PACE INSTITUTE OF TECHNOLOGY & SCIENCES, ONGOLE – 523272
(AUTONOMOUS)
AR-18 REGULATIONS B.Tech (CS&IT) COURSE STRUCTURE

I YEAR I SEMESTER								
S.No	**CODE**	**COURSE**	**L**	**T**	**P**	**Credits**	**Internal**	**External**
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	P18BST03	Applied Physics	3	0	0	3	40	60
5	P18EST03	C-Programming for Problem Solving	3	0	0	3	40	60
6	P18EST02	Engineering Graphics	1	0	3	2.5	40	60
7	P18HSL01	English Language Communication Skills Lab	0	0	3	1.5	40	60
8	P18BSL01	Applied Physics Lab	0	0	3	1.5	40	60
9	P18ESL03	C-Programming for Problem solving Lab	0	0	3	1.5	40	60
10	P18ESL02	Engineering Workshop Lab	0	0	3	1.5	40	60
Total Periods			**13**	**0**	**15**	**20.5**	**360**	**540**

I YEAR II SEMESTER								
S.No	**CODE**	**COURSE**	**L**	**T**	**P**	**Credits**	**Internal**	**External**
1	P18HST02	English-II	3	0	0	3	40	60
2	P18BST02	Mathematics – II	3	0	0	3	40	60
3	P18BST05	Applied Chemistry	3	0	0	3	40	60
4	P18EST01	Basic Electrical and Electronics Engineering	3	0	0	3	40	60
5	P18EST05	Python Programming	3	0	0	3	40	60
6	P18BSL03	Applied Chemistry Lab	0	0	3	1.5	40	60
7	P18ESL01	Basic Electrical and Electronics Engineering Lab	0	0	3	1.5	40	60
8	P18ESL04	Python Programming Lab	0	0	3	1.5	40	60
Total Periods			**15**	**0**	**9**	**19.5**	**320**	**480**

II YEAR I SEMESTER								
S.No	**CODE**	**COURSE**	**L**	**T**	**P**	**Credits**	**Internal**	**External**
1	P18ITT03	Software Engineering	3	0	0	3	40	60
2	P18CST02	Data Structures	3	1	0	4	40	60
3	P18CST06	Database Management Systems	3	1	0	4	40	60
4	P18ECT19	Digital Electronics	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	P18CSL05	Database Management Systems Lab	0	0	3	1.5	40	60
8	P18MCT02	Environmental Sciences	3	0	0	0	40	60
Total Periods			**18**	**2**	**6**	**20**	**320**	**480**

II YEAR II SEMESTER								
S.No	**CODE**	**COURSE**	**L**	**T**	**P**	**Credits**	**Internal**	**External**
1	P18CST01	Java Programming	3	0	0	3	40	60
2	P18ITT02	Computer Organization	3	0	0	3	40	60
3	P18CST03	Mathematical Foundation of Computer Science	3	1	0	4	40	60
4	P18ITT04	Design & Analysis of Algorithms	3	0	0	3	40	60
5	P18CSL03	Free Open Source Software	1	0	2	2	40	60
6		*Open Elective – I*	2	0	0	2	40	60
7	P18CSL01	Java Programming Lab	0	0	3	1.5	40	60
8	P18ITL02	Design & Analysis of Algorithms Lab	0	0	3	1.5	40	60
9	P18MCT05	Indian Constitution	3	0	0	0	40	60
10	P18CII01	Internship	0	0		2		
Total Periods			**18**	**1**	**8**	**22**	**360**	**540**

III YEAR I SEMESTER								
S.No	**CODE**	**COURSE**	**L**	**T**	**P**	**Credits**	**Internal**	**External**
1	P18CST08	Computer Networks	3	0	0	3	40	60
2	P18ITT05	Data Science	3	0	0	3	40	60
3	P18CST09	Operating Systems	3	0	0	3	40	60
4	P18CIT01	Data Warehousing & Data Mining	3	0	0	3	40	60
5	***Professional Elective – I***		3	0	0	3	40	60
6	***Open Elective-II***		2	0	0	2	40	60
7	P18ITL06	Data Science with R Lab	0	0	3	1.5	40	60
8	P18ITL07	Computer Networks Lab	0	0	3	1.5	40	60
9	P18MCT08	Design Thinking for innovation	0	0	4	2	40	60
Total Periods			**17**	**0**	**10**	**22**	**360**	**540**

Professional Elective – I		
S.No	**Course Code**	**COURSE**
i)	P18CIE01	Advanced Computer Architecture
ii)	P18CIE04	Software Testing
iii)	P18CIE02	Neural Networks and Fuzzy systems
iv)	P18CIE03	Computer Graphics

III YEAR II SEMESTER								
S.No	**CODE**	**COURSE**	**L**	**T**	**P**	**Credits**	**Internal**	**External**
1	P18CST12	Web Technologies	3	0	0	3	40	60
2	P18CST11	Hadoop & Big Data	3	0	0	3	40	60
3	P18CST10	Artificial Intelligence & Machine Learning	3	1	0	4	40	60
4	***Professional Elective-II***		3	0	0	3	40	60
5	***Open Elective –III***		2	0	0	2	40	60
6	P18ITT06	Theory of Automata and Compiler Design	3	0	0	3	40	60
7	P18CSL09	Web Technologies Lab	0	0	3	1.5	40	60
8	P18CSL07	Artificial Intelligence & Machine Learning Lab	0	0	3	1.5	40	60
9	P18CIM01	Mini Project	0	0	6	2	40	60
Total Periods			**17**	**1**	**12**	**23**	**360**	**540**

Professional Elective – II		
S.No	**Course Code**	**COURSE**
i)	P18CIE06	Cryptography and Network Security
ii)	P18CIE05	Distributed Database
iii)	P18CIE07	Unified Modelling Language
iv)	P18CIE08	Middleware Technologies

IV YEAR I SEMESTER								
S.No	**CODE**	**COURSE**	**L**	**T**	**P**	**Credits**	**Internal**	**External**
1	P18CIT02	Scripting languages	3	0	0	3	40	60
2	P18CIT03	Wireless Networks & Mobile Computing	3	0	0	3	40	60
3		Professional Elective-III	3	0	0	3	40	60
4		Professional Elective-IV	3	0	0	3	40	60
5		*Open Elective-IV*	2	0	0	2	40	60
6	P18CIL01	Scripting language Lab	0	0	3	1.5	40	60
7	P18CIL02	Software Lab-I	0	0	3	1.5	40	60
8	P18CIL03	Android Application Development Lab	0	0	4	2	40	60
9	P18MCT14	Employability skills	0	0	2	0	40	60
Total Periods			**14**	**0**	**11**	**19**	**360**	**540**

Professional Elective – III		
S.No	**Course Code**	**COURSE**
1	P18CIE09	Natural Language Processing
2	P18CIE10	Deep Learning
3	P18CIE11	Multimedia and Application Development
4	P18CIE12	GPU Programming

Professional Elective – IV		
S.No	**Course Code**	**COURSE**
1	P18CIE13	Social media Analytics
2	P18CIE14	Data Visualization Techniques
3	P18CIE15	Block Chain Technology
4	P18CIE16	Cloud Computing

IV YEAR II SEMESTER								
S.No	**CODE**	**COURSE**	**L**	**T**	**P**	**Credits**	**Internal**	**External**
1		Professional Elective-V	3	0	0	3	40	60
2		Professional Elective-VI	3	0	0	3	40	60
3		*Open Elective-V*	2	0	0	2	40	60
4	P18CIP01	Project	0	0	12	6	80	120
Total Periods			**8**	**0**	**12**	**14**	**200**	**300**

Professional Elective – V		
S.No	**Course Code**	**COURSE**
1	P18CIE17	Human Computer Interaction
2	P18CIE18	Medical Image data Analysis
3	P18CIE19	Web Development using MEAN Stack
4	P18CIE20	Cyber Security

Professional Elective – VI		
S.No	**Course Code**	**COURSE**
1	P18CIE21	Internet of Things
2	P18CIE22	Soft Computing
3	P18CIE23	High Performance Computing
4	P18CIE24	DevOps

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

	L	T	P	C
English-I	**3**	**0**	**0**	**3**

(Common to all Branches)

Internal Marks: 40

Course Code: P18HST01 **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 (9 Lectures)

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

L	T	P	C
3	0	0	3

MATHEMATICS-I
(Differential equations and Laplace Transforms)

(Common to All Branches)

Internal Marks: 40

Course code: P18BST01 **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 **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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B.Tech I Year - I Semester

Course structure

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

L	T	P	C
0	0	3	1.5

English Language Communication Skills Lab

(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

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

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:
$1+x+x^2+x^3+\ldots\ldots\ldots\ldots+x^n$.
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

ENGINEERING WORKSHOP

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

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
3	0	0	3

English-II

(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

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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
APPLIED CHEMISTRY (for ECE,CSE,IT Branches)	**3**	**0**	**0**	**3**

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**

L	T	P	C
3	0	0	3

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to ECE,CSE,IT,EEE)

Internal Marks: 40

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

Course Prerequisite: Physics.

Course Objective:

1. To study the concept of passive elements, and understand the applications of network theorems for analysis of electrical networks.
2. To Analyze the single-phase ac circuits consisting of R,L, C, RL, RC, RLC combinations.
3. To understand the faraday's laws and basic Principle of transformer.
4. To understand the working principle of various rotating machines.
5. To study the operation of PN junction diode, half wave, full wave rectifiers, Transistors and OP-AMPs.

Course Outcomes:

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

1. Solve various electrical networks in presence of active and passive elements and by using principles of network theorem.
2. Analyze the single-phase ac circuits consisting of R,L, C, RL, RC, RLC combinations.
3. Understand the faraday's laws and basic Principle of transformer.
4. Understand the working principle of various rotating machines.
5. Study the operation of PN junction diode, half wave, full wave rectifiers, Transistors and OP-AMPs

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 transformer–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 – Types of Transistors - PNP and NPN junction transistors, transistor as an amplifier- Frequency response of CE Amplifier- Characteristics of Operational Amplifiers.

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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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

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

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

L	T	P	C
0	0	3	1.5

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

(Common to ECE,CSE,EEE.IT)

Internal Marks: 40

Course Code: P18ESL01 **External Marks: 60**

Course Prerequisite: None

Course Objective:

1. To verify and demonstrate on safety precautions and Kirchhoff's laws.
2. To demonstrate various protective devices, 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 CE amplifier, Half & Full wave rectifiers.
5. 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 'slaws.
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, Half & Full wave rectifiers.
5. Analyze the characteristics of OP –Amp and CE amplifier

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's 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
    1. 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

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

L	T	P	C
0	0	3	1.5

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

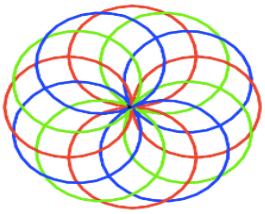
i)Robot.

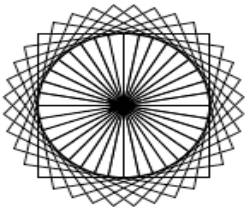
ii)ATM Machine.

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





PACEINSTITUTEOFTECHNOLOGY&SCIENCES,ONGOLE–532272
(AUTONOMOUS)
AR-18REGULATIONSB.TechCOURSESTRUCTURE-CSIT

II YEAR I SEMESTER								
S.No	**CODE**	**COURSE**	**L**	**T**	**P**	**Credits**	**Internal**	**External**
1	**P18ITT03**	Software Engineering	3	0	0	3	40	60
2	**P18CST02**	Data Structures	3	1	0	4	40	60
3	P18CST06	Database ManagementSystem	3	1	0	4	40	60
4	P18ECT19	Digital Electronics	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	P18CSL05	Database ManagementSystem Lab	0	0	3	1.5	40	60
8	P18MCT02	Environmental Sciences	3	0	0	0	40	60
Total Periods			**18**	**2**	**6**	**20**	**320**	**480**

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

L	T	P	C
3	0	0	3

SOFTWARE ENGINEERING

(CSIT)

Subject Code: P18ITT03 **Internal Marks: 40**
External Marks: 60

Course Prerequisites: Nil

Course Objectives:

1. To make the students learn about the basic concepts on software engineering methods andpractices and their appropriate application in software industry.
2. To develop an understanding of software process models and Software Development Life Cycle.
3. To provide an idea on software testing techniques.
4. To teach an understanding role of the different aspects of Software Project Management.

Course Outcomes:

At the end of the course student able to

1. Identify, formulate, and solve software engineering problems.
2. Elicit, analyze and specify software requirements with various stakeholders of a softwaredevelopment project.
3. Participate in design, development, deployment and maintenance of a medium scale software development project.
4. Convey technical material through oral presentation and interaction with an audience.
5. Evaluate the impact of potential solutions to software engineering problems in a global society, using the knowledge of models, tools, and techniques.

UNIT- I (10 Lectures)

Introduction to Software Engineering: The evolving role of software, Software Characteristics,Changing Nature of Software, Software myths.
A Generic view of Process: Software engineering- A layered technology, a Process framework, The Capability Maturity Model Integration (CMMI), Process assessment, Product and Process.

UNIT-II (8 Lectures)

Process models: The waterfall model, Incremental process models, Evolutionary process models, the unified process.
Software Requirements: User requirements, System requirements, Functional and non-functionalrequirements, the Software Requirements Document (SRS).

UNIT-III (10 Lectures)

Requirements Engineering Process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

Project planning and estimation: Project Planning Activities, Software Metrics and Measurements,Project Size Estimation, Effort Estimation Techniques: COCOMO, PERT/CPM method.

UNIT-IV (8 Lectures)

Design Engineering: Design process and Design quality, Design concepts, Software Architecture, Architectural Styles and Patterns.

Object-Oriented Design: Objects and object classes, An Object-Oriented design process, Designevolution

UNIT-V (9 Lectures)

Testing Strategies: A strategic approach to software testing, test strategies for conventional software,Validation testing, System testing, the art of Debugging, Black-Box and White-Box testing.

Quality Management : Quality concepts, Software quality assurance, Software Reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 Quality standards.

Text Books:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition,McGrawHillInternational Edition, 2010.
2. Software Engineering- Sommerville , 9th edition, Pearson education, 2011.
3. Software Engineering, concepts and practices, UgrasenSuman, Cengage learning, 2013.

Reference Books:

1. Software Engineering- K.K. Agarwal&Yogesh Singh, New Age International Publishers, 2007.
2. Software Engineering, an Engineering approach- James F. Peters, WitoldPedrycz, JohnWiely,2000.
3. Systems Analysis and Design- Shely Cash man Rosenblatt, Thomson Publications,2016.
4. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-HillCompanies, 2004.

Websites References:

1. www.en.wikibooks.org/wiki/
2. www.slideshare.net/

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

L	T	P	C
3	1	0	4

DATA STRUCTURES

(CSIT)

Subject Code: P18CST02 **Internal Marks: 40**
External Marks: 60

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

UNIT-I (13 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, Towers of Hanoi
Searching: List Searches using Linear Search, Binary Search, Fibonacci Search

UNIT-II (11 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 (12 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 (13Lectures)

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-TreesDefinition and Examples only, Red-Black Trees-Definitions and Examples only (No operations)

UNIT-V (11 Lectures)

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

Text Books:

1. Data Structures, Richard F, Gilberg, Forouzan, 2/e, Cengage, 2007.
2. Data Structures and Algorithms,G.A.V.Pai, TMH,2008.

Reference Books:

1. Data Structure with C, Seymour Lipschutz, TMH, 2010.
2. Classic Data Structures, Debasis,Samanta,2/e, PHI,2009.
3. Fundamentals of Data Structure in C, Horowitz,Sahni, Anderson Freed,2/e, UniversityPress, 2013.

Web References:

1. www.nptel.ac.in
2. www.udemy.com

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

L	T	P	C
3	1	0	4

DATABASE MANAGEMENT SYSTEMS

(CSIT)

Course Code: P18CST06 **Internal Marks: 40**
External Marks: 60

Course Prerequisites: Nil

Course Objectives:

1. Provides students with theoretical knowledge and practical skills in the design, use of databases and database management systems in information technology applications.

Course Outcomes:

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

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 (9 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, environment, Centralized and Client Server architecture for the database.

UNIT – II (10 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 (9 Lectures)

Schema Refinement (Normalization): Problems Caused by Redundancy, Decompositions, Problems Related to Decomposition, Functional dependency, Properties of Functional

dependency, Normal forms based on functional dependency - 1NF, 2NF and 3NF, concept of surrogate key, Boyce-Codd normal form(BCNF), 4NF; Properties of Decompositions - Lossless join decomposition and dependency preserving decomposition.

UNIT – IV (9 Lectures)

Transaction Management And Concurrency Control: Transaction, properties of transactions,transaction log, and transaction management with SQL using commit rollback and save point. 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. SQL constructs that grant access or revoke access from user or user groups. Basic PL/SQL procedures,triggers.

UNIT-V (8 Lectures)

Overview Of Storages And Indexing: Data on External Storage- File Organization and Indexing –Clustered Indexing – Primary and Secondary Indexes, Index Data Structures, Hash-BasedIndexing – Tree-Based Indexing, Comparison of File Organization

Textbooks:

1. Database Management Systems, 3/e Raghuram Krishnan, Johannes Gehrke, TMH, 2014.
2. Database Management System, 6/e RamezElmasri, Shamkant B. Navathe, PEA, 2010.
3. Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning, 2012.

Reference Books:

1. Database System Concepts. 6/e Silberschatz, Korth, TMH, 2013.
2. Introduction to Database Systems, 8/e C J Date, PEA, 2003.
3. The Database book: principles & practice using Oracle/MySqlNarainGehani, University Press, 2008.

Web References:

1. www.studytonight.com/dbms/
2. www.tutorialspoint.com/dbms/
3.www.beginnersbook.com/2015/04/dbms-tutorial/
4. www.w3schools.com/sql/

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

L	T	P	C
3	0	0	3

DIGITAL ELECTRONICS

(CSIT)

Subject Code: P18ECT19 **Internal Marks: 40**
External Marks: 60

Course Prerequisites: Nil

Course Objectives:

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

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 up to 6-variables.
4. Students will be able to use the concepts of Boolean algebra for the analysis & design of various combination logic and sequential circuits.
5. Students will be aware of different memories and their programming tables.

UNIT- I (9 Lectures)

Number Systems and Signed Binary Numbers: 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.

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(11 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 (8 Lectures)

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

UNIT- V (8 Lectures)

Programmable Logic Devices: Classification of memories, PROM,PAL,PLA – basic Structures, programming tables of PROM, PAL,PLA, Realization of Booleanfunctionwith PLDs , Merits & demerits ofPROM,PAL, PLA. Comparison of PROM,PAL, PLA.

Text Books:

1. Digital Design, M.Morris Mano, Michael D Ciletti,5/e, PEA, 2006.
2. Fundamentals of Logic Design, 5/e, Roth,Cengage, 2003.

Reference Books:

1. Switching Theory and Logic Design, A.Anand Kumar, PHI, 2008.
2. Digital Electronics and Logic Design, Dr. Sanjay Sharma,S.K. Kataria& Sons,2013.
3. Modern Digital Electronics, R.P. Jain,TMH, 2009.

Web References:

1. www.geeksforgeeks.org
2. www.learn.sparkfun.com

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

L	T	P	C
3	0	0	3

MATHEMATICS-III

(CSIT)

Subject Code: P18BST07 **Internal Marks: 40**
External Marks: 60

Course Prerequisites: Mathematics-I, Mathematics-II

Course Objectives:

1. The course is designed to equip **S:** 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 partialdifferential equations.
3. To calculate the Fourier transform or inverse transform of common functionsincluding Delta, Unit-Step.
4. Learn to find Solution of One dimensional Wave, Heat equation

Course Outcomes:

After learning the contents of this paper the student must be able to

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 (8 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 (10 Lectures)

Numerical Integration and solution of Ordinary Differential equations Trapezoidal rule- Simpson's 1/3rd and 3/8th ruleSolution 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 (8 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(10 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. B.S.Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers, 2015.
2. N.P.Bali, Engineering Mathematics, Lakshmi Publications, 2011.

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India, 2011.
2. Micheael Greenberg, Advanced Engineering Mathematics, 9th edition, Pearson edn, 2002.
3. Dean G. Duffy, Advanced engineering mathematics with MATLAB, CRC Press, 2010.
4. Peter O'neil,Advanced Engineering Mathematics, Cengage Learning, 2016.
5. Srimanta Pal, SubodhC.Bhunia, Engineering Mathematics, Oxford University Press, 2015.

Web References:

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

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

L	T	P	C
0	0	3	1.5

DATA STRUCTURES LAB

(CSIT)

Subject Code: P18CSL02 **Internal Marks: 40**
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:

After learning the contents of this paper the student must be able to

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 n^{th} Fibonacci number
d) Write recursive C program for Towers of Hanoi : N disks are to be transferred from peg S to peg D with Peg I as the intermediate peg.

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, in order and post order.

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 graphby using Kruskal's algorithm.

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

L	T	P	C
0	0	3	1.5

DATABASE MANAGEMENT SYSTEMSLAB

(CSIT)

Course Code: P18CSL05 **Internal Marks: 40**
External Marks: 60

Course Prerequisites: Nil

Course Objectives:

After Completion of this course student must be able to

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:

After learning the contents of this paper the student must be able to

1. Know about SQLDDL,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

Experiments List

1. Creation, altering and dropping 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.

8. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.

9. Write a PL/SQL block illustrating packages.

10. Write a PL/SQL code using CURSOR.

11. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and Instead of Triggers.

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

L	T	P	C
3	0	0	0

ENVIRONMENTAL SCIENCE

(CSIT)

Subject Code: P18MCT02

Course Prerequisites:

Basic knowledge about sciences up to intermediate or equivalent level.

Course Objectives:

1. Overall understanding of the natural resources
2. Basic understanding of the ecosystem and its diversity
3. Acquaintance on various environmental challenges induced due to unplanned anthropogenic activities
4. An understanding of the environmental impact of developmental activities
5. Awareness on the social issues, environmental legislation and global treaties

Course Outcomes:

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

1. The concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web
2. The natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources
3. Various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices
4. The biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity
5. Social issues both rural and urban environment and the possible means to combat the challenges and environmental assessment stages involved in EIA and the environmental audit.

UNIT-I (9 Lectures)

Multidisciplinary Nature Of Environmental Studies: Definition, Scope and Importance– Need for Public Awareness. Renewable energy Resources, Solar energy-solar cells, solar batteries, wind energy, wind mills, ocean energy, tidal energy and nonrenewable energy resources: LPG, water gas, producer gas. World food problems, degradation and Soil erosion -overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging and salinity.

UNIT-II (9 Lectures)

Ecosystems: Concept of an ecosystem. – Structure, Components and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Ecological pyramids - Food chains, food webs and Introduction, types, characteristic features, structure and function of the following ecosystem: a. Forest ecosystem. b. Grassland ecosystem c. Desert ecosystem d. Aquatic – River and Lake Ecosystems.

UNIT-III (9 Lectures)

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

UNIT-IV (9 Lectures)

Environmental Pollution: Definition, Cause, Effects and Control measures of : a. Air Pollution, b. Water pollution, c. Soil pollution, d. Marine pollution, e. Noise pollution, f. Nuclear hazards.

Solid Waste Management: Causes, effects and control measures of urban and industrial wastes – **Disaster management:** floods, earthquake, cyclone and landslides.

UNIT-V (9 Lectures)

Social Issues And The Environment: From unsustainable to sustainable development – Urban problems related to energy – Water conservation, rain water harvesting and watershed management –Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies Population growth – Impacts on society, variation among nations. Environmental Impact Assessment (EIA) and Environmental Protection Acts.

Text Books:

1. Text book of Environmental Studies for Undergraduate Courses by ErachBharucha for University Grants Commission, Universities Press, 2005.
2. Environmental Studies by Benny Joseph, Tata McGraw Hill Co, New Delhi, 2008.

Reference Books:

1. Environmental Science & Engineering by Dr. A. Ravikrishnan, Hitech Publishing Company Pvt. Ltd. 2013.
2. Perspectives in Environmental Studies, Second edition, AnubhaKoushik and C.P. Koushik, New Age International (P) Limited, Publishers, 2004.

Web References:

1. www.tutorialspoint.com/

2. www.sophia.org/

Department of Computer Science and Information Technology

II YEAR II SEMESTER								
S.No	**CODE**	**COURSE**	**L**	**T**	**P**	**Credits**	**Internal**	**External**
1	**P18CST01**	Java Programming	3	1	0	4	40	60
2	**P18ITT02**	Computer Organization	3	0	0	3	40	60
3	**P18CST03**	Mathematical Foundation ofComputer Science	3	0	0	3	40	60
4	P18IIT04	Design & Analysis ofAlgorithms	3	0	0	3	40	60
5	**P18CSL03**	Free Open Source Software	0	0	3	1.5	40	60
6	P18ITOX	*Open Elective – I*	2	0	0	2	40	60
7	**P18CSL01**	Java Programming Lab	0	0	3	1.5	40	60
8	**P18ITL02**	Design & Analysis ofAlgorithms Lab	0	0	3	1.5	40	60
9	P18MCT05	Indian Constitution	3	0	0	0	40	60
10	P18ITI01	Internship	0	0		3		
Total Periods			**17**	**1**	**9**	**22.5**	**360**	**540**

S.No	***Subject Code***	***Offered By Dept.***	***Open Elective – I***
1	P18MBO01	HSMC	Managerial Economics and Financial Analysis
2	P18ECO02	ECE	Introduction to Simulation Software
3	P18EST05	ME	Engineering Mechanics
4	P18ITE01	CSE/IT	Principles of programming Languages

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

L	T	P	C
3	1	0	4

JAVA PROGRAMMING

(IT)

Subject Code: P18CST01 **Internal Marks: 40**
External Marks: 60

Course Prerequisites: C++ - Programming and Object-Oriented Programming

Course Objectives:

1. To understand Object Oriented Programming concepts and basic characteristics of Java
2. To understand the principles of packages, inheritance and interfaces
3. To Implement exceptions and use I/O streams
4. To design and build simple Graphical User Interface application.

Course Outcomes:

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

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 (8 Lectures)

OOPS-Inheritance- Inheritance- constructors- polymorphism-Access specifier- Static members-Packages -Abstract classes- Interfaces and Inner classes-object cloning -Array Lists - Strings.

UNIT III (10 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, 8th Edition, Herbert Schildt, McGraw Hill Education, 2011.
2. Core Java Volume-I Fundamentals, 9th edition, Cay S. Horstmann, Gary Cornell, Prentice Hall, 2013.

Reference Books:

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

Web References:

1. www.tutorialspoint.com
2. www.beginnersbook.com
3. www.w3schools.com
4. www.udemy.com

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

L	T	P	C
3	0	0	3

COMPUTER ORGANIZATION

(IT)

Subject Code: P18ITT02 **Internal Marks: 40**
External Marks: 60

Course Prerequisites: Digital Electronics

Course Objectives:

1. Understand the architecture of a modern computer with its various processing UNITs. Also the Performance measurement of the computer system.
2. To understand various data transfer techniques in digital computer.
3. In addition to this the memory management system of computer.

Course Outcomes:

1. Ability to understand basic structure of computer.
2. Ability to perform computer arithmetic operations.
3. Ability to understand control UNIT operations.
4. Ability 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 (8 Lectures)

Basic Structure Of Computers: Functional UNIT, Basic Operational concepts, Bus structures, SystemSoftware, Performance, The history of computer development.

UNIT – II (10 Lectures)

Machine Instruction And Programs: Instruction and Instruction Sequencing: Register Transfer Notation, Assembly Language Notation, Basic Instruction Types, Addressing Modes, Basic Input/output Operations, The role of Stacks and Queues in computer programming equation.

Type Of Instructions: Component of Instructions: Logic Instructions, shift and Rotate Instructions Arithmetic and Logic Instructions, Branch Instructions, Input/output Operations.

UNIT –III (9 Lectures)

Computer Arithmetic : Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating – point Arithmetic operations. Decimal Arithmetic UNIT, Decimal Arithmetic operations.

Micro Programmed Control: Control memory, Address sequencing, micro program example, designof control UNIT.

UNIT –IV (9 Lectures)

The Memory Systems: Basic memory circuits, Memory System Consideration, Read-Only Memory: ROM, PROM, EPROM, EEPROM, Flash Memory, Cache Memories: Mapping Functions, Interleaving
Secondary Storage: Magnetic Hard Disks, Optical Disks.

UNIT –V (9 Lectures)

Input / Output Organization: Accessing I/O Devices, Interrupts: Interrupt Hardware, Enabling and Disabling Interrupts, Handling Multiple Devices, Direct Memory Access, Buses: Synchronous Bus, Asynchronous Bus, Interface Circuits, Standard I/O Interface: Peripheral Component Interconnect (PCI) Bus, Universal Serial Bus (USB)

Text Books :

1. Computer System Architecture, M.Moris Mano, 3rd Edition, Pearson/PHI, 2007.
2. Computer Organization, Carl Hamacher, Zvonks Vranesic, SafeaZaky, 5th Edition, McGraw Hill, 2002.

Reference Books:

1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI, 2007.
2. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition PHI/Pearson, 2005.
3. Fundamentals or Computer Organization and Design, - Sivaraama Dandamudi Springer Int. Edition, 2005.

Websites References:

1. www.tutorialspoint.com
2. www.studytonight.com

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

L	T	P	C
3	1	0	4

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE (IT)

Subject Code: P18CST03 **Internal Marks: 40**
External Marks: 60

Course Prerequisites:

An understanding of Mathematics in general is sufficient.

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 (12 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 (13 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 (13 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 (11 Lectures)

Discrete Probability and Advanced Counting Techniques: An Introduction to Discrete Probability, Probability Theory, Baye's 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 (11 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.2007.
2. Elements of DISCRETE MATHEMATICS- A computer Oriented Approach- C L Liu, D P Mohapatra. Third Edition, Tata McGraw Hill.2008.
3. Discrete Mathematics for Computer Scientists and 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, 2008.
2. Discrete Mathematics- Richard Johnsonbaugh, 7th Edn., Pearson Education,2009.
3. Discrete Mathematics with Graph Theory- Edgar G. Goodaire, Michael M. Parmenter.2/e, 2002.
4. Discrete and Combinatorial Mathematics - an applied introduction: Ralph.P. Grimald, 5th edition, Pearson Education, 2004.

Web References:

1. www.tutorialspoint.com
2. www.lecturenotes.in
3. www.nptel.ac.in

B.Tech II Year II Semester

Course Structure

L	T	P	C
3	1	0	4

DESIGN AND ANALYSIS OF ALGORITHMS

(IT)

Internal Marks : 40

Course Code: P18ITT04 **External Marks: 60**

Course Prerequisites: Mathematics, Data Structures

Course Objectives:

1. Analyze the asymptotic performance of algorithms.
2. Write rigorous correctness proofs for algorithms.
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 design situations.

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 .
Divide 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, University Press.
2. Introduction to AlgorithmsThomas H. Cormen, PHI Learning.

References:

1. The Design and Analysis of Computer Algorithms, Alfred V. Aho, John E. Hopcroft, Jeffrey
D. Ullman

2. Algorithm Design, Jon Kleinberg, Pearson.

Web References:

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

B.Tech II Year II Semester

Course Structure

Free Open Source Software

L	T	P	C
1	0	2	2

(CSITI)

Subject Code:P18CSL03

COURSE OBJECTIVES

- To teach students various unix utilities and shell scripting

Session-1

- Log into the system
- Use vi editor to create a file called myfile.txt which contains some text.
- correct typing errors during creation.
- Save the file
- logout of the system

Session-2

- Log into the system
- open the file created in session 1
- Add some text
- Change some text
- Delete some text
- Save the Changes
- Logout of the system

2. a) Log into the system

b) Use the cat command to create a file containing the following data. Call it mytable use tabs to separate the fields

1425	Ravi	15.65
4320	Ramu	26.27
6830	Sita	36.15
1450	Raju	21.86

c) Use the cat command to display the file, mytable.
d) Use the vi command to correct any errors in the file, mytable.
e) Use the sort command to sort the file mytable according to the first field. Call the sorted file my table (same name)

f)Print the file mytable
g)Use the cut and paste commands to swap fields 2 and 3 of mytable. Call it my table (same name)
h)Print the new file, mytable
i)Logout of the system

- Login to the system
- Use the appropriate command to determine your login shell
- Use the /etc/passwd file to verify the result of step b.
- Use the who command and redirect the result to a file called myfile1. Use the more

command to see the contents of myfile1.

- Use the date and who commands in sequence (in one line) such that the output of date will display on the screen and the output of who will be redirected to a file called myfile2. Use the more command to check the contents of myfile2.

3) Write a sed command that deletes the first character in each line in a file.

- Write a sed command that deletes the character before the last character in each line in a file.
- Write a sed command that swaps the first and second words in each line in a file.

4) Pipe your /etc/passwd file to awk, and print out the home directory of each user.

- Develop an interactive grep script that asks for a word and a file name and then tells how many lines contain that word.
- Repeat
- Part using awk

5) Write a shell script that takes a command –line argument and reports on whether it is directory, a file, or something else.

- Write a shell script that accepts one or more file name as arguments and converts all of them to uppercase, provided they exist in the current directory.

6) Write a shell script that accepts a file name starting and ending line numbers as arguments and displays all the lines between the given line numbers.

7) a) Write a shell script that computes the gross salary of a employee according to the following rules:
i)If basic salary is < 1500 then HRA =10% of the basic and DA =90% of the basic. ii)If basic salary is >=1500 then HRA =Rs500 and DA=98% of the basic The basic salary is entered interactively through the key board.

8) Write a shell script to search given number using binary search.

9) a)Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
b) Develop an interactive script that ask for a word and a file name and then tells how many times that word occurred in the file.
c) Write a shell script to perform the following string operations:

i) To extract a sub-string from a given string.
ii) To find the length of a given string.

10) Write a shell script which will display Armstrong numbers from given arguments

11) Write a shell script to display factorial value from given argument list

12) Write a C program that simulates ls Command
(Use system calls / directory API)

Do the following Shell programs also

Write a shell script to check whether a particular user has logged in or not. If he has logged in, also check whether he has eligibility to receive a message or not

1. Write a shell script which will display the username and terminal name who login recently in to the unix system
2. Write a shell script to find no. of files in a directory
3. Write a shell script to check whether a given number is perfect or not
4. Write a menu driven shell script to copy, edit, rename and delete a file
5. Write a shell script for concatenation of two strings
6. Write a shell script which will display Fibonacci series up to a given number of argument
7. Write a shell script to accept student number, name, marks in 5 subjects. Find total, average and grade. Display the result of student and store in a file called stu.dat
   Rules: avg>=80 then grade A
   Avg<80&&Avg>=70 then grade B
   Avg<70&&Avg>=60 then grade C
   Avg<60&&Avg>=50 then grade D
   Avg<50&&Avg>=40 then grade E
   Else grade F
8. Write a shell script to accept empno,empname,basic. Find DA,HRA,TA,PF using following rules. Display empno, empname, basic, DA,HRA,PF,TA,GROSS SAL and NETSAL. Also store all details in a file called emp.dat
   Rules: HRA is 18% of basic if basic > 5000 otherwise 550
   DA is 35% of basic
   PF is 13% of basic
   IT is 14% of basic
   TA is 10% of basic
9. Write a shell script to demonstrate break and continue statements
10. Write a shell script to display string palindrome from given arguments
11. Write a shell script to display reverse numbers from given argument list
12. Write a shell script which will find maximum file size in the given argument list

13. Write a shell script which will greet you “Good Morning”, ”Good Afternoon”, “Good Evening’ and “Good Night” according to current time
14. Write a shell script to sort the elements in a array using bubble sort technique
15. Write a shell script to find largest element in a array
16. Write an awk program to print sum, avg of students marks list
17. Write an awk program to display students pass/fail report
18. Write an awk program to count the no. of vowels in a given file
19. Write an awk program which will find maximum word and its length in the given input File
20. Write a shell script to generate the mathematical tables.
21. Write a shell script to sort elements of given array by using selection sort.
22. Write a shell script to find number of vowels, consonants, numbers, white spaces and special characters in a given string.
23. Write a shell script to search given number using binary search.

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

L	T	P	C
3	0	0	0

INDIAN CONSTITUTION

(CSIT)

Subject Code: P18MCT05
Course Prerequisites: Nil

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:

Upon completion of the course, students will be able to

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.

Textbooks:

1. Introduction to the Constitution of India ,Durga Das Basu, Prentice Hall of India, New Delhi, 1994.
2. Indian Political System, R.C.Agarwal, S.Chand and Company, New Delhi, 1997.
3. Society: An Introduction Analysis, Maciver and Page, Mac Milan India Ltd., New Delhi, 2007.
4. Social Stratification in India: Issues and Themes, K.L.Sharma, Jawaharlal Nehru University, New Delhi, 1997.

Reference Books:

1. Introduction to the Constitution of India, 8/e, Sharma, Brij Kishore, Prentice Hall of India, New Delhi, 2011.
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, 1997.

Web References:

1. www.tutorialspoint.com/indian_polity/
2. www.clearias.com/indian-polity/
3. www.byjus.com/free-ias-prep/polity-notes-upsc/

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

L	T	P	C
3	0	0	3

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(IT)

Subject Code: P18MBO01 **Internal Marks: 40**
External Marks: 60

Course Prerequisites: Nil

Course Objectives:

1. The Learning objective of this UNIT is to understand the concept and nature of Managerial Economic s and its relationship with other disciplines, Concept of Demand and Demand forecasting.
2. The Learning objective of this UNIT is to understand the concept of Production function, Input Output relationship, different Cost Concepts and Concept of Cost-Volume-Profit Analysis.
3. The Learning Objective of this UNIT is to understand the Nature of Competition, Characteristics of Pricing in the different market structure and significance of various pricing methods and to know the different forms of Business organization
4. The Learning objective of this UNIT is to understand the different Accounting Systems preparation of Financial Statements and uses of different tools for performance evaluation
5. The Learning objective of this UNIT is to understand the concept of Capital, Capitalization, Capital Budgeting and to know the techniques used to evaluate Capital Budgeting proposals by using different methods

Course Outcomes:

1. The Learner is equipped with the knowledge of estimating the Demand for a product and the relationship between Price and Demand.
2. One should understand the Cost Concepts for decision making and to estimate the least cost combination of inputs.
3. One has to understand the nature of different markets and Price Output determination under various market conditions and with the knowledge of different Business UNITs.
4. The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis.
5. The Learner is able to evaluate various investment project proposals with the help of capital budgeting techniques for decision making.

UNIT – I (8 Lectures)

Introduction to Managerial Economics and demand Analysis : Definition of Managerial Economics-Scope of Managerial Economics and its relationship with other subjects-Concept of Demand, Types of Demand, Determinants of Demand-Demand Schedule, Demand Curve, Law of Demand and its limitations-Elasticity of Demand-Types of Elasticity of Demand and Measurement-Demand forecasting and its Methods.

UNIT – II (10 Lectures)

Production and Cost Analyses : Concept of Production function-Cobb-Douglas Production Function – Law of one Variable proportions- Isoquants and Isocosts and choice of Least cost factor combination-Concepts of Returns to Scale and Economics of Scale-Different Cost Concepts: Opportunity Costs, Explicit Costs and Implicit Costs -Fixed Costs, Variable Costs and Total Costs - Cost Volume Profit analysis - Determination of Break-Even Point (Simple Problem) Managerial Significance and limitations of Breakeven point.

UNIT – III (8 Lectures)

Introduction to Markets and Types of Business Organization : Market Structures: Perfect Competition, Monopoly, Monopolistic Competition and Oligopoly – Features – Price and Output Determination– Other Methods of Pricing: Average Cost Pricing, Limit Pricing, Market Skimming Pricing, Internet Pricing. Features and Evaluation of Sole Trader – Partnership – Joint Stock Company –Private Public Partnership - State/Public Enterprises and their forms – Business Cycles – Meaning and Features – Phases of Business Cycle.

UNIT – IV (9 Lectures)

Introduction to Accounting & Financing Analysis : Introduction to Double Entry Systems

– Preparation of Financial Statements-Analysis and Interpretation of Financial Statements (Simple Problems) GST basic concepts and Slab rates.

UNIT – V (10 Lectures)

Capital and Capital Budgeting : Capital Budgeting: Meaning of Capital-Meaning of Capital Budgeting-Time value of Money-Methods of appraising Project profitability: Traditional methods (payback period, accounting rate of return) and Modern Methods (Discounted cash flow method, Net present value method, internal rate of return method and profitability index)

Text Books:

1. Managerial Economics and Financial Analysis, Dr. N. Appa Rao, Dr. P. Vijay Kumar, Cengage Publications, New Delhi – 2011.
2. Managerial Economics and Financial Analysis, Dr. A. R. Aryasri, TMH, 2011.
3. Managerial Economics and Financial Analysis, Prof. J.V.Prabhakara rao, Prof. P. Venkatarao, Ravindra Publication, 2011.

Reference Books:

1. Managerial Economics, V. Maheswari, Sultan Chand, 2009.
2. Managerial Economics, Suma Damodaran, Oxford 2011.
3. Managerial Economics & Financial Analysis, Dr. B. Kuberudu and Dr. T. V. Ramana, Himalaya Publishing House, 2011.
4. Managerial Economics, Vanitha Agarwal, Pearson Publications 2011.
5. Financial Accounting for Managers, Sanjay Dhameja, Pearson, 2015.
6. Financial Accounting, Maheswari, Vikas Publications, 2018.
7. Managerial Economics and Financial Analysis, S. A. Siddiqui & A. S. Siddiqui, New Age International Publishers, 2012.

Web References:

1. www.lecturenotes.in/
2. www.nptel.ac.in/
3. www.crectirupati.com/

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

L	T	P	C
3	0	0	3

INTRODUCTION TO SIMULATION SOFTWARE

(IT)

Subject Code: P18ECO02 **Internal Marks: 40**
External Marks: 60

Course Prerequisites: Nil

Course Objective:

1. By the end of this course, students in this class will understand the basic principles of programming and of implementing mathematical concepts by using MATLAB. Specifically, they will be able to write numerical algorithms and evaluate the computational results using graphical representations. The ultimate goal is to motivate the students for their profession and for future courses in curriculum.

Course Outcomes:

By the end of this course, the student will be able to

1. Translate mathematical methods to MATLAB code
2. Generalize results and represent data visually.
3. Students will be able to apply computer methods for solving a wide range of Engineering problems
4. Students will be able to utilize computer skills to enhance learning and performance in other engineering and science courses
5. Students will be able to demonstrate professionalism in interactions with industry

UNIT-1 (8 Lectures)

Introduction to Mat Lab

Historical Background, Applications, Scope of MATLAB, Importance of MATLAB for Engineers, Features, MATLAB Windows (Editor, Work Space, Command History, Command Window).Installation procedure of MATLAB. Operations with Variables, Naming and Checking Existence, Clearing Operations, Commands, Data types, Operators.

UNIT-II (9 Lectures)

Data and Data Flow in Mat Lab

Vectors, Matrix Operations & Operators, Reshaping Matrices, Arrays, Colon Notations, Numbers, Strings, Functions, File Input-Output, Importing and Exporting of data.

UNIT-III (8 Lectures)

Mat lab Programming

Conditional Statements, Loops, Writing Script Files, Error Correction, Saving Files, Worked

out Examples.

UNIT-IV (10 Lectures)

Mat lab Advanced

Plotting, Graphics, Creating Plot & Editing Plot, GUI (Graphical User Interface).
Matlab- Algebra, Calculus, Differential, Integration, Polynomials, solving a system of linear equations.

UNIT-V (10 Lectures)

Simulink

Introduction, Importance, Model Based Design, Tools, Mathematical Modeling, Converting Mathematical Model into Simulink Model, Running Simulink Models, Importing Exporting Data, Solver Configuration, Masking Block/Model.

Text Books:

1. Getting Started With Mat lab: A Quick Introduction For Scientists And Engineers (English) by Rudra Pratap, OXFORD University Press, 1998.
2. Mat lab Programming by Y. Kirani Singh, B.B. Chaudhuri, PHI Publication, 2008.
3. Understanding MATLAB, A Textbook for Beginners by S.N. ALAM & S.S. ALAM,2013.

Reference Books:

1. MATLAB® Programming For Engineers Fourth edition by Stephen J. Chapman, 2012.
2. Applied Numerical Methods Using MATLAB 1st Edition by Won Y. Yang , Wenwu Cao, Tae-Sang Chung, John Morris, 2005.
3. Signal processing simulation using MATLAB by Dr. V.S.K REDDY & Dr.Y. Madhavee Latha, 2013.

Web References:

1. www.tutorialspoint.com/matlab/
2. www.ocw.mit.edu//

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

L	T	P	C
3	0	0	3

ENGINEERING MECHANICS

Course Code: P18EST05 **Internal Marks: 40**
External Marks: 60

Course Prerequisites: Engineering Mathematics, Physics

Course Objectives:

1. Study various types of force systems, basic principles of mechanics of rigid bodies and Calculation the unknown forces through the use of equilibrium equations for a rigid body.
2. Analyze simple trusses using method of joints and method of sections
3. Study and determine centroid and centre of gravity of various composite shapes.
4. Study the concept of moment of inertia and the mathematical calculations involved in finding moments of inertia of two dimensional areas.
5. Learn principle of dynamics and apply it to impulse and momentum, work and energy which is useful to analyze turbo machineries.

Course Outcomes:

After completion of the course the student will be able to

1. Apply the principle of rigid body equilibrium and to determine unknown forces.
2. Analyze the force of friction and trusses using method of Joints and method of sections.
3. Find the centroid and center of gravity of composite areas
4. Calculate the moment of inertia of various shapes by integration and moment of inertia of composite areas.
5. Understand kinematics, kinetics and rotation of a rigid body

UNIT – I (9 Lectures)

Systems of forces: Resolution of coplanar and non-coplanar force systems (both concurrent and non-concurrent), Determining the resultant of planar force systems. Moment of force and its applications and couples.

Equilibrium of force system: Free body diagrams, equations of equilibrium of planar force systems and its applications. Problems on general case of force systems.

UNIT – II (8 Lectures)

Analysis of Trusses*:* Introduction, force calculations using method of joints and method of sections.

Theory of friction: Introduction, types of friction, laws of friction, application of friction to a single body & connecting systems. Wedge friction

UNIT – III (9 Lectures)

Centroid*:* Significance of centroid, moment of area, centroid of line elements, plane areas, composite areas, theorems of Pappus & its applications.

Center of gravity: CG of elementary and composite bodies

UNIT – IV (9 Lectures)

Moment of Inertia: Definition of MI, Polar Moment of Inertia, radius of gyration, transfers theorem, moment of Inertia of elementary & composite areas, and product of inertia. Mass moments of inertia for elementary and composite bodies

UNIT – V (10 Lectures)

Kinematics: Introduction, Rectilinear kinematics: Continuous motion, General curvilinear motion, Curvilinear motion: Rectangular components, Motion of a projectile, curvilinear motion: Normal and tangential components, Absolute dependent motion analysis of two particles.

Kinetics: Kinetics of a particle-D'Alemberts principle-Motion in a curved path – work, energy and power. Principle of conservation of energy- Kinetics of rigid body in translation, rotation work done-Principle of work-energy-Impulse-momentum.

Text Books:

1. Engineering mechanics-statics and dynamics by A. K. Tayal - Umesh publications, Delhi (For numerical problems) , 2008.
2. Engineering mechanics by S. Timoshenko, D. H. Young and J V Rao -Tata McGraw-Hill Publishing Company Limited, New Delhi(For concepts) , 2009.
3. Engineering Mechanics by Dr. R. Kumaravelan, Scitech Publications, 2014.

Reference Books:

1. Engineering Mechanics by S.S.Bhavikatti, New Age international Publishers 2012.
2. Engineering Mechanics- Statics and Dynamics by Irving H. Shames, Pearson Education, 2006.
3. Singer's Engineering Mechanics: Statics and Dynamics, K.Vijaya Kumar Reddy and J Suresh Kumar, 3rd Edition SI UNITs-BS Publications, 2010.
4. A Textbook of Engineering mechanics statics anddynamics by J. L. Meriam and L. Kraige , Wiley India , 6th Edition , 2010.

Web References:

1. www.smartzworld.com/
2. www.lecturenotes.in/

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

L	T	P	C
0	0	3	1.5

JAVA PROGRAMMING LAB

Internal Marks: 40
External
Marks: 60Course Prerequisites: Object Oriented Programming Concepts

Subject Code:

P18CSL01Exercise - 1

(Basics)

a). Write a JAVA program to display default value of all primitive data type of JAVA
b). 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.

Exercise - 2 (Operations, Expressions, Control-flow, Strings)

a). Write a JAVA program to search for an element in a given list of elements using binarysearch mechanism.
b). Write a JAVA program to sort for an element in a given list of elements using bubblesort
(c). Write a JAVA program to sort for an element in a given list of elements using mergesort.
(d) Write a JAVA program using StringBufferto delete, remove character.

Exercise - 3 (Class, Objects)

a). Write a JAVA program to implement class mechanism. – Create a class, methods andinvoke them inside main method.
b). Write a JAVA program to implement constructor.

Exercise - 4 (Methods)

a). Write a JAVA program to implement constructor overloading.b). Write a JAVA program implement method overloading.

Exercise - 5 (Inheritance)

a). Write a JAVA program to implement Single Inheritance
b). Write a JAVA program to implement multi level Inheritance
c). Write a java program for abstract class to find areas of different shapes

Exercise - 6 (Inheritance - Continued)

a). Write a JAVA program give example for “super” keyword.
b). Write a JAVA program to implement Interface. What kind of Inheritance can beachieved?

Exercise - 7 (Exception)

a).Write a JAVA program that describes exception handling mechanismb).Write a JAVA program Illustrating Multiple catch clauses

Exercise – 8 (Runtime Polymorphism)

a). Write a JAVA program that implements Runtime polymorphism
b). Write a Case study on run time polymorphism, inheritance that implements inabove problem

Exercise – 9 (User defined Exception)

a). Write a JAVA program for creation of Illustrating throw b). Write a JAVA program for creation of Illustrating finally
c). Write a JAVA program for creation of Java Built-in Exceptionsd).Write a JAVA program for creation of User Defined Exception **Exercise – 10 (Threads)**

a). 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 secondsand the third display "Welcome" every 3 seconds ,(Repeat the same by implementing Runnable)
b). Write a program illustrating **isAlive** and **join ()**

c). Write a Program illustrating Daemon Threads.

Exercise – 11 (Packages)

a). Write a JAVA program illustrate class path
b). Write a case study on including in class path in your os environment of your package.c). Write a JAVA program that import and use the defined your package in the previous Problem

Exercise - 12 (Applet)

a).Write a JAVA program to paint like paint brush in applet.
b) Write a JAVA program to display analog clock using Applet.
c). Write a JAVA program to create different shapes and fill colors using Applet.

Exercise - 13 (Swings)

a).Write a JAVA programto build a Calculator in Swings
b). Write a JAVA program to display the digital watch in swing tutorial.
Exercise – 14 (Swings - Continued)

a). Write a JAVA program that to create a single ball bouncing inside a JPanel.b). Write a JAVA program JTree as displaying a real tree upside down

III YEAR I SEMESTER								
S.No	**CODE**	**COURSE**	**L**	**T**	**P**	**Credits**	**Internal**	**External**

1	P18CST08	Computer Networks	3	0	0	3	40	60
2	P18ITT05	Data Science	3	1	0	3	40	60
3	P18CST09	Operating Systems	3	0	0	3	40	60
4	P18CSE04	Data Mining & Warehousing	3	0	0	3	40	60
5	***Professional Elective – I***		3	0	0	3	40	60
	P18ITE02	Advanced Data Structures (T1)						
	P18ITE03	Software Testing						
	P18CSITE01	Neural Networks and Fuzzy systems(T3)						
	P18CSE03	Computer Graphics (T4)						
6	***Open Elective-II***		2	0	0	2	40	60
		BS&H — Fuzzy Sets and Logic						
	P18MBO03	HSMC — Professional ethics						
	P18ECO03	ECE — Data Communicat						
	P18ECO08	CSE/IT — IT systems Management						
7	P18ITL03	Software Lab-I(Data Science)	0	0	3	1.5	40	60
8	P18CSL06	Computer Networks and OS Lab	0	0	3	1.5	40	60
9		Design Thinking for innovation	0	0	4	2	40	60
Total Periods			**17**	**1**	**10**	**22**	**360**	**540**

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B.Tech III Year I Semester

Course Structure

L	T	P	C
3	0	0	3

COMPUTER NETWORKS

(CSE,IT,CSIT)

Internal Marks : 40

Course Code: P18CST08 **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. 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 apply Various Protocols to design a network.
3. Student will be in a position to apply the World Wide Web concepts.
4. Students will be in a position to administrate a network and flow of information further.
5. 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

B.Tech III Year I Semester

Course Structure

L	T	P	C
3	0	0	3

DATA SCIENCE

(IT,CSIT)

Internal Marks : 40

Course Code: P18ITT02 **External Marks: 60**

Course Objectives:

1. To understand the mathematical foundations required for data science.
2. To describe a flow process for data science problems.
3. To introduce basic data science algorithms and data visualization.
4. To learn machine tools and techniques.
5. To learn the ideas and tools for data visualization.

Course Outcomes:

1. Explain the basic terms of Linear Algebra and Statistical Inference.
2. Describe the Data Science process and how its components interact.
3. Apply EDA and the Data Science process in a case study.
4. Classify Data Science problems.
5. Analyze and correlate the results to the solutions.
6. Simulate Data Visualization in exciting projects.

UNIT 1

(9 Lectures)

Linear Algebra: Algebraic view – vectors 2D, 3D and nD, matrices, product of matrix & vector, rank, null space, solution of over determined set of equations and pseudo-inverse. Geometric view - vectors, distance, projections, eigenvalue decomposition, Equations of line, plane, hyperplane, circle, sphere, Hypersphere.

UNIT 2

(9 Lectures)

Probability And Statistics: Introduction to probability and statistics, Population and sample, Normal and Gaussian distributions, Probability Density Function, Descriptive statistics, notion of probability, distributions, mean, variance, covariance, covariance matrix, understanding univariate and multivariate normal distributions, introduction to hypothesis testing, confidence interval for estimates.

UNIT 3

(9 Lectures)

Exploratory Data Analysis And The Data Science Process: Exploratory Data Analysis and the Data Science Process - Basic tools (plots, graphs and summary statistics) of EDA - Philosophy of EDA - The Data Science Process - Data Visualization - Basic principles, ideas and tools for data visualization - Examples of exciting projects- Data Visualization

using Tableau.

UNIT 4

(9 Lectures)

Machine Learning Tools, Techniques And Applications: Supervised Learning, Unsupervised Learning, Reinforcement Learning, Dimensionality Reduction, Principal Component Analysis, Classification and Regression models, Tree and Bayesian network models, Neural Networks, Testing, Evaluation and Validation of Models.

UNIT 5

(9 Lectures)

Introduction To Python: Data structures-Functions-Numpy-Matplotlib-Pandas- problems based on computational complexity-Simple case studies based on python (Binary search, common elements in list), Hash tables, Dictionary.

TEXT / REFERENCE BOOKS

1. Cathy O'Neil and Rachel Schutt. Doing Data Science, Straight Talk From The Frontline. O'Reilly. 2014.
2. Introduction to Linear Algebra - By Gilbert Strang, Wellesley-Cambridge Press, 5th Edition.2016.
3. Applied Statistics and Probability For Engineers – By Douglas Montgomery.2016.
4. Jure Leskovek, Anand Rajaraman and Jeffrey Ullman. Mining of Massive Datasets. v2.1, Cambridge University Press. 2014. (free online)
5. Avrim Blum, John Hopcroft and Ravindran Kannan. Foundations of Data Science.
6. Jiawei Han, Micheline Kamber and Jian Pei. Data Mining: Concepts and Techniques, 3rd Edition. ISBN 0123814790. 2011.
7. Trevor Hastie, Robert Tibshirani and Jerome Friedman. Elements of Statistical Learning, 2nd Edition. ISBN 0387952845. 2009. (free online)

B.Tech III Year I Semester

Course Structure

L	T	P	C
3	1	0	4

OPERATING SYSTEMS

(CSE,IT,CSIT)

Internal Marks : 40

Course Code: P18CST09 **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 an operating 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 and security with different crypto models.

Course Outcomes:

1. Describe the important computer system resources and the role of operating system in 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 Gagne 9th 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 Graw Hill 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.

B.Tech III Year I Semester

Course Structure

L	T	P	C
3	0	0	3

ADVANCED COMPUTER ARCHITECTURE
(PROFESSIONAL ELECTIVE I)

Internal Marks : 40

Course Code: P18CSE02 **External Marks: 60**

Course Prerequisites: Programming and Data structures, Discrete Maths, and a basic knowledge of Computer organization.

Course Objectives:

1. Understand the micro-architectural design of processors.
2. Learn about the various techniques to obtain performance improvement and power savings in current processors.

Course Outcomes:

1. Study the Concept of Parallel Processing and itsapplications.
2. Implement the Hardware for Arithmetic Operations.
3. Analyze the performance of different scalarComputers.
4. Develop the Pipelining Concept for a given set ofInstructions.
5. Distinguish the performance of pipelining and non pipelining environment in processor.

UNIT I: (9 Lectures)

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

UNIT II: (9 Lectures)

Computer Arithmetic: Addition and Subtraction, Hardware Implementation, Multiplication Algorithms and Hardware Implementation, Division Algorithms and Hardware Implementation, Floating Point Arithmetic Operations.

UNIT III: (9 Lectures)

Parallel Computer Models: Evolution of Computer Architecture, System Attributes to Performance, Shared Memory Multiprocessors, Distributed Memory Multi-computers, Vector Super Computers, SIMD Super Computers.

UNIT IV: (9 Lectures)

Processors and Memory Hierarchy: Advanced Processor Technology: Design Space of Processors, Instruction-Set Architectures, CISC scalar Processors, RISC scalar Processors, Super Scalar and Vector Processors: Super scalar Processors.

UNIT V: (9 Lectures)

Pipelining and Superscalar Techniques: Linear Pipeline Processors: Asynchronous and Synchronous models, Clocking and Timing Control, Speedup, Efficiency and Throughput, Pipeline Schedule Optimization, Instruction Pipeline Design: Instruction Execution Phases, Mechanisms for Instruction Pipelining, Dynamic Instruction Scheduling, Branch Handling Techniques.

Text Books:

1. Computer System Architecture, Morris M. Mano, 3rd edition, Pearson/Prentice Hall India. (UNIT-I,II,III,IV,V)
2. Advanced Computer Architecture, Kai Hwang, McGraw-Hill,India. (UNIT-IV,V)

References:

1. Computer Organization and Achitecture, William Stallings ,8th edition,PHI.
2. Computer Organization, Carl Hamachar, Vranesic,Zaky, 5th edition, McGrawHill.

Web References:

1. https://nptel.ac.in/courses/106/103/106103206/
2. https://www.tutorialspoint.com/parallel_computer_architecture/parallel_computer_architecture_models.htm
3. https://www.scribd.com/presentation/387051239/Mano-Computer-System-Architecture-all-ppt
4. http://wh.cs.vsb.cz/mil051/images/5/54/PAP-PR-01_%C3%9Avod_do_problematiky_z%C5%99et%C4%9Bzen%C3%A9ho_zpracov%C3%A1n%C3%AD_instrukc%C3%AD.pdf

B.Tech III Year I Semester

Course Structure

L	T	P	C
3	0	0	3

SOFTWARE TESTING

(PROFESSIONAL ELECTIVE I)

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.

Software Testing Terminology and Methodology: Software Testing Terminology, Software
Testing Life Cycle, relating test life cycle to development life cycle Software Testing.

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, power of a matrix, node reduction algorithm,

Software Testing Tools: Introduction to Testing, Automated Testing, Concepts of Test Automation, Win runner, Load Runner, Jmeter, Mapping the GUI, Recording Test, Working with Test, Enhancing Test, Checkpoints,Running and Debugging Tests, Analyzing Results, Batch Tests, Rapid Test Script Wizard.

Text Books:

3. Software testing techniques – Boris Beizer, Dreamtech, second edition.
4. 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
5. https://www.atlassian.com/landing/software-testing/

B.Tech III Year I Semester

Course Structure

L	T	P	C
3	0	0	3

NEURAL NETWORKS AND FUZZY SYSTEMS

(PROFESSIONAL ELECTIVE I)

Course Code:

Course Objectives :

1.This course introduces the basics of Neural Networks and essentials of Artificial Neural Networks with Single Layer and Multilayer Feed Forward Networks. Also deals with Associate Memories and introduces Fuzzy sets and Fuzzy Logic system components.
2.The Neural Network and Fuzzy Network system application to Electrical Engineering is also presented.
3.This subject is very important and useful for doing Project Work.

Course Outcomes:

1. To Learn about soft computing techniques and their applications.
2. To Analyze various neural network architectures.
3. To Define the fuzzy systems.
4. To Understand the genetic algorithm concepts and their applications.
5. To Identify and select a suitable Soft Computing technology to solve the problem; construct a solution.

Unit – I: (9 Lectures)

Introduction to Neural Networks: Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Characteristics of ANN, Applications of ANN.

Unit- II: (10 Lectures)

Essentials of Artificial Neural Networks:Artificial Neuron Model, Operations of Artificial Neuron, Types of Neuron Activation Function, ANN Architectures, Classification Taxonomy of ANN – Connectivity, Neural Dynamics (Activation and Synaptic), Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules, Types of Application

Unit–III: (9 Lectures)

Single Layer Feed Forward Neural Networks**,** Multilayer Feed forward Neural, Backpropagation Algorithm,Introduction to classical sets – properties, Operations and relations; Fuzzy sets, Operations, properties, fuzzy relations.

UNIT -IV: (9 Lectures)

Fuzzy Logic System Components :Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods.

UNIT -V: (9 Lectures)

Applications: Neural network applications: Process identification, control, fault diagnosis and load forecasting. Fuzzy logic applications: Fuzzy logic control and Fuzzy classification.

TEXT BOOK:

1. Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications by Rajasekharan and
Rai – PHI Publication.
2. Introduction to Neural Networks using MATLAB 6.0 – S.N.Sivanandam, S.Sumathi, S.N.Deepa, TMH, 2006

REFERENCE BOOKS:

1. Neural Networks – James A Freeman and Davis Skapura, Pearson Education, 2002.
2. Neural Networks – Simon Hakins , Pearson Education
3. Neural Engineering by C.Eliasmith and CH.Anderson, PHI
4. Neural Networks and Fuzzy Logic System by Bart Kosko, PHI Publications.

B.Tech III Year I Semester

Course Structure

L	T	P	C
3	0	0	3

COMPUTER GRAPHICS
(PROFESSIONAL ELECTIVE I)

Internal Marks : 40

Course Code: P18CSE03 **External Marks: 60**

Course Prerequisites: Mathematics

Course Objectives:

1. Gain knowledge on two dimensional graphics and their transformations.
2. Gain knowledge about graphics systems and drawing algorithms.
3. Appreciate illumination and color models.
4. Understand the comparison between two and three dimensional graphics and their transformations.
5. Be familiar with clipping techniques.

Course Outcomes:

1. Apply output primitives on graphics.
2. Design two dimensional graphics, Apply clipping techniques to graphics.
3. Design three dimensional graphics, Transformations.
4. Design RGB Colour models and Apply Illumination and colour models.
5. Design animation sequences with tools.

UNIT I: (9 Lectures)

OVERVIEW OF GRAPHICS SYSTEMS:

Raster scan systems, Random scan systems, Output primitives – points and lines, line drawing algorithms, circle and ellipse generating algorithms, filled area primitives.

UNIT II: (9 Lectures)

TWO DIMENSIONAL GRAPHICS:

Two dimensional geometric transformations – Matrix representations and homogeneous coordinates, composite transformations; Two dimensional viewing – viewing pipeline, viewing coordinate reference frame; widow-to-viewport coordinate transformation, Two dimensional viewing functions; clipping operations – point, line, and polygon clipping algorithms.

UNIT III: (9 Lectures)

THREE DIMENSIONAL GRAPHICS:

Three dimensional concepts; Three dimensional object representations – Polygon surfaces- Polygon tables- Plane equations – Polygon meshes; Curved Lines and surfaces, Quadratic surface; Spline representations – Bezier curves and surfaces -B-Spline curves and surfaces.

TRANSFORMATION AND VIEWING:

Three dimensional geometric and modeling transformations – Translation, Rotation, Scaling, composite transformations.

UNIT IV: (9 Lectures)

COLOUR MODELS:

RGB colour model – YIQ colour model – CMY colour model – HSV colour model – HLS colour model.

UNIT V: (9 Lectures)

ANIMATIONS & REALISM ANIMATION GRAPHICS:

Design of Animation sequences – animation function – raster animation – key frame systems – motion specification –morphing – tweening. COMPUTER GRAPHICS REALISM: Tiling the plane – Recursively defined curves – Koch curves – C curves – Dragons – space filling curves – fractals – Grammar based models – fractals – turtle graphics – ray tracing, Tools like 3D Studio Max, Maya, Blender.

Text Books:

1. John F. Hughes, Andries Van Dam, Morgan Mc Guire ,David F. Sklar , James D. Foley, Steven K. Feiner and Kurt Akeley ,"Computer Graphics: Principles and Practice", , 3rd Edition, Addison- Wesley Professional,2013. (UNIT I, II, III, IV).
2. Donald Hearn and Pauline Baker M, "Computer Graphics", Prentice Hall, New Delhi, 2007 (UNIT V).

References:

1. Donald Hearn and M. Pauline Baker, Warren Carithers,"Computer Graphics With Open GL", 4th Edition, Pearson Education, 2010.
2. Jeffrey McConnell, "Computer Graphics: Theory into Practice", Jones and Bartlett Publishers, 2006.
3. Hill F S Jr., "Computer Graphics", Maxwell Macmillan" , 1990.
4. Peter Shirley, Michael Ashikhmin, Michael Gleicher, Stephen R Marschner, Erik Reinhard, KelvinSung, and AK Peters, Fundamental of Computer Graphics, CRC Press, 2010.
5. William M. Newman and Robert F.Sproull, "Principles of Interactive Computer Graphics", Mc GrawHill 1978.

Web References:

1. https://nptel.ac.in/courses/106106090/
2. https://www.tutorialspoint.com/computer_graphics/index.htm
3. https://ptgmedia.pearsoncmg.com/images/9780321399526/samplepages/0321399528.pdf

B.Tech III Year I Semester

Course Structure

L	T	P	C
3	0	0	3

FUZZY SETS AND LOGIC
(OPEN ELECTIVE-II)

Internal Marks : 40

Course Code:P18ITO05 **External Marks: 60**

Prerequisites: SET THEOREY

Course Objectives:

- To introduce the theory of fuzzy sets.
- To discuss theoretical differences between fuzzy sets and classical sets.
- To discuss fuzzy logic inference
- To introduce fuzzy arithmetic concepts.
- To discuss fuzzy inference applications in the area of control.

Course Outcomes:

The Student will be able to :

- interpret fuzzy set theory and uncertainty concepts
- identify the similarities and differences between probability theory and fuzzy set theory and their application conditions
- apply fuzzy set theory in modeling and analyzing uncertainty in a decision problem iv. apply fuzzy control by examining simple control problem examples

UNIT I: (9 Lectures)

Classical sets vs Fuzzy Sets - Need for fuzzy sets - Definition and Mathematical representations - Level Sets - Fuzzy functions - Zadeh's Extension Principle.

UNIT II: (10 Lectures)

Operations on [0,1] - Fuzzy negation, triangular norms, t-conorms, fuzzy implications, Aggregation Operations, Fuzzy Functional Equations.

UNIT III: (9 Lectures)

Fuzzy Binary and n-ary relations - composition of fuzzy relations - Fuzzy Equivalence Relations - Fuzzy Compatibility Relations - Fuzzy Relational Equations

UNIT IV: (8 Lectures)

Fuzzy Measures - Evidence Theory - Necessity and Belief Measures - Probability Measures vs Possibility Measures

UNIT V: (9 Lectures)

Fuzzy Decision Making - Fuzzy Relational Inference - Compositional Rule of Inference - Efficiency of Inference - Hierarchical

Text Books:

1. George J Klir and Bo Yuan, "Fuzzy Sets and Fuzzy Logic : Theory and Applications", Prentice Hall NJ,1995.
2. Timothy J. Ross, "Fuzzy Logic with Engineering Applications", 3rd Edition, Willey, 2010.

References:

1. E P Klement, R Mesiar and E. Pap, Triangular norms, Kluwer Academic Press, Dordrecht, 2000.
2. H.J. Zimmermann, Fuzzy Set Theory and its Applications, Allied Publishers, New Delhi, 1991.
3. Kevin M Passino and Stephen Yurkovich, Fuzzy Control, Addison Wesley Longman, 1998.
4. M Grabisch et al., Aggregation Functions, Series - Encyclopedia Of Mathematics And Its Applications, Cambridge University Press, 2009
5. Michal Baczynski and Balasubramaniam Jayaram, Fuzzy Implications, Springer Verlag, Heidelberg, 2008.

Web References:

1. www.digitaldefynd.com
2. www.mathily.org

B.Tech. III Year I Semester

L	T	P	C
2	**0**	**0**	2

PROFESSIONAL ETHICS

(OPEN ELECTIVE II)

Internal Marks: 40

Course Code: P18MBO03 **External Marks: 60 Course Prerequisite:** None

Course objectives:

- 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.
- To help the students to know about the history of ethics and importance of social experimentation
- To specify the students about the importance of their responsibility towards safety and risk as Engineers.
- To specify the students about the importance of their responsibility as Engineers.
- To help the student explore the ethical values globally.

COURSE OUTCOMES:

- To learn about the different Human values to be maintained by all the people.
- To learn about the history of ethics and the importance of ethics for professionals and application of ethics in social experimentation.
- To learn about the responsibilities of engineers for safety and risk.
- To learn about the responsibilities and rights of engineers.
- 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 behaviour-computers as the object of Unethical Acts-autonomous computers-computer codes of Ethics Weapons

Development-Ethics and Research-Analysing 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
5. https://onlinecourses.nptel.ac.in/noc18_mg25

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

L	T	P	C
2	0	0	2

DATA COMMUNICATIONS
(OPEN ELECTIVE II)

Internal Marks: 40

Course Code: P18ECO03 **External Marks: 60**

Course Prerequisite: Digital Logic Design

Course Objectives:

1. To have a detailed study of various analog modulation and demodulation techniques
2. To have a detailed study of various transmission media
3. To have a thorough knowledge of various digital modulation and demodulation techniques and multiplexing schemes
4. To know about the standards and mechanisms wireless communication systems
5. To have a thorough knowledge of various Data communication formats.

Course Outcomes: After going through this course the student will be able to

1. Knowledge of working of basic communication systems
2. Ability to evaluate alternative models of communication system design
3. Ability to learn & analyze digital communication systems
4. Ability to analyze digital communication systems
5. Ability to learn & analyze data communication formats and equipment.

UNIT I **(9 Lectures)**

INTRODUCTION TO DATA COMMUNICATIONS AND NETWORKING: Standards Organizations for Data Communications, Layered Network Architecture, Open Systems Interconnection, Data Communications Circuits, Serial and parallel Data Transmission, Data communications Networks, Alternate Protocol Suites.

SIGNALS, NOISE, MODULATION, AND DEMODULATION: Signal Analysis, Electrical Noise and Signal-to-Noise Ratio, Analog Modulation Systems, Information Capacity, Bits, Bit Rate, Baud, and M-ary Encoding, Digital Modulation.

UNIT II **(9 Lectures)**

METALLIC CABLE TRANSMISSION MEDIA: Metallic Transmission Lines, Transverse Electromagnetic Waves, Characteristics of Electromagnetic Waves

OPTICAL FIBER TRANSMISSION MEDIA: Advantages of Optical Fiber cables, Disadvantages of Optical Fiber Cables, Electromagnetic spectrum, Optical Fiber Communications System Block Diagram, Optical Fiber construction, Propagation of Light Through an Optical fiber Cable, Optical Fiber Modes and Classifications, Optical Fiber Comparison, Losses in Optical Fiber Cables, Light sources, Light Detectors, Lasers.

UNIT III **(9 Lectures)**

DIGITAL TRANSMISSION: Pulse Modulation, Pulse code Modulation, Dynamic Range, Signal Voltage to- Quantization Noise Voltage Ratio, Linear Versus Nonlinear PCM Codes, Companding, PCM Line Speed, Delta Modulation PCM and Differential PCM.

MULTIPLEXING AND T CARRIERS: Time- Division Multiplexing, T1 Digital Carrier System, Digital Line Encoding, T Carrier systems, Frequency- Division Multiplexing, Wavelength- Division Multiplexing, Synchronous Optical Network.

UNIT IV **(9 Lectures)**

WIRELESS COMMUNICATIONS SYSTEMS: Electromagnetic Polarization, Electromagnetic Radiation, Optical Properties of Radio Waves, Terrestrial Propagation of Electromagnetic Waves, Skip Distance, Free-Space Path Loss, Microwave Communications Systems, Satellite Communications Systems.

UNIT V **(9 Lectures)**

DATA COMMUNICATIONS CODES, ERROR CONTROL, AND DATA FORMATS: Data Communications Character Codes, Bar Codes, Error Control, Error Detection and Correction, Character Synchronization.

DATA COMMUNICATIONS EQUIPMENT: Digital Service Unit and Channel Service Unit, Voice- Band Data Communication Modems, Bell Systems-Compatible Voice- Band Modems, Voice- Band Modem Block Diagram, Voice- Band Modem Classifications, Asynchronous Voice-Band Modems, Synchronous Voice-Band Modems, Modem Synchronization, 56K Modems, Modem Control: The AT Command Set, Cable Modems.

Text Book:

1. Introduction to Data Communications and Networking, Wayne Tomasi, Pearson Education.

Reference Books:

1. Data Communications and Networking, Behrouz A Forouzan, Fourth Edition.TMH.
2. Data and Computer communications, 8/e, William Stallings, PHI.
3. Computer Communications and Networking Technologies, Gallow, Second Edition Thomson.
4. Computer Networking and Internet, Fred Halsll, Lingana Gouda Kulkarni, Fifth Edition, Pearson Education.

Web References:

1. https://nptel.ac.in/courses/106105082/
2. http://www.telecomworld101.com/Intro2dcRev2/pagetoc.html

B.Tech III Year I Semester

Course Structure

L	T	P	C
2	0	0	2

IT SYSTEMS MANAGEMENT

(OPEN ELECTIVE II)

Internal Marks : 40

Course Code: P18CSO08 **External Marks: 60**

Course Prerequisites: None

Course Objectives:

To introduce basic computer and IT concepts including hardware, software, operating systems, Internet protocols, database design and implementation, and IT security issues.

Course Outcomes:

1. Analyze various functional components of computer system.
2. Summarize the functions of operating systems, the different types of networktopologies & protocols.
3. Implement the various internet tools and fundamentals of database.
4. Able to know the need of computer security.
5. Implement the basics of multimedia and the future trends in IT.

UNIT I: (6 Lectures)

COMPUTER BASICSANDARCHITECTURE:

Information Technology Basics: Introduction - Role of IT - Information Technology and Internet.

UNIT II: (6 Lectures)

BASICS OF OPERATING SYSTEMSAND NETWORKS:

Operating systems: Evolution-Types of Operating System –Functions of Operating System- Coordinating machine activities-Handling competition among processes.

Data Communication and Computer Networks: Introduction - Data Communication – Transmission Media - Modulation-Multiplexing – Switching - Network Topologies – Communication Protocol - Network devices.

UNIT III: (6 Lectures)

BASICS OF INTERNETANDDATABASES

Internet and Internet Tools: Internet Basics - Applications of Internet - Data over Internet, Web Browser - Email, Search Engines, Instant Messaging.

Database Fundamentals: Logical and Physical Data Concepts - Database Management System – Architecture - Database Models - Types of databases - Data warehousing and Mining.

UNIT IV: (6 Lectures)

COMPUTER SOFTWARE ANDCOMPUTERSECURITY:

Introduction to Software - Categories of Software - Software Piracy - SoftwareTerminologies.

Computer Security: Security Threats - Malicious Programs – Cryptography - Digital Signature – Firewall - User Identification and Authentication.

UNIT V: (6 Lectures)

BASICS OF MULTIMEDIA AND FUTURE TRENDSIN IT:

Multimedia Essentials: Building blocks - Multimedia system - Applications of multimedia E-Commerce – EDI - Wireless Application Protocol - Smart Card - IPTV Blogging – RFID –

Brain Computer Interface.

Text Books:

1. Computer Architecture and Organization, John P. Hayes, 3rd Edition, McGraw Hill.
2. Operating Systems-S Halder, Alex A Aravind Pearson Education Second Edition 2016 .

References:

1. ITL Education solutions limited, Introduction to Information Technology, Pearson Education,2012
2. J. Glenn Brookshear , Computer Science: An Overview,11th edition, Pearson Education,2012
3. V.Rajaraman, Introduction to Information Technology,2nd Edition, PHI Learning Private Limited,2013

B.Tech III Year I Semester

Course Structure

L	T	P	C
0	0	3	2

DATA SCIENCE LAB

(CSIT,IT)

Course Objectives:

- To understand the mathematical foundations required for data science.
- To describe a flow process for data science problems.
- To introduce basic data science algorithms and data visualization.
- To learn machine tools and techniques.
- To learn the ideas and tools for data visualization.

List of Experiments:

1. Installation and run Anaconda software.
2. Python Program to find ASCII value of given number
3. Python Program to Make a Simple Calculator.
4. Python Program to Count the Number of Each Vowel.
5. Python Program to Illustrate Different Set Operations.
6. Create List and apply different functions on it.
7. Create a tuple and apply different built-in functions on it.
8. A tuple can also be created without using parentheses. This is known as tuple packing.
9. Create DataFrames and apply merge and join functions on it.
10. Create a Village Dataset and execute the below conditions:

    a) Check for any null values in the given dataset if you find any please remove them and continue to further tasks.

    b) calculate the count of people living in hut and using smart TV.

Course Outcomes:

- Explain the basic terms of Linear Algebra and Statistical Inference.
- Describe the Data Science process and how its components interact.
- Apply EDA and the Data Science process in a case study.
- Classify Data Science problems.
- Analyze and correlate the results to the solutions.
- Simulate Data Visualization in exciting projects.

Note: The creation of sample database for the purpose of the experiments is expected to be predecided by the instructor

Text Books:

1. Cathy O'Neil and Rachel Schutt. Doing Data Science, Straight Talk From The Frontline. O'Reilly. 2014.
2. Introduction to Linear Algebra - By Gilbert Strang, Wellesley-Cambridge Press, 5th Edition.2016.
3. Applied Statistics and Probability For Engineers – By Douglas Montgomery.2016.
4. Jure Leskovek, Anand Rajaraman and Jeffrey Ullman. Mining of Massive Datasets. v2.1, Cambridge University Press. 2014. (free online)

B.Tech III Year I Semester

Course Structure

L	T	P	C
0	0	3	1.5

COMPUTER NETWORKS &OPERATING SYSTEMS LAB

(CSE,IT, CSIT)

Internal Marks : 40

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

Part-A:

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

2. Implement on a data set of characters the three CRC polynomials -CRC 12, CRC 16 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.

7. Simulate the following File allocation strategies
   a) Sequenced b) Indexed c) Linked

III YEAR II SEMESTER									
S.No	**CODE**	**COURSE**		**L**	**T**	**P**	**Credits**	**Internal**	**External**
1	P18CST10	Web Technologies		3	0	0	3	40	60
2	P18CST11	Hadoop & Big Data		3	0	0	3	40	60
3	P18CST12	Artificial Intelligence & Machine Learning		3	1	0	4	40	60
4	***Professional Elective-II***			3	0	0	3	40	60
	P18CSE08	Cryptography and Network Security (T1)							
	P18ITE04	Distributed Database (T2)							
	P18ITE05	Unified Modelling Language (T3)							
	P18CSE07	Middleware Technologies (T4)							
5	***Open Elective –III***			2	0	0	2	40	60
	P18MBO01	HSMC	Management Science						
	P18ECO08	ECE	Embedded Systems						
	P18ECO05	ECE	Microprocessors & Micro						
	P18ITO01	CSE/IT	Database Systems						
6	P18ITT04	Theory of Automata and Compiler Design		3	0	0	3	40	60
7	P18CSL07	Web Technologies Lab		0	0	3	1.5	40	60
8	P18CSL09	Artificial Intelligence & Machine Learning Lab		0	0	3	1.5	40	60
9	P18ITP01	Mini Project		0	0	6	2	40	60
Total Periods				**17**	**1**	**12**	**23**	**360**	**540**

B.Tech III Year II Semester

Course Structure

L	T	P	C
3	0	0	3

WEB TECHNOLOGIES

(CSE&IT)

Internal Marks : 40

Course Code: P18CST12 **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/

B.Tech III Year II Semester

Course Structure

L	T	P	C
3	0	0	3

HADOOP & BIG DATA

Internal Marks : 40

Course Code: P18CST11 **External Marks: 60**

Course Prerequisites: Fundamentals of Java Programming

Course Objectives:

1. Understand the big data characteristics, importance and HDFS
2. Apply the MapReduce concepts to work with the big data.
3. Able to Understand Hadoop I/O.
4. Apply Pig latin, Apache Spark tools to solve the word count example.
5. Apply Hive structure to Hadoop data.

Course Outcomes:

1. Understand HDFS Architecture to store the data in a distributed environment
2. Apply MapReduce concepts to work with the big data.
3. Implementation of custom writable in Hadoop I/O.
4. Able to Apply Pig latin, Apache Spark tools to work with big data problems
5. Apply hive client to store and work with big data.

UNIT I: (9 Lectures)

Introduction to Big Data: Big Data-definition, Characteristics of Big Data (Volume, Variety, Velocity, Veracity, Validity), Importance of Big Data.

Working with Big Data: Google File System, Hadoop Distributed File System (HDFS) – Building blocks of Hadoop (Namenode, Datanode, Secondary Namenode, JobTracker, TaskTracker), Introducing and Configuring Hadoop cluster (Local, Pseudo-distributed mode, Fully Distributed mode), Configuring XML files.

UNIT II: (9 Lectures)

Writing MapReduce Programs: A Weather Dataset, Understanding Hadoop API for MapReduce Framework (Old and New), Basic programs of Hadoop MapReduce: Driver code, Mapper code, Reducer code, RecordReader, Combiner, Partitioner

UNIT III: (9 Lectures)

Hadoop I/O: The Writable Interface, Writable Comparable and comparators, Writable Classes: Writable wrappers for Java primitives, Text, BytesWritable, NullWritable, ObjectWritable and GenericWritable, Writable collections, Implementing a Custom Writable: Implementing a RawComparator for speed, Custom comparators.

UNIT IV: (9 Lectures)

Pig: Hadoop Programming Made Easier Admiring the Pig Architecture, Going with the Pig Latin Application Flow, Working through the ABCs of Pig Latin, Evaluating Local and Distributed Modes of Running Pig Scripts, Checking out the Pig Script Interfaces, Scripting with Pig Latin.

Apache Spark: Introduction to Apache spark, features, components, RDD, installation, writing word count using apache spark, hadoop vs spark.

UNIT V: (9 Lectures)

Applying Structure to Hadoop Data with Hive: Saying Hello to Hive, Seeing How the Hive is Put Together, Getting Started with Apache Hive, Examining the Hive Clients, Working with Hive Data Types, Creating and Managing Databases and Tables, Seeing How the Hive Data Manipulation Language Works, Querying and Analyzing Data.

Text Books:

1. Hadoop: The Definitive Guide by Tom White, 3rd Edition, O'reilly 2009 (UNIT-I,II,III,IV,V).
2. Dirk deRoos, Chris Eaton, George Lapis, Paul Zikopoulos, Tom Deutsch "Understanding Big Data Analytics for Enterprise Class Hadoop and Streaming Data", 1st Edition, TMH,2012 (UNIT-I).

References:

1. Hadoop in Action by Chuck Lam, MANNING Publ.
2. Hadoop in Practice by Alex Holmes, MANNING Publishers
3. Mining of massive datasets, Anand Rajaraman, Jeffrey D Ullman, Wiley Publications.

Web References:

1. https://nptel.ac.in/courses
2. https://www.tutorialspoint.com/spark
3. https://www.youtube.com/watch?v=zez2Tv-bcXY
4. https://www.youtube.com/watch?v=VSbU7bKfNkA

B.Tech III Year II Semester

Course Structure

L	T	P	C
3	1	0	4

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

(IT)

Internal Marks : 40

Course Code: P18CST10 **External Marks: 60**

Course Prerequisites: None

Course Objectives:

1. Explain Artificial Intelligence and Machine Learning
2. Illustrate AI and ML algorithm and their use in appropriate applications
3. Familiarity with a set of well-known supervised, unsupervised and semi-supervised learning algorithms.
4. The ability to implement some basic machine learning algorithms .
5. Understanding of how machine learning algorithms are evaluated.

Course Outcomes:

1. Appraise the theory of Artificial intelligence.
2. Illustrate the working of AI Algorithms.
3. Demonstrate the applications of AI.
4. Recognize the characteristics of machine learning that make it useful to real-world Problems.
5. Characterize machine learning algorithms as supervised, semi-supervised, and unsupervised.

UNIT I: (11 Lectures)

What is artificial intelligence?, Problems, problem spaces and search, Heuristic search Techniques.

Knowledge representation issues, Predicate logic, Representation knowledge using rules.

UNIT II: (13 Lectures)

Concept Learning: Concept learning task, Concept learning as search, Find-S algorithm, Candidate Elimination Algorithm, Inductive bias of Candidate Elimination Algorithm. **Decision Tree Learning:** Introduction, Decision tree representation, Appropriate problems, ID3 algorithm.

UNIT III: (12 Lectures)

Artificial Neural Network: Introduction, NN representation, Appropriate problems, Perceptron, Back propagation algorithm. **Bayesian Learning:** Introduction, Bayes theorem, Bayes theorem and concept learning.

UNIT IV: (12 Lectures)

The ingredients of machine learning, Tasks: the problems that can be solved with machine learning, Models: the output of machine learning, Features, the workhorses of machine learning. **Binary classification and related tasks:** Classification, Scoring and ranking, Class probability estimation

UNIT V: (12 Lectures)

Supervised Learning : Regression Analysis, Linear Regression, Simple Linear Regression, Multiple Linear Regression, Backward Elimination, Polynomial Regression Classification :Classification Algorithm ,Logistic Regression, K-NN Algorithm, Support Vector Machine Algorithm ,Naïve Bayes Classifier

Text Books:

1. Elaine Rich, Kevin K and S B Nair, "Artificial Inteligence", 3 rd Edition, McGraw Hill Education, 2017.
2. Machine Learning: The art and science of algorithms that make sense of data, Peter Flach, Cambridge.
3. Machine Learning, Tom M. Mitchell, MGH.

References:

1. Saroj Kaushik, Artificial Intelligence, Cengage learning
2. Stuart Rusell, Peter Norving , Artificial Intelligence: A Modern Approach, Pearson Education 2nd Edition
3. UnderstandingMachine Learning: From Theory toAlgorithms, Shai Shalev-Shwartz, Shai
   Ben David, Cambridge.
4. Machine Learning in Action, Peter Harington, 2012, Cengage.

Web References:

1. https://nptel.ac.in/courses/106106139/
2. https://nptel.ac.in/courses/106105077/
3. https://www.tutorialspoint.com/machine_learning_with_python/index.htm

B.Tech III Year II Semester

Course Structure

L	T	P	C
3	0	0	3

CRYPTOGRAPHY & NETWORK SECURITY

(IT,CSIT)

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 and protocols 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 **Course Structure**

L	T	P	C
3	0	0	3

DISTRIBUTED DATABASES

(PROFESSIONAL ELECTIVE II)

Internal Marks : 40

Course Code: P18CSE06 **External Marks: 60**

Course Prerequisites: Database Management System

Course Objectives:

1. Understand how data is collected and distributed in a database across multiple physical locations.
2. To Gain advanced knowledge on creating and maintaining databases in distributed environment, how to handling all types of queries, query optimization techniques.
3. To improve database performance at end-users worksites.
4. Understand and to get knowledge of advanced features of object orientation and interoperability object management in distributed environment.
5. Management of distributed data with different levels of transparency.

Course Outcomes:

1. Achieve advanced knowledge on creating and maintaining databases in distributed environment.
2. Able to handle all types of queries, query optimization techniques.
3. Know how to use Foundations of Distributed Concurrency Control.
4. Recognize how to Query Processing Layers in Distributed Multi-DBMS.
5. Identify with how to implement Object Orientation and Interoperability.

UNIT I: (9 Lectures)

Distributed Databases:

Features of Distributed versus Centralized Databases, Distributed Database Management Systems (DDBMSs)

Principles Of Distributed Databases -Levels of Distribution Transparency: Reference Architecture for Distributed Databases, Types of Data Fragmentation, Integrity Constraints in Distributed Databases.

UNIT II: (9 Lectures)

Distributed Database Design:

A Framework for Distributed Database Design, the Design of Database Fragmentation, the Allocation of Fragments.

Translation of Global Queries to Fragment Queries: Equivalence Transformations For Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries.

The Management of Distributed Transactions: A Framework for Transaction Management, Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions.

UNIT III: (9 Lectures)

Concurrency Control:

Foundations of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control Based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

Reliability: Basic Concepts, Non-blocking Commitment Protocols, Reliability and Concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency.

UNIT IV: (9 Lectures)

Distributed Object Database Management Systems:

Architectural Issues: Alternative Client/Server Architectures, Cache Consistency.

Object Management: Object Identifier Management, Pointer Swizzling, Object Migration Distributed Object Storage, Object Query Processing Architectures, Query Processing Issues, Query Execution. Transaction Management in Object DBMSs, Transactions as Objects.

UNIT V: (9 Lectures)

Database Interoperability:

Database Integration: Scheme Translation, Scheme Integration. Query Processing Layers in Distributed Multi-DBMSs, Query Optimization Issues. Transaction and Computational Model, Multi database Concurrency Control, Multi database Recovery.

Object Orientation and Interoperability:

Object Management Architecture, CORBA and Database Interoperability, Distributed Component Object Model, COM/OLE and Database Interoperability.

Text Books:

1. Stefano Ceri and Giuseppe Pelagatti, *"Distributed Databases– Principles and Systems"*, 1st Edition, Tata McGraw-Hill Edition, 2008.
2. M Tamer Ozsu, Patrick Valduriez, *"Principles of Distributed Database Systems"*, 2nd Edition, Pearson Education. (Last 2 Units).

References:

1. M. Tamer ozsu, Patrick Valduriez, *"Principles of Distributed Data Base Systems"*, 3rd Edition, Springer, 2011.

Web References:

1. https://www.tutorialspoint.com/distributed_dbms/distributed_dbms_databases.htm
2. https://www.geeksforgeeks.org/distributed-database-system/

B.Tech III Year II Semester

Course Structure

L	T	P	C
3	0	0	3

UNIFIED MODELING LANGUAGE
(PROFESSIONAL ELECTIVE II)

Internal Marks : 40

Course Code: **External Marks: 60**

Course Prerequisites: Software Engineering, OOPS

Course Objectives: • To understand how to solve complex problems

• Analyze and design solutions to problems using object oriented approach

• Study the notations of Unified Modeling Language

Course Outcomes:

• Ability to find solutions to the complex problems using object oriented approach

• Represent classes, responsibilities and states using UML notation

• Identify classes and responsibilities of the problem domain

UNIT I:

Why we model: The Importance of Modeling, Principles of Modeling, Object-Oriented Modeling

Introducing the UML: An overview of the UML, A Conceptual Model of the UML, Architecture, Software Development Life Cycle

UNIT II:

Basic Structural Modeling: Classes, Relationships, Common Mechanisms, Diagrams

Advanced Structural Modeling: Advanced Classes, Advanced Relationships, Interfaces Types, and Roles, Packages, Instances

UNIT III:

Structural Modeling: Class Diagrams, Object Diagrams

Basic Behavioral Modeling: Interactions, Use Cases, Use Case Diagrams, Interaction Diagrams, Activity Diagrams

UNIT IV:

Advanced Behavioral Modeling: Events and Signals, State Machines, State chart Diagrams,

Architectural Modeling: Components, Deployment, Component Diagrams, Deployment Diagrams

UNIT V:

Case Study: Library Management Systems, Online shopping, Student Information System, Employee Information System

TEXT BOOKS:

1. Unified Modeling Language User Guide, The Grady Booch, James Rumbaugh, Ivar Jacobson, Publisher: Addison Wesley, First Edition

REFERENCE BOOKS:

1. "Object-oriented analysis and design using UML", Mahesh P. Matha, PHI
2. "Head first object-oriented analysis and design", Brett D. McLaughlin, Gary Pollice, Dave West, O"Reilly

L	T	P	C
3	0	0	3

MIDDLEWARETECHNOLOGIES

(PROFESSIONAL ELECTIVE II)

Internal Marks : 40

Course Code: P18CSE07 **External Marks: 60**

Course Prerequisites: Object Oriented Programming

Course Objectives:

1. The course provides details about the modern component platforms.
2. Based on practical examples, details about modern middleware technologieswill be analyzed.
3. Students get the chance to gain in-depth knowledge about their favorite middleware platform.

Course Outcomes:

1. Have learnt the different types of server client concepts.
2. Learn the design of EJB architecture.
3. Deploy EJB for specific applications.
4. Build an application using CORBA.
5. Build an application using COM.

UNIT I: (9 Lectures)

CLIENT / SERVER CONCEPTS:

Client – Server – File Server, Database server, Group server, Object server, Web server .Middleware – General Middleware – Service specific middleware. Client / Server Building blocks – RPC – Messaging – Peer – to- Peer.

UNIT II: (9 Lectures)

EJB ARCHITECTURE:

EJB – EJB Architecture – Overview of EJB software architecture – View of EJB Conversation – Building and Deploying EJBs – Roles in EJB.

UNIT III: (9 Lectures)

EJB APPLICATIONS:

EJB Session Beans – EJB entity beans – EJB clients – EJB Deployment – Building an application with EJB.

UNIT IV: (9 Lectures)

CORBA:

CORBA – Distributed Systems – Purpose - Exploring CORBA alternatives – Architecture overview – CORBA and networking model – CORBA object model – IDL – ORB - Building an application with CORBA.

UNIT V: (9 Lectures)

COM:

COM – Data types – Interfaces – Proxy and Stub – Marshalling – Implementing Server / Client Interface Pointers – Object Creation, Invocation , Destruction – Comparison COM and CORBA – Introduction to .NET – Overview of .NET architecture – Marshalling - Remoting.

Text Books:

1. Robert Orfali, Dan Harkey and Jeri Edwards, "The Essential Client/Server Survival Guide", Galgotia Publications Pvt. Ltd.,2002.
2. Tom Valesky,"Enterprise Java Beans", Pearson Education,2002.

References:

1. Jesse Liberty, "Programming C#", 2nd Edition, O'Reilly Press, 2002.
2. Mowbray, "Inside CORBA", Pearson Education, 2002.
3. Jason Pritchard,"COM and CORBA side by side", Addison Wesley,2000.

Web References:

1. https://www.tutorialspoint.com/ejb/index.htm
2. https://www.ece.uvic.ca/~itraore/seng422-06/notes/arch06-6-1.pdf
3. https://nptel.ac.in/content/storage2/courses/106105087/pdf/m17L42.pdf

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

L	T	P	C
3	0	0	3

MANAGEMENT SCIENCE
(OPEN ELECTIVE III)

Internal Marks : 40

Course Code: **External Marks: 60**

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

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

L	T	P	C
2	0	0	2

EMBEDDED SYSTEMS
(OPEN ELECTIVE III)

Internal Marks: 40

Course Code: P18ECO08 **External Marks: 60**

Course Prerequisite: Microprocessors and Microcontrollers

Course Objectives:

1. Building Blocks of Embedded System
2. Various Embedded Development Strategies
3. Bus Communication in processors, Input/output interfacing.
4. Various processor scheduling algorithms.
5. Basics of Real time operating system and example tutorials to discuss on one real time operating system tool.

Course Outcomes: After going through this course the student will be able to

1. Analyze the Embedded systems and suggest for a given application.
2. Utilize the various Embedded Development Strategies
3. Analyze about the bus Communication in processors.
4. Built up the knowledge on various processor scheduling algorithms.
5. Examine basics of Real time operating system.

UNIT I **(9 Lectures)**

INTRODUCTION TO EMBEDDED SYSTEMS: Introduction to Embedded Systems –Structural units in Embedded processor , selection of processor & memory devices- DMA – Memory management methods- Timer and Counting devices, Watchdog Timer, Real Time Clock, In circuit emulator, Target Hardware Debugging.

UNIT II EMBEDDED NETWORKING **(9 Lectures)**

Embedded Networking: Introduction, I/O Device Ports & Buses– Serial Bus communication protocols RS232 standard – RS422 – RS 485 - CAN Bus -Serial Peripheral Interface (SPI) – Inter Integrated Circuits (I^2C) –need for device drivers.

UNIT III **(9 Lectures)**

EMBEDDED FIRMWARE DEVELOPMENT ENVIRONMENT Embedded Product Development Life Cycle- objectives, different phases of EDLC, Modelling of EDLC; issues in Hardware-software Co-design, Data Flow Graph, state machine model, Sequential Program Model, concurrent Model, object oriented Model.

UNIT IV RTOS BASED EMBEDDED SYSTEM DESIGN **(9 Lectures)**

Introduction to basic concepts of RTOS- Task, process & threads, interrupt routines in RTOS, Multiprocessing and Multitasking, Preemptive and non-preemptive scheduling, Task communication shared memory, message passing-, Inter process Communication – synchronization between processes-semaphores, Mailbox, pipes, priority inversion, priority inheritance.

UNIT V **(9 Lectures)**

EMBEDDED SYSTEM APPLICATION AND DEVELOPMENT: Case Study of Washing Machine- Automotive Application- Smart card System Application- ATM machine –Digital camera

Text Books:

1. Peckol, "Embedded system Design", John Wiley & Sons,2010
2. Lyla B Das," Embedded Systems-An Integrated Approach", Pearson, 2013
3. Shibu. K.V, "Introduction to Embedded Systems", 2e, Mc graw Hill, 2017.

Reference Books:

1. Raj Kamal, „Embedded System-Architecture, Programming, Design", Mc Graw Hill, 2013.
2. C.R.Sarma, "Embedded Systems Engineering", University Press (India) Pvt. Ltd, 2013.
3. Tammy Noergaard, "Embedded Systems Architecture", Elsevier, 2006.
4. Han-Way Huang, "Embedded system Design Using C8051", Cengage Learning, 2009.
5. Rajib Mall "Real-Time systems Theory and Practice" Pearson Education, 2007.

Web References:

1. https://www.edx.org/learn/embedded-systems
2. https://www.udemy.com/course/introduction-to-embedded-systems/

3. https://nptel.ac.in/courses/108/102/108102045/

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

L	T	P	C
2	0	0	2

MICROCPROCESSORS & MICROCONTROLLERS
(OPEN ELECTIVE III)

Internal Marks: 40

Course Code: P18ECO05 **External Marks: 60**

Course Prerequisite: Switching Theory and Logic Design

Course Objectives:

1. Understand the theory and basic architectures of 8086 microprocessors
2. Learn the assembly language programming.
3. Understand Interfacing of 8086, With memory and other peripherals
4. Study the features 8051 microcontroller and programming.
5. Learn the features of PIC microcontroller families.

Course Outcomes: After going through this course the student will be able to

1. Describe the microprocessor capability in general and explore the evaluation of microprocessors.
2. Write the assembly language programming
3. Describe 8086 interfacing with different peripherals and implement programs.
4. Describe hardware concepts, development of programs for 8051 Micro controller and interfacing.
5. Describe hardware features of PIC microcontroller families.

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UNIT-I **(9 Lectures)**

8086 ARCHITECTURE: Main features, pin diagram/description, 8086 microprocessor family, 8086 internal architecture, bus interfacing unit, execution unit, interrupts and interrupt responses, 8086 system timing, minimum mode and maximum mode configuration, Advanced microprocessors.

UNIT-II **(8 Lectures)**

8086 PROGRAMMING: Program development steps, instructions, addressing modes, assembler directives, writing simple programs with an assembler, assembly language program development tools.

UNIT-III **(10 Lectures)**

8086 INTERFACING : Semiconductor memories interfacing (RAM,ROM), 8254 software programmable timer/counter, Intel 8259 programmable interrupt controller, software and hardware interrupt applications, Intel 8237a DMA controller, Intel 8255 programmable peripheral interface, keyboard interfacing, alphanumeric displays (LED,7-segment display, multiplexed 7-segment display, LCD), Intel 8279 programmable keyboard/display controller, stepper motor, A/D and D/A converters.

UNIT-IV **(8 Lectures)**

Intel 8051 MICROCONTROLLER: Architecture, Memory organization, counters/timers, serial data input/output, interrupts. Assembly language programming: Instructions, addressing modes, simple programs. Interfacing: keyboard, displays (LED, 7-segment display unit), A/D and D/A converters.

UNIT-V **(10 Lectures)**

PIC MICROCONTROLLER: Introduction, characteristics of PIC microcontroller, PIC microcontroller families, memory organization, parallel and serial input and output, timers, Interrupts, PIC 16F877 architecture, instruction set of the PIC 16F877.

Text Books:

1. Microprocessors and Interfacing – Programming and Hard ware by Douglas V Hall, SSSP Rao, Tata McGraw Hill Education Private Limited, 3rd Edition.
2. The 8051 Microcontroller & Embedded Systems Using Assembly and C by Kenneth J.Ayala, Dhananjay V.Gadre,Cengage Learninbg , India Edition.

References Books:

1. The Intel Microprocessors-Architecture, Programming, and Interfacing by Barry B.Brey, Pearson, Eighth Edition-2012.
2. Microprocessors and Microcontrollers-Architecture, Programming and System Design by Krishna Kant, PHI Learning Private Limited, Second Edition, 2014.
3. Microprocessors and Microcontrollers by N.Senthil Kumar, M.Saravanan and S.Jeevananthan, Oxford University Press, Seventh Impression 2013

Web References:

1. https://nptel.ac.in/courses/106108100/

2. https://www.sanfoundry.com/best-reference-books-microprocessors-microcontrollers/

B.Tech III Year II Semester

Course Structure

L	T	P	C
2	0	0	2

DATABASE SYSTEMS
(OPEN ELECTIVE III)

Internal Marks : 40

Course Code: P18CSO12 **External Marks: 60**

Course Prerequisites: None

Course Objectives:

1. Provides students with theoretical knowledge
2. Design a database system andunderstand the issues involved in implementing the database.

Course Outcomes:

1. Create conceptual data model using Entity Relationship Diagram
2. Design conceptual and logical database models for an application.
3. Normalize relational database design of an application.
4. Implement the need for Indexing and Hashing and illustrate transactional processing.
5. Implement the various files indexing techniques.

UNIT I: (6 Lectures)

Introduction: Database System Application, Purpose of Database Systems, View of Data, Database Languages, Relational Database, Database Design, Specialty Databases, Data Storage and Querying, Database Architecture , Database Users and Administrators.

Database Design and E-R Model: Overview of the Design Process, The E-R Model, Constraints, E-R Diagrams, E-R Design Issues, Extended E-R features, Reduction to Relational Schemas, Other aspects of Database Design.

UNIT II: (6 Lectures)

Relational Model: Structure of Relation Database, Fundamental Relational Algebra Operations, Additional Relational Algebra Operations, Extended Relational Algebra Operations, Modification of the Database.

Structured Query Language: Introduction, Basic Structure of SQL Queries, Set Operations, Additional Basic Operations, Aggregate Functions, Null Values, Nested Sub queries, Views, JoinExpression.

UNIT III: (6 Lectures)

Schema Refinement (Normalization): Problems Caused by Redundancy, Decompositions, Problems Related to Decomposition, Functional dependency, Properties of Functional dependency, Normal forms based on functional dependency - 1NF, 2NF and 3NF, concept of surrogate key, Boyce-Codd normal form(BCNF), 4NF; Properties of Decompositions – Lossless join decomposition and dependency preserving decomposition.

UNIT IV: (6 Lectures)

Transaction Management: Transaction concept, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation and Atomicity, Serializability, Recoverability, Transaction Isolation Levels, Implementation of IsolationLevels.

Concurrency Control: Lock Based Protocols, Timestamp – Based Protocols Validation Based Protocols, Multiples Granularity, Multiversion Schemes, Deadlock Handling, Insert and Delete Operations.

UNIT V: (6 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, Comparison of File Organization.

Text Books:

1. Abraham Silberschatz, Henry F Korth, S Sudharshan, *Database System Concepts,* 6th Edition, McGraw-Hill International Edition,2011
2. Date CJ, Kannan A, Swamynathan S, *An Introduction to Database System* , 8th Edition, PearsonEducation-2006.
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

B.Tech III Year II Semester

Course Structure

L	T	P	C
3	0	0	3

Theory of Automata and Compiler Design
(IT,CSIT)

Internal Marks : 40

Course Code: **External Marks: 60**

Course Prerequisites: Programming Languages, computer architecture, data structures and simple graph algorithms, logic or algebra.

Course Objectives:

- To understand the various phases in the design of a compiler.
- To understand the design of top-down and bottom-up parsers.
- To understand syntax directed translation schemes.
- To introduce lex and yacc tools.
- To learn to develop algorithms to generate code for a target machine.

Course Outcomes:

- Ability to design, develop, and implement a compiler for any language.
- Able to use lex and yacc tools for developing a scanner and a parser.
- Able to design and implement LL and LR parsers.
- Able to design algorithms to perform code optimization in order to improve the performance of a program in terms of space and time complexity.
- Ability to design algorithms to generate machine code

UNIT I

Fundamentals: Introduction, Basic Concepts, Introduction to Formal Proofs, Inductive proofs, Introduction to Defining Language, Kleen Closures, Arithmetic Expressions, Graphs, Trees, Finite State Machine, Acceptance of Strings and Languages, Deterministic Finite Automata, Non-Deterministic Finite Automata.

UNIT II

Finite Automata:Introduction, Significance of Nondeterministic Finite Automation, NFA with Є – Transactions, Conversions and Equivalence , NFA to DFA Conversion, Minimization of FSM, Equivalence between Two FSMs.

UNIT III

Grammar Formalism: Introduction, Regular Grammar, Equivalence between Regular Grammar and FA, Conversation of Right – Linear Grammar to Left Linear Grammar, Context Free Grammar.

Overview of Language Processing : Introduction, Preprocessors, Compiler, Assembler, Interpreters, Linkers and loaders, structure of compiler, Phases of compiler

UNIT IV

Lexical Analysis : Introduction , Role of Lexical Analysis, Lexical Analysis Vs Parsing, Token, Patterns and Lexeme, Lexical Errors, Input Buffering, Regular Expressions

UNIT V

Syntax Analysis : Introduction, Role of Parser, Context Free Grammar(CFG), Classification of Parsing Techniques, Top Down Parsing, Recursive Descent Parser

TEXT BOOKS:

1. John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman (2007), Introduction to Automata Theory Languages andComputation, 3rdedition, Pearson Education, India.

2. Compilers: Principles, Techniques and Tools, Second Edition, Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffry D. Ullman, Pearson.

REFERENCE BOOKS:

1. K. L. P Mishra, N. Chandrashekaran (2003), Theory of Computer Science-Automata Languages and Computation, 2nd edition, Prentice Hall of India, India.
2. Compiler Construction-Principles and Practice, Kenneth C Louden, Cengage Learning.
3. Modern compiler implementation in C, Andrew W Appel, Revised edition, Cambridge University Press.
4. Formal Languages & Automata Theory, A.A.Puntambekar, First Edition, Technical Publications .
5. Compiler Design, A.A.Puntambekar, First Edition, Technical Publications

B.Tech III Year II Semester

Course Structure

L	T	P	C
0	0	3	1.5

WEB TECHNOLOGIES LAB

(CSE,IT,CSIT)

Internal Marks : 40

Course Code: P18CSL09 **External Marks: 60**

Course Prerequisites: Java Programming

Course Outcomes:

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

The students have to choose one of the following project and do the all 12 experiments related 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 the websites given as examples.

List of Experiments

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

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

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 users who 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, pwd3 and 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 authenticate with 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 password from 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 and produce sorted list or according to their Enroll number.

B.Tech III Year II Semester

Course Structure

L	T	P	C
0	0	3	2

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING LAB (IT,CSIT)

Course Objectives:

- Explain Artificial Intelligence and Machine Learning
- Illustrate AI and ML algorithm and their use in appropriate applications
- Familiarity with a set of well-known supervised, unsupervised and semi-supervised learning algorithms.
- The ability to implement some basic machine learning algorithms .
- Understanding of how machine learning algorithms are evaluated.

List of Experiments:

1. Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.

2. For a given set of training data examples stored in a .CSV file, implement and demonstrate the Candidate-Elimination algorithm to output a description of the set of all hypotheses consistent with the training examples.

3. Write a program to demonstrate the working of the decision tree based ID3 algorithm. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.

4. Build an Artificial Neural Network by implementing the Backpropagation algorithm and test the same using appropriate data sets.

5. Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets.

6. Assuming a set of documents that need to be classified, use the naïve Bayesian Classifier model to perform this task. Built-in Java classes/API can be used to write the program. Calculate the accuracy, precision, and recall for your data set.

7. Write a program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set. You can use Java/Python ML library classes/API.

8. Apply EM algorithm to cluster a set of data stored in a .CSV file. Use the same data set for clustering using *k*-Means algorithm. Compare the results of these two algorithms and comment on the quality of clustering. You can add Java/Python ML library classes/API in the program.

9. Write a program to implement *k*-Nearest Neighbour algorithm to classify the iris data set. Print both correct and wrong predictions. Java/Python ML library classes can be used for this problem.

10. Implement the non-parametric Locally Weighted Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.

Course Outcomes:

6. Appraise the theory of Artificial intelligence.
7. Illustrate the working of AI Algorithms.
8. Demonstrate the applications of AI.
9. Recognize the characteristics of machine learning that make it useful to real-world Problems.
10. Characterize machine learning algorithms as supervised, semi-supervised, and unsupervised.

Note: The creation of sample database for the purpose of the experiments is expected to be predecided by the instructor

Text Books:

4. Elaine Rich, Kevin K and S B Nair, "Artificial Inteligence", 3 rd Edition, McGraw Hill Education, 2017.
5. Machine Learning: The art and science of algorithms that make sense of data, Peter Flach, Cambridge.
6. Machine Learning, Tom M. Mitchell, MGH.

B.Tech IV Year - I Semester

Course structure

L	T	P	C
3	0	0	3

SCRIPTING LANGUAGES

(CSIT)

Course Code:

Internal Marks: 30

External Marks: 70

Course Prerequisite: Nil

Course Objectives:

To impart adequate knowledge on the need of scripting language is a type of computer programming language

To used to provide instructions, called scripts, to software. Scripts contain a series of commands that a software,

To improve application or scripting engine interprets one at a time within a runtime environment.

To impart problem solving skills.

To enable student to write script language program and to solve the problems.

Course Outcomes:

1. Comprehend the differences between typical scripting languages and typical system and application programming languages.

2. Gain knowledge of the strengths and weakness of Perl, TCL and Ruby; and select an appropriate language for solving a given problem.

3. Acquire programming skills in scripting language .

Unit 1

Introduction:

Ruby, Rails, The structure and Execution of Ruby Programs, Package Management with RUBYGEMS, Ruby and web: Writing CGI scripts, cookies, Choice of Web servers, SOAP and web services

Unit 2

Extending Ruby:

Ruby Objects in C, the Jukebox extension, Memory allocation, Ruby Type System, Embedding Ruby to Other Languages, Embedding a Ruby Interpreter, Scripting Languages and Java, Java Scripting API

Unit 3

Scripting

Scripts and Programs, Origin of Scripting, Scripting Today, Characteristics of Scripting Languages, Uses for Scripting Languages, Web Scripting, and the universe of Scripting Language, SQL commands 1.DDL, 2 DML, 3.DCL and 4.DQL.

Unit 4

PERL

Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, Finer points of looping, pack and unpack, file system, eval, data structures, packages,

Unit 5

TCL Transaction Control Languages.

Data Structures, input/output, procedures, strings, patterns, files, Advance TCL- eval, source, exec and uplevel commands, Name spaces, trapping errors, event driven programs, making applications internet aware, Nuts and Bolts Internet Programming, Security Issues, C Interface

REFERENCE BOOKS:

1. Open Source Web Development with LAMP using Linux Apache, MySQL, Perl and PHP, J. Lee and B. Ware (Addison Wesley) Pearson Education.
2. Perl by Example, E. Quigley, Pearson Education.
3. Programming Perl, Larry Wall, T. Christiansen and J. Orwant, O'Reilly, SPD.
4. Tcl and the Tk Tool kit, Ousterhout, Pearson Education.
5. Perl Power, J. P. Flynt, Cengage Learning.

B.Tech IV Year - I Semester

Course structure

L	T	P	C
3	0	0	3

WIRELESS NETWORKS AND MOBILE COMPUTING (CSIT)

Course Code: **Internal Marks: 30**

External Marks: 70

Course Prerequisite: Nil

Course Objectives:

1. To make the student understand the concept of mobile computing paradigm, its applications and limitations.
2. To understand the typical mobile networking infrastructure through GSM.
3. To understand the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer & Transport Layer.
4. To understand the ad hoc networks and related concepts.

Course Outcomes:

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

1. Compare the various types of Wireless Networks from teaching perspective.
2. Interpret the applications and architecture of Mobile Computing and multiplexing techniques.
3. Analyze the Mobile IP issues.
4. Analyze the various Mobile TCP Variants.
5. Analyze the various routing protocols in MANET.

UNIT-I: (8 Lectures)

Wireless Networks: Computing Networks, types of networks, wired networks, wireless networks, Generation of Wireless Networks: 2G, 3G, 4G, Cellular Networks, Mobile Ad Hoc Networks, Mesh Networks, Sensor Networks, Vehicular Adhoc Networks, Next Generation Networks.

Unit-II: (9 Lectures)

Mobile Computing: Architecture of Mobile Computing, Mobile Computing Applications,

Limitations of Mobile Devices

GSM: Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS.

UNIT-III (12 Lectures)

(Wireless) Medium Access Control (MAC): Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

Mobile Network Layer: Mobile IP- Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunnelling and encapsulation, optimizations, Dynamic Host Configuration Protocol (DHCP).

UNIT-IV (8 Lectures)

Mobile Transport Layer : Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

UNIT-V (8 Lectures)

Mobile Ad hoc Networks (MANETs): Introduction, Characteristics, Applications & Challenges of a MANET, Routing, Proactive, Reactive and Hybrid Routing Algorithms.

Text Books:

1. Jochen Schiller, "Mobile Communications", Addison-Wesley, 2nd edition, 2004.
2. Rajkamal, "Mobile computing" Second Edition ,Oxford University Press.

Reference Books:

1. Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", Wiley, 2002, ISBN 0471419028.
2. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden ,Schwiebert, Loren, "Fundamentals of Mobile and Pervasive Computing", ISBN: 0071412379, McGraw- Hill Professional, 2005.
3. Hansmann, Merk, Nicklous, Stober, "Principles of Mobile Computing", Springer, second edition, 2003.
4. MartynMallick, "Mobile and Wireless Design Essentials", Wiley DreamTech, 2003.

Web References:

1. https://www.youtube.com/watch?v=Eu_mTZxPofI
2. https://slideplayer.com/slide/4810167/
3. https://www.tutorialspoint.com/mobile_computing/mobile_computing_useful_resources.htm.
4. http://www.freepdfbook.com/mobile-communications-jochen-schiller/

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B.Tech IV Year II Semester

Course Structure

L	T	P	C
3	0	0	3

NATURAL LANGUAGE PROCESSING
(CSIT)

Internal Marks :

Course Code: **External Marks:**

Course Prerequisites: Artificial Intelligence, Machine Learning

Course Objectives:

1. Understand and apply fundamental algorithms and techniques in the area of natural language processing (NLP).
2. Understand approaches to syntax and semantics in NLP.
3. Understand current methods for statistical approaches to machine translation.
4. Understand language modeling.
5. Understand machine learning techniques used in NLP.

Course Outcomes:

1. Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.
2. Ability to design, implement and analyze NLP algorithms.
3. To develop language modelling using NLP algorithms.
4. To write NLP algorithms to check syntax and semantics
5. To deploy a conversational agent using NLP.

UNIT I: (9 Lectures)

Introduction to Natural Language Understanding, Syntactic Processing: Grammars and Parsing.

UNIT II: (9 Lectures)

Features and Augmented Grammars, Toward Efficient Parsing, Ambiguity Resolution.

UNIT III: (10 Lectures)

Statistical Methods: Probabilistic Context-Free Grammars, Best-First Parsing.

UNIT IV: (8 Lectures)

Semantic Interpretation: Linking Syntax and Semantics, Ambiguity Resolution, other Strategies for Semantic Interpretation.

UNIT V: (9 Lectures)

Context and World Knowledge: Using World Knowledge, Discourse Structure, Defining a Conversational Agent.

Text Books:

1. Natural Language Understanding – James Allen, Second Edition, Pearson Education.

References:

1. Speech and Language Processing – Daniel Jurafsky, James H.Martin.
2. Foundations of Statistical Natural Language Processing – Christopher Manning, Hinrich Schutze, MIT Press.
3. Charniack, Eugene, Statistical Language Learning, MIT Press, 1993.
4. Jurafsky, Dan and Martin, James, Speech and Language Processing, 2nd Edition, Prentice Hall, 2013-2014
5. Manning, Christopher and Henrich, Schutze, Foundations of Statistical Natural Language Processing, MIT Press, 1999.

Web References:

1. https://onlinecourses.nptel.ac.in/noc19_cs56/preview
2. https://www.coursera.org/specializations/natural-language-processing
3. https://lecturenotes.in/subject/371/natural-language-processing-nlp
4. https://www.tutorialspoint.com/natural_language_processing/index.htm

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B.Tech IV Year I Semester

Course Structure

L	T	P	C
3	0	0	3

DEEP LEARNING
(CSIT)

Internal Marks : 30

Course Code: **External Marks: 70**

Course Prerequisites: Artificial Intelligence, Machine Learning

Course Objectives:

1. Understand complexity of Deep Learning algorithms and their limitations.
2. Understand modern notions in data analysis oriented computing.
3. Be capable of confidently applying common Deep Learning algorithms in practice and implementing their own.
4. Be capable of performing distributed computations.
5. Be capable of performing experiments in Deep Learning using real-world data.

Course Outcomes:

1. Implement deep learning algorithms, understand neural networks and traverse the layers of data abstraction which will empower the student to understand data more precisely.
2. Learn topics such as convolutional neural networks, recurrent neural networks, training deep networks and high-level interfaces
3. Understand the language and fundamental concepts of artificial neural networks
4. Troubleshoot and improve deep learning models
5. Build own deep learning project
6. Differentiate between machine learning, deep learning and artificial intelligence

UNIT I: (9 Lectures)

Introduction to Machine Learning : Supervised and Unsupervised learning,Linear Models, Perceptrons: What is a Perceptron, XOR Gate

Introduction to TensorFlow : Computational Graph, Key highlights, Creating a Graph, Regression example.

UNIT II: (9 Lectures)

Activation Functions : Sigmoid,ReLU, Hyperbolic Fns,Softmax Artificial Neural Networks : Introduction, Perceptron Training Rule, Gradient Descent Rule.

Gradient Descent and Backpropagation: Gradient Descent, Stochastic Gradient Descent, Backpropagation, Some problems in ANN.

UNIT III: (10 Lectures)

Optimization and Regularization :Overfitting and Capacity, Cross Validation,Feature Selection, Regularization, Hyperparameters

Autoencoders (standard, sparse, denoising, contractive, etc), Adversarial Generative Networks, Autoencoder and DBM.

UNIT IV: (9 Lectures)

Introduction to Convolutional Neural Networks: Introduction to CNNs, Kernel filter, Principles behind CNNs, Multiple Filters, CNN applications **Introduction to Recurrent Neural Networks**: Introduction to RNNs, Unfolded RNNs, Seq2Seq RNNs, LSTM, RNN applications.

UNIT V: (8 Lectures)

Deep Learning applications: Image Processing, Natural Language Processing, Speech Recognition, Video Analytics.

Text Books:

1. Goodfellow, I., Bengio,Y., and Courville, A., Deep Learning, MIT Press, 2016.

References:

1. Yegnanarayana, B., Artificial Neural Networks PHI Learning Pvt. Ltd, 2009.
2. Golub, G.,H., and Van Loan,C.,F., Matrix Computations, JHU Press,2013.
3. Satish Kumar, Neural Networks: A Classroom Approach, Tata McGraw- Hill Education, 2004

Web References:

1. https://www.ibm.com/cloud/learn/deep-learning
2. https://en.wikipedia.org/wiki/Deep_learning
3. https://www.geeksforgeeks.org/introduction-deep-learning/

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B.Tech IV Year I Semester

Course Structure

L	T	P	C
3	0	0	3

MULTIMEDIA APPLICATION DEVELOPMENT
(CSIT)

Internal Marks : 30

Course Code: **External Marks: 70**

Course Prerequisites: Nil.

Course Objectives:

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

Course Outcomes:

1. Demonstrate knowledge and understanding of the concepts, principles and theories of Multimedia Applications and Virtual environments
2. Demonstrate knowledge and understanding of the current issues involved with development and deployment of multimedia system
3. Analyze and solve problems related to their expertise in Multimedia Applications
4. Demonstrate their ability to extend their basic knowledge to encompass new principles and practice
5. Demonstrate their computing, technical and theoretical skills by developing a substantial Multimedia application.

UNIT I: (7 Lectures)

Fundamental concepts Fundamental concepts in Text and Image: Multimedia and hypermedia. World Wide Web, overview of multimedia software tools.

Graphics and Image data representation graphics/image data types, file formats.

UNIT II: (7 Lectures)

Color in image and video Color in image and video: color science, color models in images, color models in video.

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 III: (12 Lectures)

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 IV: (10 Lectures)

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, Frequency Masking, Temporal Masking, MPEG Audio, MPEG Layers, MPEG Audio Strategy, MPEG Audio Compression Algorithm, MPEG-2 AAC (Advanced Audio Coding).

UNIT V: (9 Lectures)

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, Media-on-Demand (MOD).

Text Books:

1. Fudamentals of Multimedia by Ze-Nian Li and Mark S. Drew PHIl l Pearson Education
2. Multimedia System Design, Andleigh and Thakarar , PHI
3. Multimedia Technology & Application, David Hillman, Galgotia Publications.

References:

1. Rajan Parekh “Principles of Multimedia” (Tata McGraw-Hill)
2. S.J.Gibbs & D.C.Tsichritzis “Multimedia Programming”, Addison Wesley 1995
3. P.W.Agnew & A.S.Kellerman “Distributed Multimedia”, AddisonWesley 1996
4. C.A.Poynton, “A Technical Introduction to Digital Video” Wiley1996
5. F.Fluckiger, “Understanding Networked Multimedia”, Prentice- Hall 1995

Web References:

1. https://www.tutorialspoint.com/multimedia/index.htm

2. https://www.wisdomjobs.com/e-university/multimedia-tutorial-270.html
3. https://dokumen.tips/documents/the-manualscom-fundamentals-of-multimedia-by-ze-nian-li-and-mark-s-drew-solution-manual.html
4. https://www.academia.edu/34336904/Fundamentals_of_Multimedia

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B.Tech IV Year I Semester

Course Structure

L	T	P	C
3	0	0	3

BIG DATA ANALYTICS
(CSIT)

Internal Marks : 30
Course Code: **External Marks: 70**

Course Prerequisites: Fundamentals of Java Programming

Course Objectives:

6. Understand the big data characteristics, importance and HDFS.
7. Apply the MapReduce concepts to work with the big data.
8. Able to Understand Hadoop I/O.
9. Apply Pig latin, Apache Spark tools to solve the word count example.
10. Apply Hive structure to Hadoop data.

Course Outcomes:

6. Understand HDFS Architecture to store the data in a distributed environment
7. Apply MapReduce concepts to work with the big data.
8. Implementation of custom writable in Hadoop I/O.
9. Able to Apply Pig latin, Apache Spark tools to work with big data problems
10. Apply hive client to store and work with big data.

UNIT I: (9 Lectures)

Introduction to Big Data: Big Data-definition, Characteristics of Big Data (Volume, Variety, Velocity, Veracity, Validity), Importance of Big Data.

Working with Big Data: Google File System, Hadoop Distributed File System (HDFS) – Building blocks of Hadoop (Namenode, Datanode, Secondary Namenode, JobTracker, TaskTracker), Introducing and Configuring Hadoop cluster (Local, Pseudo-distributed mode, Fully Distributed mode), Configuring XML files.

UNIT II: (9 Lectures)

Writing MapReduce Programs: A Weather Dataset, Understanding Hadoop API for MapReduce Framework (Old and New), Basic programs of Hadoop MapReduce: Driver code, Mapper code, Reducer code, RecordReader, Combiner, Partitioner

UNIT III: (9 Lectures)

Hadoop I/O: The Writable Interface, WritableComparable and comparators, Writable Classes: Writable wrappers for Java primitives, Text, BytesWritable, NullWritable, ObjectWritable and GenericWritable, Writable collections, Implementing a Custom Writable: Implementing a RawComparator for speed, Custom comparators.

UNIT IV: (9 Lectures)

Pig: Hadoop Programming Made Easier Admiring the Pig Architecture, Going with the Pig Latin Application Flow, Working through the ABCs of Pig Latin, Evaluating Local and Distributed Modes of Running Pig Scripts, Checking out the Pig Script Interfaces, Scripting with Pig Latin.

Apache Spark: Introduction to Apache spark, features, components, RDD, installation, writing word count using apache spark, hadoop vs spark.

UNIT V: (9 Lectures)

Applying Structure to Hadoop Data with Hive: Saying Hello to Hive, Seeing How the Hive is Put Together, Getting Started with Apache Hive, Examining the Hive Clients, Working with Hive Data Types, Creating and Managing Databases and Tables, Seeing How the Hive Data Manipulation Language Works, Querying and Analyzing Data.

Text Books:

3. Hadoop: The Definitive Guide by Tom White, 3rd Edition, O'reilly 2009 (UNIT-I,II,III,IV,V).
4. Dirk deRoos, Chris Eaton, George Lapis, Paul Zikopoulos, Tom Deutsch "Understanding Big Data Analytics for Enterprise Class Hadoop and Streaming Data", 1st Edition, TMH,2012 (UNIT-I).

References:

4. Hadoop in Action by Chuck Lam, MANNING Publ.
5. Hadoop in Practice by Alex Holmes, MANNING Publishers
6. Mining of massive datasets, AnandRajaraman, Jeffrey D Ullman, Wiley Publications.

Web References:

5. https://nptel.ac.in/courses
6. https://www.tutorialspoint.com/spark

7. https://www.youtube.com/watch?v=zez2Tv-bcXY
8. https://www.youtube.com/watch?v=VSbU7bKfNkA

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B.Tech IV Year I Semester

Course Structure

L	T	P	C
3	0	0	3

SOCIAL MEDIA ANALYTICS
(CSIT)

Internal Marks : 30

Course Code: **External Marks: 70**

Course Prerequisites: Nil

Course Objectives:

1. To understand the concept of semantic web and related applications.
2. To learn knowledge representation using ontology.
3. To understand human behaviour in social web and related communities.
4. To learn visualization of social networks.

Course Outcomes:

1. Develop semantic web related applications.
2. Represent knowledge using ontology.
3. Predict human behaviour in social web and related communities.
4. Visualize social networks..

UNIT I: (9 Lectures)

Introduction to Semantic Web: Limitations of current Web – Development of Semantic Web – Emergence of the Social Web – Social Network analysis: Development of Social Network Analysis – Key concepts and measures in network analysis – Electronic sources for network analysis: Electronic discussion networks, Blogs and online communities – Web-based networks.

UNIT II: (9 Lectures)

Modelling, Aggregating and Knowledge Representation: Ontology and their role in the Semantic Web: Ontology-based knowledge Representation – Ontology languages for the Semantic Web: Resource Description Framework – Web Ontology Language – **Modelling and aggregating social network data**: State-of-the-art in network data representation – Ontological representation of social individuals – Ontological representation of social relationships.

UNIT III: (10 Lectures)

Extraction and Mining Communities in Web Social Networks: Extracting evolution of Web Community from a Series of Web Archive – Detecting communities in social networks –

Definition of community – Evaluating communities – Methods for community detection and mining – Applications of community mining algorithms – Tools for detecting communities social network infrastructures and communities – Decentralized online social networks.

UNIT IV: (8 Lectures)

Predicting Human Behaviour and Privacy Issues: Understanding and predicting human behaviour for social communities – User data management – Inference and Distribution – Enabling new human experiences – Reality mining – Context – Awareness – Privacy in online social networks – Trust in online environment – Trust models based on subjective logic – Trust network analysis – Trust transitivity analysis – Combining trust and reputation.

UNIT V: (9 Lectures)

Visualization and Applications of Social Networks: Graph theory – Centrality – Clustering – Node-Edge Diagrams – Matrix representation – Visualizing online social networks, Visualizing social networks with matrix-based representations – Matrix and Node-Link Diagrams – Hybrid representations – Applications – Cover networks – Community welfare – Collaboration networks – Co-Citation networks.

Text Books:

1. Peter Mika, -Social Networks and the Semantic Web, First Edit ion, Springer 2007.
1. Borko Furht, -Handbook of Social Network Technologies and Applicat ions, 1st Edition, Springer, 2010.

References:

1. Guandong Xu, Yanchun Zhang and Lin Li, Web Mining and Social Networking – Techniques and applications, First Edition, Springer, 2011.
2. Dion Goh and Schubert Foo - Social information Retrieval Systems: Emerging Technologies and Applications for Searching the Web Effectively, IGI Global Snippet, 2008.
3. Max Chevalier, Christine Julien and Chantal Soulé-Dupuy, Collaborative and Social Information Retrieval and Access: Techniques for Improved user Modelling, IGI Global Snippet, 2009.
4. John G. Breslin, Alexander Passant and Stefan Decker, -The Social Semantic Web, Springer, 2009

Web References:

1. https://learnengineering.in/cs6010-social-network-analysis/
2. https://www.tutorialspoint.com/social_media_marketing/social_media_analysis.htm
3. https://csenotescorner.blogspot.com/2017/01/cs6010-social-network-analysis-syllabus.html

4. https://www.sagepub.com/sites/default/files/upm-binaries/35208_Chapter1.pdf

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

L	T	P	C
3	0	0	3

DATA VISUALIZATION TECHNIQUES
(CSIT)

Course Code: **Internal Marks: 30**
External Marks: 70

Course Prerequisite: **Nil**

Course Objectives:

1. To develop skills to both design and critique visualizations.
2. To introduce visual perception and core skills for visual analysis.
3. To understand visualization for time-series analysis.
4. To understand visualization for ranking analysis.
5. To understand visualization for deviation analysis.
6. To understand visualization for distribution analysis.
7. To understand visualization for correlation analysis.
8. To understand visualization for multivariate analysis.
9. To understand issues and best practices in information dashboard design.

Course Outcomes:

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

1. Explain principles of visual perception
2. Apply core skills for visual analysis
3. Apply visualization techniques for various data analysis tasks
4. Apply Visualization techniques for multivariate analysis
5. Design information dashboard

UNIT-I: (9 Lectures)

CORE SKILLS FOR VISUAL ANALYSIS

Information visualization – effective data analysis – traits of meaningful data – visual perception –making abstract data visible – building blocks of information visualization – analytical interaction – analytical navigation – optimal quantitative scales – reference lines and regions – trellises and crosstabs – multiple concurrent views – focus and context – details on demand – over-plotting reduction – analytical patterns – pattern examples.

UNIT II:

TIME-SERIES, RANKING, AND DEVIATION ANALYSIS (9 Lectures)
Time-series analysis – time-series patterns – time-series displays – time-series best practices – part-to-whole and ranking patterns – part-to-whole and ranking displays – best practices – deviation analysis – deviation analysis displays – deviation analysis best practices.

UNIT III:
DISTRIBUTION, CORRELATION, AND MULTIVARIATE ANALYSIS (9Lectures)
Distribution analysis – describing distributions – distribution patterns – distribution displays – distribution analysis best practices – correlation analysis –describing correlations – correlation patterns – correlation displays – correlation analysis techniques and best practices – multivariate analysis – multivariate patterns – multivariate displays – multivariate analysis techniques and best practices.

UNIT IV:
INFORMATION DASHBOARD DESIGN (9 Lectures)
Information dashboard – Introduction– dashboard design issues and assessment of needs – Considerations for designing dashboard-visual perception – Achieving eloquence.

UNIT V:
INFORMATION DASHBOARD DESIGN (9 Lectures)
Advantages of Graphics _Library of Graphs – Designing Bullet Graphs – Designing Spark lines – Dashboard Display Media –Critical Design Practices – Putting it all together- Unveiling the dashboard.

Text Books

1. Ben Fry, "Visualizing data: Exploring and explaining data with the processing environment", O'Reilly, 2008.
2. Edward R. Tufte, "The visual display of quantitative information", Second Edition, Graphics Press, 2001.
3. Evan Stubbs, "The value of business analytics: Identifying the path to profitability", Wiley, 2011.

Reference Books

1. Gert H. N. Laursen and Jesper Thorlund, "Business Analytics for Managers: Taking business intelligence beyond reporting", Wiley, 2010.
2. Nathan Yau, "Data Points: Visualization that means something", Wiley, 2013.
3. Stephen Few, "Information dashboard design: Displaying data for at-a-glance monitoring", second edition, Analytics Press, 2013.
4. Stephen Few, "Now you see it: Simple Visualization techniques for quantitative analysis", Analytics Press, 2009.
5. Tamara Munzner, Visualization Analysis and Design, AK Peters Visualization Series, CRC Press, Nov. 2014

Web References:

1. https://www.tutorialspoint.com/business_writing_skills/data_visualization.htm

B.Tech IV Year I Semester

Course Structure			
L	**T**	**P**	**C**
3	**0**	**0**	**3**

BLOCKCHAIN TECHNOLOGY
(CSIT)

Internal Marks : 30

Course Code: **External Marks: 70**

Course Prerequisites: Cryptography.

Course Objectives:

1. The students to explore the driving force behind the crypto currency Bit coin.
2. Along with the Decentralization, Cryptography,
3. Bit coins with its alternative coins,
4. Smart contracts and outside of currencies.

Course Outcomes:

1. Understand the types, benefits and limitation of blockchain.
2. Explore the blockchain decentralization and cryptography concepts.
3. Enumerate the Bitcoin features and its alternative options.
4. Describe and deploy the smart contracts
5. Summarize the blockchain features outside of currencies.

UNIT I: (9 Lectures)

Introduction: Distributed systems, History of blockchain, Introduction to blockchain, Types of blockchain, CAP theorem and blockchain, Benefits and limitations of blockchain.

UNIT II: (9 Lectures)

Decentralization and Cryptography: Decentralization using blockchain, Methods of decentralization, Routes to decentralization, Decentralized organizations.

Cryptography and Technical Foundations: Cryptographic primitives, Asymmetric cryptography, Public and private keys.

UNIT III: (10 Lectures)

Bitcoin and Alternative Coins A: Bitcoin, Transactions, Blockchain, Bitcoin payments B:Alternative Coins, Theoretical foundations, Bitcoin limitations, Namecoin, Litecoin, Primecoin, Zcash..

UNIT IV: (9 Lectures)

Smart Contracts and Ethereum: Smart Contracts: Definition, Ricardian contracts. Ethereum 101: Introduction, Ethereum blockchain, Elements of the Ethereum blockchain, Precompiled contracts.

UNIT V: (8 Lectures)

Alternative Blockchains: Blockchains Blockchain-Outside of Currencies: Internet of Things, Government, Health, Finance, Media.

Text Books:

1. Mastering Blockchain - Distributed ledgers, decentralization and Smart contracts explained, Author- Imran Bashir, Packt Publishing Ltd, Second Edition, ISBN 978-1-78712-544-5, 2017.

References:

1. Bitcoin and Crypto currency Technologies, Author- Arvind Narayanan, Joseph Bonneau,Edward Felten, Andrew Miller, Steven Goldfeder, Princeton University, 2016
2. Blockchain Basics: A Non-Technical Introduction in 25 Steps, Author- Daniel Drescher, Apress, First Edition, 2017
3. Mastering Bitcoin: Unlocking Digital Cryptocurrencies, Andreas M. Antonopoulos, O'Reilly Media, First Edition, 2014

Web References:

1. https://www.javatpoint.com/blockchain-tutorial
2. https://www.tutorialspoint.com/blockchain/index.htm
3. https://www.guru99.com/blockchain-tutorial.html
4. https://www.simplilearn.com/tutorials/blockchain-tutorial

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B.Tech IV Year I Semester

Course Structure

L	T	P	C
3	0	0	3

CLOUD COMPUTING
(CSIT)

Internal Marks : 40

Course Code: **External Marks: 60**

Course Prerequisites: Nil

Course Objectives:

1. The cloud environment, building software systems and components that scale to millions of users in modern internet.
2. Cloud concepts capabilities across the various cloud service models including Iaas, Paas, Saas, and Virtualizations.
3. Developing cloud based software applications on top of cloud platforms.
4. Programming and Software Environments on different cloud platforms.
5. Understanding of cloud resource management scheduling algorithms and file systems.

Course Outcomes:

1. Apply the key dimensions of the challenge on Cloud Computing
2. Assessment of the economics, financial, and technological implications for selecting cloud computing for own organization
3. Assessing the financial, technological, and organizational capacity of employer's for actively initiating and installing cloud-based applications.
4. Assessment of own organizations' needs for capacity building and training in cloud computing-related IT areas.
5. Accessing the data from different file systems on different cloud flat forms.

UNIT I: (9 Lectures)

Systems modeling, Clustering: Scalable Computing over the Internet, Technologies for Network based systems, System models for Distributed and Cloud Computing, Software environments for distributed systems and clouds, Performance, Security And Energy Efficiency.

UNIT II: (8 Lectures)

Virtual Machines and Virtualization: Implementation Levels of Virtualization, Virtualization Structures/ Tools and mechanisms, Virtualization of CPU, Memory and I/O Devices.

UNIT III: (10 Lectures)

Cloud Platform Architecture: Cloud Computing and service Models, Architectural Design of Compute and Storage Clouds, Public Cloud Platforms, Inter Cloud Resource Management, Cloud Security and Trust Management. Service Oriented Architecture, Message Oriented Middleware.

UNIT IV: (8 Lectures)

Cloud Programming and Software Environments: Parallel & Distributed Programming Paradigms, Programming Support of Google App Engine, Programming on Amazon AWS-Simple Storage Service(S3) Architecture and Microsoft Azure, Emerging Cloud Software Environments.

UNIT V: (10 Lectures)

Cloud Resource Management and Scheduling and Storage Systems: Policies and Mechanisms for Resource Management, Two level Resource Allocation Architecture.

Scheduling Algorithms for Computing Clouds: Fair Queuing, Borrowed Virtual Time, Deadlines in cloud and map reduce scheduling.

Storage models: Distributed Vs parallel file systems: Google file system. Apache Hadoop, BigTable.

Text Books:

1. Distributed and Cloud Computing, Kai Hwang, Geoffry C. Fox, Jack J. Dongarra MK Elsevier.
2. Cloud Computing, Theory and Practice, Dan C Marinescu, MK Elsevier.\
3. Cloud Computing, A Hands on approach, ArshadeepBahga, Vijay Madisetti,University

References:

1. Cloud Computing, A Practical Approach, Anthony T Velte, Toby J Velte, Robert Elsenpeter, TMH

2. Mastering Cloud Computing, Foundations and Application Programming, Raj Kumar Buyya, Christen vecctiola, S Tammaraiselvi, TMH.

Web References:

1. https://pdfs.semanticscholar.org/0c79/1585b91e80320e9cbff9edefcdd834bd2791.pdf
2. http://www.ijircce.com/upload/2017/january/49_2_NEW.pdf
3. https://www.ripublication.com/irph/ijict_spl/ijictv4n1spl_07.pdf
4. http://aircconline.com/ijist/V6N2/6216ijist01.pdf
5. www.javatpoint.com

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

L	T	P	C
0	0	3	1.5

SCRIPTING LANGUAGES LAB
(CSIT)

Internal Marks : 15
Course Code: **External Marks: 60**

Course Prerequisites: Nil

Course Objectives:

1. To understand the various steps in program development.
2. To understand the basic concepts in Script Language.
3. To understand how to write modular and readable Script language Programs.
4.To write script language to solve problems using Ruby, Perl and TCL.

List of Experiments:

1. Write a Ruby script to create a new string which is n copies of a given string where n is a nonnegative integer
2. Write a Ruby script which accept the radius of a circle from the user and compute the parameter and area.
3. Write a Ruby script which accept the user's first and last name and print them in reverse order with a space between them
4. Write a Ruby script to accept a filename from the user print the extension of that

5. Write a Ruby script to find the greatest of three numbers
6. Write a TCL script for Sorting a list using a comparison function
7. Write a TCL script to comparing the file modified times.
8. a) Write a Perl script to substitute a word, with another word in a string.
   b) Write a Perl script to validate IP address and email address.
9. Write a Perl script to print the file in reverse order using command line arguments
10. Write a TCL script to find the factorial of a number.

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

L	T	P	C
0	0	3	1.5

Android Application Development Lab

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

Course Prerequisite: Nil

Course Objectives:
To enlighten the student with knowledge base in Android Applications Development.

Course Outcomes:
On successful completion of this course, the students will be able to:
1 : Demonstrate various components of Android Framework.
2 : Develop user Interfaces for the Android Application.
3 : Develop Android Applications using Android API and Services.
4 : Develop Android Applications which access data from Internet.

List of Experiment
1. Create Hello World Android App using **Android Studio** and explain each step in detail.
2. Create an Activity that receive name form the user and displays **Hello Name** to the user using Android Studio.
3. Create an Activity that demonstrates the Life Cycle of an Activity.
4. Create an Android Application which receives URL form the user and open appropriate page in the system browser with the help of Implicit Intents using Android Studio.
5. Create an Android App which receives name form the user and displays welcome name in Second Activity.

6. Create Login Screen Application which shows Home screen if Login success otherwise displays error message using Android Studio.
7. Write an Android application program that demonstrate the use of
    a. RelativeLayout.
    b. LinearLayout.
    c. GridLayout.
    d. TableLayout.
8. Write an Android application program that demonstrates the use ImageView.
9. Write an Android application program that demonstrates the use of ListView and ArrayAdapter.
10. Write an Android application program that demonstrates how to create Custom ListView and Custom Adapters.
11. Write an Android application program that demonstrates the use of SQLite Database and Cursor.
12. Write an Android application program that demonstrates the use AsyncTask.
13. Write an Android application program that demonstrates Notifications.
14. Write an Android application program that demonstrates Shared Preferences.
15. Write an Android application program that connect to the internet, gets JSON data and displays the result in UI by parsing JSON data.

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HUMAN COMPUTER INTERACTION

(CSIT)

Course Code: P18CIE17 **Internal Marks: 40**

External Marks: 60

Course Prerequisite: Knowledge of Computer and Its Architecture

Course Objectives:

1. To provide basic methodologies and processes for designing interfaces.
2. To improve the interaction between users and computers by making computers more usable and receptive to the user‘s needs.
3. To provide relevant principles of behaviour, mostly derived from cognitive science and psychology and other sources that describe human ethologic in particular environment, especially technological ones.
4. To make the students familiar with developing new interfaces and interaction techniques.

Course Outcomes:

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

1. Identify the elements of good user interface design through effective GUI.
2. Identify the importance of human characteristics and understanding business functions.
3. Analyze screen design principles for making good decisions based on technological considerations in interface design.
4. Select the window, device and screen based controls through navigation schemes.
5. Identify the basic components and interaction devices to interact with the computers.

UNIT-I: (9 Lectures)

Introduction: Importance of user Interface – definition, importance of good design, benefits of

good design. A brief history of Screen design.

The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

Unit-II: (9 Lectures)

Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions.

UNIT-III (10 Lectures)

Screen Designing : Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

UNIT-IV (8 Lectures)

Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls.

UNIT-V (9 Lectures)

Components – text and messages, Icons and images – Multimedia, colour – uses, problems with choosing colours.

Interaction Devices – Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

Text Books:

1. Wilbert O Galitz, ‖The Essential Guide to User Interface Design‖, Wiley DreamaTech, Third Edition, 2007.

Reference Books:

1. Ben Shneiderman,CatherinePlaisant,―Designing the User Interface‖,Fourth Edition, Pearson Education ,2008.
2. ALAN DIX, JANET FINLAY, GREGORYD. ABOWD, RUSSELL BEALE,―HumanComputer Interaction‖,Third Edition,PEARSON,2009.

Web References:

1. http://ps.fragnel.edu.in/~dipalis/prgdwnl/eguid.pdf
2. https://www.alljntuworld.in/download/human-computer-interaction-materials-notes/
3. http://www.crectirupati.com/sites/default/files/lecture_notes/HCI-notes.pdf

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Web Development Using MEAN Stack
(CSIT)

Course Code: P18CIE19 **Internal Marks: 40**
External Marks: 60

Course Prerequisite: HTML, JAVA Script

Course Objectives:

This course is designed to introduce students to learn how to design both the front and back end of web applications. The course will introduce web-based media-rich programming tools for creating interactive web pages.

Course Outcomes:

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

1. Apply Angular8 to develop web applications.
2. Make use of Forms and Services.
3. Utilize Node.js to create Server Side Applications.
4. Make use of Express to deploy web applications.
5. Experiment with NoSQL using MongoDB.

UNIT-I: (11 Lectures)

Angular8: Introduction, Installation, Creating First Angular8 Application, Architecture, Angular Components and Templates, Data Binding, Directives, Pipes, Services and Dependency Injection.

Unit-II: (12 Lectures)

Angular8: Reactive Programming, HTTP Client Programming, Angular Material, Routing and Navigation, Forms, Form Validation, CLI Commands.

UNIT-III (13 Lectures)

Node.js: Introduction, Node.js Process Model, Node.js Console, Node.js Basics, Node.js Modules, Local Modules, Export Module, Node Package Manager, Node.js Web Server..

UNIT-IV (12 Lectures)

Node.js Contd. & Express.js: Node.js File System, Node.js Event Emitter,
Express.js: Express.js Web App, Serving Static Resources.

UNIT-V (12 Lectures)

MongoDB: Access MongoDB in Node.js, Connecting and Creating Database in MongoDB, Insert Documents, Update Documents, Delete Documents, Query Database.

Text Books:

1. Node.js, MongoDB and Angular Web Development by Brad Dayley, Brendan Dayley-2nd Edition – Addison –Wesley.
2. Getting MEAN with Mango, Express, Angular and Node by Simon Holmes, Clive Harber-2nd Edition - Manning Publications.
3. MEAN Cookbook by Nicholas McClay- Packt.

Reference Books:

1. Node.js: Web Development for Beginners by Joseph Conner.
2. Mean Stack Developer by Camila Cooper.

Web References:

1. https://www.tutorialspoint.com/angular8/index.htm.
2. https://www.edx.org/course/introduction-to-mongodb-using-the-mean-stack.
3. https://www.simplilearn.com/full-stack-web-developer-mean-stack-certification-training.
4. https://www.tutorialsteacher.com/nodejs/expressjs-web-application.

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CYBER SECURITY

(CSIT)

Course Code: P18CIE20 **Internal Marks: 40**

External Marks: 60

Course Prerequisite: Nil

Course Objectives:

1. The Cyber security Course will provide the students with foundational Cyber Security principles, Security architecture, risk management, attacks, incidents, and emerging IT and IS technologies.
2. Students will gain insight into the importance of Cyber Security and the integral role of Cyber Security professionals.

Course Outcomes:

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

1. Cyber Security architecture principles
2. Identifying System and application security threats and vulnerabilities
3. Identifying different classes of attacks
4. Cyber Security incidents to apply appropriate response
5. Describing risk management processes and practices

UNIT-I: (9 Lectures)

Introduction to Cyber Security: Basic Cyber Security Concepts, layers of security, Vulnerability, threat, Harmful acts, Internet Governance – Challenges and Constraints, Computer Criminals, CIA Triad, Assets and Threat, motive of attackers, active attacks, passive attacks, Software attacks, hardware attacks, Spectrum of attacks, Taxonomy of various attacks, IP spoofing, Methods of defence, Security Models, risk management, Cyber Threats-Cyber Warfare, Cyber Crime, Cyber terror

Unit-II: (10 Lectures)

Cyber offenses: How Criminals Plan Them –Introduction, How Criminals Plan the Attacks, Social Engineering, Cyber stalking, Cyber cafe and Cybercrimes, Botnets: The Fuel for Cybercrime, Attack Vector Cloud Computing.

Cybercrime Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit Card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication Service Security, Attacks on Mobile/Cell Phones, Laptops.

UNIT-III (8 Lectures)

Tools and Methods Used in Cybercrime: Introduction, Proxy Servers and Anonymizers, Phishing, Password Cracking, Key loggers and Spywares, Virus and Worms, Trojan Horses and Backdoors, Steganography, DoS and DDoS Attacks, SQL Injection, Buffer Overflow, Attacks on Wireless Networks, Phishing and Identity Theft.

UNIT-IV (8 Lectures)

Cybercrimes and Cyber security: Why Do We Need Cyber laws: The Indian Context, The Indian IT Act, Challenges to Indian Law and Cybercrime Scenario in India, Consequences of Not Addressing the Weakness in Information Technology Act, Digital Signatures and the Indian IT Act, Information Security Planning and Governance, Information Security Policy Standards, Practices, The information Security Blueprint, Security education, Training and awareness program, Continuing Strategies

UNIT-V (10 Lectures)

Understanding Computer Forensics: Introduction, Historical Background of Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber forensics and Digital Evidence, Forensics Analysis of E-Mail, Digital Forensics Life Cycle, Network Forensics, Approaching a Computer Forensics Investigation, Computer Forensics and Steganography, Relevance of the OSI 7 Layer Model to Computer Forensics,

Forensics and Social Networking Sites: The Security/Privacy Threats, Computer Forensics from Compliance Perspective, Challenges in Computer Forensics, Special Tools and Techniques, Forensics Auditing, Anti-forensics.

Text Books:

1. Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole, SunitBelapure, Wiley.
2. Principles of Information Security, MichealE.Whitman and Herbert J.Mattord, Cengage Learning
3. B. B. Gupta, D. P. Agrawal, Haoxiang Wang, Computer and Cyber Security: Principles, Algorithm, Applications, and Perspectives, CRC Press, ISBN 9780815371335, 2018..

Reference Books:

1. Information Security, Mark Rhodes, Ousley, MGH.

Web References:

1. https://www.udemy.com/cyber-security/online-course
2. https://www.tutorialspoint.com/.../cyber_crime_and_cyber_security.htm
3. https://byjus.com/free-ias-prep/cyber-security
4. https://www.coursehero.com/file/97034432/cyber-security

Internet of Things
(CSIT)

Internal Marks : 40

Course Code: P18CIE21 **External Marks: 60**

Course Prerequisites: Computer Networks

Course Objectives:

1. Identify problems that are amenable to solution by AI methods, and which AI methods may be suited to solving a given problem.
2. Formulate a given problem in the language/framework of different AI methods (e.g., as a search problem, as a constraint satisfaction problem, as a planning problem, as a Markov decision process, etc).
3. Implement basic AI algorithms (e.g., standard search algorithms or dynamic programming).
4. Design and carry out an empirical evaluation of different algorithms on problem formulation, and state the conclusions that the evaluation supports.

Course Outcomes:

1. Demonstrate knowledge and understanding of the security and ethical issues of the Internet of Things
2. Conceptually identify vulnerabilities, including recent attacks, involving the Internet of Things
3. Develop different M2M communication models
4. Compare and contrast the threat environment based on industry and/or device type.
5. Understand and Implement various IoT cloud based services..

UNIT I: (8 Lectures)

The Internet of Things: An Overview of Internet of things, Internet of Things Technology, behind IoTs, Sources of the IoTs, M2M Communication, Examples of IoTs, Design Principles For Connected Devices.

UNIT II: (10 Lectures)

IoT DESIGN METHODOLOGY: Purpose & Requirements Specification, Process Specification, Domain Model Specification, Information Model Specification, Service Specification, IoT Level Specification, Functional View Specification, Operational View specification, Device & Component Integration and Application Development.

UNIT III: (11 Lectures)

PROTOTYPING EMBEDDED DEVICE WITH ARDUINO: Sensors, Actuators, Embedded Computing Basics- Micro Controllers, System on Chips, Choosing your Platform, Arduino – Developing on the Arduino.

PROTOTYPING EMBEDDED DEVICE WITH RASPBERRY PI: Raspberry PI – Introduction, cases and Extension Boards, Developing on the Raspberry PI.

UNIT IV: (8 Lectures)

Web Communication protocols for Connected Devices, Data Acquiring, Organizing and Analytics in IoT/M2M, Applications/Services/Business Processes, Everything as a service and Cloud Service Models, IOT cloud-based services using the Xively (Pachube/COSM).

UNIT V: (8 Lectures)

DOMAIN SPECIFIC APPLICATIONS OF IoT: Home Automation, Agriculture Applications, Smart City applications.

Text Books:

1. Internet of Things: Architecture, Design Principles And Applications, Rajkamal, McGraw Hill Higher Education
2. Internet of Things, A.Bahgya and V.Madisetti, Univesity Press, 2015
3. Adrian McEwen & Hakim Cassimally, "Designing the Internet of Things", Wiley Publications – 2014..

References:

1. Designing the Internet of Things, Adrian McEwen and Hakim Cassimally, Wiley
2. Getting Started with the Internet of Things CunoPfister , Oreilly
3. Marco Schwartz, "Internet of Things with the Arduino Yun", Packt Publishing, 2014.
4. Manoel Carlos Ramon, "Intel® Galileo and Intel® Galileo Gen 2: API Features and Arduino Projects for Linux Programmers", Apress, 2014.
5. Waltenegus Dargie,Christian Poellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice.

Web References:

1. https://internetofthingsagenda.techtarget.com/definition/Internet-of-Things-IoT
2. https://www.tutorialspoint.com/internet_of_things/internet_of_things_tutorial.pdf
3. https://www2.deloitte.com/content/dam/insights/us/articles/iot-primer-iot-technologies-applications/DUP_1102_InsideTheInternetOfThings.pdf

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SOFT COMPUTING
(CSIT)

Internal Marks : 40

Course Code: P18CIE22 **External Marks: 60**

Course Prerequisites: Nil

Course Objectives:

To introduce the concepts in Soft Computing such as Artificial Neural Networks, Fuzzy logic- based systems, genetic algorithm-based systems and their hybrids.

Course Outcomes:

1. To Learn about soft computing techniques and their applications.
2. To Analyze various neural network architectures.
3. To Define the fuzzy systems.
4. To Understand the genetic algorithm concepts and their applications.
5. To Identify and select a suitable Soft Computing technology to solve the problem; construct a solution.

UNIT I: (8 Lectures)

Introduction to Soft Computing: Artificial neural networks - biological neurons, Basic models of artificial neural networks – Connections, Learning, Activation Functions, McCulloch and Pitts Neuron, Hebb network.

UNIT II: (9 Lectures)

Artificial Neural Networks : Perception networks – Learning rule – Training and testing algorithm, Adaptive Linear Neuron, Back propagation Network – Architecture, Training algorithm.

UNIT III: (10 Lectures)

Fuzzy Logic and Fuzzy systems:

Fuzzy logic - fuzzy sets - properties - operations on fuzzy sets, fuzzy relations - operations on fuzzy relations.

Fuzzy systems: Fuzzy membership functions, fuzzification, Methods of Membership value assignment - intuition-inference-rank ordering, Lambda –cuts for fuzzy sets, Defuzzification methods.

UNIT IV: (9 Lectures)

Genetic Algorithms: Truth values and Tables in Fuzzy Logic, Fuzzy propositions, Formation of

fuzzy rules -Decomposition of rules –Aggregation of rules, Fuzzy Inference Systems – Mamdani and Sugeno types, Neuro-fuzzy hybrid systems –characteristics – classification.

UNIT V: (9 Lectures)

Hybrid systems: Introduction to genetic algorithm, operators in genetic algorithm - coding - selection - cross over – mutation, Stopping condition for genetic algorithm flow, Genetic -neuro hybrid systems, Genetic-Fuzzy rule based system.

Text Books:

1. S. N. Sivanandam and S. N.Deepa, Principles of soft computing - Wiley India.
2. Timothy J. Ross, Fuzzy Logic with engineering applications – Wiley India.

References:

1. N. K. Sinha and M. M. Gupta, Soft Computing & Intelligent Systems: Theory & Applications-Academic Press /Elsevier. 2009.
2. Simon Haykin, Neural Network- A Comprehensive Foundation- Prentice Hall International, Inc.
3. R. Eberhart and Y. Shi, Computational Intelligence: Concepts to Implementation, Morgan Kaufman/Elsevier, 2007.
4. Ross T.J. , Fuzzy Logic with Engineering Applications- McGraw Hill.
5. Driankov D., Hellendoorn H. and Reinfrank M., An Introduction to Fuzzy Control-Narosa Pub.
6. Bart Kosko, Neural Network and Fuzzy Systems- Prentice Hall, Inc., Englewood Cliffs Goldberg D.E., Genetic Algorithms in Search, Optimization, and Machine Learning-Addison Wesley.

Web References:

1. https://onlinecourses.nptel.ac.in/noc21_cs11/preview
2. https://www.javatpoint.com/what-is-soft-computing
3. https://www.tutorialspoint.com/fuzzy_logic/index.htm
4. https://www.tutorialspoint.com/artificial_neural_network/index.htm

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HIGH PERFORMANCE COMPUTING

(CSIT)

Course Code: P18CIE23 **Internal Marks: 40**

External Marks: 60

Course Prerequisite: Nil

Pre-requisites: Computer Organization and Architecture

Course Objectives

- To introduce the concepts of Modern Processors.
- To introduce Optimization techniques for serial code.
- To introduce Parallel Computing Paradigms.
- To introduce Parallel Programming using MPI.
- To introduce Parallel Programming using OpenMP.

Course Outcome

The students will be able to

i. Appreciate the concepts used in Modern Processors for increasing the performance.
ii. Appreciate Optimization techniques for serial code.
iii. Appreciate Parallel Computing Paradigms.
iv. Identify the performance issues in Parallel Programming using MPI.
v. Identify the performance issues in Parallel Programming using OpenMP.

Unit – I

Modern Processors : Stored Program Computer Architecture- General purpose cache- based microprocessor-Performance based metrics and benchmarks- Moore's Law- Pipelining- Superscalarity- SIMD- Memory Hierarchies Cache- mapping- prefetch- Multicore processors- Mutithreaded processors- Vector Processors- Design Principles- Maximum performance estimates- Programming for vector architecture.

Unit – II

Basic optimization techniques for serial code : scalar profiling-function and line based runtime profiling- hardware performance counters- common sense optimizations- simple measures, large impact- elimination of common subexpressions- avoiding branches-using simd instruction sets- the role of compilers - general optimization options- inlining - aliasing- computational accuracy- register optimizations- using compiler logs- c++ optimizations -temporaries- dynamic memory management- loop kernels and iterators data access optimization: balance analysis and light speed estimates- storage order- case study: jacobi algorithm and dense matrix

transpose.

Unit – III

Parallel Computers : Taxonomy of parallel computing paradigms- Shared memory computers- Cache coherance- UMA - ccNUMA- Distributed-memory computers- Hierarchical systems- Networks- Basic performance characteristics- Buses- Switched and fat- tree networks- Mesh networks- Hybrids - Basics of parallelization - Why parallelize - Data Parallelism - Function Parallelism- Parallel Scalability- Factors that limit parallel execution- Scalability metrics- Simple scalability laws- parallel efficiency - serial performance Vs Strong scalability- Refined performance models- Choosing the right scaling baseline- Case Study: Can slow processors compute faster- Load balance.

Unit – IV

Distributed memory parallel programming with MPI : message passing - introduction to MPI – example - messages and point-to- point communication - collective communication – nonblocking point-to-point communication- virtual topologies – MPI parallelization of Jacobi solver- MPI implementation - performance properties

Unit – V

Shared memory parallel programming with OpenMp : introduction to OpenMp - parallel execution - data scoping- OpenMp work sharing for loops- synchronization - reductions - loop scheduling - tasking - case study: OpenMp- parallel jacobi algorithm- advanced OpenMpwavefront parallelization- Efficient OpenMP programming: Profiling OpenMP programs - Performance pitfalls- Case study: Parallel Sparse matrix-vector multiply.

Text Book

1. Georg Hager, Gerhard Wellein, Introduction to High Performance Computing for Scientists and Engineers, Chapman & Hall / CRC Computational Science series, 2011.

References

1. Charles Severance, Kevin Dowd, High Performance Computing, O'Reilly Media, 2nd Edition, 1998.
2. Kai Hwang, Faye Alaye Briggs, Computer Architecture and Parallel Processing, McGrawHill, 1984.