
2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.
3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.
4. Queries using Conversion functions, string functions and date functions
5. i) Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section

   ii)Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.
6. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions,   RAISEAPPLICATION ERROR.
8. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.

9. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.
10. Write a PL/SQL block illustrating packages.
11. Write a PL/SQL code using CURSOR.

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JAVA PROGRAMMING LAB
Internet of Things (Cyber Security Including Block Chain)

Internal Marks : 40

Course Code: P18CSL01   **External Marks: 60**

Course Prerequisites: C Programming and Object-Oriented Concepts.

Course Objectives:
4. To build software development skills using java programming for real-world applications.
5. To understand and apply the concepts of classes, packages, interfaces, arraylist, exception handling and file processing.
6. To develop applications using JDBC programming and event handling.

Course Outcomes:
3. Develop and implement Java programs for simple applications that make use of classes, packages and interfaces.
4. Develop and implement Java programs with arraylist, exception handling and multithreading .
5. Design applications using file processing, JDBC programming and event handling.

Exercise - 1 (Basics)
1. Write a JAVA program to display default value of all primitive data type of JAVA.
2. Write a java program that display the roots of a quadratic equation $ax2+bx=0$. Calculate the discriminate D and basing on value of D, describe the nature of root.
3. Write a program to check whether a number is Armstrong or not

Exercise - 2 (Operations, Expressions, Control-flow, Strings)
1. Write a JAVA program to search for an element in a given list of elements using binary search mechanism.
2. Write a JAVA program to sort for an element in a given list of elements using bubble sort.
3. Write a Java program to demonstrate String handling methods.

Exercise - 3 (Class, Objects, Constructor)
1. Write a JAVA program to implement class mechanism. – Create a class, methods and invoke them inside main method.
2. Write a JAVA program implement method overloading.
3. Write a JAVA program to implement constructor and constructor overloading.

Exercise - 4 (Inheritance, Method Overriding)
1. Write a JAVA program to implement Single Inheritance

2. Write a JAVA program to implement multi level Inheritance
3. Write a java program for abstract class to find areas of different shapes
4. Write a JAVA program that implements Runtime polymorphism(Method Overriding) problem

Exercise - 5 (Array List & Exception)
1. Write a program to perform string operations using ArrayList. Write functions for the following
   a. Append
   b. Insert
   c. Search
   d. List all string starts with given letter.
2. Write a JAVA program that describes exception handling mechanism
3. Write a JAVA program Illustrating Multiple catch clauses

Exercise – 6 (User defined Exception)
1. Write a JAVA program for creation of Illustrating throw.
2. Write a JAVA program for creation of Illustrating finally.
3. Write a JAVA program for creation of Java Built-in Exceptions.
4. Write a JAVA program for creation of User Defined Exception.

Exercise – 7 (Threads)
1. Write a JAVA program that creates threads by extending Thread class .First thread display "Good Morning "every 1 sec, the second thread displays "Hello "every 2 seconds and the third display "Welcome" every 3 seconds ,(Repeat the same by implementing Runnable).
2. Write a program illustrating **isAlive** and **join ().**

Exercise - 8 (File Handling)
Write a Java program that reads a file name from the user, displays information about whether the file exists, whether the file is readable, or writable, the type of file and the length of the file in bytes.

Exercise – 9 (JDBC & Packages)
1. Write a java program that connects to a database using JDBC of the following
   a. add
   b. Delete
   c. Modify
   d. Retrieve operations.
2. Write a java program to create a package called employee and implement this package out of the package.

Exercise - 10 (Applet)
1. Write a JAVA program to paint like paint brush in applet.
2. Write a JAVA program to display analog clock using Applet.
3. Write a JAVA program to create different shapes and fill colors using Applet.

Exercise - 11 (Event Handling)
1. Write a JAVA program that display the x and y position of the cursor movement using Mouse.
2. Write a JAVA program that identifies key-up key-down event user entering text in a Applet.

Exercise - 12 (Swings)
1. Write a JAVA program to build a Calculator in Swings.
2. Write a JAVA program to display the digital watch in swing tutorial.

Exercise – 13 (Swings - Continued)
1. Write a JAVA program that to create a single ball bouncing inside a JPanel.
2. Write a JAVA program JTree as displaying a real tree upside down

B.Tech II Year II Semester

INDIAN CONSTITUTION
Internet of Things (Cyber Security Including Block Chain)

Course Code: P18MCT05   **Internal Marks: 100**

Course Objectives:
1. To know about Indian constitution.
2. To know about central government functionalities in India.
3. To know about state government functionalities in India.
4. To know about functions of Indian Constitution
5. To know about Indian society.

Course Outcomes:
1. Understand the background and structure of Indian Constitution
2. Understand the functions of the Indian government
3. Understand the functions of the State government
4. Understand and abide the rules of the Indian constitution.
5. Understand and appreciate different culture among the people.

UNIT I: (9 Lectures)
INTRODUCTION: Historical Background – Constituent Assembly of India – Philosophical foundations of the Indian Constitution – Preamble – Fundamental Rights – Directive Principles of State Policy – Fundamental Duties – Citizenship – Constitutional Remedies for citizens.

UNIT II: (9 Lectures)
STRUCTURE AND FUNCTION OF CENTRAL GOVERNMENT: Union Government – Structures of the Union Government and Functions – President – Vice President – Prime Minister – Cabinet – Parliament – Supreme Court of India – Judicial Review.

UNIT III: (9 Lectures)
STRUCTURE AND FUNCTION OF STATE GOVERNMENT: State Government – Structure and Functions – Governor – Chief Minister – Cabinet – State Legislature – Judicial System in States – High Courts and other Subordinate Courts.

UNIT IV: (9 Lectures)
CONSTITUTION FUNCTIONS: Indian Federal System – Center – State Relations – President‟s Rule – Constitutional Amendments – Constitutional Functionaries – Assessment of working of the Parliamentary System in India.

UNIT V: (9 Lectures)

INDIAN SOCIETY: Society : Nature, Meaning and definition; Indian Social Structure; Caste, Religion, Language in India; Constitutional Remedies for citizens – Political Parties and Pressure Groups; Right of Women, Children and Scheduled Castes and Scheduled Tribes and other Weaker Sections.

Text Books:
1. Introduction to the Constitution of India, Durga Das Basu, Prentice Hall of India, New Delhi,1993.
2. Indian Political System, R.C.Agarwal, (1997) S.Chand and Company, New Delhi.
3. Society: An Introduction Analysis, Maciver and Page, Mac Milan India Ltd., New Delhi.
4. Social Stratification in India: Issues and Themes, K.L.Sharma, (1997) Jawaharlal Nehru University, New Delhi.

Reference Books:
1. Introduction to the Constitution of India:, Sharma, Brij Kishore, Prentice Hall of India, New Delhi,2005.
2. Indian Political System, U.R.Gahai, New Academic Publishing House, Jalaendhar,1998.
3. Indian Social Problems, R.N. Sharma, Media Promoters and Publishers Pvt. Ltd.
4. Constitution of India, Dr.P.K.Agarwal, Dr.K.N.Chaturvedi, PRABHAT

Web References:
1. www.india.gov.in
2. www.legislative.gov.in
3. www.constitution.org

III B.Tech - I Semester   **Course Structure**

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WEB TECHNOLOGIES

                                                        Internal Marks : 40

Course Code: **External Marks: 60**

Course Prerequisites: Object Oriented Programming

Course Objectives:

This course enables the students to identify the fundamental concepts for developing web application using PHP language for server side scripting, analyze how data can be transported using XML, develop a web applications with server side programming using java servlets & JSP Servlets and client side scripting with java script.

Course Outcomes:

1. Summarize the basic tags and properties in HTML, XHTML and CSS.
2. Create web pages using .client side scripting, validating of forms and XML.
3. Identify the role of server side scripting using PHP programming
4. Design dynamic web application using server side programming with java servlets.
5. Contrast on how to connect and retrieve data through web page from database using JDBC.

UNIT I: (9 Lectures)

HTML Common tags- List, Tables, images, forms, Frames, Links and Navigation, **CSS:** Introduction, CSS Properties, Controlling Fonts, Text Formatting, Pseudo classes, Selectors.

UNIT II: (9 Lectures)

Client side Scripting: Introduction to Javascript: Javascript language – declaring variables, scope of variables, functions, event handlers (onclick, onsubmit etc.), Document Object Model, Form validation.
XML: Introduction to XML, Defining XML tags, their attributes and values, Document Type Definition, XML Schemas, Document Object Model.

UNIT III: (9 Lectures)

Introduction to PHP: Creating PHP script, Running PHP script, 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.

UNIT IV: (9 Lectures)

A: Introduction to Servlets: Common Gateway Interface (CGI), Lifecycle of a servlet, deploying a servlet, **B:** The Servlet API, Reading Servlet parameters, Reading Initialization parameters, Handling Http Request & Responses, Using Cookies and Sessions.

UNIT V: (9 Lectures)

Introduction to JSP: The Anatomy of a JSP Page, JSP Processing, JSP application design with MVC, Declaring variables and methods, sharing data between JSP pages, Requests and users passing control and data between pages, Sharing sessions and application data. **JDBC connectivity in JSP:** Data base programming using JDBC, Studying javax.sql.* package, Accessing a database from a JSP page, Application specific database actions.

Text Books:

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

References:

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, O'Reilly,SPD.
4. Beginning Web Programming-Jon Duckett WROX.
5. Programming World Wide Web, R. W. Sebesta, Fourth Edition, Pearson.
6. Internet and World Wide Web – How to program, Dietel and Nieto, Pearson.

Web References:

1. https://www.w3schools.com/html/
2. https://www.javatpoint.com/servlet-tutorial
3. http://nptel.ac.in/courses/106105084/

III B.Tech - I Semester   **Course Structure**
                                                                 L T P C
                                                                 3 0 0 3

COMPUTER NETWORKS

                                                                 Internal Marks : 40

Course Code: **External Marks: 60**

Course Prerequisites: Operating System and Computer Architecture.

Course Objectives:

1.   Understand state-of-the-art in network protocols, architectures, and applications.

2.   To demonstrate the TCP/IP & OSI model merits & demerits.

3.   Constraints and thought processes for networking research.

4.   Problem Formulation- Approach- Analysis.

5.   To know the role of various protocols in Networking.

Course Outcomes:

1.   Enables the students to visualize the different aspects of networks, protocols and network design

models.

2.   Students should be understand and explore the basics of Computer Networks and Various Protocols.

3.   Student will be in a position to understand the World Wide Web concepts.

4.   Students will be in a position to administrate a network and flow of information further.

5.   Student can understand easily the concepts of network security, Mobile.

6.   Enables the students to compare and select appropriate routing algorithms for a network.

UNIT I: (9 Lectures)

Introduction: Network, Uses of Networks, Types of Networks, Reference Models: TCP/IP Model, The OSI Model, Comparison of the OSI and TCP/IP reference model. Architecture of Internet.

Physical Layer: Guided transmission media, Wireless transmission media, Switching Multiplexing: Frequency Division Multiplexing, Time Division Multiplexing, Code Division Multiplexing

UNIT II: (9 Lectures)

Data Link Layer - Design issues, Error Detection & Correction, Elementary Data Link Layer Protocols, Sliding window protocols.

Multiple Access Protocols - ALOHA, CSMA,CSMA/CD, CSMA/CA, Collision free protocols, Ethernet-Physical Layer, Ethernet Mac Sub layer, Data link layer switching: Use of bridges, learning bridges, spanning tree bridges, repeaters, hubs, bridges, switches, routers and gateways.

UNIT III: (10 Lectures)

Network Layer: Network Layer Design issues, store and forward packet switching connection less and connection oriented networks-routing algorithms-optimality principle, shortest path, flooding, Distance Vector Routing, Count to Infinity Problem, Link State Routing, Path Vector Routing, Hierarchical

Routing; Congestion control algorithms, IP addresses, CIDR, Subnetting, Super Netting, IPv4, Packet Fragmentation, IPv6 Protocol,

Transition from IPv4 to IPv6, ARP, RARP.

UNIT IV: (9 Lectures)

Transport Layer: Services provided to the upper layers elements of transport protocol addressing connection establishment, Connection release, Error Control & Flow Control, Crash Recovery.

The Internet Transport Protocols: UDP, Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Sliding Window, The TCP Congestion Control Algorithm.

UNIT V: (8 Lectures)

Application Layer- Introduction, providing services. Applications layer paradigms: Client server model, HTTP, E-mail, WWW, TELNET, DNS; RSA algorithm.

Text Books:

1.   Tanenbaum and David J Wetherall, Computer Networks, 5th Edition, Pearson Edu,2010.

2.   Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH,2013.

References:

1.   Computer Networks: A Top Down Approach, Behrouz A. Forouzan, Firouz Mosharraf, McGraw Hill Education.

2.   An Engineering Approach to Computer Networks - S. Keshav, 2nd Edition, Pearson Education.

3.   Understanding communications and Networks, 3rd Edition, W. A. Shay, Cengage Learning.

4.   Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, K. W. Ross, 3rd Edition, Pearson Education.

Web References:
1.   en.wikipedia.org/wiki/
2.   www.w3schools.com/
3.   www.w3.org/
4.   http://computing.dcu.ie/~humphrys/ca651/index.html
5.   http://www.cs.ccsu.edu/~stan/classes/CS490/Slides/Networks4-Ch4-4.pdf
6.   http://ecourses.vtu.ac.in/nptel/courses/Webcourse-contents/IIT- MADRAS/ComputerNetworks/pdf/
7.   http://www.solarwinds.com/support/tutorials.aspx

Course Structure

L T P C

3 0 0 3

OPERATING SYSTEMS

Internal Marks : 40

External Marks: 60

Course Prerequisites: Computer System fundamentals

Course Objectives:

1. Analyze the tradeoffs inherent in operating system design.
2. Summarize the various approaches to solving the problem of mutual exclusion in anoperating system.
3. Understand the principles of Deadlocks.
4. Evaluate the trade-offs in terms of memory size (main memory, cache memory,auxiliary memory) and processor speed.
5. Demonstrate disk storage strategies, file strategies and system protection andsecurity with different crypto models.

Course Outcomes:

1. Describe the important computer system resources and the role of operating systemin their management and Identify the System.
2. Design various Scheduling algorithms and Apply the principles of concurrency.
3. Design deadlock, prevention and avoidance algorithms.
4. Compare and contrast various memory management schemes.
5. Design and Implement a prototype file systems.

UNIT I: (11 Lectures)

Computer System and Operating System Overview: Overview of Computer System hardware, Operating System Objectives and functions, Evaluation of operating System, Operating System Services, System Calls.

Process Management: Process Description, Process Control, Process States, Cooperating Processes , Inter-process Communication.

UNIT II: (13 Lectures)

CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Threads Overview, Threading issues. **Synchronization**: Background, The Critical-Section Problem, Peterson solution, Synchronization Hardware, Mutex Locks, Semaphores, Classic Problems of Synchronization, Monitors.

UNIT III: (11 Lectures)

Dead Locks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.

UNIT IV: (13 Lectures)

Memory Management Strategies: Background, Swapping, Contiguous Memory Allocation,Segmentation, Paging, Structure of Page Table.

Virtual Memory Management: Background, Demand Paging, Page Replacement, allocation of frames, Thrashing.

UNIT V: (12 Lectures)

File system Interface: The concept of a file, Access Methods, Directory structure, File system mounting, file sharing, protection.
File System implementation: File system structure, allocation methods, free space management Mass storage structure, overview of Mass-storage structure, Disk scheduling.

Text Books:

1. Operating System Concepts, Abraham Silberschatz, Peter Baer Galvin and Greg
Gagne9th Edition, John Wiley and Sons Inc., 2012.
2. Operating Systems – Internals and Design Principles, William Stallings, 7th
Edition,Prentice Hall, 2011.

References:

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

Web References:

1. https://nptel.ac.in/courses/106/106/106106144/
2. https://www.tutorialspoint.com/operating_system
3. https://www.youtube.com/playlist?list=PLEJxKK7AcSEGPOCFtQTJhOElU44J_JAun
4. https://www.pdf-archive.com/2016/12/25/operating-system-concepts-
9th- edition/operating-system-concepts-9th-edition.pdf.

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B.Tech III Year I Semester   **Course Structure**
                                                                L   T   P   C

                                                                3   0   0   3

                                                                Internal Marks: 40

Course code: **External marks: 60**

Course prerequisite:

Course Objectives:

- To learn and understand elements of IoTsystem.
- Acquire knowledge about various protocols of IoT.
- To learn and understand design principles and capabilities ofIoT.

Course Outcomes:

- Understand internet of Things and its hardware and softwarecomponents.
- Interface I/O devices, sensors &communicationmodules.
- Remotely monitor data and controldevices.
- Design real time IoT basedapplications

UNIT-1: **Introduction to IoT**

Introduction to IoT, Architectural Overview, Design principles and needed capabilities, Basics of Networking, M2M and IoT Technology Fundamentals- Devices andgateways, Data management, Business processes in IoT, Role ofCloud in IoT, Security aspects inIoT.

UNIT-2: IoT Physical Devices and Endpoints

Introduction   to   Arduino   and   Raspberry   Pi-Installation, Interfaces(serial,SPI,I2C),Programming-Python program with Raspberry PI with focus on interfacing external gadgets, controlling output, reading inputs from pins.

UNIT-3: Elements of IoT

Hardware Components- Computing- Arduino, Raspberry Pi, ARM Cortex-A class processor, Embedded Devices – ARM Cortex-M class processor, ArmCortex-M0 Processor Architecture, Cortex-M0 Processor Instruction Set, ARM and Thumb Instruction Set.

UNIT-4: Solution framework for IoT applications

Implementation of Device integration, Data acquisition and integration, Device data storage Unstructured data storage on cloud/local server, Authentication, authorization of devices.

UNIT-5: IoT Case Studies

IoT case studies and mini projects based on Industrial automation, Transportation, Agriculture, Healthcare, Home Automation.

TEXT BOOKS:

1. Raj Kamal, "Internet of Things: Architecture and Design Principles", 1st Edition, McGraw Hill Education,2017.
2. The Definitive Guide to the ARM Cortex-M0 by JosephYiu,2011
3. Vijay Madisetti, ArshdeepBahga, Internet of Things, "A Hands on Approach", UniversityPress,2015.

REFERENCE BOOKS:

1. Cypress Semiconductor/PSoC4 BLE (Bluetooth Low Energy) Product TrainingModules.
2. Pethuru Raj and Anupama C. Raman, "The Internet of Things: EnablingTechnologies, Platforms, and Use Cases", CRC Press,2017.

B.Tech III Year I Semester	Course Structure			
	L	T	P	C
	3	0	0	3

SOFTWARE TESTING

Internal Marks : 40

Course Code: **External Marks: 60**

Course Prerequisites: Software Engineering

Course Objectives:

- Describe the principles and procedures for designing test cases.
- Provide supports to debugging methods.
- Acts as the reference for software testing techniques and strategies.

Course Outcomes:

- Interpret a model for testing and understand the process of testing.
- Visualize control flow graph and demonstrate complete path testing to achieve C1+C2 and identify the complications in a transaction flow testing and anomalies in data flow testing.
- Apply reduction procedures to control flow graph and simplify it into a single path expression.
- Able to understand the use of decision tables and KV charts in test case design.
- Identify effective approach for node reduction. And able to apply different testing tools to resolve the problems in Real time environment.

UNIT I: (8 Lectures)

Introduction: Purpose of Testing, Dichotomies, model for testing, consequences of bugs, Taxonomy of bugs.

Functional Testing : Boundary value Analysis, Equivalence class testing, Decision table based testing, Cause-effect graphing technique.

UNIT II: (9 Lectures)

Flow Graphs and Path testing: Basic concepts, Predicates, Path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

Data flow testing: Basics of Data flow testing, strategies in dataflow testing, application of dataflow testing

UNIT III: (9 Lectures)

Paths, path products and Regular expressions: Path products & Path expression, reduction procedure, applications, regular expressions and flow anomaly detection.

UNIT IV: (9 Lectures)

Logic Based Testing: Overview, decision tables, path expressions, kv charts, specifications.

State, state graphs and Transition Testing: State Graphs, good and bad state graphs, state testing, testability tips.

UNIT V: (9 Lectures)

Graph matrices and Application: Motivational overview, matrix of graph relations, powerof a matrix, node reduction algorithm,

Automated Test Data Generation: What is Automated Test Data generation. Approachesto test Data Generation, Test data Generation using Genetic Algorithm, Test Data Generation Tools

Text Books:
1. Software testing techniques – Boris Beizer, Dreamtech, second edition.
2. Software Testing- Yogesh Singh, Camebridge

References:
1. Brain Marick; ―The Craft of Software Testing‖; Prentice Hall Series in innovative technology.
2. RenuRajaniPradeep Oak; ―Software Testing,Effectivemethods,Tools and Techniques‖;TMHI
3. Dr.K.V.K.K.Prasad, ―Software Testing Tools‖ –Dreamtech.
4. Edward Kit, ―Software Testing in the Real World‖ –Pearson.
5. Perry, ―Effective methods of Software Testing‖, John Wiley.

Web References:
1. https://freevideolectures.com › Computer Science › IIT Bombay
2. https://www.youtube.com/watch?v=gPE9emPFrwo
3. https://nptel.ac.in/courses/106105150
4. www.softwaretestinghelp.com

B.Tech. III Year I   **Course Structure**

                                                            L   T   P   C

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PROFESSIONAL ETHICS

                                                    Internal Marks: 40

                                                    External Marks: 60

Course Code:

Course Prerequisite: None

1. **Course objectives:**
   a. To introduce the students to the Human values and help them to lead a peaceful life in the society by contributing to peace and safety in the society.
   b. To help the students to know about the history of ethics and importance of social experimentation
   c. To specify the students about the importance of their responsibility towards safety and risk as Engineers.
   d. To specify the students about the importance of their responsibility as Engineers.
   e. To help the student explore the ethical values globally.

COURSE OUTCOMES:

1.   To learn about the different Human values to be maintained by all the people.

2.   To learn about the history of ethics and the importance of ethics for professionals and application of ethics in social experimentation.

3.   To learn about the responsibilities of engineers for safety and risk.

4.   To learn about the responsibilities and rights of engineers.

5.   To learn about global work environment with respect to ethics.

UNIT I : Human Values   (9 Lectures)

Human Values: Morals, Values and Ethics – Integrity – Work Ethics – Service Learning – Civic Virtue – Respect for others – Living Peacefully – Caring – Sharing –Honesty –Courage – Value time – Co-operation – Commitment – Empathy – Self-confidence – Spirituality- Character.

 UNIT II : Engineering Ethics and Social Experimentation   (12 Lectures)

Engineering Ethics: The History of Ethics-Purposes for Engineering Ethics-Engineering Ethics - Consensus and Controversy –Professional and Professionalism –Professional Roles to be played by an Engineer –Self Interest, Customs and Religion-Uses of Ethical Theories-Professional Ethics-Engineering and Ethics-Kohlberg's Theory – Gilligan's Argument –Heinz's Dilemma.

Engineering as Social Experimentation: Comparison with Standard Experiments –Knowledge gained – Conscientiousness – Learning from the Past – Engineers as Managers, Consultants, and Leaders – Role of Codes – Codes and Experimental Nature of Engineering.

UNIT III : Engineers' Responsibility for Safety and Risk   (9 Lectures)

Engineers' Responsibility for Safety and Risk: Safety and Risk, Concept of Safety

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

UNIT IV : Engineers' Responsibilities and Rights   (12 Lectures)

Engineers' Responsibilities and Rights: Collegiality-Techniques for Achieving Collegiality –Two Senses of Loyalty - obligations of Loyalty-misguided Loyalty –professionalism and Loyalty - Professional Rights – Professional Responsibilities –confidential and proprietary information-Conflict of Interest-solving conflict problems – Self interest, Customs and Religion- Ethical egoism-Collective bargaining Confidentiality-Acceptance of Bribes/Gifts-when is a Gift and a Bribe examples of Gifts v/s Bribes-problem solving-interests in other companies Occupational Crimes-industrial espionage-price fixing-endangering lives Whistle Blowing-types of whistle blowing-when should it be attempted preventing whistle blowing.

UNIT V :   Global Issues   (10 Lectures)

Global Issues: Globalization- Cross-culture Issues-Environmental Ethics-Computer Ethics computers as the instrument of Unethical behavior-computers as the object of Unethical Acts-autonomous computers-computer codes of Ethics Weapons

Development-Ethics and   Research-Analyzing   Ethical Problems   in   Research-Intellectual Property Rights.

Text Books:

1.   "Engineering Ethics and Human Values" by M.Govindarajan, S.Natarajan and V.S. Senthil Kumar-PHI Learning Pvt. Ltd-2009.

2.   "Professional Ethics and Morals" by Prof.A.R.Aryasri, Dharanikota Suyodhana-Maruthi Publications.

3.   "Professional Ethics and Human Values" by A.Alavudeen, R.Kalil Rahman and M. Jayakumaran-Laxmi Publications.

4.   "Professional Ethics and Human Values" by Prof. D.R. Kiran.

Reference Books:

1.   "Indian Culture, Values and Professional Ethics" by PSR Murthy, BS Publication.

2.   "Ethics in Engineering" by Mike W. Martin and Roland Schinzinger – Tata McGraw-Hill – 2003.

3.   "Engineering Ethics" by Harris, Pritchard and Rabins, CENGAGE Learning, India Edition, 2009.

Web References:

1. crescent.education/wp-content/.../12/Crescent-human-values-professional-ethics.pdf

2. https://www.crectirupati.com/.../HVPE-MBA-K%20YAMUNA-LECTURE%20NOTES...

3. https://lecturenotes.in/subject/576/professional-ethics-and-human-values-pehv

4. https://nptel.ac.in/courses/109104068/30

III B.Tech-I Semester   **Course Structure**

L T P C

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WEB TECHNOLOGIES LAB

Internal Marks : 40

External Marks: 60

Course Prerequisites: Java Programming

CODE:P18CSL09

Course Outcomes:

5. Create a static web pages using HTML and CSS.
6. Develop JavaScript code for data validation.
7. Integrate frontend and backend technologies in client-server systems.
8. Design dynamic web applications using PHP and JSP.
9. Demonstrate database connectivity for developing web applications.

The students have to choose one of the following projects and do the all 12 experimentsrelated to that project.
1. Training and placement cell.
2. School Education System.
3. University Management System.
4. Hospital Management System.

The following are the experiments related to Training and Placement cell project. For the remaining projects, the concern lab instructor has to decide the experiments according to thewebsites given as examples.

List of Experiments

Experiment 1: Design the following static web pages required for a Training and placementcell web site.
1) Home Page 2) Login Page 3) Registration page

Experiment 2: 4) Company Details Page 5) Alumni Details Page 6) Placement Staff DetailsPage

Experimen 3: 7) Student personal Info Page 8) Student Academic Info page 9) Semester Wise Percentage & their Aggregate page

Experiment 4: Validate login page and registration page using regular expressions.

Experiment 5: Apply different font styles, font families, font colors and other formatting styles to the above static web pages.

Experiment 6: Install wamp server and tomcat server, access above developed static web pages using these servers.

Experiment 7: Write a servlet/PHP to connect to the database, Insert the details of the userswho register with the web site, whenever a new user clicks the submit button in the registration.

Experiment 8: Write a JSP/PHP to connect to the database, Insert the details of the student academic information with student academic info page.

Experiment 9: User Authentication:

Assume four users user1user2, user3 and user4 having the passwords pwd1, pwd2, pwd3and pwd4 respectively. Write a servlet for doing the following.

1. Create a Cookie and add these four user id's and passwords to this Cookie.
2. Read the user id and passwords entered in the Login form (week1) and authenticatewith the values (user id and passwords) available in the cookies.

If he is a valid user (i.e., user-name and password match) you should welcome him by name(user-name) else you should display "You are not an authenticated user ".
Use init-parameters to do this. Store the user-names and passwords in the webinf.xml and access them in the servlet by using the getInitParameters() method.

Experiment 10: Write a JSP which does the following job:

Authenticate the user when he submits the login form using the user name and passwordfrom the database.

Experiment 11: write a JSP to insert the student's semester wise percentages and calculate aggregate and insert into database.

Experiment 12: write a JSP to search the students according to their aggregate

B.Tech III Year I Semester   **Course Structure**

	L	T	P	C
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COMPUTER NETWORKS LAB

Internal Marks : 40

Course Code:P18CSL06   **External Marks: 60**

Course Objectives:

1. Understand the functionalities of various layers of OSI model.
2. Understand the operating System functionalities

Part-A:

1. Implement the data link layer farming methods such as character, character stuffingand bit stuffing.

2. Implement on a data set of characters the three CRC polynomials -CRC 12, CRC16 and CRC CCIP.

3. Implement Dijkstra's algorithm to compute the Shortest path thru a graph.

4. Implementation of distance vector routing algorithm.

5. Take an example subnet of hosts. Obtain broadcast tree for it.

6. Implementation of RSA algorithm.

Part-B:

1. Simulate the following CPU scheduling algorithms
   a) Round Robin b) SJF c) FCFS d) Priority

2. Implementation of fork (), wait (), exec() and exit () System calls

3. Simulate the following.
   a) Multiprogramming with a fixed number of tasks (MFT)
   b) Multiprogramming with a variable number of tasks (MVT)

4. Simulate Bankers Algorithm for Dead Lock Avoidance

5. Simulate the following page replacement algorithms.
   a) FIFO   b) LRU   c) LFU
6. Simulate the following File allocation strategies
   a) Sequenced   b) Indexed   c) Linked

B.Tech III Year II Semester		**Course Structure**	

L	T	P	C
3	0	0	3

CRYPTOGRAPHY & NETWORK SECURITY(IT)

Internal Marks : 40

Course Code: P18CSE08 **External Marks: 60 Course**

Prerequisites: Computer Networks

Course Objectives:

1. The main objective of this course is to teach students to understand and how to address various software security problems in a secure and controlled environment.
2. During this course the students will gain knowledge in various kinds of software security problems, and techniques that could be used to protect the software from security threats.

Course Outcomes:

1. Evaluate the use of encryption algorithm for achieving data confidentiality.
2. Apply Secure hash functions for attaining data integrity.
3. Analyse the security mechanisms for achieving authentication.
4. Analyse the protocols for achieving availability, access control to resources andprotocols for non-repudiation
5. Explore the threats and remedial measures for system security .

UNIT I: (10 Lectures)

Introduction: Security Attacks(Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, Access Control and Availability) and Mechanisms, A Model for Internetwork security.

Symmetric Key Cryptography: Symmetric Encryption Principles, Symmetric Encryption Algorithms (DES,Triple DES and AES), Cipher Block Modes of Operations.

UNIT II: (8 Lectures)

Public-Key Cryptography and Message Authentication: Approaches to Message Authentication, Secure Hash Functions, Message Authentication Codes, Public-Key Cryptography Principles, Public-Key Cryptography Algorithms, Digital Signatures.

UNIT III: (9 Lectures)

Electronic Mail Security: Pretty Good Privacy (PGP) and S/MIME.

IP Security: IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations, Internet Key Exchange.

UNIT IV: (9 Lectures)

Web Security: Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT V: (9 Lectures)

Intruders and Malicious Software: Intruders, Intrusion Detection, Viruses and Related Threats, Trusted System.

Firewalls: Firewalls-Characteristics, Types of Firewalls, Placement of Firewalls, Firewall Configuration.

Text Books:
1. Cryptography and Network Security: Principles and Practice,6th Edition, William Stallings, Pearson Education,2011.
2. Network Security Essentials (Applications and Standards), William Stallings,Pearson Education.
3. Introduction to Computer Networks & Cyber Security, Chwan Hwa Wu, J.David Irwin, CRC Press, 2013.

References:
1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press).
2. Principles of Information Security, Withman , Thomson.
3. Introduction to Cryptography, Buchmann, Springer.

Web References:

1. https://onlinecourses.nptel.ac.in/noc18_cs07/preview
2. https://www.coursera.org/learn/cryptography
3. https://www.coursera.org/specializations/computer-network-security
4. https://www.youtube.com/watch?v=Q-HugPvA7GQ&list=PL71FE85723FD414D7

B.Tech III Year II Semester

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Course Structure

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INTRODUCTION TO MACHINE LEARNING

CSE(IOT & CSBT)

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Internal Marks: 40
External Marks: 60

</div>

Course Code:
Course Prerequisites: Data ware housing and data mining . Statistics and probability, linear algebra and calculus.

Course Objectives:
1. This course explains machine learning techniques such as decision tree learning, Bayesian learning etc.
2. To understand computational learning theory.
3. To study the pattern comparison techniques
4. Explore supervised and unsupervised learning paradigms of machine learning.

Course Outcomes:
1. Understand the concepts of computational intelligence like machine learning

2. Ability to get the skill to apply machine learning techniques to address the real time problems in different areas

3. Understand the Neural Networks and its usage in machine learning application

4. Understand how to apply variety of learning algorithm to data

5. Understand how to perform evaluation of learning algorithms and model selection

UNIT-1: Introduction to Machine learning:

What is Machine Learning, Why Use Machine Learning, History of Machine Learning, Role of Data in Machine Learning, Challenges in Machine Learning, Machine Learning Life Cycle and Pipelines, Applications of Machine Learning, , Types of Machine Learning Systems,

UNIT-2   Supervised Learning

 Classification: Types of Classification Algorithms: Naive Bayes classifier, Decision Trees, Logistic Regression, K-Nearest Neighbors, Support vector machine, Random forest classification.

Regression: Simple linear Regression, Multiple linear Regression, polynomial Regression, Decision Tree Regression, Random forest Regression, Ensemble Method

UNIT-3 Unsupervised Learning

Types of Unsupervised Learning: Clustering, K-means clustering, KNN (k-nearest neighbors), Hierarchal clustering, Anomaly detection, Neural Networks, Principle Component Analysis, Independent Component Analysis, Apriori algorithm, Singular value decomposition

UNIT-4 Sparse Modeling

Sparse Modeling and Estimation, Modeling Sequence/Time-Series Data, Deep Learning and Feature Representation learning

UNIT-5 Reinforcement learning:

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

Text Books:

1. Machine Learning – Tom M. Mitchell, - MGH

2. Kevin Murphy, Machine learning : A probabilistic Perspective MIT Press,2012

3. Trevor Hastie, Robert Tibshirani, Jerome Friedman, The elements of statistical learning, Springer 2009

   Reference Books:

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

2. Hands-On Machine Learning with Scikit-Learn and Tensor Flow by Aurélien Géron

3. Christopher Bishop, Pattern Recognition and Machine Learning,Springer,2007

Web Reference:

 https://www.coursera.org/learn/machine-learning

Multimedia and Application Development

Course Code: P18CSE13   **InternalMarks:40**

                                                              ExternalMarks: 60

CoursePrerequisite:Nil

Course Objectives:

1. Togiveeachstudentafirmgroundinginthefundamentalsoftheunderpinning technologies in graphics, distributed systems and multimedia
2. 2. To teach students about the principled design of effective media for entertainment, communication, training and education
3. 3.Toprovideeachstudentwithexperienceinthegenerationofanimations,virtual environments and multimedia applications, allowing the expression of creativity
4. 4. To provide each student with a portfolio of their own completed work at the end of the programme

CourseOutcomes:

Attheendofthiscoursethe studentwillbeableto

1. Demonstrateknowledgeandunderstandingoftheconcepts,principlesand theories of Multimedia Applications and Virtual environments
2. Demonstrateknowledgeandunderstandingofthecurrentissuesinvolvedwith development and deployment of multimedia system
3. AnalyseandsolveproblemsrelatedtotheirexpertiseinMultimediaApplications
4. Demonstratetheirabilitytoextendtheirbasicknowledgetoencompassnew principles and practice
5. Demonstratetheircomputing,technicalandtheoreticalskillsbydevelopinga substantial Multimedia application.

Unit-1   (**7**Lectures)

Fundamentalconcepts: FundamentalconceptsinTextandImage-Multimediaand hypermedia. World Wide Web, overview of multimedia software tools.

GraphicsandImage:datarepresentationgraphics/imagedatatypes,fileformats.

Unit-2   (**7**Lectures)

Colorinimageandvideo:colorscience,colormodelsinimages,colormodelsinvideo.

Basic concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

Unit-3 (12Lectures)

Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding.

Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, Embedded Zero tree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).

Unit-4 (10Lectures)

Video Compression Techniques: Introduction to video compression,Video compression based on motion compensation,Search for motion vectors. MPEG.

Basic Audio Compression Techniques: ADPCM, Vocoders, Phase Insensitivity, Channel Vocoder, Formant Vocoder, Linear Predictive Coding, CELP. MPEG Audio Compression: Psychoacoustics,Equal-Loudness Relations,FrequencyMasking,Temporal Masking,MPEG Audio, MPEG Layers, MPEG Audio Strategy, MPEG Audio Compression Algorithm, MPEG-2 AAC (Advanced Audio Coding).

Unit-5 (8Lectures)

Multimedia Networks: Basics of Multimedia Networks, Multimedia Network Communications and Applications,Quality of Multimedia Data Transmission,Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, t Media-on-Demand (MOD).

TextBooks:

1. FudamentalsofMultimediabyZe-NianLiandMarkS.DrewPHIllPearson Education
2. MultimediaSystemDesign,AndleighandThakarar,PHI
3. MultimediaTechnology&Application,DavidHillman,GalgotiaPublications.

References:

1. RajanParekh"PrinciplesofMultimedia"(TataMcGraw-Hill)
2. S.J.Gibbs&D.C.Tsichritzis"MultimediaProgramming",AddisonWesley1995

3. P.W.Agnew&A.S.Kellerman"DistributedMultimedia",AddisonWesley1996
4. C.A.Poynton,"ATechnical IntroductiontoDigitalVideo" Wiley1996
5. F.Fluckiger,"UnderstandingNetworkedMultimedia",Prentice-Hall1995

WebReferences:

1. https://www.tutorialspoint.com/multimedia/index.htm
2. https://www.wisdomjobs.com/e-university/multimedia-tutorial-270.html

https://dokumen.tips/documents/the-manualscom-fundamentals-of-multimedia-by-ze-nian-li-and-mark-s-drew-solution-manual.html

Code: P18MBO04

MANAGEMENT SCIENCE

COURSE OBJECTIVES:

- To understand the application of management science in decision making process& its importance, evaluation of management thought, how organisation structure is designed and its principle and types.
- To understand the types of management about work study, how quality is controlled, control charts and inventory control and their types.
- To learn the main functional areas of organisation i.e., Financial Management, Production Management, Marketing Management, Human resource Management, Product life cycles and Channels of Distribution.
- The learning objective of this unit is to understand the Development of Network and Identifying Critical Path.
- The learning objective of this unit is to understand the concept of strategic management, and the basic concepts of MIS, MRP, JIT, TQM, Six sigma, CMM, Supply chain management, ERP, Business Process Outsourcing, bench marking and business process re-engineering.

COURSE OUTCOMES:
- Able to apply the concepts & principles of management in real life. The student will be able to design & develop organization structure for an enterprise.
- Able to apply PPC techniques, Quality Control, Work-study principles in industry.
- The student can identify and apply Marketing, HRM, and Production Strategies and implement them effectively.
- Able to develop PERT/CPM Charts for projects of an enterprise and estimate time & cost of project.
- Able to develop Mission, Objectives, Goals & strategies for an enterprise in dynamic environment and apply modern management techniques MIS, ERP, TQM, SCM, BPR, and Bench Marking wherever possible

UNIT-I:

Introduction to management: Concept –nature and importance of Management –Generic Functions of Management – Evaluation of Management thought- Theories of Motivation – Decision making process-Designing organization structure- Principles of organization – Organizational typology- International Management: Global Leadership and Organizational behavior Effectiveness(GLOBE) structure.

UNIT – II

Operations Management: Principles and Types of Management – Work study- Statistical Quality Control- Control charts (P-chart, R-chart, and C-chart) Simple problems- Material Management:

Need for Inventory control- EOQ, ABC analysis (simple problems) and Types of ABC analysis (HML, SDE, VED, and FSN analysis).

UNIT – III
Functional Management: Concept of HRM, HRD and PMIR- Functions of HR Manager- Wage payment plans (Simple Problems) – Job Evaluation and Merit Rating - Marketing Management- Functions of Marketing – Marketing strategies based on product Life Cycle, Channels of distributions. Operationalising change through performance management.

UNIT-IV
Project Management: (PERT/CPM): Development of Network – Difference between PERT and CPM Identifying Critical Path- Probability- Project Crashing (Simple Problems)

UNIT –V
Strategic Management: Vision, Mission, Goals, Strategy – Elements of Corporate Planning Process –SWOT analysis- Steps in Strategy Formulation and Implementation, Generic Strategy Alternatives. Global strategies.
Contemporary Management Practices: basic concepts of MIS, Total Quality Management (TQM), Six Sigma, Supply chain management, Enterprise Resource Planning(ERP), Business process Re- engineering and Bench Marketing,

Text Books:
1. Dr. P. Vijaya Kumar & Dr. N. Appa Rao, '*Management Science'* Cengage, Delhi, 2012.
2. Dr. A. R. Aryasri, *Management Science'* TMH 2011.

References:
1.Philip Kotler & Armstrong: Principles of Marketing, Pearson publications
2. Biswajit Patnaik: Human Resource Management, PHI, 2011
3. Hitt and Vijaya Kumar: Starategic Management, Cengage learning
4. Seth & Rastogi: Global Management Systems, Cengage learning , Delhi, 2011

Web References:
1. https://mrcet.com/downloads/digital_notes/ECE/II%20Year/Management%20Science.pdf
2. https://books.askvenkat.org/management-science-textbook-aryasri-pdf/
3. https://nptel.ac.in/courses/122/102/122102007/
4. https://nptel.ac.in/courses/122/108/122108038/
5. http://www.universityofcalicut.info/SDE/Management_science_corrected_on13April2016.pdf

SENSORS TECHNOLOGY

B.Tech. III Year II Semester   **L   T   P   C**

3   0   0   3

Course Objectives:
1. To **provide** basic knowledge in transduction principles, sensors and transducer technologyand measurement systems.
2. To **provide** better familiarity with the Theoretical and Practical concepts of Transducers.
3. To **provide** familiarity with different sensors and their application in real life.
4. To **provide** the knowledge of various measurement methods of physical and electrical parameters

Course Outcomes:
1. After completion of the course the student is able to:
2. **Identify** suitable sensors and transducers for real time applications.
3. **Translate** theoretical concepts into working models.
4. **Design** the experimental applications to engineering modules and practices.
5. **Design** engineering solution to the Industry/Society needs and develop products.

UNIT - I

Introduction to measurement systems

General concepts and terminology, measurement systems, sensor classifications: Analog Input and Output, Digital Input and Output, general input-output configuration, methods of correction.

Passive Sensors
Resistive Sensors: Potentiometers, Strain Gages, Resistive Temperature Detectors (RTDs), Thermistors, Light-dependent Resistors (LDRs), Resistive Hygrometers.
Capacitive Sensors: Variable capacitor and Differential capacitor.

Inductive Sensors: Reluctance variation sensors, Eddy current sensors, Linear variable differential transformers (LVDTs)

UNIT II

Self-generating Sensors or active sensors

Thermoelectric Sensors: Thermocouples, Thermo electric effects, Common thermocouples, Practicalthermocouple laws, Cold junction compensation in thermocouples circuits.
Piezoelectric Sensors: Piezoelectric effect, piezoelectric materials, applications.

UNIT III
VELOCITY AND ACCELERATION MEASUREMENT

Relative velocity – Translational and Rotational velocity measurements – Revolution counters and Timers - Magnetic and Photoelectric pulse counting stroboscopic methods. Accelerometers-different types, Gyroscopes-applications.
Density measurements – Strain Gauge load cell method – Buoyancy method - Air pressure balance method – Gamma ray method – Vibrating probe method.

UNIT IV
DENSITY, VISCOSITY AND OTHER MEASUREMENTS

Units of Viscosity, specific gravity scales used in Petroleum Industries, Different Methods of measuring consistency and Viscosity –Two float viscorator –Industrial consistency meter. Sound-Level Meters, Microphones, Humidity Measurement

UNIT V
CALIBRATION AND INTERFACING

Calibration using Master Sensors, Interfacing of Force, Pressure, Velocity, Acceleration, Flow, Densityand Viscosity Sensors, Variable Frequency Drive

TEXT BOOKS:
1. Measurement Systems – Applications and Design – by Doeblin E.O., 4/e, McGraw Hill International, 1990.
2. Principles of Industrial Instrumentation – Patranabis D. TMH. End edition 1997

REFERENCES:
1. Sensors and Transducers: D. Patranabis, TMH 2003
2. Wiley & Sons Ltd. (2006).
3. Sensor Technology Hand Book – Jon Wilson, Newne 2004.
4. Instrument Transducers – An Introduction to their Performance and design – by Herman K.P. Neubrat, Oxford University Press.
5. Measurement system: Applications and Design – by E. O. Doeblin, McGraw Hill Publications.
6. Electronic Instrumentation by H. S. Kalsi.

B.Tech III Year II Semester   **Course Structure**

                                                                            L   T   P   C

                                                                            3   1   0   4

WIRELESS ADHOC NETWORKS

CSE (IOT&CSBT)

                                                              Internal Marks: 40

Course Code: **External Marks: 60**

Course Prerequisites:

Course Objectives: This course will enable students to

- Explain fundamental principles of Ad-hoc Networks
- Discuss a comprehensive understanding of Ad-hoc network protocols
- Outline current and emerging trends in Ad-hoc Wireless Networks.
- Analyze energy management in ad-hoc wireless networks.

Course Outcomes: The students shall able to:

- Design their own wireless network
- Evaluate the existing network and improve its quality of service
- Choose appropriate protocol for various applications
- Examine security measures present at different level

UNIT-1: INTRODUCTION

Wireless Ad-hoc Networks Introduction, Issues in Ad-hoc Wireless Networks, Ad-hoc Wireless Internet; MAC Protocols for Ad-hoc Wireless Networks: Introduction, Issues in Designing a MAC Protocol, Design Goals of MAC Protocols, Classification of MAC protocols, Contention-Based Protocols, Contention-Based Protocols with Reservation Mechanisms, Contention-Based Protocols with Scheduling Mechanisms, MAC Protocols that Use Directional Antennas.

UNIT-2: ROUTING PROTOCOLS FOR WIRELESS AD-HOC NETWORKS

Routing Protocols for Ad-hoc Wireless Networks Introduction, Issues in Designing a Routing Protocol for Ad-hoc Wireless Networks; Classification of Routing Protocols; Table Driven Routing Protocols; On-Demand Routing Protocols, Hybrid Routing Protocols, Hierarchical Routing Protocols and Power-Aware Routing Protocols.

UNIT-3: MULTICAST ROUTING IN WIRELESS AD-HOC NETWORKS

Multicast Routing in Ad-hoc Wireless Networks Introduction, Issues in Designing a Multicast Routing Protocol, Operation of Multicast Routing Protocols, An Architecture Reference Model for Multicast Routing Protocols, Classifications of Multicast Routing Protocols, Tree-Based Multicast Routing Protocols and Mesh-Based Multicast Routing Protocols.

UNIT-4: TRANSPORT LAYER AND SECURITY PROTOCOLS FOR WIRELESS AD-HOC NETWORKS

Transport Layer and Security Protocols for Ad-hoc Networks: Introduction, Issues in Designing a Transport Layer Protocol; Design Goals of a Transport Layer Protocol; Classification of Transport Layer Solutions; TCP over Transport Layer Solutions; Other Transport Layer Protocols for Ad-hoc Networks; Security in Ad-hoc Wireless Networks, Issues and Challenges in Security Provisioning, Network Security Attacks, Key Management and Secure Touting Ad-hoc Wireless Networks.

UNIT-5: QUALITY OF SERVICE AND ENERGY MANAGEMENT

Quality of Service and Energy Management in Ad-hoc Wireless Networks: Introduction, Issues and Challenges in Providing QoS in Ad-hoc Wireless Networks, Classification of QoS Solutions, MAC Layer Solutions, Network Layer Solutions; Energy Management in Ad-hoc Wireless Networks: Introduction, Need for Energy Management in Ad-hoc Wireless Networks, Classification of Energy Management Schemes, Battery Management Schemes, Transmission Management Schemes, System Power Management Schemes.

Text Books:
1. C. Siva Ram Murthy & B. S. Manoj: Ad-hoc Wireless Networks, 2nd Edition, Pearson Education, 2011.

Reference Books:

1. Ozan K. Tonguz and Gianguigi Ferrari: Ad-hoc Wireless Networks, John Wiley, 2007.
2. Xiuzhen Cheng, Xiao Hung, Ding-Zhu Du: Ad-hoc Wireless Networking, Kluwer Academic Publishers, 2004.
3. C.K. Toh: Ad-hoc Mobile Wireless Networks- Protocols and Systems, Pearson Education, 2002

B.Tech III Year II Semester

Course Structure

L	T	P	C
0	0	3	1.5

IOT Devices Lab

Internal Marks: 40

Course Code: **External Marks: 60**

Course Prerequisites: IOT Devices Lab

List of Experiments

1. Design of digital dc voltmeter and ammeter
2. Design of digital ac voltmeter and ammeter
3. Direction control of three phase induction motor
4. Design of digital frequency meter
5. Measurement of power and energy
6. Measurement of phase shift and power factor
7. Implementation of over current relay
8. Over/under voltage protection of home appliances
9. Protection of three phase induction motor
10. Traffic signal control
11. Railway gate control by stepper motors
12. Direction and Speed control of DC motor

B.Tech III Year II Semester

Course Structure

L	T	P	C
0	0	3	1.5

SENSOR TECHNOLOGIES LAB

Internal Marks: 40

Course Code: **External Marks: 60**

Course Prerequisites: Nil

S.No	Name of the Experiment
1	Voltage and CurrentDetection Circuitry
2	Temperature and Pressure DetectionCircuitry
3	Water flow andLevel detectionCircuitry
4	Position Indication(LVDT,Pot)
5	Proximity sensors(inductive)
6	Distance(Ultrasonic) sensor
7	Light sensor
8	Humidity sensor
9	Rainfall and Soilmoisture Sensor
10	Motion sensor