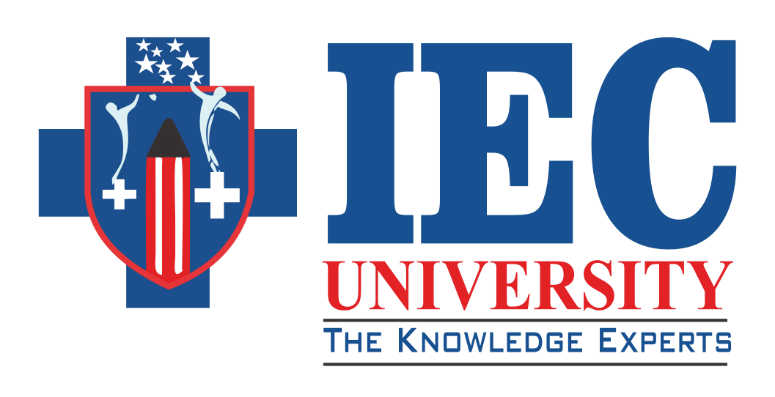
Schemes and Syllabus

(For academic session 2019-20 & onwards)

B.Tech CSE

IEC School of Engineering



Atal Shiksha Nagar (Kallujhanda), P.O.

Mandhala, Village- Nanakpura,

Pinjore-Nalagarh highway, District- Solan,

Himachal Pradesh- 174103

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Table of Content

|  |  |  |
| --- | --- | --- |
| **Section** | **Content** | **Page no.** |
| 1 | Program Outcomes and Program Specific Outcomes |  |
| 2 | Semester wise Scheme |  |
| 3 | Semester wise Syllabus |  |

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| Section 1 |
| Program Outcomes and Program Specific Outcomes |

***Program Outcomes***

***PO-1 Engineering knowledge:*** Apply the knowledge of mathematics, science, engineering fundamentals, and engineering specialization to the solution of complex engineering problems.

***PO-2 Problem analysis:*** Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural and engineering sciences.

***PO-3 Design/development of solutions:*** Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.

***PO-4 Conduct investigations of complex problems:*** Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

***PO-5 Modern tool usage:*** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

***PO-6 The engineer and society:*** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

***PO-7 Environment and sustainability:*** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

***PO-8 Ethics:*** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice**.**

***PO-9 Individual and team work:*** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

***PO-10 Communication:*** Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.

***PO-11 Project management and finance:*** Demonstrate knowledge and understanding of engineering and management principles and apply these to one’s own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

***PO-12 Life-long learning:*** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

***Program Specific Outcomes***

***PSO1:*** An effective skill set while demonstrating through programming and analytical skills.

***PSO2:*** Productivity in the relevant field while professionally even in diverse environment succeeding.

***PSO3:*** An ability to identify /develop/design solutions for Industry/Society Problems through their coding, database and networking skills

***PSO-4:*** Ability to absorb and adopt the ever changing advance Technology in the field of Computer Science & Engineering.

|  |
| --- |
| Section 2 |
| Semester wise Scheme |

**Semester – I**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **L** | **T** | **P** | **CH** | **CP** | **Int. A** | **ESE** | **Total** |
| MATH-101 | Engineering Mathematics-I | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| PHY-101 | Engineering Physics | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-101 | Fundamentals of computer and programming in “C” | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| HUM-101 | Communication Skills | 3 | - | - | 3 | 3 | 60 | 40 | 100 |
| ME-101 | Engineering Mechanics | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-102 | IT infrastructure Landscape Overview | 3 | - | - | 3 | 3 | 60 | 40 | 100 |
| PHY-151 | Engineering Physics Lab. | - | - | 2 | 2 | 1 | 30 | 20 | 50 |
| CSE-151 | Programming in “C” lab. | - | - | 2 | 2 | 1 | 30 | 20 | 50 |
| ME-151 | Engineering Mechanics Lab | - | - | 2 | 2 | 1 | 30 | 20 | 50 |
| HUM-151 | Communication Skills Lab | - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Semester – II**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **L** | **T** | **P** | **CH** | **CP** | **Int. A** | **ESE** | **Total** |
| MATH-201 | Engineering Mathematics-II | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CHEM-101 | Engineering Chemistry | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| ME- 201 | Engineering Drawing | 3 | - | - | 3 | 3 | 60 | 40 | 100 |
| EVS-101 | Environment Science and technology | 3 | - | - | 3 | 3 | 60 | 40 | 100 |
| EEE-101 | Basic Electrical & Electronics | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-201 | Introduction to Internet of Things | 3 | - | - | 3 | 3 | 60 | 40 | 100 |
| CHEM-151 | Engineering Chemistry Lab | - | - | 2 | 2 | 1 | 30 | 20 | 50 |
| EEE-151 | Basic Electrical & Electronics Lab | - | - | 2 | 2 | 1 | 30 | 20 | 50 |
| ME-152 | Workshop lab | 1 | - | 2 | 4 | 2.5 | 60 | 40 | 100 |

**Semester – III**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | | **L** | **T** | **P** | **CH** | **CP** | **Int. A** | **ESE** | **Total** |
| MAT-301 | Engineering Mathematics III | | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-301T | Data Structure Using C | | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-302 | Introduction to sensor Technology & Instrumentation | | 3 | - | - | 3 | 3 | 60 | 40 | 100 |
| CSE-303 | Computer Organization | | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-304 | Digital Electronics | | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-305 | Human Values & Professional Ethics | | 3 | - | - | 3 | 3 | 60 | 40 | 100 |
| CSE-301P | Data Structure Using C Lab | - | | - | 2 | 2 | 1 | 30 | 20 | 50 |
| CSE-352 | Introduction to Sensor Technology & Instrumentation | - | | - | 2 | 2 | 1 | 30 | 20 | 50 |
| CSE-353 | Digital Electronics Lab | - | | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Semester – IV**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **L** | **T** | **P** | **CH** | **CP** | **Int. A** | **ESE** | **Total** |
| CSE-401 | Theory of Computation | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-402 | Software Engineering | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-403 | Data Base Management System | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-404 | Wireless Sensor Networks (WSN) & IoT Standards | 3 | - | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-405 | Computer Networks | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-406 | Discrete Structure | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-451 | DBMS Lab | - | - | 2 | 2 | 1 | 30 | 20 | 50 |
| CSE-452 | Software Engineering & Testing Lab | - | - | 2 | 2 | 1 | 30 | 20 | 50 |
| CSE-453 | Wireless Sensor Networks (WSN) & IoT Standards Lab | - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Semester V**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | | **L** | **T** | **P** | **CH** | **CP** | **Int. A** | **ESE** | **Total** |
| CSE-501 | Data Warehousing & Data Mining | | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-502 | Operating System | | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-503 | Complier Design | | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-504 | Cloud Architecture & Deployment Models | | 3 | - | - | 3 | 3 | 60 | 40 | 100 |
| CSE-505 | Big Data | | 3 | - | - | 3 | 3 | 60 | 40 | 100 |
| CSE-506 | Microprocessor & its Applications | | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-551 | Operating System Lab | - | | - | 2 | 2 | 1 | 30 | 20 | 50 |
| CSE-552 | Cloud Architecture & Deployment Models Lab | - | | - | 2 | 2 | 1 | 30 | 20 | 50 |
| CSE-553 | Big Data Lab | - | | - | 2 | 2 | 1 | 30 | 20 | 50 |
| CSE-554 | Microprocessor Lab | - | | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Semester VI**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **L** | **T** | **P** | **CH** | **CP** | **Int. A** | **ESE** | **Total** |
| CSE-601 | Analysis & Design of Algorithm | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-602 | Computer Graphics | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-603 | Advance Java | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-604 | Analytics for IOT | 3 | - | - | 3 | 3 | 60 | 40 | 100 |
| CSE -605 | Smarter City | 3 | - | - | 3 | 3 | 60 | 40 | 100 |
| CSE -606 | Digital Image Processing | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-651 | Advance Java Lab | - | - | 2 | 2 | 1 | 30 | 20 | 50 |
| CSE-652 | Computer Graphics Lab | - | - | 2 | 2 | 1 | 30 | 20 | 50 |
| CSE-653 | Analytics for IOT | - | - | 2 | 2 | 1 | 30 | 20 | 50 |
| CSE-654 | Smarter City | - | - | 2 | 2 | 1 | 30 | 20 | 50 |
| CSE-655 | Digital Image Processing Lab | - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Semester VII**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | | **L** | **T** | **P** | **CH** | **CP** | **Int. A** | **ESE** | **Total** |
| CSE-701 | Artificial Intelligence | | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-702 | .Net Technology | | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-703 | IOT for Industries | | 3 | - | - | 3 | 3 | 60 | 40 | 100 |
| CSE-704 | Advanced Computer Architecture | | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-705 | Elective – I | | 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |
| CSE-706 | Elective – II | | 3 | 1 | - | 4 | 3 | 60 | 40 | 100 |
| CSE-751 | Artificial Intelligence Lab | - | | - | 2 | 2 | 1 | 30 | 20 | 50 |
| CSE-752 | .Net Technology Lab | - | | - | 2 | 2 | 1 | 30 | 20 | 50 |
| CSE-753 | Major Project | - | | - | 4 | 4 | 3 | 30 | 20 | 50 |

**List of Electives**

**Elective – I**

|  |  |
| --- | --- |
| CSE-705 | Cryptography& Network Security |
| CSE-709 | Fuzzy Logic |
| CSE-707 | Neural Networks |
| CSE-708 | Software Project Management |

**Elective – II**

|  |  |
| --- | --- |
| CSE-706 | Software Testing |
| CSE-710 | Natural Language Processing |
| CSE-711 | Nano Technology |
| CSE-712 | Internet Technologies |

**Semester VIII**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **L** | **T** | **P** | **CH** | **CP** | **Int. A** | **ESE** | **Total** |
| CSE-851 | Industrial Training | - | - | - | - | 20 | 300 | 200 | 500 |

**L** – Lecture

**T** – Tutorial

**P** – Practical

**CH** – Contact hour

**CP** – Credits points

**Int. A** – Internal assessment

**ESE** – End-semester exam

**1st Year**

**SEMESTER I**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** I | | |
| **Course Title:** Engineering Mathematics-I | | | | | **Course Code:** MATH-101 | | |
| **L** | **T** | **P** | **CH** | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** This course is designed to introduce students to the theory of systems of linear equations and to mathematical proof. Topics include solving systems of linear equations, linear independence, linear transformations, matrix operations, determinants, vector spaces.

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

**CO1:** Find and analyze area, mass of lamina and volume of solid by using double and triple integration.

**CO2:** Understand the concepts of linear transformations and their properties

**CO3:** Apply Cayley- Hamilton theorem to problems for finding the inverse of a matrix and higher powers of matrices without using routine methods

**CO4:** Ad-joint of a linear transform.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Linear Algebra:** Review of Matrices; Linearly dependent / independent of vectors; Rank and Matrix Inverse; Linear Transformation & Matrix Representation; System of Linear Equations, Eigen values and Eigenvectors; properties of Eigen values, Diagonalization of Matrices; Jordan Canonical Form, Cayley Hamilton Theorem. | 09 |
| 2 | **Complex Numbers:** Roots of complex number, Real and imaginary parts of functions of a complex variables - Exponential, Circular, Hyperbolic, Logarithmic and Inverse hyperbolic functions; Summation of the series C+ iS; Limit and derivative of complex functions, Cauchy -Riemann equations, Analytic functions, Entire functions and its applications. | 11 |
| 3 | **Differential Calculus:** Leibnitz theorem, Partial derivatives, Euler‟s theorem for homogenous function, Total derivative, Change of variable; Taylor‟s and Maclaurin‟s series, Jacobian, Extrema of function of two variables, Method of undetermined multipliers. Multiple Integrals: Double and triple integrals and their applications, Change of order of integration, Change of variables. Application of multiple integral to surface area and volume, Beta and Gamma functions and their relationships. | 13 |
| 4 | **Vector Differentiation:** Scalar and vector point functions, Gradient of a scaler field, Directional derivative, Divergence and Curl of a vector field, Laplacian and second order operators.  **Vector Integration**: Line, surface and volume integrals; Vector integral theorems: Greens, Stokes and Gauss divergence theorems (Without proof) and related problems. | 12 |

**Textbooks**

* Kreyszig E., “Advanced Engineering Mathematics”, Wiley ,9th edition.
* B.S. Grewal, “Higher Engineering Mathematics”, Khanna Publishers.

**Reference Books**

* H.K. Dass and Rama Verma, “Engineering Mathematics”, S. Chand Publications.
* N.P. Bali and Manish Goel, “Engineering Mathematics”, Laxmi Publications.
* D. Kandu, “Engineering Mathematics”, Neel Kamal Prakashan.
* B.V. Ramana, “Higher Engineering Mathematics”, Tata McGraw Hill Education Pvt. Ltd., New Delhi

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | 1 | - | 2 | - | - | - | - | 1 | 2 | - | 3 | 3 | 3 | 3 |
| **CO2** | 3 | 2 | 1 | - | 2 | - | - | - | - | 1 | 2 | - | 3 | 3 | 3 | 3 |
| **CO3** | 3 | 2 | 1 | - | 2 | - | - | - | - | 1 | 2 | - | 3 | 3 | 3 | 3 |
| **CO4** | 3 | 2 | 1 | - | 2 | - | - | - | - | 1 | 2 | - | 3 | 3 | 3 | 3 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** I | | |
| **Course Title:** Engineering Physics | | | | | **Course Code:** PHY-101 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** The course aims at making students to understand the basic concepts and Principles of Physics in a broader sense with a view to lay foundation for the various engineering courses. Students will be able to demonstrate competency and understanding of the concepts found in electromagnetic waves, quantum concepts, magnetic and superconducting phenomenon, wave Optics, Lasers and a broad base of knowledge in physics.

**Course Outcomes**

**CO1:** Learn about position of electrons, their interactions with each other and shapes and geometries of molecules.

**CO2:** Give knowledge about quantum mechanics of particle behaviour, energy wise arrangement of electrons and their interactions in bond formation.

**CO3:** Learn about the process of polymerization of different substances with more emphasis on rubber.

**CO4:** Give knowledge about interaction of light with matter and the principles on which different types of spectroscopic techniques were based.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Electromagnetic fields and em wave:** Gradient of a scalar, divergence and cul of a vector, Gauss’s law (integral and differential form) and its applications, Electric potential and electric field (in vector form), Dieletrics, Polarization, Electric displacement, Susceptibility and permittivity, Lorentz foce law, Magnetic field of a steady current (Biot-Savart’s law), Faraday’s law, Ampere’s circuital law and its applications, Maxwell’s equations a dn their significance, Electromagnetic Spectrum (basic idea of different regions). | 11 |
| 2 | **Quantum Theory:** Need of Quantum Mechanics, Davisson-Germer Experiment and Matter waves, Group and Phase velocities. Uncertainity Principle and its applications, Time-independent and Time-Dependent Schrödinger Wave equation, Eigen values and Eigen Functions, Applications of Schrödinger Wave equation to Particle in a box (one dimensional) | 08 |
| 3 | **Lasers and Optical Fibers:** Spontaneous and Stimulated Emission, Einstein’s coefficients, Population Inversion and Optical Pumping, Three-level and Four-level Lasers, Ruby, He-Ne, CO2, Semiconductor Lasers, Application of lasers, Basic theory of fiber optics, accepatance angle, numerical aperture, modes of propagation, material and pulse dispersion, application of optical fibers. | 09 |
| 4 | **Magnetic materials and Superconductivity:** Hard and soft magnetic materials and their applications, Ferrites and their applications, Phenomenon of superconductivity, Magnetic properties of superconductors (Meissner effect), Type-I and Type-II Superconductors, Applications of Superconductivity. | 08 |
| 5 | **Radiation Physics:** A few X- and Gamma-radioisotopes (109Cd, 241Am, 60Co, 137Cs) and their applications, Coolidge tube; Continuous and Characteristic X-rays; Moosley’s law; Absorption of X-rays and gamma rays; X-ray Diffraction and Bragg’s law, EDXRF and WDXRF (qualitative idea). | 8 |

**Textbooks**

* Applied Solid State Physics; Wiley India Pvt Ltd.
* Quantum Mechanics: Theory and Applications- Ajoy Ghatak, Tata McGraw-Hill.
* Engineering Physics; Satya Prakash and Vibhav saluja, Pragti Prakashan Meerut.
* Modern Engineering Physics; A.S.Vasudeva, S. Chand & Co. Ltd.

**Reference Books**

* M.Armugam, Engineering Physics, Anuradha Agencies, 2003
* Optics- Ajoy Ghatak, Tata McGraw-Hill.
* Optics- N. Subrahmanyam, Brij Lal, M.N. Avadhanulu, S. Chand & Co. Ltd.
* Fiber optics and laser Principles and Applications- Anuradha De, New Age International.
* Concepts of Modern Physics-Arthur Beiser, Tata McGraw-Hill.
* Introduction to electrodynamics; David J Griffiths, Prentice Hall of India, New Delhi.

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | - | 1 | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 2 | 2 |
| **CO2** | 3 | 2 | - | 1 | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 2 | 2 |
| **CO3** | 3 | 2 | - | 1 | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 2 | 2 |
| **CO4** | 3 | 2 | - | 1 | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 2 | 2 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** I | | |
| **Course Title:** Engineering Physics Lab | | | | | **Course Code:** PHY-151 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:** The course will describe the experimental part related to lasers, optics, energy bandgaps, e/m ration, spectrometers, etc. In this course students will perform experiments to determine physical quantities specific rotation of cane sugar, Planck’s constant, wavelength of monochromatic light, numerical aperture, divergence and angle of prism.

**Course Outcomes:** The course will help the students to:

**CO1:** understand the apparatus of various experiments.

**CO2:** understand the physical working procedure of apparatus.

**CO3:** learn to perform experiments and make record by taking readings.

**CO4:** understand the physical concept behind the experiment, which will strengthen their theoretical knowledge.

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr No.** | **Experiment Title** |
|  | To determine the specific rotation of cane sugar solution with the help of polarimeter. |
|  | To determine Planck’s constant. |
|  | To determine the dispersive power of the material of the prism using mercury light with the help of a spectrometer. |
|  | To determine the wavelength of sodium light by Newton’s Ring. |
|  | To determine the Energy Band Gap of a Semiconductor by using Four probe method. |
|  | To measure the numerical aperture of the given an optical fiber. |
|  | To determine the specific resistance of a given wire using Carey Foster’s bridge. |
|  | To determine e/m ratio using Thompson’s method |
|  | To determine angle of divergence of Laser beam |
|  | To determine angle of prism and minimum deviation using spectrometer. |

**Textbooks**

* Printed Manual supplied to the students.

**Reference books**

* M.Armugam, Engineering Physics, Anuradha Agencies, 2003
* Optics- Ajoy Ghatak, Tata McGraw-Hill.
* Optics- N. Subrahmanyam, Brij Lal, M.N. Avadhanulu, S. Chand & Co. Ltd.
* Fiber optics and laser Principles and Applications- Anuradha De, New Age International.
* Concepts of Modern Physics-Arthur Beiser, Tata McGraw-Hill.
* Introduction to electrodynamics; David J Griffiths, Prentice Hall of India, New Delhi.

**Assessment Process (Internal)**

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks)**
* **Attendance = 10 Marks**

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | - | 1 | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 2 | 2 |
| **CO2** | 3 | 2 | - | 1 | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 2 | 2 |
| **CO3** | 3 | 2 | - | 1 | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 2 | 2 |
| **CO4** | 3 | 2 | - | 1 | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 2 | 2 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** I | | |
| **Course Title:** Fundamental of Computer & Programming in “C” | | | | | **Course Code:** CSE-101 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** This course introduces the concepts of computer basics & programming with particular attention to Engineering examples. The C programming language is used but the course will stress on fundamental parts of programming language, so that it will help basic concept for understanding and using other programming language.

**Course Outcomes**

**CO1:** Understanding the concept of input and output devices of Computers and how it works and recognize the basic terminology used in computer programming

**CO2:** Write, compile and debug programs in C language and use different data types for writing the programs

**CO3:** Design programs connecting decision structures, loops and functions

**CO4:** Explain the difference between call by value and call by address

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **An Overview of Computer System:** Anatomy of a digital Computer, Memory Units, Main and Auxiliary Storage Devices, Input Devices, Output Devices, Classification of Computers, Introduction to microprocessor, commonly used CPUs, Input/output ports and connectors. Radix Number System: Decimal, Binary, Octal, Hexadecimal numbers  **Operating System:** The user Interface, Running Programmes, Managing files, Introduction to PC operating Systems: Unix/Linux, DOS, and Windows 2000. | 09 |
| 2 | **Networking Basics**: Introduction to the basic concepts of Networks and Data Communications, Network topologies, Network Types (LAN, WAN and MAN), How Internet works, Major features of internet, Emails, FTP, Using the internet.  **Programming Languages:** Machine-, Assembly-, High Level- Language, Assembler, Compiler, Interpreter, debuggers, Programming fundamentals: problem definition, algorithms, flow charts and their symbols, introduction to compiler, interpreter, assembler, linker and loader and their inter relationship | 13 |
| 3 | **C Programming language**: C fundamentals formatted input/ output, expressions, selection statements, loops and their applications; Basic types, arrays, union, structure, functions, including recursive functions, program organization: local and external variables and scope, pointers & arrays. | 11 |
| 4 | **Strings**: strings literals, string variables, I/O of strings, arrays of strings; applications. Structures, Unions and Enumerations: Structure variables and operations on structures; Structured types, nested array structures; unions; enumeration as integers, tags and types. Standard library: Input / output; streams, file operations, formatted I/O, character I/O, line I/O, block, string I/O, Library support for numbers and character data, error Handling: | 12 |

**Textbooks**

* Fundamentals of Computing and C Programming, R. B. Patel, Tech Publications, New Delhi.
* C Programming – A modern approach by K.N. King, 1996, WW Norton & Co.

**Reference Books**

* Using Information Technology, 5th Edi, Brian K Williams & Stacey C. Sawyer, 2003, TMH
* The C Programming Language by Dennis M Ritchie, Brian W. Kernigham, 1988, PHI.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Upto 75% | 0 |
| 75% - 80% | 1 |
| 80% - 85% | 2 |
| 85% - 90% | 3 |
| 90% - 95% | 4 |
| 95% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | - | - | 2 | - | 1 | - | - | - | 2 | - | 1 | 1 | 1 | 1 |
| **CO2** | 3 | 2 | - | - | 2 | - | 1 | - | - | - | 2 | - | 1 | 1 | 1 | 1 |
| **CO3** | 3 | 2 | - | - | 2 | - | 1 | - | - | - | 2 | - | 1 | 1 | 1 | 1 |
| **CO4** | 3 | 2 | - | - | 2 | - | 1 | - | - | - | 2 | - | 1 | 1 | 1 | 1 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** I | | |
| **Course Title:** Programming in “C” Lab | | | | | **Course Code:** CSE-151 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:** The purpose of this course is to introduce to students to the field of programming using C language. The students will be able to enhance their analyzing and problem solving skills and use the same for writing programs in C.

**Course Outcomes**

**CO1:** Read, understand and trace the execution of programs written in C language.

**CO2:** Write the C code for a given algorithm.

**CO3** Know concepts in problem solving.

**CO4:** Write programs that perform operations using derived data types.

**Practical 2Hrs/Week**

|  |  |
| --- | --- |
| **Sr No.** | **Experiment Title** |
|  | Wap to add two numbers. |
|  | Wap to swap two numbers. |
|  | Wap to find simple interest. |
|  | Wap to check no is odd/even. |
|  | Wap to find greatest no. Out of three numbers. |
|  | Wap to find greatest & second greatest out of three numbers. |
|  | Wap to find year is centuary/leap year or not. |
|  | Wap to find grade with percentage. |
|  | Wap to find income tax from total salary. |
|  | Wap to print day of weeks using switch statement. |
|  | Wap to print no of days of months using switch statement. |
|  | Wap to print ‘n’ natural numbers using while loop. |
|  | Wap to find number of digits in an integer using while loop. |
|  | Wap to find reverse of an integer using while loop. |
|  | Wap to check wheather number is pallindrome or not using while loop. |
|  | Wap to find sum of an integer using do-while loop. |
|  | Wap to use goto & continue statement |
|  | Wap for linear search |
|  | Wap for binary search |
|  | Wap for bubble sort |
|  | Wap to find addition of two matrices |
|  | Wap to find multiplication of two matrices |
|  | Wap to find transpose of a matrix |
|  | Wap to find wheather the matrix is symmetric or not |
|  | Wap to print address using pointers |
|  | Wap for structure, union |

**Textbooks**

* Printed Manual supplied to the students.

**Reference books**

* Fundamentals of Computing and C Programming, R. B. Patel, Tech Publications, New Delhi.
* C Programming – A modern approach by K.N. King, 1996, WW Norton & Co.
* Using Information Technology, 5th Edi, Brian K Williams & Stacey C. Sawyer, 2003, TMH
* The C Programming Language by Dennis M Ritchie, Brian W. Kernigham, 1988, PHI.

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks )**
* **Attendance = 10 Marks**

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | - | - | 2 | - | 1 | - | - | - | 2 | - | 1 | 1 | 1 | 1 |
| **CO2** | 3 | 2 | - | - | 2 | - | 1 | - | - | - | 2 | - | 1 | 1 | 1 | 1 |
| **CO3** | 3 | 2 | - | - | 2 | - | 1 | - | - | - | 2 | - | 1 | 1 | 1 | 1 |
| **CO4** | 3 | 2 | - | - | 2 | - | 1 | - | - | - | 2 | - | 1 | 1 | 1 | 1 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** I | | |
| **Course Title:** Engineering Mechanics | | | | | **Course Code:** ME-101 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description**: Course will help the students to develop the capacity to predict the effects of force and motion while carrying out the creative design functions of engineering.

**Course Outcomes:** Students will be able to understand and solve following particular problems by the end of this course:-

**CO1:** Solve for the resultants of any force system and determine equivalent force system.

**CO2:**  Determine displacement of completely constrained bodies by principles of virtual work and solve the mechanics problems associated with friction force.

**CO3:** Calculate the centroid, first moment and second moment of area.

**CO4:** Analyze the forces acting on rigid body during translation motion.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Two Dimensional Concurrent Force Systems:** Basic concepts, Units, Force systems, Laws of motion, Moment and Couple, Vectors - Vectorial representation of forces and moments - Vector operations. Principle of Transmissibility of forces,, Resultant of a force system, Equilibrium and Equations of Equilibrium, Equilibrium conditions, Free body diagrams, Determination of reaction, Resultant of Two dimensional concurrent forces, Applications of concurrent forces. | 08 |
| 2 | **Two Dimensional Non-Concurrent Force Systems:** Basic Concept, Varignon’s theorms, Transfer of a force to parallel position, Distributed force system, Types of supports and their reactions, converting force into couple and Vise versa Applications.  **Friction:** Introduction, Laws of Coulomb Friction, Equilibrium of Bodies involving Dry-friction, Belt friction, ladder Friction, Applications of Friction in daily life.  **Structure:** Plane truss, perfect and imperfect truss, assumption in the truss analysis, analysis of perfect plane trusses by the method of joints, method of section. | 13 |
| 3 | **Centroid and Moment of Inertia:** Centroid of plane, curve, area, volume and composite bodies, Moment of inertia of plane area, Parallel Axes Theorem, Perpendicular axes theorems, Mass Moment of Inertia of Circular Ring, Disc, Cylinder, Sphere and Cone about their , Axis of Symmetry. Pappus theorems, polar moment of inertia, Applications of Moment of Inertia in daily life. | 08 |
| 4 | **Kinematics of Rigid Body:** Introduction, plane rectilinear motion of rigid body, Plane curvilinear Motion of Rigid Body, Velocity and Acceleration under Translation and Rotational Motion, Relative Velocity. | 8 |
| 5 | **Kinetics of Rigid Body:** Introduction, Force, Mass and Acceleration, Work and Energy, Impulse and Momentum, D’Alembert’s Principles and Dynamic Equilibrium, Friction in moving bodies. | 08 |

**Textbooks**

* Engineering Mechanics(Static & Dynamics) , Dr. D.S. Kumar , Katson Books
* A Textbook Of Engineering Mechanics , R.S. Khurmi , N Khurmi , S. Chnad

**Reference Books**

* Engineering Mechanics Statics , J.L Meriam , Wiley
* Engineering Mechanics Dynamics , J.L Meriam , Wiley
* Engineering Mechanics by Irving H. Shames, Prentice-Hall
* Engineering Mechanics : Statics and Dynamics, R. C. Hibbler
* Mechanics of Solids by Abdul Mubeen, Pearson Education Asia.
* Mechanics of Materials by E.P.Popov, Prentice Hall of India Private limited.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | - | - | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 2 | 2 |
| **CO2** | 3 | 2 | - | - | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 2 | 2 |
| **CO3** | 3 | 2 | - | - | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 2 | 2 |
| **CO4** | 3 | 2 | - | - | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 2 | 2 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** I | | |
| **Course Title:** Engineering Mechanics Lab | | | | | **Course Code:** ME-151 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description**: Course will help the students to develop the capacity to predict the effects of force and motion while carrying out the creative design functions of engineering.

**Course Outcomes:** Students will be able to understand and solve following particular problems by the end of this course:-

**CO1:** To understand about 2- stroke and 4- stroke engines through prototypes.

**CO2:** To understand about the methods of measurements.

**CO3:** To verify various theories by experimenting different performance characteristics of various devices like screw jack.

**CO4:** Analyze data, assess its reliability and draw conclusions.

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr No.** | **Experiment Title** |
|  | To study the 2-stroke & 4-stroke I.C. Engine models. |
|  | Friction experiment(s) on inclined plane. |
|  | To determine the velocity ratio, mechanical advantage and efficiency of a simple screw jack. |
|  | Simple & compound gear-train experiment. |
|  | Belt-Pulley experiment. |
|  | Torsion of rod/wire experiment. |
|  | Experiment on Trusses. |
|  | Dynamics experiment on momentum conservation |
|  | Experiment on Moment of Inertia. |
|  | To draw the load-extension curve of a metallic wire and hence determine the modulus of elasticity of the material of the wire. |
|  | To investigate the relationship between shear stress and shear strain for rubber and to determine the modulus of rigidity of the material. |
|  | To determine the central deflection of a simply supported beam loaded by a concentrated load at mid point and hence determine the modulus of elasticity of the material of the beam. |
|  | To determine the central deflection of a fixed ended beam loaded at mid-span by concentrated loads and to compare with theoretical value. |
|  | To verify the laws of shearing force and bending moment on a beam. |

**Textbooks**

* Printed Manual supplied to the students.

**Reference books**

* Engineering Mechanics Statics , J.L Meriam , Wiley
* Engineering Mechanics Dynamics , J.L Meriam , Wiley
* Engineering Mechanics by Irving H. Shames, Prentice-Hall
* Engineering Mechanics : Statics and Dynamics, R. C. Hibbler
* Mechanics of Solids by Abdul Mubeen, Pearson Education Asia.
* Mechanics of Materials by E.P.Popov, Prentice Hall of India Private limited.
* Engineering Mechanics(Static & Dynamics) , Dr. D.S. Kumar , Katson Books
* A Textbook Of Engineering Mechanics , R.S. Khurmi , N Khurmi , S. Chnad

**Assessment Process (Internal)**

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks )**
* **Attendance = 10 Marks**

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | - | - | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 2 | 2 |
| **CO2** | 3 | 2 | - | - | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 2 | 2 |
| **CO3** | 3 | 2 | - | - | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 2 | 2 |
| **CO4** | 3 | 2 | - | - | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 2 | 2 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** I | | |
| **Course Title:** Communication Skills | | | | | **Course Code:** HUM-101 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | - | - | 3 | 3 | 60 | 40 | 100 |

**Course Description:** This course aims to equip students with basics of communication and English grammar.

**Course Outcomes**

**CO1:** To adept students with meaning and purpose of communication.

**CO2:** To develop effective writing skills of students.

**CO3:** To prepare students for interviews.

**CO4:** To develop the overall personality of students.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Communication:** Meaning of Communication, Types of Communication, Process of Communication, Channels of Communication, modes of communication, Barriers to communication, Role of communication in society.  **Reading Skills:** Characteristics of reading, Types of reading, Purpose of reading, Process of reading, Rules for faster comprehension, Approach to reading, SQ3R, Comprehension (Unseen passage). | 13 |
| 2 | **Listening Skills:** Process of listening, Types of listening, and Barriers to effective listening, Difference between hearing and listening, Feedback skills.  **Speaking Skills:** Study of Vowels symbols & diagram( Long, Short, Open, Close, Rounded, Unrounded, Monophthongs, Diphthongs) , Consonants & symbols , Accent , Stress , Voice Modulation | 09 |
| 3 | **Grammar:** Abbreviations, Idioms & phrases, One word substitution, Antonyms, Synonyms, Homophones, Homonyms, Word formation: prefix, suffix, Punctuation. Transformation of sentences: Simple to compound, compound to Complex& vice versa. | 09 |
| 4 | **Writing Skills:** Business letters: principles, structure, Writing a memo, Job application letters, preparing a personal resume; Writing notices, Agenda and Minutes of meetings; Paragraph writing, Report writing: Characteristics, types of reports, structure of technical/research reports, preparatory steps to report writing. | 10 |

**Textbooks**

* Bhattacharya, Inderjit, an Approach to Communication Skills. Dhanpat Rai, New Delhi.
* K.K.Sinha, Business Communication, Galgotia Publishing Company, New Delhi, 1999.

**Reference Books**

* Sheila H.A. Smith, M and Thomas, L., Methuen, Reading to Learn; London, 1982.
* McGraw, SJ;Basic Managerial Skills for all, Prentice Hall of India, New Delhi 1991
* Technical Reporting Writing British Association for commercial and Industrial Education, BACIE, 1992
* Chrissie Wright (Ed.); Handbook of Practical Communication Skills; JAICO Books
* Common Errors in English, by Sudha Publication (P) Ltd., B-5, Prabhat Kiran Building, Rajendra Place, New Delhi – 110008.
* Abul Hashem, Common Errors in English, Ramesh Pub. House, Daryagang New Delhi.
* Objective English by Tata McGraw Hill Publishing Co. Ltd., New Delhi.
* R.K.Bansal & J.B. Harrison, spoken English for India, Orient Longman.
* Veena Kumar, the Sounds of English, Makaav Educational Software, New Delhi.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | **-** | **-** | **-** | 3 | - | 2 | 1 | 1 | 3 | - | 1 | - | - | - | - | 1 |
| **CO2** | **-** | **-** | **-** | 3 | - | 2 | 1 | 1 | 3 | - | 1 | - | - | - | - | 1 |
| **CO3** | **-** | **-** | **-** | 3 | - | 2 | 1 | 1 | 3 | - | 1 | - | - | - | - | 1 |
| **CO4** | **-** | **-** | **-** | 3 | - | 2 | 1 | 1 | 3 | - | 1 | - | - | - |  | 1 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** I | | |
| **Course Title:** Communication Skills Lab | | | | | **Course Code:** HUM-151 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:** This course aims to enhance the general conversational skills of students in different socio-cultural contexts and to strengthen their professional skills.

**Course Outcomes**

**CO1:** Better pronunciation and accent

**CO2:** Ability to use functional English

**CO3:** Competency in analytical skills and problem solving skills

**CO4:** Effective spoken skills.

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr No.** | **Experiment Title** |
|  | Group Discussion. |
|  | Just a minutes session: Speaking Extempore for one minutes on given topics. |
|  | Reading aloud of newspaper headlines and important articles. |
|  | Improving pronunciation through tongue twisters. |
|  | Soft Skills: Mannerism or Etiquette. |
|  | Mock Interview. |
|  | Preparing PPTs. |
|  | Telephonic Skills. |
|  | Phonetics. |

**Textbooks**

* Printed Manual supplied to the students.
* Chrissie Wright (Ed.); Handbook of Practical Communication Skills; JAICO Books
* Common Errors in English, by Sudha Publication (P) Ltd., B-5, Prabhat Kiran Building, Rajendra Place, New Delhi – 110008.

**Reference books**

* Sheila H.A. Smith, M and Thomas, L., Methuen, Reading to Learn; London, 1982.
* McGraw, SJ;Basic Managerial Skills for all, Prentice Hall of India, New Delhi 1991
* Technical Reporting Writing British Association for commercial and Industrial Education, BACIE, 1992
* Abul Hashem, Common Errors in English, Ramesh Pub. House, Daryagang New Delhi.
* Objective English by Tata McGraw Hill Publishing Co. Ltd., New Delhi.
* R.K.Bansal & J.B. Harrison, spoken English for India, Orient Longman.
* Veena Kumar, the Sounds of English, Makaav Educational Software, New Delhi.

**Assessment Process (Internal)**

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks )**
* **Attendance = 10 Marks**

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | - | - | - | 3 | - | 2 | 1 | 1 | 3 | - | 1 | - | - | - | - | 1 |
| **CO2** | - | - | - | 3 | - | 2 | 1 | 1 | 3 | - | 1 | - | - | - | - | 1 |
| **CO3** | - | - | - | 3 | - | 2 | 1 | 1 | 3 | - | 1 | - | - | - | - | 1 |
| **CO4** | - | - | - | 3 | - | 2 | 1 | 1 | 3 | - | 1 | - | - | - | - | 1 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** I | | |
| **Course Title:** IT Infrastructure Landscape Overview | | | | | **Course Code:** CSE-102 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | - | - | 3 | 3 | 60 | 40 | 100 |

**Course Description:** To understand the concept of database system. To understand the understanding of the differences between OODBMS, ORDBMS, and RDBMS and the practical implications of each approach. Analyze and design a software design application connecting with databases

**Course Outcomes**

**CO1:** Gains good knowledge of Database, Application, and middleware software along with System Hardware and networking.

**CO2:** Develop an understanding of the differences between OODBMS, ORDBMS, and RDBMS and the practical implications of each approach.

**CO3:** Gains practical understanding of industry-standard storage networking concepts.

**CO4:** Analyze and design a software design application connecting with databases.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | Database Overview:- Understanding Database types, Database Terminology, Characteristics Of Databases, Introduction To Database Management Systems, Types Of Database Management Systems, Database Security And Recovery, Data Mining, Data Warehousing, And Data Marts, Data Mining (DM), Data Warehousing and Data Marts, SQL Overview , Introduction to SQL, History of SQL, Relational database schema, Data Types, Dates and Times, Creating a table, Default Values, NULL values, Constraints, Referential integrity, Creating a schema, Creating a view, Creating other database objects, Modifying database objects, Renaming database objects, Data manipulation with SQL, Selecting data, Ordering the result set, Cursors, Inserting data, Deleting data, Updating data, Table joins, Inner joins , Equi-join, Natural join, Cross join, Outer joins, Left outer join, Right outer join, Full outer join, Union, intersection, and difference operations, Union, Intersection, Difference (Except), Relational operators, Grouping operators, Aggregation operators, HAVING Clause, Sub-queries, Sub-queries returning a scalar value, Sub-queries returning vector values, Correlated sub-query, Sub-query in FROM Clauses, Mapping of object-oriented concepts to relational concepts, JDBC, What is JDBC?, JDBC Architecture:, Common JDBC Components: Database APIs, ODBC and the IBM Data Server CLI driver, Indexes , Clustered And Non-clustered Indexes, Failure Management With Db2 Cluster Services. | 16 |
| 2 | Storage Overview :-Storage Networking Technology, Types Of Storage System, FC-AL (Fibre Channel Arbitrated Loop), Fabric, Storage Area Network, Zoning, Storage Virtualization. | 06 |
| 3 | Systems & Directory Services Overview :- Server Technology, Operating System, Virtualization, Hypervisor, I/o Virtualization, Partitioning, Server Deployment, Server Management Console, Server Availability Concepts And Techniques, Server Workload. Directory Server Concepts, Directory, LDAP PROTOCOL, Overview of LDAP, LDAP Architecture, LDAP Models, LDAP Replication Topologies, LDAP Data Interchange Format (LDIF). | 07 |
| 4 | Network Security and Overview:-Network Overview, Network Topologies, Tree Topology, Firewalls, Switching Concepts , What Is Routing? , Virtual Lan’s, Security Basics, Loss Of Privacy, Loss Of Integrity, Security Technology, Active Audit , Secure Messaging, Data Security, Network Security. | 07 |
| 5 | Application and Middleware Overview:-Introduction To Common Messaging System (MQ SERIES), Application Integration – Business Need, Middleware, Message Oriented Middleware, Synchronous interaction, Asynchronous interaction, Coupling, Reliability, Scalability, Availability, IBM Websphere MQ, Websphere MQ Objects, Web Tier Deployment, Application Servers And Clustered Deployment, EMAIL, Lotus Architecture, Lotus Domino Server Types, Lotus Notes Clients, Types of Certificates, data warehousing, Warehouse Modeling Approaches , Basic Concepts, Dimension, Basic OLAP Operations. | 09 |

**Textbooks**

* IT Infrastructure Landscape Overview (IBM ICE Publication)

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | - | - | 2 | - | 1 | - | - | - | 2 | - | 1 | 1 | 1 | 1 |
| **CO2** | 3 | 2 | - | - | 2 | - | 1 | - | - | - | 2 | - | 1 | 1 | 1 | 1 |
| **CO3** | 3 | 2 | - | - | 2 | - | 1 | - | - | - | 2 | - | 1 | 1 | 1 | 1 |
| **CO4** | 3 | 2 | - | - | 2 | - | 1 | - | - | - | 2 | - | 1 | 1 | 1 | 1 |

**1st Year**

**SEMESTER II**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** II | | |
| **Course Title:** Engineering Mathematics-II | | | | | **Course Code:** MATH-201 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** This course is designed to introduce students to the Ordinary Differential Equations,Linear Differential Equations of first order and Higher degree,Special Functions, Laplace Transforms.

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

**CO1:** Apply and analyse various types of numerical methods for solving differential equations.

**CO2:** Solve and analyse the Differential equations and its application in related field of Engineering.

**CO3:** Apply Laplace transform and Fourier transform techniques to solve differential Equations involved in Vibration theory, Heat transfer and related engineering Applications.

**CO4:** Solve various partial differential equations such as wave equation, one and two dimensional heat flow equations.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Ordinary Differential Equations:** Brief review of first order ordinary differential equations, Exact differential equations, Equations reducible to exact equations; Solution of differential equations – variable separable.  **Linear Differential Equations of first order and Higher degree:** Equations of the first order and higher degree, Linear differential equations with constant coefficients (nth order): general solution, complementary function and particular integral; Method of variation of parameters, Equations reducible to linear equations with constant co-efficients (Cauchy‟s and Legendre‟s linear equations), Applications of differential equations to engineering problems. | 13 |
| 2 | **Series Solution of Differential Equations:** Series solution of second order differential equations with variable coefficient (Power series method and Frobeneous method).  **Special Functions:** Bessel and Legendre equations and their series solutions, Properties of Bessel function and Legendre polynomials. | 08 |
| 3 | **Laplace Transforms:** Laplace **t**ransforms of simple functions, Basic operational properties, Transforms of derivatives and integrals, Initial and final value theorems; Inverse Laplace transforms – Convolution theorem; Periodic functions - Unit step function, Laplace transform of Periodic function; Applications of Laplace transforms for solving linear ordinary differential equations up to second order with constant coefficients only. | 11 |
| 4 | **Fourier Series:** Periodic Functions, Fourier Series of period 2π, Change of interval, Even and Odd periodic functions, Expansion of odd and even periodic functions, Half range Sine and Cosine Series, Typical wave-forms, Parseval‟s formula.  **Partial Differential Equations:** Harmonic analysis, Partial Differential Equations with constant coefficients, Complimentary function and particular integral. | 09 |

**Textbooks**

* B.S. Grewal, “Higher Engineering Mathematics”, Khanna Publishers.
* H.K. Dass and Rama Verma, “Engineering Mathematics”, S. Chand Publications.

**Reference Books**

* N.P. Bali and Manish Goel, “Engineering Mathematics”, Laxmi Publications
* B.V. Ramana, “Higher Engineering Mathematics”, Tata McGraw Hill Education Pvt. Ltd., New Delhi.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | 1 | - | 2 | - | 1 | - | - | - | 2 | - | 3 | 3 | 3 | 3 |
| **CO2** | 3 | 2 | 1 | - | 2 | - | 1 | - | - | - | 2 | - | 3 | 3 | 3 | 3 |
| **CO3** | 3 | 2 | 1 | - | 2 | - | 1 | - | - | - | 2 | - | 3 | 3 | 3 | 3 |
| **CO4** | 3 | 2 | 1 | - | 2 | - | 1 | - | - | - | 2 | - | 3 | 3 | 3 | 3 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** II | | |
| **Course Title:** Engineering Chemistry | | | | | **Course Code:** CHEM-101 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** The course of engineering chemistry is a basic introductory course based on curriculum of senior secondary level. This course provide knowledge to students about chemical aspects of matter, its constitution upto electronic level, the interactions at electronic level and its effect on the states of matter. This course explains the interaction of light with matter with different parameters defining the interaction effects. This course give some brief introduction about recent researches in the field of production of products using green approach for the moto of sustainable development.

**Course Outcomes**

**CO1:** Learn about position of electrons, their interactions with each other and shapes and geometries of molecules.

**CO2:** Give knowledge about quantum mechanics of particle behaviour, energy wise arrangement of electrons and their interactions in bond formation.

**CO3:** Learn about the process of polymerization of different substances with more emphasis on rubber.

**CO4:** Give knowledge about interaction of light with matter and the principles on which different types of spectroscopic techniques were based.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Periodic properties** Effective nuclear charge, penetration of orbitals, variations of s, p, d and f orbital energies of atoms in the periodic table, electronic configurations, atomic and ionic sizes, ionization energies, electron affinity and electronegativity, polarizability, oxidation states, coordination numbers and geometries, hard soft acids and bases, molecular geometries. | 09 |
| 2 | **Atomic and molecular structure** Schrodinger equation. Particle in a box solutions and their applications for conjugated molecules and nanoparticles. Forms of the hydrogen atom wave functions and the plots of these functions to explore their spatial variations. Molecular orbitals of diatomic molecules and plots of the multicentre orbitals. Equations for atomic and molecular orbitals. Energy level diagrams of diatomics. Pi-molecular orbitals of butadiene and benzene and aromaticity. Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. | 12 |
| 3 | **Polymers** Introduction, classification, types of polymerization, synthesis and applications of some important polymers. PVC, Polyamides, Polyurethane, Polyethylene, Poly propylene, PET, Resins (Phenol Formaldehyde), PMMA, PAN. Conducting and Biodegradable polymers; Introduction: Rubber and different types of rubber, Vulcanization of rubber. Natural and synthetic rubber. Some important rubber and its uses. | 07 |
| 4 | **Spectroscopic techniques and applications** Principles of spectroscopy and selection rules. Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational and rotational spectroscopy of diatomic molecules. Applications. Nuclear magnetic resonance and magnetic resonance imaging, surface characterisation techniques. Diffraction and scattering. | 08 |
| 5 | **Green Chemistry** Solvents: Reactions in solvent less systems, use of supercritical fluids such as CO2, Ionic liquids.Catalysts: For increased selectivity, reduced energy requirement, photocatalytic reaction and asymmetric synthesis. Synthetic Methodologies: New synthetic protocols using new energy sources like Microwaves, Ultrasound etc. | 08 |

**Textbooks**

* A Text Book of Engineering Chemistry: by Shashi Chawla.
* Applied Chemistry- A textbook for engineers and technologist by H.D. Gesser.
* Engineering Chemistry: by P C Jain & Monika Jain
* Chemistry: Principles and Applications, byM. J. SienkoandR. A. Plane

**Reference Books**

* Organic Chemistry, P.Y. Bruice, Ninth Impression, 2011, Pearson India
* Chemistry 3 , A. Burrows, john Holman, A, Parsons, G. Pilling, G.Price, Oxford Univ. Press, 2009
* Engineering Chemistry, published by John Wiley and Sons, India 2011
* Unit processes in Organic Synthesis by Groggins, Tata McGraw Hill, 2001

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | | **PO2** | **PO3** | **PO4** | | **PO5** | **PO6** | | **PO7** | | **PO8** | | **PO9** | | **PO10** | **PO11** | | **PO12** | **PSO1** | | **PSO2** | **PSO3** | | **PSO4** |
| **CO1** | 3 | | 2 | 1 | - | | 2 | - | | 1 | | - | | - | | 2 | - | | 1 | - | | 1 | - | | 1 |
| **CO2** | 3 | | 2 | 1 | - | | 2 | - | | 1 | | - | | - | | 2 | - | | 1 | - | | 1 | - | | 1 |
| **CO3** | 3 | | 2 | 1 | - | | 2 | - | | 1 | | - | | - | | 2 | - | | 1 | - | | 1 | - | | 1 |
| **CO4** | 3 | | 2 | 1 | - | | 2 | - | | 1 | | - | | - | | 2 | - | | 1 | - | | 1 | - | | 1 |
| **Program:** B.Tech CSE | | | | | | | | | | | | | **Semester:** II | | | | | | | | |
| **Course Title:** Engineering Chemistry Lab | | | | | | | | | | | | | **Course Code:** CHEM-151 | | | | | | | | |
| **L** | | | | **T** | | | **P** | | CH | | **CP** | | **Int. A** | | | **ESE** | | | **Total** | | |
| - | | | | - | | | 2 | | 2 | | 1 | | 30 | | | 20 | | | 50 | | |

**Course Description:** The lab of engineering chemistry for the students impart on hand practice of some basic chemical procedures or processes occurring in the nature. Natural water with the addition of minerals have changes its nature, its verification in lab by experiment will impart knowledge to students. Properties of polymeric substances, estimation of constituent in the mixture, its separation by different methods can enhance knowledge of student.

**Course Outcomes**

**CO1:** Knowledge about hardness of water and its removal.

**CO2:** preparation of polymers in lab and to check its properties.

**CO3:** Separation of constituent of mixture by chromatography.

**CO4:** on hand verification of spectroscopic principle.

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr No.** | **Experiment Title** |
|  | Determination of total, permanent and temporary hardness of water sample EDTA method. |
|  | Preparation of polystyrene by anionic/cationic/emulsion polymerization method. |
|  | Estimation of chloride content in water by argentometric method [mohr’s method]. |
|  | Estimation of alkalinity in water sample. |
|  | Ion exchange column for removal of hardness of water. |
|  | Thin layer chromatography. |
|  | Estimation of total iron in iron ore. |
|  | Chemical analysis of a salt. |
|  | Verification of Lamberts Beer’s law by UV-Vis spectrophotometer. |
|  | Analysis of concentration of a drug in the given sample by comparing with the given standard. |

**Textbooks**

* Printed Manual supplied to the students.
* Unit processes in Organic Synthesis by Groggins, Tata McGraw Hill, 2001
* Engineering Chemistry: by P C Jain & Monika Jain
* Chemistry: Principles and Applications, byM. J. SienkoandR. A. Plane.

**Reference books**

* Organic Chemistry, P.Y. Bruice, Ninth Impression, 2011, Pearson India
* Chemistry 3 , A. Burrows, john Holman, A, Parsons, G. Pilling, G.Price, Oxford Univ. Press, 2009
* Engineering Chemistry, published by John Wiley and Sons, India 2011

**Assessment Process (Internal)**

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks )**
* **Attendance = 10 Marks**

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | 1 | - | 2 | 1 | 1 | - | - | 2 | - | 1 | - | 1 | - | 1 |
| **CO2** | 3 | 2 | 1 | - | 2 | 1 | 1 | - | - | 2 | - | 1 | - | 1 | - | 1 |
| **CO3** | 3 | 2 | 1 | - | 2 | 1 | 1 | - | - | 2 | - | 1 | - | 1 | - | 1 |
| **CO4** | 3 | 2 | 1 | - | 2 | 1 | 1 | - | - | 2 | - | 1 | - | 1 | - | 1 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** II | | |
| **Course Title:** Engineering Drawing | | | | | **Course Code:** ME-201 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | - | - | 3 | 3 | 60 | 40 | 100 |

**Course Description**: Course will help the students to to know projection of points ,straight lines, solids etc. To know development of different types of surfaces and about isometric projection. Different lines used for representation of different Engineering Sections.

**Course Outcomes:** Students will be able to understand and solve following particular problems by the end of this course:-

**CO1:**  Know the Standard conventions and Construction of various Engineering curves

**CO2:** Apply fundamentals of theory of projections and draw    orthographic projections of points and lines in any position

**CO3:**  Draw sectional views and developments of various objects

**CO4:**  Construct isometric views and construct multi view drawings of simple and complex objects

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Introduction** Sheet layout, Drawing instruments and their uses, Lettering and free hand practicing, Dimensioning, Types of lines, BIS conventions | 9 |
| 2 | **Orthographic projections** Definitions, Planes of projection, Reference line and convention employed, Projections of points, lines, True and apparent lengths, inclinations, Orthographic projections of plane surfaces. | 8 |
| 3 | **Projections of solids** Definitions, Projections of right regular tetrahedron, Projections of hexahedron, Projections of prisms, Projections of pyramids, cylinders and cones. | 08 |
| 4 | **Isometric projections** Isometric scales, Isometric projections of simple figures, tetrahedron, hexahedron, right regular prisms, pyramids, cylinder and cones, Spheres, cut spheres and combination of solids. | 7 |
| 5 | **Sections and Sectional Views of Right Angular Solids** Covering, Prism, Cylinder, Pyramid, Cone – Auxiliary Views; Development of surfaces of Right Regular Solids - Prism, Pyramid, Cylinder and Cone. | 10 |

**Textbooks**

* Engineering Drawing – N D Bhatt & V M Panchal, 48th edition, 2005 Charotar Publishing House, Gujarat.
* A Primer on Computer Aided Engineering Drawing – 2006, Published by VTU, Belgaum.
* A Textbook of Engineering Graphics, K. Venugopal and V. Prabhu Raja, New Age International Publishers.
* Engineering Drawing and Graphics using Auto Cad, T. Jeyapoovan, Vikas Publishing House Pvt. Ltd.
* Engineering Drawing (Geometrical Drawing), P.S. Gill , Ketson Books

**Reference Books**

* Computer Aided Engineering Drawing – S. Trymabaka Murthy, I K International Publishing House Pvt. Ltd., New Delhi, 3rd revised edition – 2006.
* Engineering Graphics – K R Gopalakrishna, 32nd edition, 2005 – Subhash Publishers, Bangalore.
* Fundamentals of Engineering Drawing with an introduction to Interactive Computer
* Graphics for Design and Production – Luzadder Warren J., duff John M., Eastern Economy Edition, 2005 - Prentice – Hall of India Pvt. Ltd., New Delhi.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | 1 | - | 2 | - | 1 | - | - | 2 | - | 1 | - | 1 | - | 1 |
| **CO2** | 3 | 2 | 1 | - | 2 | - | 1 | - | - | 2 | - | 1 | - | 1 | - | 1 |
| **CO3** | 3 | 2 | 1 | - | 2 | - | 1 | - | - | 2 | - | 1 | - | 1 | - | 1 |
| **CO4** | 3 | 2 | 1 | - | 2 | - | 1 | - | - | 2 | - | 1 | - | 1 | - | 1 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** II | | |
| **Course Title:** Environmental Science & Technology | | | | | **Course Code:** EVS-101 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | - | - | 3 | 3 | 60 | 40 | 100 |

**Course Description:** The course deals with the subjects on environment relevant matters like Pollution Control, Hazardous waste management, Toxic materials control, Water supply-related problems and other main areas in this field. The course helps to reduce the effects of ozone depletion, global warming, automobile emissions and acid rain. They are also concerned in the protection of wildlife. Several sponsored and consulting projects in areas like health-based air quality index, atmospheric dispersion of pollutants, air pollution monitoring and control, drinking water supply, heavy metal pollution, industrial waste treatment, biological processes, bio-sorption, virology, environmental systems modeling,

**Course Outcomes:** After completion of the program, the students have:

**CO1:** Acquired fundamental knowledge of different aspects of environment and local, regional and global environmental problems.

**CO2:** Developed environmental monitoring skills, including conduct of experiments and data analysis.

**CO3:** Acquired the knowledge and skills needed for the environmental design and management.

**CO4:** Acquired skills in the preparation, planning and implementation of environmental projects

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Introduction: Definition and Scope:**Importance, Public awareness and education.  **Natural Resources:** Introduction, Renewable and non-renewable, Forest, water, mineral, food, energy and land resources, Conservation of resources, Equitable use of resources.  **Human population and the environment:** Population growth, Environment and human health, Human rights, HIV/AIDS, Value education, Women and child welfare. | 10 |
| 2 | **Ecology: Ecosystems,** Concept, Structure, Function, Energy flow, Ecological pyramids, Forest, grassland, desert and aquatic ecosystems - Introduction, characteristic features, structure and function.  **Biodiversity:** Genetic, Species and ecological diversity, Threats to biodiversity, Conservation of Biodiversity. | 07 |
| 3 | **Social issues & environmental legislation: Social Issues**: Sustainable development, Water conservation, Climatic change, Concept of Green Computing, and Green Building  **Environmental Laws**: Environmental ethics, EIA, Environmental protection acts and issues. | 08 |
| 4 | **Pollution &waste management**  **Pollution**: Definition, Causes, effects and control measures of the pollution – Air, soil, Noise, Water, Marine and Thermal and Nuclear Pollution.  **Disaster management:** Flood, Earthquake, Cyclone, Landslide, Drought.  **Solid waste management**: Waste Management hierarchy; Collection, transportation and storage of MSW; Treatment and disposal of MSW | 11 |
| 5 | **Environmental chemistry**  **General Chemistry:** Review of concepts like oxidation-reduction, Gas laws, pH and Buffers.  **Atmospheric Chemistry:** Photochemical reactions in atmosphere, Major chemical pollutants and their effects.  **Water and Wastewater Chemistry:**  Hardness, Residual chlorine, Dissolved oxygen, BOD, COD, Solids.  **Green Chemistry:** Principles, Green materials, reactions, reagents and product. | 06 |

**Textbooks**

* Environmental Studies by J.P.Sharma.
* Environmental studies by Smriti Srivastava.

**Reference Books**

* Environment and Ecology by H.Kaur.
* Environmental Studies by Ranjit Daniels.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | 1 | - | 2 | - | 1 | - | - | 2 | - | 1 | - | 1 | - | 1 |
| **CO2** | 3 | 2 | 1 | - | 2 | - | 1 | - | - | 2 | - | 1 | - | 1 | - | 1 |
| **CO3** | 3 | 2 | 1 | - | 2 | - | 1 | - | - | 2 | - | 1 | - | 1 | - | 1 |
| **CO4** | 3 | 2 | 1 | - | 2 | - | 1 | - | - | 2 | - | 1 | - | 1 | - | 1 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** II | | |
| **Course Title:** Basic Electrical & Electronics | | | | | **Course Code:** EEE-101 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** To understand the various laws and principles associated with electrical and electronics engineering

**Course Outcomes:-**

**CO1:** Calculate energy consumption in electrical systems.

**CO2:** Basic knowledge about the Electric and Magnetic circuits, electromagnetism

**CO3:** Understand & demonstrate fundamentals of electromagnetism for working of single phase transformer & electrostatics

**CO4:** Use the concept of poly phase ac circuit to analyze three phase star, delta circuits

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **DC Circuits**  Electrical circuit elements (R, L and C), voltage and current sources, Kirchoff current and voltage laws, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems. | 8 |
| 2 | **AC Circuits**  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 (series and parallel), resonance. Three-phase balanced circuits, voltage and current relations in star and delta connections. | 8 |
| 3 | **DC Machine**  Construction and working of DC motor and generator, Fleming’s Rule, Different types of Dc Motors , Starting of DC motor and Speed Control. | 6 |
| 4 | **Transformers** Construction and Working Principle, Transformation Ratio, emf equation, losses in transformers, regulation and efficiency. Auto-transformer and three-phase transformer. | 6 |
| 5 | **Electrical Machines** Types of AC motors and their applications, Construction and working principle of Single phase and three phase induction motor, Stating of Three phase induction motor using Star/Delta and DOI, Starters, Starting of Single Phase Motors. | 6 |
| 6 | **Basic Electronics**  Basic idea of Semiconductor products, Diode, Zener Diode, Transistor, SCR and their Applications. | 8 |

**Textbooks**

* J. B. Gupta, “Basic Electrical Engineering”, S.K. Kataria & Sons.
* Basic Electrical and Electronics Engineering, S.K S. K. Bhattacharya, Pearson.

**Reference Books**

* D. P. Kothari and I. J. Nagrath, “Basic Electrical Engineering”, Tata McGraw Hill, 2010.
* T.K. Nagsarkar and M.S. Sukhija, “Basic Electrical Engineering”, Oxford University Press
* D. C. Kulshreshtha, “Basic Electrical Engineering”, McGraw Hill, 2009.
* L. S. Bobrow, “Fundamentals of Electrical Engineering”, Oxford University Press, 2011.
* E. Hughes, “Electrical and Electronics Technology”, Pearson, 2010.
* V. D. Toro, “Electrical Engineering Fundamentals”, Prentice Hall India, 1989.
* B. L. Theraja, “Electrical Technology”, S Chand Publishing.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | 1 | - | 1 | - | 1 | - | - | - | - | - | 2 | 2 | 2 | 2 |
| **CO2** | 3 | 2 | 1 | - | 1 | - | 1 | - | - | - | - | - | 2 | 2 | 2 | 2 |
| **CO3** | 3 | 2 | 1 | - | 1 | - | 1 | - | - | - | - | - | 2 | 2 | 2 | 2 |
| **CO4** | 3 | 2 | 1 | - | 1 | - | 1 | - | - | - | - |  | 2 | 2 | 2 | 2 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** II | | |
| **Course Title:** Basic Electrical & Electronics Lab | | | | | **Course Code:** EEE-151 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:** To enhance the student with knowledge on electrical and electronic equipments

**Course Outcomes**

**CO1:** Get an exposure to common electrical components and their ratings.

**CO2:** Understand the usage of common electrical measuring instruments.

**CO3:** Understand the basic characteristics of transformers and electrical machines.

**CO4:** Get an exposure to the working of power electronic converters

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr No.** | **Experiment Title** |
|  | Verification of Ohm’s Law |
|  | Series and parallel connection of resistance. |
|  | Verification of Kirchoffs laws. |
|  | Verification of Superpostion theorem |
|  | Verification of Thevenin’s theorem. |
|  | Verification of Maximun Power Transfer theorem |
|  | To observe sine wave, square wave, triangular wave and ramp waveforms on the C.R.O. and to measure amplitude and frequency of the waveforms. |
|  | Study of study of phenomenon of resonance in RLC series circuit and obtain resonance frequency. |
|  | Measure the armature and field resistance of a dc machine. |
|  | Starting and speed control of a DC shunt motor. |
|  | Determination of, voltage ratio, polarity and efficiency by load test of a single phase transformer. |
|  | Short circuit/open circuit tests on single phase transformer. |
|  | Measurement of power and power factor in a single phase AC series inductive circuit. |
|  | To study VI characteristics of PN diode. |
|  | To study VI characteristics of NPN diode. |
|  | To obtain V-I characteristics of Zener diode. |

**Textbooks**

* Printed Manual supplied to the students.

**Reference books**

* D. P. Kothari and I. J. Nagrath, “Basic Electrical Engineering”, Tata McGraw Hill, 2010.
* T.K. Nagsarkar and M.S. Sukhija, “Basic Electrical Engineering”, Oxford University Press
* D. C. Kulshreshtha, “Basic Electrical Engineering”, McGraw Hill, 2009.
* L. S. Bobrow, “Fundamentals of Electrical Engineering”, Oxford University Press, 2011.
* E. Hughes, “Electrical and Electronics Technology”, Pearson, 2010.
* V. D. Toro, “Electrical Engineering Fundamentals”, Prentice Hall India, 1989.
* B. L. Theraja, “Electrical Technology”, S Chand Publishing.

**Assessment Process (Internal)**

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks )**
* **Attendance = 10 Marks**

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | 1 | - | 1 | - | 1 | - | - | 1 | - | - | 2 | 2 | 2 | 2 |
| **CO2** | 3 | 2 | 1 | - | 1 | - | 1 | - | - | 1 | - | - | 2 | 2 | 2 | 2 |
| **CO3** | 3 | 2 | 1 | - | 1 | - | 1 | - | - | 1 | - | - | 2 | 2 | 2 | 2 |
| **CO4** | 3 | 2 | 1 | - | 1 | - | 1 | - | - | 1 | - | - | 2 | 2 | 2 | 2 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** II | | |
| **Course Title:** Introduction to Internet of Things | | | | | **Course Code:** CSE-201 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | - | - | 3 | 3 | 60 | 40 | 100 |

**Course Description:** The Internet of Things (IoT) is everywhere. It provides advanced data collection, connectivity, and analysis of information collected by computers everywhere—taking the concepts of Machine-to-Machine communication farther than ever before. This course gives a foundation in the Internet of Things, including the components, tools, and analysis by teaching the concepts behind the IoT and a look at real-world solutions.

**Course Outcomes**

**CO1**: Understand the definition and significance of the Internet of Things.

**CO2:** Discuss the architecture, operation, and business benefits of an IoT solution

**CO3:** Examine the potential business opportunities that IoT can uncover

**CO4:** Explore the relationship between IoT, cloud computing, and big data & Identify how IoT differs from traditional data collection systems

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | Introduction:-IOT Concepts, Introduction to IOT Communications, Telemetry vs IOT, Applications of IOT Communications, People, Processes and Devices. | 05 |
| 2 | IOT Technologies behind smart and intelligent devicesAutomation, asset management, telemetry, transportation, telematics. Telemetry and Telemetric; Report location, logistics, tracking and remote assistance; Next generation kiosks, self-service technology; Cellular IOT connectivity services | 07 |
| 3 | IOT Applications IOT Verticals; IOT Hosted Services; IOT Application development.; IOT Connectivity; IOT Software providers. | 04 |
| 4 | IOT Systems and Networks Study of RF Wireless Sensors; Wireless networks; Computer Connected to Internet; Network Devices; Device configuration and management; Exchange information in real time without human intervention. | 07 |
| 5 | IOT Design and System Engineering Discuss IOT Requirements; Hardware & Software; Study of IOT Sensors; Tagging and Tracking; Embedded Products; IOT Design; (U) SIM Card Technology; IOT Connectivity and Management; IOT Security & IOT Communication | 06 |
| 6 | IOT Communication Technologies Discuss Wireless Sensor Networking (WSN); Cellular Machine-to- Machine (M2M) application networks; Software for M2M Applications, Hardware, IP Based Cellular Networks & 3G, 4G. | 06 |
| 7 | IOT Security Discuss Security & Trust M2M Communications; Secure Communications;; M2M Security Framework; Securing Data input/output and internet communication. | 05 |

**Textbooks**

* Introduction to Internet Of Things (IOT) (IBM ICE Publications)

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | - | - | 1 | - | 1 | - | - | - | 2 | 2 | 1 | - | - | 1 |
| **CO2** | 3 | 2 | - | - | 1 | - | 1 | - | - | - | 2 | 2 | 1 | - | - | 1 |
| **CO3** | 3 | 2 | - | - | 1 | - | 1 | - | - | - | 2 | 2 | 1 | - | - | 1 |
| **CO4** | 3 | 2 | - | - | 1 | - | 1 | - | - | - | 2 | 2 | 1 | - | - | 1 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** II | | |
| **Course Title:** Workshop lab | | | | | **Course Code:** ME-152 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 1 | - | 2 | 4 | 2.5 | 60 | 40 | 100 |

**Course Description:** Course will help the students to learn about the fundamental knowledge of various shops like welding, fitting and casting etc. Furthermore use such technology in real time working industries.

**Course Outcomes:** Students will be able to understand and solve following particular problems by the end of this course:-

**CO1:** Student will be able to know how much time a joint will take for the assessment of time.

**CO2:**  Student will be able to make various joints in the given object with the available work material.

**CO3:** Student will be able to make various welding joints.

**CO4:** Student will be able to make castings by different gating systems.

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr No.** | **Experiment Title** |
|  | **Carpentry Shop:-** To Prepare a “T–LAP JOINT” |
|  | **Carpentry Shop:-** To prepare a “Cross Lap Joint” |
|  | **Carpentry Shop:-** To prepare “Mortise and Tenon Joint” |
|  | **Fitting Shop :-** To Make Right Angle Fitting Job |
|  | **Fitting Shop :-** To Make A Square Fitting Job. |
|  | **Machine Shop :-** To prepare the job as per the given specifications provided for different operations on lathe machine |
|  | **Welding Shop:-** Beading practice with arc welding |
|  | **Welding Shop:-** To make a butt joint by arc welding. |

**Textbooks**

* A text book of workshop technology , R.S. Khurmi , J.K. Gupta , S Chand.
* Workshop Practice , Sawarn Singh, Katson Books

**Reference books**

* Workshop Technology, Chapman W. A. J., CBS Publishers & Distributors.
* A Course in Workshop,B.S. Raguwanshi Dhanpat Rai & Co.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Practical work Performance = 50 Marks. (Practical File = 30 Marks , Viva-Voce = 20 Marks )**
* **Attendance = 10 Marks**

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | 1 | - | 1 | - | 1 | 1 | - | 1 | - | - | 2 | 1 | 1 | 2 |
| **CO2** | 3 | 2 | 1 | - | 1 | - | 1 | 1 | - | 1 | - | - | 2 | 1 | 1 | 2 |
| **CO3** | 3 | 2 | 1 | - | 1 | - | 1 | 1 | - | 1 | - | - | 2 | 1 | 1 | 2 |
| **CO4** | 3 | 2 | 1 | - | 1 | - | 1 | 1 | - | 1 | - | - | 2 | 1 | 1 | 2 |

**2nd Year**

**SEMESTER III**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** III | | |
| **Course Title:** Engineering Mathematics-III | | | | | **Course Code:** MAT-301 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** This Course contains linear differential equations, vector calculus, Laplace transform, probability distributions, Fourier series and applications of partial differential equations.

**Course Outcomes**

**CO1:** Solve linear differential equations with constants coefficients and apply them to realistic problems.

**CO2:** Find directional derivatives and apply knowledge of vector differentiation to find curl and divergence of vector fields.

**CO3:** Determine the defectiveness in items / products using probability distributions.

**CO4:** Express the given function as Fourier series over the given interval.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Fourier Series:** Periodic functions, Fourier series of period , Euler’s formulas, Dirichlet’s condition, Fourier series for discontinuous functions, Change of interval, Odd and even function, Half- range sine and cosine series. | 06 |
| 2 | **Fourier Transforms:** Fourier integrals, Fourier transforms, Fourier cosine and sine transforms, Properties of Fourier transforms, Convolution theorem, Perseval’s identity, Relation between Fourier and Laplace transforms, Fourier transforms of the derivatives of a function, Application to boundary value problems. | 08 |
| 3 | **Functions of a Complex Variables:** Functions of a complex variable, Exponential function, limit and continuity of a function, Analytic function, Cauchy-Riemann equations, Necessary and sufficient conditions for a function to be analytic, Polar form of the Cauchy-Riemann equations, Harmonic functions, Cauchy integral theorem, Cauchy residue theorem. | 09 |
| 4 | **Numerical analysis:**  Solution of algebraic and transcendental equations by the Bisection, Regula-falsi and Newton-Raphsion methods, Solution of linear simultaneous equations by Gauss elimination method, Iteration methods, Jacobi’s iteration method, Gauss-seidel method, Relaxation method, Numerical integration methods, Trapezoidal rule, Simpson’s one-third rule, Simpson’s three-eighth rule, Numerical solution of differential equations, Picard’s method, Taylor’s series method, Euler’s method and forth-order Runge-Kutta method. | 13 |
| 5 | **Linear Programming:**Linear programming problems formulation, Solution of Linear Programming Problem using Graphical method, Simplex Method, Dual-Simplex Method. | 06 |

**Textbooks**

* Higher Engg. Mathematics: B.S. Grewal
* Advanced Engg. Mathematics: E. Kreyzig.

**Reference Books**

* Complex variables and Applications: R.V. Churchil; Mc. Graw Hill
* Engg. Mathematics Vol. II: S.S. Sastry; Prentice Hall of India.
* Operation Research: H.A. Taha
* Probability and statistics for Engineer: Johnson. PHI

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | - | - | - | - | - | - | - | - | - | 1 | 1 | - | - | 1 |
| **CO2** | 1 | 1 | 3 | 1 | - | 1 | - | - | - | - | 1 | - | 1 | - | - | 1 |
| **CO3** | - | 3 | - | 2 | 1 | - | - | 1 | - | - | 3 | 2 | - | 2 | - | 1 |
| **CO4** | 3 | 2 | 1 | 2 | 2 | - | 1 | - | - | - | - | - | - | - | 1 | 1 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** III | | |
| **Course Title:** Data Structure Using C | | | | | **Course Code:** CSE-301 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** The course is designed to develop skills to design and analyze simple linear and non linear data structures. It strengthen the ability to the students to identify and apply the suitable data structure for the given real world problem. It enables them to gain knowledge in practical applications of data structures.

**Course Outcomes**

**CO1:** To gain knowledge on the notions of data structure, Abstract Data Type.

**CO2:** For a given algorithm student will able to analyze the algorithms to determine the time and computation complexity and justify the correctness.

**CO3:** Student will able to implement Graph search and traversal algorithms and determine the time and computation complexity.

**CO4:** For a given problem of Stacks, Queues and linked list student will able to implement it and analyze the same to determine the time and computation complexity.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Overview of C, Introduction, Stacks and Queues: Overview of ‘C’ :**Introduction , History, Structure of a C program, Flow of Control, Input output functions, Arrays and Structures, Functions  **Data structures and Algorithms: an overview**: concept of data structure, choice of right data structures, types of data structures, basic terminology Algorithms, how to design and develop an algorithm: stepwise refinement, use of accumulators and counters; algorithm analysis, complexity of algorithms Big-oh notation.  **Arrays : Searching Sorting**: Introduction, Arrays and its representations, One Dimensional Arrays, Two Dimensional arrays, Three dimensional arrays operations defined : traversal, selection, searching, insertion, deletion, and sorting  Searching: linear search, binary search; Sorting: selection sort, bubble sort, insertion sort, merge sort, quick sort, shell sort. Multidimensional arrays, address calculation of a location in arrays.  **Stacks and queues**: Introduction Stacks and queues, array representation of stack. Applications of stacks. Queues, Circular queues, array representation of Queues, Deques, priority queues, Applications of Queues. | 19 |
| 2 | **Pointers and Linked Lists: Pointers**: Definition, Pointer variables, Pointer and arrays, array of pointers, pointers and structures, Dynamic allocation.  **Linked Lists**: Concept of a linked list,. Circular linked list, doubly linked list, operations on linked lists. Concepts of header linked lists. Applications of linked lists, linked stacks linked Queues. | 08 |
| 3 | **Trees and Graphs : Trees**: Introduction to trees, binary trees, representation and traversal of trees, operations on binary trees, types of binary trees, Infix, Prefix, Postfix operations, threaded binary trees, B Trees, leaf nodes. Application of trees. **Graphs**: Introduction, terminology, ‘set, linked and matrix’ representation, operations on graphs, Applications of graphs, Graph Traversals. | 08 |
| 4 | **File Handling and Advanced data Structure**  Introduction to file handling, Data and Information, File concepts, File organization, files and streams, working with files. AVL trees, Sets, list representation of sets, applications of sets, skip lists | 07 |
|  | | |

**Text Book:**

• Data Structures using C by A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub.

• Data Structures using C by A. K. Sharma, Pearson

Introduction to Computers Science -An algorithms approach , Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H.

• Data Structure and the Standard Template library – Willam J. Collins, 2003, T.M.H

**Reference Books:**

• Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition.

• Fundamentals of Data structures by Ellis Horowitz & Sartaj Sahni, Pub, 1983,AW

• Fundamentals of computer algorithms by Horowitz Sahni and Rajasekaran.

• Data Structures and Program Design in C By Robert Kruse, PHI,

• Theory & Problems of Data Structures by Jr. SymourLipschetz, Schaum’s outline by TMH

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 1 | - | - | 1 | - | - | - | 2 | - | 1 | - | - | - | - | - | - |
| **CO2** | 3 | - | - | 2 | - | 3 | - | - | 2 | 3 | 2 | - | 1 | - | - | - |
| **CO3** | - | - | 1 | - | - | - | 3 | 1 | 2 | - | - | - | - | - | 2 | - |
| **CO4** | - | - | - | 1 | - | - | - | - | 2 | - | - | - | - | - | - | - |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** III | | |
| **Course Title:** Introduction to Sensor Technology & Instrumentation | | | | | **Course Code:** CSE-302 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | - | - | 3 | 3 | 60 | 40 | 100 |

**Course Description:** This course provide in depth knowledge in physical principles applied in sensing, measurement and a comprehensive understanding on how measurement systems are designed, calibrated, characterised, and analysed. This course will introduce the students to sources and detectors of various Optical sensing mechanisms and provide in-depth understanding of the principle of measurement, and theory of instruments and sensors for measuring velocity and acceleration.

**Course Outcomes**

**CO1:** Use concepts in common methods for converting a physical parameter into an electrical quantity

**CO2:** Choose an appropriate sensor comparing different standards and guidelines to make sensitive measurements of physical parameters like pressure, flow, acceleration, etc.

**CO3:** Design and develop sensors using optical methods with desired properties

**CO4:** Evaluate performance characteristics of different types of sensors 5.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Introduction to Sensor:** Sensors, Wireless Sensors | 07 |
| 2 | **Sensor Technologies:** Capacitive sensors, Hall effect sensors | 06 |
| 3 | **Type and Application of different Sensors:** Pressure Sensors, Accelerometers, Magnetometers, Tire pressure monitoring sensors, Touch sensors, 6-axis sensors, Gyroscopes, Intelligent sensors | 09 |
| 4 | **Sensor Data Analytics:** Static priority assignments (RM, DM), Dynamic priority assignments (EDF, EDF\*) | 08 |
| 5 | **Sensing-as-a service; business model:** Sensors by Application – Automotive, Consumer, Industrial, Medical/Health | 06 |
| 6 | **Actuators** | 05 |
|  | | |

**Text Book:**

1. Introduction to Sensor Technology & Instrumentation (IBM ICE Publications)
2. Jacob Fraden, “Hand Book of Modern Sensors: physics, Designs and Applications”, 2015, 3rd edition, Springer, New York.
3. Jon. S. Wilson, “Sensor Technology Hand Book”, 2011, 1st edition, Elsevier, Netherland.

**Reference Books:**

1. GerdKeiser,”Optical Fiber Communications”, 2017, 5th edition, McGraw-Hill Science, Delhi.
2. John G Webster, “Measurement, Instrumentation and sensor Handbook”, 2017, 2nd edition, CRC Press, Florida.
3. Eric Udd and W.B. Spillman, “Fiber optic sensors: An introduction for engineers and scientists”, 2013, 2nd edition, Wiley, New Jersey.
4. Bahaa E. A. Saleh and Malvin Carl Teich, “Fundamentals of photonics”, 2012, 1st edition, John Wiley, New York

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | - | 3 | 1 | 1 | 2 | 3 |
| **CO2** | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 3 | - | 3 | 2 | - | 3 | 3 |
| **CO3** | 3 | 3 | 3 | - | 2 | 3 | - | 2 | 3 | 3 | - | 3 | 2 | 1 | 2 | 2 |
| **CO4** | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | - | 3 | 2 | - | 2 | 2 |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** III | | |
| **Course Title:** Computer Organization | | | | | **Course Code:** CSE-303 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** This course qualitatively and quantitatively examines computer design trade-offs and teaches the fundamentals of computer architecture and organization, including CPU, memory, registers, arithmetic unit, control unit, and input/output components.

**Course Outcomes:**

**CO1:** Understand the theory and architecture of central processing unit.

**CO2:** Analyze some of the design issues in terms of speed, technology, cost, performance.

**CO3:** Design a simple CPU with applying the theory concepts.

**CO4:** Understand the architecture and functionality of central processing unit.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | Introduction: Functional units of digital system, and their interconnections, buses, bus architecture, Boolean algebra and Logic gates, Combinational logic blocks(Adders, Multiplexers, Encoders, de-coder), Sequential logic blocks(Latches, Flip-Flops, Registers, Counters) Store program control concept, Flynn’s classification of computers (SISD, MISD, MIMD); Multilevel viewpoint of a machine: digital logic, micro architecture, ISA, operating systems, high level language; structured organization; CPU, caches, main memory, secondary memory units & I/O; Performance metrics; MIPS, MFLOPS. | 10 |
| 2 | **Instruction Set Architecture:**  Interrupts: interrupt hardware, types of interrupts and exceptions, Instruction set based classification of processors (RISC, CISC, and their comparison); addressing modes: register, immediate, direct, indirect, indexed; Operations in the instruction set; Arithmetic and Logical, Data Transfer, Control Flow; Instruction set formats (fixed, variable, hybrid); Language of the machine: 8086 ; simulation using MSAM. | 09 |
| 3 | **Basic non pipelined CPU Architecture and Memory Hierarchy & I/O Techniques:** Arithmetic and logic unit: Look ahead carries adders. Peripheral devices, I/O interface, I/O ports, CPU Architecture types (accumulator, register, stack, memory/ register) detailed data path of a typical register based CPU, Fetch-Decode-Execute cycle (typically 3 to 5 stage); microinstruction sequencing, implementation of control unit, Enhancing performance with pipelining.  The need for a memory hierarchy (Locality of reference principle, Memory hierarchy in practice: Cache, main memory and secondary memory, Memory parameters: access/ cycle time, cost per bit); Main memory (Semiconductor RAM & ROM organization, memory expansion, Static & dynamic memory types); Cache memory (Associative & direct mapped cache organizations. | 13 |
| 4 | **Introduction to Parallelism and Computer Organization [80x86]:**  Goals of parallelism (Exploitation of concurrency, throughput enhancement); Amdahl’s law; Instruction level parallelism (pipelining, super scaling –basic features); Processor level parallelism (Multiprocessor systems overview).  Instruction codes, computer register, computer instructions, timing and control, instruction cycle, type of instructions, memory reference, register reference. I/O reference, Basics of Logic Design, accumulator logic, Control memory, address sequencing, micro-instruction formats, micro-program sequencer, Stack Organization, Instruction Formats, Types of interrupts; Memory Hierarchy. | 11 |
|  | | |

**Text Book:**

* Computer Organization and Design, 2ndEd., by David A. Patterson and John L. Hennessy, Morgan 1997, Kauffmann.
* Computer Architecture and Organization, 3rdEdi, by John P. Hayes, 1998, TMH.
* Computer Organisation& Architecture: Designing for performance by W. Stallings, 4th edition, 1996, Prentice-Hall International edition.
* Computer System Architecture by M. Mano, 2001, Prentice-Hall.
* Computer Architecture- Nicholas Carter, 2002, T.M.H.

**Reference Books:**

* Operating Systems Internals and Design Principles by William Stallings,4th edition, 2001, Prentice-Hall Upper Saddle River, New Jersey
* Computer Organization, 5th Edi, by Carl Hamacher, Zvonko Vranesic,2002, SafwatZaky.
* Structured Computer Organisation by A.S. Tanenbaum, 4th edition, Prentice-Hall of India, 1999, Eastern Economic Edition.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO-1** | - | - | - | 1 | - | - | - | 1 | - | - | - | 2 | - | 1 | - | - |
| **CO-2** | 2 | 1 | - | - | - | - | 1 | - | 2 | - | - | - | - | - | - | - |
| **CO-3** | - | 1 | 1 | - | 1 | - | - | - | - | 3 | - | - | 1 | - | 3 | - |
| **CO-4** | - | - | - | - | - | 3 | - | - | - | - | - | 3 | - | - | - | - |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** III | | |
| **Course Title:** Digital Electronics | | | | | **Course Code:** CSE-304 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits.

**Course Outcomes**

**CO1:** Have a thorough understanding of the fundamental concepts and techniques used in digital electronics.

**CO2:** To understand and examine the structure of various number systems and its application in digital design.

**CO3:** The ability to understand, analyze and design various combinational and sequential circuits. **CO4:** Ability to identify basic requirements for a design application and propose a cost-effective solution.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | Number system and their inter conversion, signed binary numbers, binary codes, cyclic codes, error detecting and correcting codes, hamming codes. Logic Gates, Minimization of logic gates using K- map method and Quine Mc-Clusky method (Tabular method) Combinational circuits, analysis procedure, design procedure, binary adder-subtractor, decimal adder, binary multiplier, magnitude comparator, decoders, encoders, multiplexers, demultiplexers. | 13 |
| 2 | Sequential circuits, Flip flops, SR flip flop JK flip flop.D Flip flop and T flip flop. Registers and counters: Shift registers, ripple counter, synchronous counter, and other counters. | 12 |
| 3 | Introduction and performance criteria for logic families, various logic families - DCTL, RTL, DTL, TTL & ECL working and their characteristics in brief, MOS Gates and GMOS Gates, comparison of various logic families. | 09 |
| 4 | Memory and programmable logic: Introduction, Memory organisation, Classification and characteristics of memories, Sequential memories, RAM, ROM, PLA, and PAL. | 08 |
|  | | |

**Text Book:**

* M. Morris Mano and M. D. Ciletti, “Digital Design”, 4thEdition, Pearson Education
* Pedroni - Digital Electronics & Design, Elsevier
* R.P. Jain , “Modern digital electronics” , 3rd edition , 12th reprint TMH Pub, 2007.
* Digital Design and computer organization: Nasib Singh Gill & J. B. Dixit

**Reference Books:**

* Grout - Digital Design using FPGA'S & CPLD's, Elsevier.
* F. Vahid: Digital Design: Wiley Student Edition, 2006.
* J. F. Wakerly, Digital Design Principles and Practices, Fourth Edn, Prentice-Hall, 2005.
* R. L. Tokheim, Digital electronics, Principles and applications, 6th Edition, Tata McGraw Hill Edition, 2003

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO-1** | 3 | - | - | 1 | - | - | 2 | - | 3 | 1 | - | 2 | - | 2 | - | 1 |
| **CO-2** | 1 | - | - | 2 | 1 | 1 | - | - | - | - | - | - | 1 | - | - | - |
| **CO-3** | 1 | 2 | 3 | - | - | - | 1 | 1 | - | 2 | - | 2 | 1 | - | - | 2 |
| **CO-4** | 1 | - | - | 3 | - | - | - | - | - | - | 2 | - | - | 3 | - | - |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** III | | |
| **Course Title:** Human Values & Professional Ethics | | | | | **Course Code:** CSE-305 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | - | - | 3 | 3 | 60 | 40 | 100 |

**Course Description:** To develop the ability to distinguish between what is of value and what is superficial in life. To develop the ability to face difficult situations in life boldly and resolve them confidently also the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.

**Course Outcomes**

**CO1:** Assess their own ethical values and the social context of problems**.**

**CO2:** Identify the multiple ethical interests at stake in a real-world situation or practice.

**CO3:** Articulate what makes a particular course of action ethically defensible.

**CO4:** Identify and analyze an ethical issue in the subject matter under investigation or in a relevant field.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Course Introduction** - Understanding the need Basic Guidelines, Content and Process for Value Education Understanding the need, basic guidelines, content and process for Value Education. Self Exploration–what is it?- its purpose content and process; „Natural Acceptance‟ and Experiential Validation- as the mechanism for self exploration. Continuous Happiness and Prosperity- A look at basic Human Aspirations Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario Method to fulfill the above human aspirations: understanding and living in harmony at various levels | 11 |
| 2 | **Understanding Harmony in the Human Being** - Process for Value Education Harmony in Myself! Understanding human being as a co-existence of the sentient “I” and the material „Body‟ Understanding the needs of Self („I‟) and „Body‟ - *Sukh* and *Suvidha* Understanding the Body as an instrument of „I‟ (I being the doer, seer and enjoyer) Understanding the characteristics and activities of „I‟ and harmony in „I‟ Understanding the harmony of I with the Body: *Sanyam* and *Swasthya*; correct appraisal of Physical needs, meaning of Prosperity in detail Programs to ensure *Sanyam* and *Swasthya*) | 11 |
| 3 | **Understanding Harmony in the Family and Society**- Understanding harmony in the family, society and nature. Harmony in Human-Human Relationship Understanding harmony in the Family- the basic unit of human interaction Understanding values in human-human relationship; meaning of *Nyaya* and program for its fulfillment to ensure *Ubhay-tripti*; Trust (*Vishwas)* and Respect (*Samman)* as the foundational values of relationship Understanding the meaning of *Vishwas*; Difference between intention and competence Understanding the meaning of *Samman*, Difference between respect and differentiation; the other salient values in relationship Understanding the harmony in the society (society being an extension of family): *Samadhan, Samridhi, Abhay, Sah-astitva* as comprehensive Human Goals Visualizing a universal harmonious order in society- Undivided Society (*Akhand* *Samaj),* Universal Order (*Sarvabhaum Vyawastha )*- from family to world family! | 13 |
| 4 | Understanding Harmony in the Nature and Existence - Whole existence as Coexistence Understanding the harmony in the Nature Interconnectedness and mutual fulfilment among the four orders of nature recyclability and self-regulation in nature Understanding Existence as Co-existence (*Sah-astitva*) of mutually interacting units in all-pervasive space Holistic perception of harmony at all levels of existence. | 09 |
|  | | |

**Text Book:**

1. Charles D. Fleddermann, “Engineering Ethics”, Pearson Education / Prentice Hall, New Jersey,2004 (Indian Reprint)
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, “Engineering Ethics – Concepts and Cases”, Wadsworth Thompson Learning, United States, 2000 (Indian Reprint now available)
3. John R Boatright, “Ethics and the Conduct of Business”, Pearson Education, New Delhi, 2003
4. R R Gaur, RSangal and GP Bagaria, A Foundation Course in value Education, Published by Excel Books (2009).

**Reference Books:**

1. Govindarajan M, Natarajan S, Senthil Kumar V. S, “Engineering Ethics”, Prentice HallofIndia,NewDelhi,2004.
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, "Engineering Ethics - Concepts and Cases", Wadsworth Thompson Learning, United States, 2000.
3. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi,2003.
4. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001.
5. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw-Hill, New York, 1996. 6. Introduction to the Constitution of India- Dr.Durga Das Basu.
6. Empowerment of rural women in India-Hemalatha H.M and Rameshwari Varma,Hema Prakashana.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | - | 2 | 1 | - | - | 3 | 2 | 1 | - | 3 | 3 | 2 | 1 | 1 | 1 | - |
| **CO2** | - | 1 | - | - | - | - | 2 | 1 | 2 | - | 1 | 3 | - | - | 1 | 1 |
| **CO3** | - | - | 1 | - | - | - | 1 | 1 | 1 | 2 | 1 | - | - | - | - | - |
| **CO4** | - | - | - | - | - | - | - | 1 | 1 | 2 | 2 | - | - | 1 | 2 | - |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** III | | |
| **Course Title:** Data Structure Using C Lab | | | | | **Course Code:** CSE-351 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:** The course is designed to develop skills to design and analyze simple linear and non linear data structures. It strengthen the ability to the students to identify and apply the suitable data structure for the given real world problem.

**Course Outcomes:**

**CO1:** Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms.

**CO2:** Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs.

**CO3:** Demonstrate different methods for traversing trees.

**CO4:** Programs that use arrays, records, linked structures, stack, queues, trees, and graphs.

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr No.** | **Experiment Title** |
| **1.** | Write a program to search an element in a two-dimensional array using linear search. |
| **2.** | Using iteration & recursion concepts write programs for finding the element in the array using Binary Search Method |
| **3.** | Write a program to perform following operations on tables using functions only: (a) Addition (b) Subtraction (c) Multiplication (d) Transpose |
| **4.** | Using iteration & recursion concepts write the programs for Quick Sort Technique |
| **5.** | Write a program to implement the various operations on string such as length of string concatenation, reverse of a string & copy of a string to another. |
| **6.** | Write a program for swapping of two numbers using ‘call by value’ and ‘call by reference strategies. |
| **7.** | Write a program to implement binary search tree.  ( Insertion and Deletion in Binary search Tree) |
| **8.** | Write a program to create a linked list & perform operations such as insert, delete, update, and reverse in the link list. |
| **9.** | Write the program for implementation of a file and performing operations such as insert, delete, update a record in the file. |
| **10.** | Create a linked list and perform the following operations on it  (a) add a node (b) Delete a node |
| **11.** | Write a program to simulate the various searching & sorting algorithms and compare their timings for a list of 1000 elements. |
| **12.** | Write a program to simulate the various graph traversing algorithms. |
| **13.** | Write a program which simulates the various tree traversal algorithms. |

**Textbooks**

1. Langsam, Augestein, Tenenbaum: Data Structures using C and C++, 2nd Edn, 2000, Horowitz and Sahani : Fundamental of Data Structures in C, 2 Edn, 2008.
2. Weiss: Data Structures and Algorithm Analysis in C/C++, 3rd Edn, 2006.
3. Sahani: Data Structures, Algorithms and applications in C++, 1997. 4. Corman et al: Introduction to Algorithms, 3rd Edn., 2009.

**Assessment Process (Internal)**

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks)**
* **Attendance = 10 Marks**

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | - | 2 | 1 | - | - | 3 | 2 | 1 | - | 3 | - | 2 | 1 | 1 | 1 | - |
| **CO2** | - | 1 | - | - | - | - | 2 | - | - | - | 1 | 3 | - | - | 1 | 1 |
| **CO3** | - | - | 1 | - | - | - | 1 | 1 | 1 | 2 | 1 | - | - | - | - | - |
| **CO4** | - | - | - | - | - | - | - | 1 | 1 | 2 | 2 | - | - | 1 | 2 | - |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** III | | |
| **Course Title:** Introduction to Sensor Technology & Instrumentation Lab | | | | | **Course Code:** CSE-352 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description: This course** provides the fundamental knowledge on the basic laws and phenomena on which operation of sensor transformation of energy is based. To impart a reasonable level of competence in the design, construction, and execution of mechanical measurements strain, force, torque and pressure.

**Course Outcomes:**

**CO1:** Use concepts in common methods for converting a physical parameter into an electrical quantity

**CO2:** Choose an appropriate sensor comparing different standards and guidelines to make sensitive measurements of physical parameters like pressure, flow, acceleration, etc.

**CO3:** Design and develop sensors using optical methods with desired properties

**CO4:** Evaluate performance characteristics of different types of sensors & Create analytical design and development solutions for sensors and Locate different types of sensors used in real life applications and paraphrase their importance.

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr No.** | **Experiment Title** |
| **1.** | 1. Design of signal conditioning circuits for strain gauges- Strain, Force, pressure, and torque measurement   1. Strain measurement with Bridge Circuit 2. Beam force sensor using Strain Gauge Bridge 3. Beam deflection sensing with Strain Gauge Bridge 4. Diaphragm pressure sensor using Strain Gauge Bridge 5. Shear strain and angle of shift measurement of hollow shaft.   After completing the 1st set of characteristics. Design a weighing machine having a range of 0-5 Kg with a sensitivity of 5 mg. What modification he/she has to do to change the upper range to 100 Kg with a sensitivity of 100 mg. |
| **2.** | Develop a displacement measurement system with the following sensors:   1. Inductive transducer (LVDT) 2. ii. Hall effect sensor. |
| **3.** | . After studying the characteristics of temperature sensors listed below, develop a temperature measurement system for a particular application using the suitable sensor.   1. Thermocouple principles 2. Thermistor and linearization of NTC Thermistor 3. Resistance Temperature Detector 4. Semiconductor Temperature sensor OA79. 5. Current output absolute temperature sensor |
| **4.** | Develop a sensor system for force measurement using piezoelectric transducer |
| **5.** | Measurement of shear strain and angle twist using strain gauge is not suitable for many applications. Based on other sensing experiments carried out suggest a non-contact method and try to complete its proof of concept. |

**Assessment Process (Internal)**

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks)**
* **Attendance = 10 Marks**

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 3 | 3 | 2 | 2 | - | 2 | 2 | 2 | - | - | 3 | 1 | 1 | 2 | 3 |
| **CO2** | 3 | - | 3 | 2 | 3 | 2 | - | 2 | 2 | 3 | - | 3 | 2 | - | 3 | 3 |
| **CO3** | 3 | - | - | - | 2 | 3 | - | 2 | - | 3 | - | 3 | 2 | 1 | 2 | 2 |
| **CO4** | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | - | - | 3 | 2 | - | 2 | 2 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** III | | |
| **Course Title:** Digital Electronics Lab | | | | | **Course Code:** CSE-353 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:** To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits. To prepare students to perform the analysis and design of various digital electronic circuits.

**Course Outcomes**

**CO1:** Learn the basics of gates.

**CO2:** Construct basic combinational circuits and verify their functionalities.

**CO3:** Apply the design procedures to design basic sequential circuits

**CO4:** Learn about counters AND Shift registers.

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr No.** | **Experiment Title** |
| **1.** | Introduction to digital electronics lab- nomenclature of digital ICs, specifications, study of the data sheet, concept of Vcc and ground, verification of the truth tables of logic gates using TTL ICs. |
| **2.** | Implementation and verification of various logic gates. |
| **3.** | Verification of state tables of RS, JK, T and D flip-flops. |
| **4.** | Implementation and verification of Decoder/De-multiplexer and Encoder using logic gates. |
| **5.** | Implementation of 4x1 multiplexer using logic gates. |
| **6.** | Implementation of 4-bit parallel adder using 7483 IC. |
| **7.** | Design, and verify the 4-bit synchronous counter. |

**Textbooks**

* Thomas L Floyd “ Digital Fundamentals ”

**Reference books**

* Reference Books 1. M. Morris Mano. “Digital Logic and Computer Design”, 2. M . Morris Mano, “Digital Design”, Pearson Education Asia,

**Assessment Process (Internal)**

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks)**
* **Attendance = 10 Marks**

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO-1** | 3 | 3 | 3 | - | - | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | - | - | 2 |
| **CO-2** | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | - | 3 | 2 | - | - | 3 |
| **CO-3** | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 |
| **CO-4** | 3 | 3 | 2 | 3 | 3 | 3 | 2 | - | - | - | 3 | 3 | 2 | - | - | 1 |

**SEMESTER IV**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** IV | | |
| **Course Title:** Theory of Computation | | | | | **Course Code:** CSE-401 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** Introduces the foundations of automata theory, computability theory, and complexity theory. Shows relationship between automata and formal languages. Addresses the issue of which problems can be solved by computational means (decidability vs undecidability), and Introduces concepts related to computational complexity of problems. It also provides an overview of the theoretical foundations of computer science from the perspective of formal languages. Apply mathematical foundations, algorithmic principles and computer science theory to the modelling and design of computational systems

**Course Outcomes**

**CO1:** Able to design Finite Automata machines for given problems

**CO2:** Able to design Pushdown Automata machine for given CF language(s)

**CO3:** Able to generate the strings/sentences of a given context-free languages using its grammar

**CO4:** Able to design Turing machines for given any computational problem.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Finite Automata:** Introduction, Deterministic Finite Automata (DFA) -Formal definition, simpler notations (state transition diagram, transition table), language of a DFA. Nondeterministic Finite Automata (NFA)- Definition of NFA, language of an NFA), Equivalence of DFA and NDFA Conversion of NFA to DFA Finite automata with E- moves, Regular Expressions, Equivalence of finite automata and Regular Expressions, Regular expression conversion and vice versa.  **Introduction to Machines:** Concept of basic Machine, Properties and limitations of FSM. Moore and mealy Machines, Equivalence of Moore and Mealy machines, state and prove Arden‟s Method. | 19 |
| 2 | **Properties of Regular Sets:** The Pumping Lemma for Regular Sets, Applications of the pumping lemma, Closure properties of regular sets, Myhill-Nerode Theorem and minimization of finite Automata, Minimization Algorithm.  **Grammars:** Definition, Derivation Trees ,Context free and Context sensitive grammar, Ambiguity regular grammar, Reduced forms, Removal of useless Symbols, unit production and null production Chomsky Normal Form (CNF), Pumping Lemma for CFL’s, Griebach Normal Form (GNF). | 08 |
| 3 | **Pushdown Automata:** Introduction to Pushdown Machines, Application of Pushdown Machines  **Turing Machines: :** Formal definition and behaviour, Languages of a TMDeterministic and Non-Deterministic Turing Machines, Design of T.M, Halting problem of T.M., PCP Problem | 08 |
| 4 | **Chomsky Hierarchies:** Chomsky hierarchies of grammars, Unrestricted grammars, Context sensitive languages, Relation between languages of classes.  **Computability:** Properties of recursive and recursively enumerable languages**,** Basic concepts, Primitive Recursive Functions. | 07 |
|  | | |

**Text Book:**

* Introduction to automata theory, language & computations- Hopcroaft & O.D.Ullman, R Mothwani, 2001, AW
* Introduction to formal Languages & Automata-Peter Linz, 2001, Narosa Publ..
* Fundamentals of the Theory of Computation- Principles and Practice by RamondGreenlaw and H. James Hoover, 1998, Harcourt India Pvt. Ltd.
* J. C. Martin, “Introduction to Languages and Theory of Computation”, Tata Mcgraw Hill, 3rd Edition, 2007.

**Reference Books:**

* Theory of Computer Sc.(Automata, Languages and computation):K.L.P.Mishra & N.Chandrasekaran, 2000, PHI.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 1 | - | 2 | - | - | 3 | 2 | - | 3 | - | 3 | 2 | 2 | - | - | 3 |
| **CO2** | 3 | 2 | - | - | 1 | - | 2 | - | 2 | - | 3 | - | - | - | 2 | - |
| **CO3** | 2 | 2 | 3 | - | 3 | - | - | - | - | 3 | - | 3 | 3 | 3 | - | 3 |
| **CO4** | 3 | 3 | - | 2 | 3 | - | - | 2 | 2 | - | 3 | 3 | - | - | - | 3 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** IV | | |
| **Course Title:** Software Engineering | | | | | **Course Code:** CSE-402 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** This course is an introduction to the practical problems of specifying, designing, building, testing, and delivering reliable software systems. Special topics include professionalism, project management, and the legal framework for software development. As a central part of the course, student teams carry out projects for real clients. Each project includes all aspects of software development from a feasibility study to final delivery. It provides a brief account of associated professional and legal issues.

**Course Outcomes**

**CO1:** Knowledge of basic SW engineering methods and practices, and their appropriate application

**CO2:** A general understanding of software process models such as the waterfall and evolutionary models.

**CO3:** Understanding of software requirements and the SRS documents.

**CO4:** Understanding on quality control and how to ensure good quality software.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Introduction:** Software Evolution**,** The process, software products, emergence of software engineering, evolving role of software, Need for software engineering ,software life cycle models, Software Characteristics, Applications, Software crisis, Software prototyping and specification.  **Software project management**: Project management concepts and its importance, software process and project metrics Project planning, project size estimation metrics, project organization, project estimation Techniques, empirical estimation techniques, COCOMO- A Heuristic estimation techniques, staffing level estimation, team structures, staffing, risk analysis and management, project scheduling and tracking , Project monitoring and control | 11 |
| 2 | **Requirements Analysis and specification** Value of Good SRSrequirements engineering, system modeling and simulation Analysis principles modeling, Classification of requirements, partitioning Software, prototyping: , Prototyping methods and tools; Specification principles, Representation, the software requirements specification and reviews Analysis Modeling: Data Modeling, Functional modeling and information flow: Data flow diagrams, Behavioral Modeling; The mechanics of structured analysis: Creating entity/ relationship diagram, data flow model, control flow model, the control and process specification; The data dictionary; Other classical analysis methods.  **System Design**: Design concepts and principles: the design process: Design and software quality, design principles; Function oriented and OO Design, Detailed Design, Verification., Abstraction, refinement, modularity, software architecture, control hierarchy, structural partitioning, data structure, software procedure, information hiding; Effective modular design: Functional independence, Cohesion, Coupling; Design Heuristics for effective modularity; The design model; Design documentation | 11 |
| 3 | **Architectural Design:** Software architecture, Data Design: Data modeling, data structures, databases and the data warehouse, Analyzing alternative Architectural Designs ,architectural complexity; Mapping requirements into a software architecture; Transform flow, Transaction flow; Transform mapping: Refining the architectural design.  **Testing and maintenance:,** Testing Issues, Testing Object-Oriented SystemsSoftware Testing Techniques, software testing fundamentals: objectives, principles, testability; Test case design, white box testing, basis path testing: Control structure testing: Black box testing, testing for specialized environments ,architectures and applications. Planning for maintenance Software Testing Strategies: Verification and validation, Unit testing, Integration testing,; Validation testing, alpha and beta testing; System testing: Recovery testing, security testing, stress testing, performance testing; The art of debugging, the debugging process debugging approaches. Software re-engineering , reverse engineering ,restructuring, forward engineering. | 11 |
| 4 | **Software Reliability and Quality Assurance** :Quality concepts, Quality Dimension , Process quality and product quality, quality assurance planning Software quality assurance , Quality measurement SQA activities; Software reviews: cost impact of software defects, defect amplification and removal; formal technical reviews: The review meeting, review reporting and record keeping, review guidelines; Formal approaches to SQA; Statistical software quality assurance; software reliability: Measures of reliability and availability ,The ISO 9000 Quality standards: The ISO approach to quality assurance systems, The ISO 9001 standard, Software Configuration Management. Computer Aided software Engineering: CASE, building blocks, integrated case environments and architecture, repository. | 08 |
|  | | |

**Text Book:**

* Software Engineering – A Practitioner‟s Approach, Roger S. Pressman, 1996, MGH.
* Software Engineering: Pankaj Jalote A Precise Approach, Wiley India Publications
* Software Engineering Fundamentals Oxford University, Ali Behforooz and Frederick J. Hudson 1995 JW&S,

**Reference Books:**

* Fundamentals of software Engineering, Rajib Mall, PHI
* Software Engineering by Ian sommerville, Pearson Edu, 5th edition, 1999, AW,
* Software Engineering – David Gustafson, 2002, T.M.H
* Software Engineering Fundamentals Oxford University, Ali Behforooz and Frederick J. Hudson 1995 JW&S,

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 3 | - | 2 | 2 | - | 2 | 2 | 2 | 3 | 1 | 3 | 3 | 2 | 3 | 1 |
| **CO2** | - | 3 | 3 | - | - | 2 | 3 | - | 2 | 3 | 1 | - | - | - | - | - |
| **CO3** | 3 | - | - | 2 | 2 | - | 1 | 2 | 3 | - | - | - | - | 2 | - | - |
| **CO4** | 3 | 3 | 3 | - | 3 | 3 | 2 | 2 | 3 | 3 | 1 | - | 3 | 3 | 2 | - |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** IV | | |
| **Course Title:** Database Management System | | | | | **Course Code:** CSE-403 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS. It present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve-efficiently, and effectively-information from a DBMS

**Course Outcomes**

**CO1:** Demonstrate the basic elements of a relational database management system.

**CO2:** Use the basics of SQL and construct queries using SQL in database creation and interaction.

**CO3:** Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system.

**CO4:** Analyze and Select storage and recovery techniques of database system.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Introduction, Client Server Arch., E-R Diagram and Keys :** Basic Terminology of Database: Data and information, Problems in Manual Database ,Overview of database Management System; Various views of data, data Models, Introduction to Database Languages. Advantages of DBMS over file processing systems, Responsibility of Database Administrator, Introduction to Client/Server architecture, Three levels architecture of Database Systems, E-R Diagram (Entity Relationship), mapping Constraints, Keys, Reduction of E-R diagram into tables, Converting ERModel into relational schema. | 19 |
| 2 | **File Organization and Relational Model and Calculus:** Sequential Files, index sequential files, direct files, Hashing, B-trees Index files.  Relational Model, Components, Properties of relational model {Codd’s 12 rules (integrity rules (concept of keys))}, Relational Algebra & various operations, Relational and Tuple calculus. | 08 |
| 3 | **Introduction to Query Languages:**  QLB , QBE, Structured query language – with special reference of (SQL of ORACLE), integrity constraints, functional dependencies & NORMALISATION – (up to 4th Normal forms), BCNF (Boyce – code normal forms) | 08 |
| 4 | Introduction to Distributed Data processing, parallel Databases, data mining & data warehousing, network model & hierarchical model, Introduction to transaction, properties of transaction and life cycle of transaction, Introduction to Concurrency control and Recovery systems., need of concurrency control and recovery system, problems in concurrent transactions. | 07 |
|  | | |

**Text Book:**

* Database System Concepts by A. Silberschatz, H.F. Korth and S. Sudarshan, 3rd edition, 1997, McGraw-Hill, International Edition.
* Introduction to Database Management system by Bipin Desai, 1991, Galgotia Pub.
* C.J. Date, “ An Introduction To Data Base System”, 7th ed. Pearson Publication , 2000

**Reference Books:**

* Fundamentals of Database Systems by R. Elmasri and S.B. Navathe, 3rd edition, 2000, Addision-Wesley, Low Priced Edition.
* An Introduction to Database Systems by C.J. Date, 7th edition, Addison-Wesley, Low Priced Edition, 2000.
* Database Management and Design by G.W. Hansen and J.V. Hansen, 2nd edition, 1999, Prentice-Hall of India, Eastern Economy Edition.
* Database Management Systems by A.K. Majumdar and P. Bhattacharyya, 5th edition, 1999, Tata McGraw-Hill Publishing.

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 3 | 2 | 1 | 2 | 2 | 2 | - | - | - | 3 | - | 2 | - | 1 | 3 |
| **CO2** | 3 | - | 3 | 2 | - | 2 | - | 2 | 2 | 1 | - | 2 | - | 1 | - | - |
| **CO3** | 3 | - | 2 | - | 1 | 3 | - | 3 | - | - | 1 | - | - | - | 3 | - |
| **CO4** | 3 | 2 | 3 | 1 | 2 | - | 2 | - | 1 | 2 | 1 | 2 | - | 3 | - | 2 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** IV | | |
| **Course Title:** Wireless Sensor Networks (WSN) & IoT Standards | | | | | **Course Code:** CSE-404 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | - | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** In this course students will learn the basic principles and related techniques of wireless sensor networks and IoT, namely: node architecture, physical layer, MAC protocol, routing and network protocols, security, and energy management. In addition, in the lecture, modes and concepts of JSN and IoT will be implemented that are learned on existing devices.

**Course Outcomes**

**CO1:** Having an ability to apply mathematics and science in engineering applications.

**CO2:** Having an ability to design a component or a product applying all the relevant standards and with realistic constraints, including public health, safety, culture, society and environment.

**CO3:** Having problem solving ability- to assess social issues (societal, health, safety, legal and cultural) and engineering problems.

**CO4:** Having an ability to design and conduct experiments, as well as to analyse and interpret data, and synthesis of information.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Characteristics of WSN**  Hardware Components; Energy Consumption of Sensor Nodes; Operating Systems and execution environments; Network Architecture | 09 |
| 2 | **Physical Layer**  Frequency Allocation; Packet transmission and Synchronization | 08 |
| 3 | **MAC and Link Layer Protocols**  IEEE 802.15.4 MAC Protocol; Contention based protocols; Schedule based protocols; Error Control; Link Management | 08 |
| 4 | **Routing Protocols and Data / Content centric Networking**  Energy-efficient unicast; Broadcast and multicast; Geographic Routing; Data-Centric routing; Data Aggregation | 07 |
| 5 | **Applications of WSN**  IPv6,CoAP; Building Automation; Internet Of Things; Smart Agriculture; Perimeter monitoring; Object Tracking | 06 |
| 6 | **IOT Standards** | 05 |
|  | | |

**Text Book:**

* Wireless Sensor Networks (WSN) & IoT Standards (IBM ICE Publications).

**Reference Books:**

# IOT (Internet of Things) Programming: A Simple and Fast Way of Learning IOT Kindle Edition (David Etter).

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 3 | 3 | - | - | - | 2 | 2 | 2 | - | 1 | - | - | 2 | 3 | 3 |
| **CO2** | 3 | - | - | 2 | 3 | - | 3 | - | - | - | 1 | 3 | - | 3 | - | 1 |
| **CO3** | 3 | - | - | 2 | 2 | - | 1 | 2 | 3 | 1 | 2 | 3 | - | - | 3 | 3 |
| **CO4** | 3 | 3 | - | 2 | 3 | 3 | 2 | - | 3 | 3 | 1 | 3 | - | 3 | 2 | 1 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** IV | | |
| **Course Title:** Computer Networks | | | | | **Course Code:** CSE-405 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** The course objectives include learning about computer network organization and implementation, obtaining a theoretical understanding of data communication and computer networks, and gaining practical experience in installation, monitoring, and troubleshooting of current LAN systems.

**Course Outcomes**

**CO1:** Study the functions of OSI Layers.

**CO2:** Familiarize with the Transmission Media, Flow Control and Error Detection & Correction.

**CO3:** Understand fundamental concepts in Routing, Addressing & working of Transport Protocols.

**CO4:** Gain familiarity with common networking & Application Protocols.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **OSI Reference Model and Network Architecture:** Introduction to Computer Networks, Layered Network Architecture; ISO-OSI Model; TCP/IP, Example networks ARPANET, Internet, Private Networks, Network Topologies: Bus-, Star-, Ring-, Hybrid -, Tree -, Complete -, Irregular –Topology; Types of Networks : Local Area Networks, Metropolitan Area Networks, Wide Area Networks; Functions of each layer, Services and Protocols of each layer | 12 |
| 2 | **TCP/IP:** Introduction, History of TCP/IP, Layers of TCP/IP, Protocols, Internet Protocol, Transmission Control Protocol , User Datagram Protocol, IP Addressing, IP address classes, Subnet Addressing, Internet Control Protocols, ARP, RARP, ICMP, Application Layer, Domain Name System, Email – SMTP, POP,IMAP; FTP, NNTP, HTTP, Overview of IP version 6. | 12 |
| 3 | **Local Area Networks:** Introduction to LANs, Features of LANs, Components of LANs, Usage of LANs, LAN Standards, IEEE 802 standards, Channel Access Methods, Aloha, CSMA, CSMA/CD, Token Passing, Ethernet, Layer 2 & 3 switching, Fast Ethernet and Gigabit Ethernet, Token Ring, LAN interconnecting devices: Hubs, Switches, Bridges, Routers, Gateways.  **Wide Area Networks:** Introduction of WANs, Routing, Congestion Control, WAN Technologies, Distributed Queue Dual Bus (DQDB) | 11 |
| 4 | Synchronous Digital Hierarchy (SDH)/ Synchronous Optical Network (SONET), Asynchronous Transfer Mode (ATM), Frame Relay.,Wireless Links.  **Introduction to Network Management:** Simple Network Management Protocol, File Transfer Protocol, Simple Mail Transfer Protocol, Telne**t,**Remote Monitoring Techniques: Polling, Traps, Performance Management, Class of Service, Quality of Service, Security management, Firewalls, VLANs, Proxy Servers, Introduction to Network Operating Systems: Client-Server infrastructure, Windows NT/2000. | 7 |
|  | | |

**Text Book:**

* **W** Computer Networks (3rd edition), Tanenbaum Andrew S., International edition, 1996.

**Reference Books:**

* Data Communications, Computer Networks and Open Systems (4th edition), Halsall Fred, 2000,
* 2. Addison Wesley, Low Price Edition.
* 3. Business Data Communications, Fitzgerald Jerry,.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | - | - | - | 2 | 2 | - | - | 2 | 2 | 3 | 1 | - | 3 | 3 | - | 3 |
| **CO2** | - | - | - | - | - | 2 | 3 | 2 | - | 2 | 1 | 3 | 1 | - | 3 | 3 |
| **CO3** | 3 | 3 | 3 | 2 | 2 | 3 | 1 | - | 3 | - | 2 | - | 2 | - | - | - |
| **CO4** | 3 | 3 | 3 | 2 | 3 | - | 2 | 2 | 3 | 3 | 1 | 3 | - | 3 | 3 | 2 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** IV | | |
| **Course Title:** Discrete Structure | | | | | **Course Code:** CSE-406 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** This course provides a foundation for Computer Science. Many other areas of Computer Science require the ability to work with concepts from discrete structures. Discrete structures include topics such as set theory, logic, graph theory.

**Course Outcomes**

**CO1:** Perform operations on various discrete structures such as sets, functions, relations, and sequences.

**CO2:** Ability to solve problems using Counting techniques, Permutation and Combination,   
Recursion and generating functions.

**CO3:** Apply algorithms and use of graphs and trees as tools to visualize and simplify Problems

**CO4:** Understand the various properties of algebraic systems like Rings, Monoids and Groups.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Theory and Propositional Calculus:**  Introduction to set theory, Set operations, Algebra of sets, Duality, Finite and Infinite sets, Classes of sets, Power Sets, Multi sets, Cartesian Product, Representation of relations, Types of relation, Equivalence relations and partitions , Partial ordering relations and lattices Function and its types, Composition of function and relations, Cardinality and inverse relations  Introduction to propositional Calculus: Basic operations: AND (^), OR(v), NOT(~), Truth value of a compound statement, propositions, tautologies, contradictions. | 15 |
| 2 | **Techniques of Counting and Recursion and recurrence Relation:**  Permutations with and without repetition, Combination. Polynomials and their evaluation, Sequences, Introduction to AP, GP and AG series, partial fractions, linear recurrence relation with constant coefficients, Homogeneous solutions, Particular solutions, Total solution of a recurrence relation using generating functions. | 10 |
| 3 | **Algebric Structures:** Definition and examples of a monoid, Semigroup, Groups and rings, Homomorphism, Isomorphism and Automorphism, Subgroups and Normal subgroups, Cyclic groups, Integral domain and fields, Cosets, Lagrange’s theorem | 08 |
| 4 | **Section Graphs and Trees:** Introduction to graphs, Directed and Undirected graphs, Homomorphic and Isomorphic graphs, Subgraphs, Cut points and Bridges, Multigraph and Weighted graph, Paths and circuits, Shortest path in weighted graphs, Eurelian path and circuits, Hamilton paths and circuits, Planar graphs, Euler’s formula, Trees, Spanning trees, Binary trees and its traversals | 08 |
|  | | |

**Text Book:**

* Elements of Discrete Mathematics,C.L Liu, 1985, McGraw Hill

**Reference Books:**

* Discrete Mathematics by Johnson Bough R., 5th Edition, PEA, 2001..
* Concrete Mathematics: A Foundation for Computer Science, Ronald Graham, Donald Knuth and Oren Patashik, 1989, Addison-Wesley.
* Mathematical Structures for Computer Science, Judith L. Gersting, 1993, Computer Science Press.
* Applied Discrete Structures for Computer Science, Doerr and Levasseur, (Chicago: 1985,SRA
* Discrete Mathematics by A. Chtewynd and P. Diggle (Modular Mathematics series), 1995, Edward Arnold, London,

**Assessment Process (Internal)**

|  |  |  |
| --- | --- | --- |
|  |  | Maximum Marks |
| Assignment -1 | (AT1) | 05 |
| Assignment -2 | (AT1) | 05 |
| Assignment -3 | (AT1) | 05 |
| Mid Sessional Terms 1, 2, 3  (Best of two MST) | MST | 40 |
| Final Semester Examination | FSE | 40 |
| Attendance | A | 05 |
| **Total Marks** |  | **100** |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 2 | - | - | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 3 | 2 | 3 | 1 | 2 |
| **CO2** | - | - | 3 | 2 | - | 3 | 3 | - | 3 | - | 1 | 3 | - | 3 | - | 3 |
| **CO3** | 2 | 2 | - | 3 | - | 3 | 1 | 2 | - | - | 1 | - | - | - | - | 3 |
| **CO4** | 3 | 3 | - | - | - | - | 3 | 2 | 2 | - | 1 | 3 | 2 | 3 | 2 | - |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** IV | | |
| **Course Title:** DBMS Lab | | | | | **Course Code:** CSE-451 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:** The objective of this lab course is to understand the practical applicability of database management system concepts. Working on existing database systems, designing of database, creating relational database, analysis of table design. It also covers essential DBMS concepts such as: Transaction Processing, Concurrency Control and Recovery.

**Course Outcomes**

**CO1:** Infer database language commands to create simple database.

**CO2:** Analyze the database using queries to retrieve records

**CO3:** Applying PL/SQL for processing database

**CO4:** Understand various advanced queries execution such as relational constraints, joins, set operations, aggregate functions, trigger, views and embedded SQL

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr. No.** | **List Of Experiments** |
| 1 | **I Create a database and write the programs to carry out the following operation:**  1. Add a record in the database  2. Delete a record in the database  3. Modify the record in the database |
| 2 | **I Create a database and write the programs to carry out the following operation:**  4. Generate queries  5. Generate the report  6. List all the records of database in ascending order. |
| 3 | **II Develop two menu driven project for management of database system:**  1. Library information system  a. Engineering  b. MCA |
| 4 | **II Develop two menu driven project for management of database system:**  2. Inventory control system  a. Computer Lab  b. College Store |
| 5 | **II Develop two menu driven project for management of database system:**  3. Student information system  c. Academic  d. Finance |
| 6 | **II Develop two menu driven project for management of database system:**  4. Time table development system  e. CSE, IT & MCA Departments  f. Electrical & Mechanical Departments |

**Assessment Process (Internal)**

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks)**
* **Attendance = 10 Marks**

**CO-PO Mapping**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | - | - | 2 | - | 2 | 3 | 2 | - | 2 | - | 3 | - | 2 | - | - | - |
| **CO2** | 3 | 1 | - | - | 2 | - | 3 | 2 | - | - | 2 | 2 | 2 | - | - | 1 |
| **CO3** | - | 3 | 2 | - | 1 | 3 | - | 3 | 3 | - | 1 | - | - | 3 | 2 | - |
| **CO4** | 3 | - | 2 | - | 2 | 2 | - | - | - | - | 1 | 1 | - | - | - | 3 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** IV | | |
| **Course Title:** Software Engineering & Testing Lab | | | | | **Course Code:** CSE-452 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:** The course is capable to acquire the generic software development skill through various stages of software life cycle. He will also be able to ensure the quality of software through software development with various protocol based environment. After completion of course student will be able to generate test cases for software testing.

**Course Outcomes**

**CO1:** Understands the Automation Testing Approach. Write test suites for software.

**CO2:** Use the basics of SQL and construct queries using SQL in database creation and interaction.

**CO3:** Construct and test simple programs.

**CO4:** Practice clean coding. Take part in project management.

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr. No.** | **List Of Experiments** |
| 1 | Phases in software development project, overview, need, coverage of topics. |
| 2 | To assign the requirement engineering tasks |
| 3 | To perform the system analysis: Requirement analysis, SRS |
| 4 | To perform the function oriented diagram: DFD and Structured chart |
| 5 | To perform the user’s view analysis: Use case diagram |
| 6 | To draw the structural view diagram: Class diagram, object diagram |
| 7 | To draw the behavioural view diagram: Sequence diagram, Collaboration diagram |
| 8 | To draw the behavioral view diagram: State-chart diagram, Activity diagram. |
| 9 | To draw the implementation view diagram: Component diagram. |
| 10 | To draw the environmental view diagram : Deployment diagram |
| 11 | To perform various testing using the testing tool unit testing, integration testing |

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks)**
* **Attendance = 10 Marks**

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | - | 2 | 2 | - | - | 3 | 2 | - | - | 2 | - | 3 | 1 | - |
| **CO2** | - | 3 | 3 | - | 3 | - | 3 | - | 2 | 3 | 2 | 3 | 2 | - | - | 3 |
| **CO3** | - | 3 | - | 2 | 2 | - | - | 3 | - | 3 | - | 2 | - | 3 | 2 | - |
| **CO4** | 3 | - | - | - | 3 | - | 3 | - | 2 | - | - | 3 | 1 | - | 2 | - |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** IV | | |
| **Course Title:** WSN & IoT Standards Lab | | | | | **Course Code:** CSE-453 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:** New Areas of Technology “Internet of things (IoT) and applications” will be mainly designed for theoretical as well as hands on experience using hardware and software. This is a multidisciplinary activity and hence is open to academic and Industry representatives with varied background. It will cover topics like Smart Cities and IoT, Software defined networks, Smart sensors and systems, Computer forensics and IoT related cyber legislation issues. Basic to advanced topics with hands on using hardware and software will be focus of this course.

**Course Outcomes**

**CO1:** Effective usage of IoT deployment for different sectors.

**CO2:** Developing and modifying code for various sensor based applications using wireless sensor modules and working with variety of modules like environmental and security module.

**CO3:** Modular hands on training will enable participants to conduct IoT related activities in academic environment and initiate new projects in Industrial sectors.

**CO4:** Participants will be encouraged to orient themselves to specific focused areas of their interest with hands on training.

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr. No.** | **List Of Experiments** |
| 1 | Getting started with  ·         IDE  ·         Sample programs and uploading binaries to the device  ·         Creating an empty project  ·         Different ways of importing |
| 2 | Attaching sensors and actuators. |
| 3 | Connecting a communication module  ·         Nucleo board pin out |
| 4 | Creating a virtual device and communicating with it through DeviceHub.net  ·         Creating a project |

**Assessment Process (Internal)**

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks)**
* **Attendance = 10 Marks**

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 2 | - | 3 | - | - | - | 3 | - | 2 | 3 | - | 3 | 2 | - | 3 | - |
| **CO2** | - | - | 3 | 3 | - | 2 | - | 3 | - | - | 3 | - | - | - | - | 2 |
| **CO3** | 2 | 2 | - | - | - | 3 | 3 | - | 3 | - | 3 | 1 | 1 | - | - | - |
| **CO4** | 3 | - | - | 3 | - | - | 3 | 3 | 2 | - | 1 | 3 | 2 | - | - | 2 |

**SEMESTER V**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** V | | |
| **Course Title:** Data Warehousing & Mining | | | | | **Course Code:** CSE-501 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** This course gives an introduction to methods and theory for development of data warehouses and data analysis using data mining. Data quality and methods and techniques for pre-processing of data. Modelling and design of data warehouses. Algorithms for classification, clustering and association rule analysis. Practical use of software for data analysis.

**Course Outcomes**

**CO1:** Understand the functionality of the various data mining and data warehousing component.

**CO2:** Appreciate the strengths and limitations of various data mining and data warehousing models

**CO3:** Explain the analyzing techniques of various data Analyze

**CO4:** Describe different methodologies used in data mining and data ware housing.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Overview, Motivation (for Data Mining), Data Mining**-Definition & Functionalities, Data Processing, Form of Data Preprocessing, Data Cleaning: Missing Values, Noisy Data,(Binning, Clustering, Regression, Computer and Human inspection),Inconsistent Data, KDD, Challenges Data Integration and Transformation. Data Reduction:-Data Cube Aggregation, Dimensionality reduction, Data Compression, Numerosity Reduction, Clustering, Discretization and Concept hierarchy generation | 11 |
| 2 | **Concept Description**:- Definition, Data Generalization, Analytical Characterization, Analysis of attribute relevance, Mining Class comparisons, Statistical measures in large Databases.  Measuring Central Tendency, Measuring Dispersion of Data, Graph Displays of Basic Statistical class Description, Mining Association Rules in Large Databases, Association rule mining, mining Single-Dimensional Boolean Association rules from Transactional Databases– Apriori Algorithm, The Partition Algorithms, FP-Growth Algorithms, Mining Multilevel Association rules from Transaction Databases and Mining Multi-Dimensional Association rules from Relational Databases | 13 |
| 3 | **Classification and Predictions:** What is Classification & Prediction, Issues regarding Classification and prediction, Decision Tree, Bayesian Classification, Classification by Back propagation, Multilayer feed-forward Neural Network, Back propagation Algorithm, Classification methods K-nearest neighbour Classifiers, Genetic Algorithm.  **Cluster Analysis:** Data types in cluster analysis, Categories of clustering methods, Partitioning clustering K-Means Algorithm, K-Means Additional Issues, and Partitioning methods. Hierarchical Clustering- CURE and Chameleon, Density Based Methods-DBSCAN, OPTICS, Grid Based Methods- STING, CLIQUE, Model Based Method –Statistical Approach, Neural Network approach, Outlier Analysis | 10 |
| 4 | **Data Warehousing**: Overview, Definition, Delivery Process, Data Ware House characteristics, Difference between Database System and Data Warehouse, Multi Dimensional Data Model, Data Cubes, Stars, Snow Flakes,Fact Constellations, Concept hierarchy, Process Architecture, 3 Tier Architecture, Data Marting.  Aggregation, Historical information, Query Facility, OLAP function and Tools. OLAP Servers, ROLAP, MOLAP, HOLAP, Data Mining interface, Security, Backup and Recovery, Tuning Data Warehouse, Testing Data Warehouse. | 08 |
|  | | |

**Text Book: Books:**

1. M.H.Dunham,”Data Mining:Introductory and Advanced Topics” Pearson Education

2. Jiawei Han, Micheline Kamber, ”Data Mining Concepts & Techniques” Elsevier

3. Sam Anahory, Dennis Murray, “Data Warehousing in the Real World: A Practical Guide for Building Decision Support Systems, Pearson Education

4. Mallach,”Data Warehousing System”,McGraw –Hill

**Reference Books:**

1) Data Mining Techniques, Arun K Pujari, 3rd Edition, Universities Press.

2) Data Ware Housing Fundamentals, Pualraj Ponnaiah, Wiley Student Edition.

3) The Data Ware House Life Cycle Toolkit- Ralph Kimball, Wiley Student Edition.

4) Data Mining, Vikaram Pudi, P Radha Krishna, Oxford University.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 2 | - | 1 | - | - | - | 3 | - | 2 | 3 | - | 3 | 2 | - | 3 | - |
| **CO2** | - | 1 | 3 | 3 | - | 2 | - | 3 | - | - | 3 | - | - | 1 | - | 2 |
| **CO3** | 2 | 2 | - | - | - | 3 | 1 | - | 3 | - | 3 | 1 | 1 | - | - | 1 |
| **CO4** | 3 | - | - | 3 | - | - | 1 | 3 | 2 | - | 1 | 3 | 2 | - | - | 2 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** V | | |
| **Course Title:** Operating System | | | | | **Course Code:** CSE-502 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** The purpose of this course is to provide an overview of computer operating systems. Topics to be discussed include a brief history of OS's and their design and development. The course will cover major components and the algorithms and implementation techniques used to create them.

**Course Outcomes**

**CO1:** Differentiate between multiprocessing, multiprogramming, and multitasking.

**CO2:** Differentiate between programs, processes and threads.

**CO3:** Apply segmentation and paging techniques.

**CO4:** Compare file naming in Linux and Windows.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Introduction:** Introduction to Operating System Concepts (including Multitasking, multiprogramming, multi user, Multithreading  etc)., Types of Operating Systems: Batch operating system, Time-sharing systems, Distributed OS, Network OS, Real Time OS; Various Operating system services, architecture, System programs and calls.  **Process Management:** Process concept, process scheduling, operation on processes; CPU scheduling, scheduling criteria, scheduling algorithms -First Come First Serve (FCFS), Shortest-Job-First (SJF), Priority Scheduling, Round Robin(RR), Multilevel Queue Scheduling. | 13 |
| 2 | **Memory Management:** Logical & Physical Address Space, swapping, contiguous memory allocation, non-contiguous memory allocation paging and segmentation techniques, segmentation with paging; virtual memory management - Demand Paging & Page- Replacement Algorithms; Demand Segmentation. | 09 |
| 3 | **File System:** Different types of files and their access methods, directory structures, various allocation methods, disk scheduling and management and its associated algorithms, Introduction to distributed file system.  **Process-Synchronization & Deadlocks:** Critical Section Problems, semaphores; methods for handling deadlocks-deadlock prevention, avoidance & detection; deadlock recovery. | 11 |
| 4 | **I/O Systems:** I/O Hardware, Application I/O Interface, Kernel, Transforming I/O requests, Disk structure ,Disk scheduling, Performance Issues and Thresds  **Unix System And Windows NT Overview**  Unix system call for processes and file system management, Shell interpreter, Windows NT architecture overview, Windows NT file system. | 08 |
|  | | |

**Text Book: Books:**

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, Operating System Concepts. Seventh edition. Addison-Wesley
2. Andrew Tanenbaum, Modern Operating Systems, Prentice Hall.

**Reference Books:**

1. Operating Systems (5th Ed) – Internals and Design Principles By WilliamStallings, Prentice Hall 2.Operating Systems Achyut S. Godbole Tata Mc Graw Hill

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | - | - | 1 | - | - | - | 3 | - | 2 | 3 | - | 3 | 2 | - | 3 | - |
| **CO2** | - | 1 | 1 | 2 | - | 2 | - | 3 | - | 1 | 3 | - | - | 1 | - | - |
| **CO3** | 2 | 2 | - | - | 2 | 3 | 2 | - | 3 | - | 3 | 1 | 1 | - | - | 1 |
| **CO4** | 1 | - | - | 3 | - | - | 1 | 3 | 2 | - | 1 | 3 | 2 | - | - | 2 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** V | | |
| **Course Title:** Compiler Design | | | | | **Course Code:** CSE-503 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** This Course describes the theory and practice of compilation, in particular, the lexical analysis, parsing and code generation and optimization phases of compilation, and design a compiler for a concise programming language.

**Course Outcomes**

**CO1:** To realize basics of compiler design and apply for real time applications.

**CO2:** To introduce different translation languages

**CO3:** To understand the importance of code optimization

**CO4:** To know about compiler generation tools and techniques

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Introduction to Compilers:Need for translators** – Structure of a compiler – Error handling – Compiler writing tools. Lexical Analysis:  **The role of lexical analyze** – Design – Languages for specifying lexical analyzer implementation. Design of a Lexical Analyzer generator. | 12 |
| 2 | **Parsing: Parsers** – Shift reduce parsers – Operator Precedence parsing – Top down  **Parsing** – Predictive parsers.  Automatic Construction of Efficient Parsers: **LR Parsers** – Construction SLR, Canonical LR and LALR Parsing tables – Automatic parser generation– Implementation of LR parsing tables. | 09 |
| 3 | **Syntax Directed Translation:** Schemes – Implementation – Intermediate code – Parse trees and syntax trees – Three Address code – Quadruples and triples – Translation of assignment statements – Boolean expressions.  **Symbol tables and runtime storage:** Contents of Symbol table – Data structures for symbol table – Representation of scope information – Implementation of stack allocation schemes – Block Structured languages and storage allocation. | 13 |
| 4 | **Introduction to Code Optimization**: Need and objective of optimization, Places of optimization, Optimization at user level Principal sources – Loop optimization – Global data flow analysis. Code Generation: Object program – Problems in code generation – A simple code generator - Register allocation and assignment. Storage Allocation strategies – Access to non-local names – Parameter Passing Peephole optimization, Code scheduling | 07 |
|  | | |

**Text Book: Books:**

1. Alfred V.Aho & Jeffrey D. Ullman : PRINCIPLES OF COMPILER DESIGN; Narosa Publishing House, 1990
2. Dhamdhere D.M.: COMPILER CONSTRUCTION-PRINCIPLES AND PRACTICE; McMillan India Ltd.
3. Ravi Sethi & Ullman: COMPILER DESIGN; Narosa Publishing House.
4. David Gries :COMPILER CONSTRUCTION FOR DIGITALCOMPUTERS; John Wiley &Sons

**Reference Books:**

1. Alfred V. Aho et.al. : COMPILERS:PRINCIPLES, TECHNIQUES AND TOOLS; Addison Wesley Publishing Company, 1986

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 1 | 3 | - | - | - | - | - | - | - | 1 | 2 | 1 | 3 | - | 3 | 1 |
| **CO2** | - | - | 1 | 2 | - | - | 1 | - | 2 | 2 | 3 | - | - | 1 | 2 | 2 |
| **CO3** | 1 | 1 | - | 3 | 1 | - | - | - | 1 | 3 | - | 1 | 1 | - | 1 | - |
| **CO4** | 2 | - | - | - | 2 | 3 | 2 | 1 | 2 | 2 | - | 2 | - | 3 | 2 | - |

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| **Program:** B.Tech CSE | | | | | **Semester:** V | | |
| **Course Title:** Cloud Architecture & Deployment Models | | | | | **Course Code:** CSE-504 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | - | - | 3 | 3 | 60 | 40 | 100 |

**Course Description:** Cloud computing is an emerging computing paradigm where various users access the resources and services offered by service providers. Use of cloud computing at this course encompasses the production services and it can offer benefits in the cost, performance, and delivery of IT services. The use of cloud computing services is forecast to grow significantly over the coming years

**Course Outcomes**

**CO1:** Learn the basics of cloud computing including its benefits, challenges and services. Explain the concepts of resource virtualization, resource pooling sharing and provisioning

**CO2:** Understand Cloud delivery models in details

**CO3:** Understand briefly Cloud Computing Reference Architecture.

**CO4:** Understands Cloud deployment models in details e.g., Public, Private and Hybrid.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | CLOUD COMPUTING FUNDAMENTALS: Cloud Computing definition, private, public and hybrid cloud. Cloud types; IaaS, PaaS, SaaS. Benefits and challenges of cloud computing, public vs private clouds, role of virtualization in enabling the cloud; Business Agility: Benefits and challenges to Cloud architecture. Application availability, performance, security and disaster recovery; next generation Cloud Applications. | 13 |
| 2 | CLOUD APPLICATIONS: Technologies and the processes required when deploying web services; Deploying a web service from inside and outside a cloud architecture, advantages and disadvantages | 07 |
| 3 | MANAGEMENT OF CLOUD SERVICES: Reliability, availability and security of services deployed from the cloud. Performance and scalability of services, tools and technologies used to manage cloud services deployment; loud Economics : Cloud Computing infrastructures available for implementing cloud based services. Economics of choosing a Cloud platform for an organization, ased on application requirements, economic constraints and business needs (e.g Amazon, Microsoft and Google, Salesforce.com, Ubuntu and Redhat) | 14 |
| 4 | APPLICATION DEVELOPMENT Service creation environments to develop cloud based applications. Development environments for service development; Amazon, Azure, Google App. | 05 |
| 5 | CLOUD IT MODEL Analysis of Case Studies when deciding to adopt cloud computing architecture. How to decide if the cloud is right for your requirements. Cloud based service, applications and development platform deployment so as to improve the total cost of ownership (TCO) | 05 |
|  | | |

**Text Book: Books:**

1. Alfred V.Aho & Jeffrey D. Ullman : PRINCIPLES OF COMPILER DESIGN; Narosa Publishing House, 1990
2. Dhamdhere D.M.: COMPILER CONSTRUCTION-PRINCIPLES AND PRACTICE; McMillan India Ltd.
3. Ravi Sethi & Ullman: COMPILER DESIGN; Narosa Publishing House.
4. David Gries :COMPILER CONSTRUCTION FOR DIGITALCOMPUTERS; John Wiley &Sons

**Reference Books:**

1. Alfred V. Aho et.al. : COMPILERS:PRINCIPLES, TECHNIQUES AND TOOLS; Addison Wesley Publishing Company, 1986

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 1 | - | - | - | - | - | - | - | - | 1 | 2 | 1 | 3 | - | 3 | 1 |
| **CO2** | - | - | 1 | 2 | - | - | 1 | - | 2 | - | 3 | - | - | 1 | 2 | 2 |
| **CO3** | 1 | 1 | - | 3 | 1 | - | - | - | 1 | 3 | - | 1 | 1 | - | 1 | - |
| **CO4** | 2 | - | - | - | 2 | 3 | 2 | 1 | - | - | - | 2 | - | 3 | 2 | - |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** V | | |
| **Course Title:** Big Data | | | | | **Course Code:** CSE-505 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | - | - | 3 | 3 | 60 | 40 | 100 |

**Course Description:** The course gives an overview of the Big Data phenomenon, focusing then on extracting value from the Big Data using predictive analytics techniques.

**Course Outcomes**

**CO1:** Identify Big Data and its Business Implications

**CO2:** List the components of Hadoop and Hadoop Eco-System

**CO3:** Access and Process Data on Distributed File System

**CO4:** Apply Machine Learning Techniques using R.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | Introduction: Types of Digital Data, Introduction to Big Data, Big Data Analytics, Four Vs, Drivers for Big data, Big data analytics, Big data applications.  Hadoop: History of Hadoop, Apache Hadoop, Analysing Data with Unix tools, Analysing Data with Hadoop, Hadoop Streaming, Hadoop Echo System, IBM Big Data Strategy, Introduction to Infosphere BigInsights and Big Sheets. | 13 |
| 2 | The Design of HDFS, HDFS Concepts, Command Line Interface, Hadoop file system interfaces, Data flow, Data Ingest with Flume and Scoop and Hadoop archives, Hadoop I/O: Compression, Serialization, Avro and File-Based Data structures. | 09 |
| 3 | Anatomy of a Map Reduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution, Map Reduce Types and Formats, Map Reduce Features | 06 |
| 4 | Pig : Introduction to PIG, Execution Modes of Pig, Comparison of Pig with Databases, Grunt, Pig Latin, User Defined Functions, Data Processing operators. Hive : Hive Shell, Hive Services, Hive Metastore, Comparison with Traditional Databases, HiveQL, Tables, Querying Data and User Defined Functions.  Hbase: HBasics, Concepts, Clients, Example, Hbase Versus RDBMS. Big SQL: Introduction | 10 |
| 5 | Machine Learning: Introduction, Supervised Learning, Unsupervised Learning, Collaborative Filtering. Big Data Analytics with BigR. | 05 |
|  | | |

**Text Book: Books:**

### 1. Too Big to Ignore: The Business Case for Big Data, by award-winning author Phil Simon

### 2. Big Data at Work: Dispelling the Myths, Uncovering the Opportunities, by T. H. Davenport

### 3. Big Data: Principles and Best Practices of Scalable Real-Time Data Systems By Nathan Marz And James Warren

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | - | 2 | - | - | 2 | - | - | - | 1 | 2 | 1 | 3 | - | 3 | 1 |
| **CO2** | - | - | 1 | 2 | 2 | - | 1 | 2 | 2 | - | 3 | - | - | 1 | 2 | 2 |
| **CO3** | 1 | 1 | - | 3 | 1 | - | - | - | 1 | 3 | - | 1 | 1 | - | 1 | - |
| **CO4** | 2 | - | - | - | 2 | 3 | 2 | 1 | - | - | - | 2 | - | 3 | 2 | - |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** V | | |
| **Course Title:** Microprocessor & its Applications | | | | | **Course Code:** CSE-506 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** This course deals with the systematic study of the Architecture and programming issues of 8 bit 8085-microprocessor and interfacing with other peripheral ICs and co-processor. In addition, a 16-bit microprocessors and other chips are introduced.

**Course Outcomes**

**CO1:** Understand the basic architecture of 8085 and 8086

**CO2:** Impart the knowledge about the instruction set.

**CO3:** Understand the basic idea about the data transfer schemes and its applications

**CO4:** Develop skill in simple program writing for INTEL 8085 and INTEL 8086.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | Introduction to Microprocessor, Microprocessor architecture and its operations, Memory, Input & output devices, Logic devices for interfacing, The 8085 MPU, Example of an 8085 based computer, Memory interfacing.  Basic interfacing concepts, Interfacing output displays, Interfacing input devices, Memory mapped I/O, Flow chart symbols, Data Transfer operations, Arithmetic operations, Logic Operations, Branch operation, Writing assembly language programs, Programming techniques: looping, counting and indexing | 12 |
| 2 | Additional data transfer and 16 bit arithmetic instruction, Arithmetic operations related to memory, Logic operation: rotate, compare, counter and time delays, Illustrative program: Hexadecimal counter, zero-to-nine, (module ten) counter, generating pulse waveforms, debugging counter and time delay, Stack, Subroutine, Restart, Conditional call and return instructions, Advance subroutine concepts, The 8085 Interrupts, 8085 vector interrupts | 11 |
| 3 | Program: BCD-to-Binary conversion, Binary-to-BCD conversion, BCD-to- Seven segment code converter, Binary-to-ASCII and ASCII-to-Binary code conversion, BCD Addition, BCD Subtraction, Introduction to Advance instructions and Application, Multiplication, Subtraction with carry. | 10 |
| 4 | 8255 Programmable peripheral interface, interfacing keyboard and seven segment display, 8254 (8253) programmable interval timer, 8259A programmable interrupt controller, Direct Memory Access and 8237 DMA controller. Introduction to 8086 microprocessor: Architecture of 8086 (Pin diagram, Functional block diagram, Register organization). | 8 |
|  | | |

**Text Book: Books:**

1. Microprocessor Architecture, Programming & Applications with 8085 : Ramesh S Gaonkar; Wiley Eastern Ltd.

2. The Intel Microprocessors 8086- Pentium processor : Brey; PHI

**Reference Books:**

1. Microprocessors and interfacing : Hall; TMH

2. The 8088 & 8086 Microprocessors-Programming, interfacing,Hardware & Applications :Triebel & Singh; PHI

3. Microcomputer systems: the 8086/8088 Family: architecture, Programming & Design : Yu-Chang Liu & Glenn A Gibson; PHI.

4. Advanced Microprocessors and Interfacing : Badri Ram; TMH

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 3 | 2 | - | 2 | 2 | - | 1 | - | 1 | 2 | 1 | 3 | - | 3 | 1 |
| **CO2** | - | - | 1 | 2 | 2 | - | 1 | 2 | 2 | - | 3 | - | - | 1 | 2 | 2 |
| **CO3** | 1 | 1 | - | 3 | 1 | - | - | - | 1 | 3 | - | 1 | 1 | - | 1 | 1 |
| **CO4** | 2 | - | 2 | - | 2 | 3 | 2 | 1 | - | - | - | 2 | - | 3 | 2 | - |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** V | | |
| **Course Title:** OS Lab | | | | | **Course Code:** CSE-551 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:** Introduction to operating systems concepts, process management, memory management, file systems, virtualization, and distributed operating systems. The laboratory exercises will include familiarization with UNIX system calls for process management and inter-process communication.

**Course Outcomes**

**CO1:** Demonstrate the fundamental UNIX commands & system calls S3

**CO2:** Apply the scheduling algorithms for the given problem S3

**CO3:** Apply the process synchronous concept using message queue, shared memory, semaphore and Dekker’s algorithm for the given situation

**CO4:** Demonstrate the various operations of file system.

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr No.** | **Experiment Title** |
| **1** | Study of WINDOWS 2000 Operating System. |
| **2** | Administration of WINDOWS 2000 (including DNS,LDAP, Directory Services) |
| **3** | Study of LINUX Operating System (Linux kernel, shell, basic commands pipe& filter |
| **4** | Administration of LINUX Operating System |
| **5** | Writing of Shell Scripts (Shell programming). |
| **6** | AWK programming |

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 1 | 2 | 3 | 2 | 1 | 2 | - | 2 | - | 4 | 2 | 1 | 3 | 2 | 1 | - |
| **CO2** | 2 | 3 | 2 | 3 | 2 | 1 | 2 | 1 | 2 | 3 | 3 | 3 | 2 | 1 | 2 | 1 |
| **CO3** | 3 | 1 | - | 2 | 3 | 3 | 1 | 3 | 1 | 2 | 2 | 2 | 1 | 3 | 3 | 2 |
| **CO4** | 1 | 2 | 3 | 1 | 1 | 1 | 3 | 2 | 3 | 1 | 1 | 1 | 2 | 1 | 1 | 3 |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** V | | |
| **Course Title:** Cloud Architecture & Deployment Models Lab | | | | | **Course Code:** CSE-552 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:** To provide wide knowledge on Cloud Computing Architecture & Deployment Models

**Course Outcomes**

CO1: A clear definition of what Cloud Computing is

CO2: A comprehensive understanding of Cloud Computing

CO3: An understanding of Cloud Computing benefits and key concepts

CO4: An understanding of when and where to use it using the appropriate industry models

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr No.** | **Experiment Title** |
| **1** | Secure IOT integration with Cloud |
| **2** | Desktop Virtualization using Chrome Remote Desktop |
| **3** | Create Nested Virtual Machine(VM under another VM) |
| **4** | Create EC2 Linux instance on Amazon AWS and create SSH client configuration through PUTTY. |
| **5** | Create MySQL database through AWS RDS. Connect AWS RDS through MySQL workbench from any remote location. |

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 1 | 2 | 1 | 3 | 2 | 2 | 1 | 3 | 2 | 1 | 2 | 1 | 3 | 2 | 1 | 2 |
| **CO2** | - | 1 | 2 | 1 | 3 | 1 | - | 2 | 3 | 2 | 1 | 2 | 2 | 1 | - | 1 |
| **CO3** | 2 | 2 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 1 | 3 | 2 | 2 |
| **CO4** | 3 | 1 | 2 | - | 2 | 3 | 3 | - | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** V | | |
| **Course Title:** Big Data Lab | | | | | **Course Code:** CSE-553 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:** This course will introduce the students to practical aspects of analytics at large scale, i.e., big data. The course will start with a basic introduction to big data concepts spanning hardware, systems and software, and then delve into the following topics.

**Course Outcomes**

**CO1:** Optimize business decisions and create competitive advantage with Big Data analytic

**CO2:** Imparting the architectural concepts of Hadoop and introducing map reduce

**CO3:** Paradigm Introducing Java concepts required for developing map reduce programs

**CO4:** Derive business benefit from unstructured data

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr No.** | **Experiment Title** |
| **1** | Downloading and installing Hadoop; Understanding different Hadoop modes. Startup scripts, Configuration files. |
| **2** | Hadoop Implementation of file management tasks, such as Adding files and directories, Retrieving files and Deleting files |
| **3** | Implement of Matrix Multiplication with Hadoop Map Reduce |
| **4** | Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm. |
| **5** | Implementation of K-means clustering using Map. |
| **6** | Reduce Installation of Hive along with practice examples |
| **7** | Installation of HBase, Installing thrift along with Practice examples |
| **8** | Patrice importing and exporting data from various data bases. |

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | | **PO2** | **PO3** | **PO4** | | **PO5** | **PO6** | | **PO7** | | **PO8** | | **PO9** | **PO10** | | **PO11** | **PO12** | | **PSO1** | | **PSO2** | **PSO3** | | **PSO4** |
| **CO1** | 1 | | 2 | 1 | 3 | | 1 | - | | 1 | | - | | 2 | - | | 2 | 3 | | 1 | | 2 | 3 | | - |
| **CO2** | 2 | | 1 | - | 2 | | - | - | | 2 | | - | | - | 2 | | 3 | - | | 2 | | - | - | | 1 |
| **CO3** | 3 | | 3 | - | - | | 3 | 1 | | 3 | | - | | 1 | 3 | | 1 | 1 | | 1 | | - | 1 | | 2 |
| **CO4** | 1 | | 2 | 1 | 2 | | 1 | - | | - | | 2 | | 3 | - | | 2 | 2 | | 3 | | 2 | - | | - |
| **Program:** B.Tech CSE | | | | | | | | | | | | | | **Semester:** V | | | | | | | |
| **Course Title:** Microprocessor Lab | | | | | | | | | | | | | | **Course Code:** CSE-554 | | | | | | | |
| **L** | | | | **T** | | | **P** | | CH | | **CP** | | | **Int. A** | | | **ESE** | | **Total** | | |
| - | | | | - | | | 2 | | 2 | | 1 | | | 30 | | | 20 | | 50 | | |

**Course Description:** Through this course, the students will be exposed to hardware details of 8085 microprocessor with the related signals and their implications.

**Course Outcomes**

**CO1:** Understand the architecture of 8085, 8086 and 8051

**CO2:** Impart the knowledge about the instruction set.

**CO3:** Understand the basic idea about the data transfer schemes and its applications.

**CO4:** Develop skill in simple program writing for 8051, 8086 & 8085 and applications

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr No.** | **Experiment Title** |
| **1** | Simple programs for sorting a list of numbers in ascending and descending order. |
| **2** | To find the largest and smallest number in an array of data using 8085 instruction set |
| **3** | Sorting a list without destroying the original list. |
| **4** | Code conversion - Binary to Gray/Gray to Binary. |
| **5** | Program for addition of BCD numbers |
| **6** | Program for multiplication of 8-bit numbers |
| **7** | Interface an LED array and 7-segment display through 8255 and display a specified bit pattern/character sequence at an interval of 2 seconds |
| **8** | Interface the given microprocessor kit to a personal computer through R.S-232C. The bandrate is specified. Verify data transfer in both directions ( P - PC and PC - P) |
| **9** | Assembly language programming of 8086 |

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **CO2** | 2 | 2 | 1 | 3 | - | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO3** | - | - | 2 | 3 | - | 1 | - | - | - | - | - | - | - | - | - | - |
| **CO4** | - | - | 2 | 3 | - | 1 | - | - | - | - | - | - | - | - | - |  |

**SEMESTER VI**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VI | | |
| **Course Title:** Analysis & Design of Algorithms | | | | | **Course Code:** CSE-601 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** This course introduces basic methods for the design and analysis of efficient algorithms emphasizing methods useful in practice. Different algorithms for a given computational task are presented and their relative merits evaluated based on performance measures. The following important computational problems will be discussed: sorting, searching, elements of dynamic programming and greedy algorithms, advanced data structures, graph algorithms (shortest path, spanning trees, and tree traversals), string matching, elements of computational geometry, NP completeness.

**Course Outcomes**

**CO1:** Ability to Understand, Analyze the performance of recursive and non recursive algorithms and use of asymptotic notations to measure the performance of algorithms.

**CO2:** Identify and analyze various algorithm design techniques.

**CO3:** Understand and evaluate algorithms using various algorithm design techniques.

**CO4:** 4 Solve problems by applying appropriate algorithm design techniques and analyze the efficiency of various algorithms including parallel algorithms.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Introduction:** Brief Review of Graphs, Sets and disjoint sets, union, Analysis, Basics of Algorithm, Time and Space complexity of an Algorithm, sorting and searching algorithms and their analysis in terms of space and time complexity.  **Divide and Conquer:** General method, binary search, merge sort, Divide and Conquer, Analysis of Merge Sort Algorithm by divide and conquer technique, quick sort, selection sort, Strassen’s matrix multiplication algorithms and analysis of algorithms for these problems. | 10 |
| 2 | **Greedy Method:** General method, Making change, General characteristics of Greedy algorithms, Graphs MST - Kruskal's and Prims's algorithms, Graphs: shortest paths knapsack problem, job sequencing with deadlines, Minimum spanning trees, single source paths and analysis of these problems.  **Dynamic Programming:** General method, optimal binary search trees, Making change, Principles of optimality, O/I knapsack, the traveling salesperson problem, Knapsack Problem using Greedy technique. | 12 |
| 3 | **Back Tracking:** General method, 8 queen’s problem (Backtracking), graph coloring and its applications, Hamiltonian cycles, and analysis of these problems.  **Branch and Bound:** Method, O/I knapsack and traveling salesperson problem, efficiency considerations. Techniques for algebraic problems, some lower bounds on parallel computations. | 13 |
| 4 | **NP Hard and NP Complete Problems:** Basic concepts, Cook’s theorem, NP hard graph and NP scheduling problems some simplified NP hard problems. P Class, NP Class, NP Hard and NP Complete – inter relationship. Discuss the relation of P, NP, NP-Hard. | 07 |
|  | | |

**Text Books:**

1. Fundamental of Computer algorithms, Ellis Horowitz and Sartaj Sahni, 1978, Galgotia Publ.

2. Introduction To Algorithms, Thomas H Cormen, Charles E Leiserson And Ronald L Rivest: 1990, TMH

3. Anany Levitin: Introduction to The Design & Analysis of Algorithms, 2nd Edition, Pearson Education, 2007. (Listed topics only from the Chapters 1, 2, 3, 5, 7, 8, 10, 11).

1. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekar an: Fundamentals of Computer Algorithms, 2nd Edition, Universities Press, 2007. (Listed topics only from the Chapters 3, 4, 5, 13)

**Reference Books:**

1. The Design and Analysis of Computer Algorithm, Aho A.V. Hopcroft J.E., 1974, Addison Wesley.

2. Algorithms-The Construction, Proof and Analysis of Programs, Berlion, P.Bizard, P., 1986. Johan Wiley & Sons,

3. Writing Efficient Programs, Bentley, J.L., PHI

4. Introduction to Design and Analysis of Algorithm, Goodman, S.E. & Hedetnieni, 1997, MGH.

5. Introduction to Computers Science- An algorithms approach , Jean Paul Trembley, Richard B.Bunt, 2002, T.M.H.

6. Thomas H. Cormen, Charles E. Leiserson, Ronal L. Rivest, Clifford Stein: Introduction to Algorithms, 3rd Edition, PHI, 2010.

1. R.C.T. Lee, S.S. Tseng, R.C. Chang & Y.T.Tsai: Introduction to the Design and Analysis of Algorithms A Strategic Approach, Tata McGraw Hill, 2005.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 3 | - | - | 3 | 1 | 1 | 3 | - | - | 1 | 3 | 3 | 2 | 3 | 3 |
| **CO2** | 2 | - | 2 | 2 | 2 | - | - | - | 2 | 1 | 1 | 2 | 2 | - | - | 2 |
| **CO3** | 3 | 3 | 3 | - | - | - | - | 1 | - | 1 | 1 | 3 | - | 1 | - | 2 |
| **CO4** | 2 | 2 | - | 2 | 2 | - | 1 | 1 | 2 | - | 2 | 2 | - | - | - | - |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VI | | |
| **Course Title:** Computer Graphics | | | | | **Course Code:** CSE-602 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** The objective of this course is to familiarize students with fundamental algorithms and data structures that are used in today's interactive graphics systems as well as programming and architecture of high-resolution graphics computers. This introduces interactive computer graphics and some drawing algorithms.

**Course Outcomes**

**CO1:** Explain the basics of computer graphics, different graphics systems and applications of computer graphics.

**CO2:** Explore the background and standard line and circle drawing algorithms.

**CO3:** Exposure of various transformation approaches and its comparative analysis.

**CO4:** Illustrate Projection and clipping with explore different techniques.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Introduction to Computer Graphics:** What is Computer Graphics, Computer Graphics Applications, Computer Graphics Hardware and software, Computer Graphics Systems and Related Fields, Description of some graphics devices, Input Devices for Operator Interaction, Active and Passive Graphics Devices, Display Technologies, Two dimensional Graphics ,Primitives: Points and Lines, Line drawing algorithms: DDA, Bresenham‟s; Circle drawing algorithms: Using polar coordinates, Bresenham‟s circle drawing, midpoint circle drawing algorithm; Filled area algorithms: Scan line: Polygon filling algorithm, boundary filled algorithm. | 09 |
| 2 | **Two/Three Dimensional Viewing:** Transformations and Matrices, Transformation Conventions, 2D Transformations, Homogeneous Coordinates and Matrix Representation of 2D Transformations, Translations and Homogeneous Coordinates, The 2-D viewing pipeline, windows, viewports, window to view port mapping; Clipping: point, clipping line (algorithms):- 4 bit code algorithm, Sutherland-cohen algorithm, parametric line clipping algorithm (Cyrus Beck).  **Polygon clipping algorithm:** Sutherland-Hodgeman polygon clipping algorithm. **Two** **dimensional transformations:** transformations, translation, scaling, rotation, reflection, composite transformation. | 11 |
| 3 | **Three-dimensional transformations:** Introduction, Three-Dimensional Scaling, Three dimensional graphics concept, Matrix representation of 3-D Transformations, Composition of 3-D transformation.  **Viewing in 3D:** Projections, types of projections, the mathematics of planner geometric projections, coordinate systems.  **Hidden surface removal:** Introduction to hidden surface removal. The Z- buffer algorithm, scanline algorithm, area sub-division algorithm. | 13 |
| 4 | **Representing Curves and Surfaces:** Parametric representation of curves: Bezier curves, B-Spline curves. Parametric representation of surfaces; Interpolation method.  **Illumination, shading, image manipulation:** Illumination models, shading models for polygons, Reflectance properties of surfaces, Ambient, shadows, transparency. What is an image? Filtering, image processing, geometric transformation of images. | 09 |
|  | | |

**Text Books: & Reference Books:**

1. Computer Graphics Principles and Practices second edition by James D. Foley, Andeies van Dam, Stevan K. Feiner and Johb F. Hughes, 2000, Addision Wesley.

2. Computer Graphics by Donald Hearn and M.Pauline Baker, 2nd Edition, 1999, PHI

3. Procedural Elements for Computer Graphics – David F. Rogers, 2001, T.M.H Second Edition Fundamentals of 3Dimensional Computer Graphics by Alan Watt, 1999, Addision Wesley. Computer Graphics: Secrets and Solutions by Corrign John, BPB

1. Hearn Donald & Baker, M. Pauline (1990). “Computer Graphics – C Version” Prentice Hall of India Pvt. Ltd.

**Reference Books:**

1. Procedural Elements for Computer Graphics – David F. Rogers, 2001, T.M.H Second

Edition Fundamentals of 3Dimensional Computer Graphics by Alan Watt, 1999,

Addision Wesley. Computer Graphics: Secrets and Solutions by Corrign John, BPB

1. Foley, J.D. & Dam, A. Van (1982), “Fundamentals of Interective Computer Graphics”, AddisonWesley
2. Harrington, S. (1983). “Computer Graphics: A Programming Approach”‟ Mc-Graw Hill Book Co.

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 3 | 1 | 3 | - |
| **CO2** | 3 | 3 | - | 3 | - | - | 2 | - | 3 | 3 | 3 | - | - | - | - | - |
| **CO3** | 3 | 3 | 3 | - | 3 | 1 | - | 1 | - | - | - | 3 | 3 | 1 | - | 2 |
| **CO4** | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 3 | 1 | 3 | 3 | 2 | - | - | 3 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VI | | |
| **Course Title:** Advance Java | | | | | **Course Code:** CSE-603 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** This course of study builds on the skills gained by students in Java Fundamentals or Java Foundations to help advance Java programming skills. Students will design object-oriented applications with Java and will create Java programs using hands-on, engaging activities. A continuation of advanced Java programming techniques including Network Programming, Search Engines, Servlets, JSON, and Java EE & Frameworks. As the Java language was designed to facilitate object oriented programming, we begin with a thorough coverage of classes/objects, methods, console and file input/output, exceptions, and the concepts of inheritance, encapsulation, and polymorphism write rigorous correctness proofs for algorithms.

**Course Outcomes**

**CO1:** To learn the graphics and animation on the web pages, using Java Applets. To learn and design a full set of Event driven UI widgets and other components, including windows, menus, buttons, checkboxes, text fields, scrollbars and scrolling lists, using Abstract Windowing Toolkit (AWT) & Swings

**CO2:** To learn Java Data Base Connectivity (JDBC) so as to retrieve and manipulate the information on any relational database through Java programs.

**CO3:** Equip the students with the advanced feature of contemporary java which would enable them to handle complex programs relating to managing data and processes over the network

**CO4:** To learn the invocation of the remote methods in an application using RMI

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Core Java:** Introduction to Java, Data types, variables, operators, Arrays, Control Statements, Classes & Methods, Inheritance, Exception Handling, Multithreading, Collections, I/O streams, AVVT & Apolet Programming.  **Networking:** Connecting to a Server, Implementing Servers, Sending E-Mail, Making URL Connections, Advanced Socket Programming | 08 |
| 2 | **Database Networking:** Introduction to Java RMI, RMI architecture, Creating distributed application using RMI, The Design of JDBC. The Structured Query Language, JDBC Installation, Basic JDBC Programming Concepts, Query Execution, Scrollable and Updatable Result Sets, Matadata, Row Sets, Transactions, Advanced Connection Management, Introduction of LDAP  **Distributed Objects:** The Roles of Client and Server, Remote Method Invocations, Setup for Remote Method Invocation, Parameter Passing in Remote Methods Server Object Activation, Java IDL and CCRA, Remote Method Calls with SOAP | 13 |
| 3 | **Swing:** Lists, Trees, Tables, Styled Text Components, Progress Indicators, Component Organizers  **AWT:** The Rendering Pipeline, Shapes, Areas, Strokes, Paint, Coordinate Transformations, Clipping, Transparency and Composition, Rendering Hints, Readers and Writers for Images, Image Manipulation, Printing. The Clipboard, Drag and Drop | 11 |
| 4 | **Javabeans Components:** Beans, The Bean-Writing Process, Using Beans to Build an Application, Naming Patterns for Bean Components and Events Bean Property Tubes Beaninfo Classes Property Editors Cuatomizes  **Security:** Class Loaders, Bytecode Verification, Security Managers and Permissions, Digital Signatures, Code Signing, Encryption | 09 |
|  | | |

**Text Book:**

1. Core JavaTM 2, Volume II-Advanced Features, 7th Edition by Cay Horetmann, Gary Cornelll Pearson Publisher, 2004
2. Developing Java Servlets (Techmedia – SAMS) By James Goodwill
3. Using Java 1.2 Special Edition (PHI) By Webber
4. Java 2 Unleashed (Techmedia – SAMS) By Jamie Jaworski
5. Professional Java Server Programming (a Press) By Allamaraju

**Reference Books:**

1. Professional Java Programming by Brett Spell, WROX Publication
2. Advanced Java 2 Platform, How to Program, 2 nd Edition, Harvey. M. Dietal, Prentice Hall
3. Jaison Hunder & William Crawford, Java Servlet Programming, O'REILLY, 2002
4. Dietal and Deital, ―JAVA 2ǁ PEARSON publication
5. David Flanagan,Jim Parley, William Crawford & Kris Magnusson, Java Enterprise in anutshell- A desktop Quick reference -O'REILLY, 2003
6. Stephen Ausbury and Scott R. Weiner, Developing Java Enterprise Applications, Wiley-2001

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 3 | - | 3 | 1 | 3 | 3 | - | - | 3 |
| **CO2** | 3 | 3 | 2 | - | 1 | 2 | - | - | - | 2 | - | 2 | - | - | - | 2 |
| **CO3** | - | 3 | 2 | - | 3 | 3 | 1 | - | - | - | 3 | 2 | - | - | 1 | - |
| **CO4** | 3 | 3 | 2 | 3 | 3 | 3 | 1 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 |

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| **Program:** B.Tech CSE | | | | | **Semester:** VI | | |
| **Course Title:** Analytics for IoT | | | | | **Course Code:** CSE-604 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | - | - | 3 | 3 | 60 | 40 | 100 |

**Course Description:** It provides advanced data collection, connectivity, and analysis of information collected by computers everywhere—taking the concepts of Machine-to-Machine communication farther than ever before. This course gives a foundation in the Internet of Things, including the components, tools, and analysis by teaching the concepts behind the IoT and a look at real-world solutions.

**Course Outcomes**

**CO1:** Explain the concept of Internet of Things

**CO2:** Illustrate key technologies, protocols and standards in Internet of Things.

**CO3:** Analyse trade-offs in interconnected wireless embedded device networks

**CO4:** Application of IoT in automation of Commercial and Real World examples. Design a simple IoT system comprising sensors, edge devices and wireless network connections involving prototyping, programming and data analysis.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | Introduction: Overview and Motivations, IPv6 Role, IoT Definitions, IoT Frameworks.  Prototyping Embedded Devices Electronics, Embedded Computing Basics, Arduino, Raspberry Pi, BeagleBone Black, Electric Imp, Other Notable Platforms | 09 |
| 2 | IPv6 Technologies for the IoT Overview and Motivations, Address Capabilitie, IPv6 Protocol Overview , IPv6 Tunneling , IPsec in IPv6, Header Compression Schemes , Quality of Service in IPv6 , Migration Strategies to IPv6 | 08 |
| 3 | Evolving IoT Standards Overview and Approaches, IETF IPv6 Routing Protocol for RPL Roll , Constrained Application Protocol (CoAP) , Representational State Transfer (REST) , ETSI M2M , Third-Generation Partnership Project Service Requirements for Machine-Type Communications , CENELEC, IETF IPv6 Over Lowpower WPAN (6LoWPAN) , ZigBee IP (ZIP), IP in Smart Objects (IPSO) | 08 |
| 4 | Prototyping Online Components Getting Started with an API, Writing a New API, Real-Time Reactions, Other Protocols: MQTT, Extensible Messaging and Presence Protocol | 09 |
| 5 | IoT Application Examples Overview, Smart Metering/Advanced Metering Infrastructure, e-Health/Body Area Networks, City Automation, Automotive Applications, Home Automation, Smart Cards, Tracking (Following and Monitoring Mobile Objects),Over-The-Air-Passive Surveillance/Ring of Steel,Control Application Examples, Myriad Other Applications | 06 |
|  | | |

**Textbooks:**

1) Building the Internet of Things with IPv6 AND MIPv6 by DANIEL MINOLI Published by John Wiley & Sons, Inc., Hoboken, New Jersey.

2) Designing the Internet of Things by Adrian McEwen and Hakim Cassimally Published by John Wiley & Sons (UNIT-II, IV)

3) Olivier Hersent, David Boswarthick, Omar Elloumi, “The Internet of Things” Key Applications and Protocols, ISBN 978-1-119-99435-0, Wiley Publications.

**References:**

1) Getting Started with the Internet of Things by CunoPfister Published by O’Reilly Media, Inc.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 3 | 2 | - | 1 | 2 | 2 | - | 1 | - | - | 3 | 3 | 2 | - | - |
| **CO2** | - | - | - | 2 | - | - | 1 | - | 2 | - | - | 2 | - | - | - | 2 |
| **CO3** | - | 3 | 2 | - | - | 3 | - | - | - | 3 | 3 | - | 3 | - | 1 | - |
| **CO4** | 3 | 3 | 2 | 3 | 3 | 3 | 1 | - | 2 | 3 | 3 | 2 | 2 | 2 | - | 3 |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VI | | |
| **Course Title:** Smarter City | | | | | **Course Code:** CSE-605 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | - | - | 3 | 3 | 60 | 40 | 100 |

**Course Description:** A smart city is one where the needs of a populace meet the needs of environmental sustainability. The balance between the social and environmental issues is governed by Information and Communication Technologies (ICT) that power a smart city infrastructure. Students will learn about the influence of urban networks, smart city urban planning, energy as a catalyst of sustainable development, smart city infrastructure, sustainable transportation, flow of information and communications, smart grids, digital infrastructure and the role of data and information technology.

**Course Outcomes**

**CO1:** Explain the concept of Internet of Things

**CO2:** Illustrate key technologies, protocols and standards in Internet of Things.

**CO3:** Design, implement and evaluate a wireless network, component, or program to meet desired needs.

**CO4:** Choose different MAC, routing protocols for the desired need. Use techniques, skills and simulation tools.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | Introduction to Internet of Things : Definition & Characteristics of IoT, Physical Design of IoT, Things in IoT, IoT Protocols, Logical Design of IoT, IoT Communication Models, IoT Communication APIs, IoT Enabling Technologies.  IoT Enabling Technologies : Wireless Sensor Networks, Cloud Computing, Big Data Analytics, Communication Protocols, Embedded Systems, Embedded Systems, IoT Level-1, IoT Level-2, IoT Level-3, IoT Level-4, IoT Level-5. | 11 |
| 2 | Domain Specific IoTs I: Home Automation, Smart Lighting, Smart Appliances, Intrusion Detection, Smoke/Gas Detectors, Cities- Smart Parking, Smart Lighting, Structural Health Monitoring, Surveillance, Environment- Weather Monitoring, Air Pollution Monitoring, Noise Pollution Monitoring, Forest Fire Detection, River Floods Detection. | 08 |
| 3 | Domain Specific IoTs II: Energy- Smart Grids, Renewable Energy Systems, Prognostics, Retail- Inventory Management, Smart Payments, Smart Vending Machines, Logistics- Route Generation & Scheduling, Shipment Monitoring, Remote Vehicle Diagnostics, Agriculture- Smart Irrigation, Green House Control, Industry- Machine Diagnosis & Prognosis, Indoor Air Quality Monitoring, Health & Lifestyle, Wearable Electronics. | 09 |
| 4 | IoT and M2M: Introduction to M2M , Difference between IoT and M2M, SDN and NFV for IoT, Software Defined Networking, Network Function Virtualization , IoT System Management with NETCONF-YANG, Need for IoT Systems Management , Network Operator Requirements , NETCONF , YANG. | 06 |
| 5 | IoT Platforms Design Methodology: Process Specification, Domain Model Specification , Information Model Specification , Service Specifications , IoT Level Specification , Functional View Specification , Operational View Specification , Device & Component Integration , Case Study on IoT System for Weather Monitoring, IoT Physical Devices & Endpoints , Basic building blocks of an IoT Device, Exemplary Device: Raspberry Pi , pcDuino, Beagle Bone Black , Cubie board. | 07 |
|  | | |

**Textbooks:**

1. Vijay Madisetti and Arshdeep Bahga, Internet of Things: A Hands-On Approach, VPT edition1, 2014

**References:**

1. Jonathan Follett, Designing for Emerging - UX for Genomics, Robotics, and the Internet of Things Technologies, O’Reilly, 2014.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | - | - | 2 | - | 1 | 2 | 2 | 3 | 1 | 3 | 1 | 3 | 2 | - | - | 3 |
| **CO2** | - | 1 | - | - | 1 | 2 | - | 3 | - | 2 | - | 2 | - | 3 | - | 2 |
| **CO3** | 3 | 3 | - | 3 | 3 | - | 1 | - | 2 | 3 | 3 | - | - | - | - | 2 |
| **CO4** | 3 | 3 | 2 | 3 | 3 | 3 | 1 | 3 | - | 3 | 3 | 2 | 2 | 2 | 2 | - |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VI | | |
| **Course Title:** Digital Image Processing | | | | | **Course Code:** CSE-606 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** This course provides an introduction to basic concepts, methodologies and algorithms of digital image processing focusing on the following two major problems concerned with digital images: (1) image enhancement and restoration for easier interpretation of images, and (2) image analysis and object recognition.

**Course Outcomes**

**CO1:** To learn the basic concepts and terminology in digital Image Processing.

**CO2:** To learn about image transformation techniques and issues related to image transformation.

**CO3:** To learn the basic techniques for Image Compression

**CO4:** To learn about enhancing images through techniques like filtering and equalization

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Introduction and Fundamentals:** Motivation and Perspective, Applications, Components of Image Processing System, Element of Visual Perception, a Simple Image Model, Sampling and Quantization.  **Image Enhancement in Frequency Domain:** Fourier Transform and the Frequency Domain, Basis of Filtering in Frequency Domain, Filters –Low-pass, High-pass; Correspondence between Filtering in Spatial and Frequency Domain; Smoothing Frequency Domain Filters – Gaussian Low pass Filters; Sharpening Frequency Domain Filters – Gaussian High pass Filters; Homomorphism Filtering. | 10 |
| 2 | **Image Enhancement in Spatial Domain:** Introduction; Basic Gray Level Functions – Piecewise-Linear Transformation Functions: Contrast Stretching; Histogram Specification; Histogram Equalization; Local Enhancement; Enhancement using Arithmetic/Logic Operations – Image Subtraction, Image Averaging; Basics of Spatial Filtering; Smoothing - Mean filter, Ordered Statistic Filter; Sharpening – The Laplacian. | 12 |
| 3 | **Image Restoration:** A Model of Restoration Process, Noise Models, Restoration in the presence of Noise only-Spatial Filtering – Mean Filters: Arithmetic Mean filter, Geometric Mean Filter, Order Statistic Filters –Median Filter, Max and Min filters; Periodic Noise Reduction by Frequency Domain Filtering –Band pass Filters; Minimum Mean-square Error Restoration.  **Morphological Image Processing:** Introduction, Logic Operations involving Binary Images, Dilation and Erosion, Opening and Closing, Morphological Algorithms – Boundary Extraction, Region Filling, Extraction of Connected Components, Convex Hull, Thinning, Thickening | 13 |
| 4 | **Registration:** Introduction, Geometric Transformation – Plane to Plane transformation, Mapping, Stereo Imaging –Algorithms to Establish Correspondence, Algorithms to Recover Depth  **Segmentation:** Introduction, Region Extraction, Pixel-Based Approach, Multi-level Thresholding, Local Thresholding, Region-based Approach, Edge and Line Detection: Edge Detection, Edge Operators, Pattern Fitting Approach, Edge Linking and Edge Following, Edge Elements Extraction by Thresholding, Edge Detector Performance, Line Detection, Corner Detection. | 7 |
|  | | |

**Text Books:**

1. Digital Image Processing 2ndEdition, Rafael C. Gonzalvez and Richard E. Woods.Published by: Pearson Education.

2. Digital Image Processing and Computer Vision, R.J. Schalkoff. Published by: John Wiley and Sons, NY.

3. Fundamentals of Digital Image Processing, A.K. Jain. Published by Prentice Hall, Upper Saddle River, NJ.

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | - | 3 | 3 | - | 1 | 3 | - | 3 | - | 3 | - | 2 | - | 2 | 3 | 3 |
| **CO2** | - | 1 | - | - | 3 | - | - | - | - | - | - | 3 | 2 | - | - | 2 |
| **CO3** | 3 | 3 | - | - | 3 | - | 3 | - | 3 | 3 | - | - | - | 1 | - | - |
| **CO4** | 1 | 3 | 2 | 3 | - | - | - | - | 1 | 1 | 3 | - | - | 2 | 2 | 3 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VI | | |
| **Course Title:** Advance Java Lab | | | | | **Course Code:** CSE-651 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:**  Using Graphics, Animations and Multithreading for designing Simulation and Game based applications. Design and develop GUI applications using Abstract Windowing Toolkit (AWT), Swing and Event Handling. Design and develop Web applications. Designing distributed applications using Remote Method Invocation (RMI)

**Course Outcomes**

**CO1:** To learn the graphics and animation on the web pages, using Java Applets. To learn and design a full set of Event driven UI widgets and other components, including windows, menus, buttons, checkboxes, text fields, scrollbars and scrolling lists, using Abstract Windowing Toolkit (AWT) & Swings

**CO2:** To learn Java Data Base Connectivity (JDBC) so as to retrieve and manipulate the information on any relational database through Java programs.

**CO3:** To learn the server side programming using Servlets and JSP.

**CO4:** To learn the invocation of the remote methods in an application using RMI

**Theory 3 Hrs/Week**

|  |  |
| --- | --- |
| **S. No.** | **Description** |
| 1 | Write a program to provide database connectivity using Type 1 Driver to a employee table to insert, update, delete data using Servlets. |
| 2 | Java Database Connectivity (JDBC): JDBC Product, Types of Drivers, Two-Tier Client/Server Model, Three-Tier Client/Server Model, Basic Steps of JDBC, Creating and Executing SQL Statement, The Result Set Object, Working with Database MetaData Interface |
| 3 | Write a swing-based GUI to create a tabbed pane with two tabs: Table and Tree.   * The first tab contains a table displaying the information of Employee {empid, ename, age}. * The second tab contains a tree structure. * Insert both JTable and JTree in JScrollPane. * JScrollPane has to be inserted at the centre of the BorderLayout manager (with panels). * When user clicks on any node of the tree, its path should be displayed on the TextField |
| 4 | Consider a table Bank {account\_no, customer\_name, balance, phone\_no, and address}. Write a database application which allows insertion, updation and deletion of records in the Bank table. Print values of all customers whose balance is less than 5,000 |
| 5 | User enters the name and password through an HTML form.   * Both these parameters are being passed to the Servlet1. * The Servlet1 after retrieving the parameters generates a Cookie with username being stored in the cookie. * The Servlet1 generates an HTML form, which is linked to the Servlet2. * Along with the response object, the Cookie is stored permanently on the client‟s hard disk. * The same user then submits the form to invoke the Servlet2. * The Servlet2 must have the provision to access and display the cookie name. * Modify the above program to use the concept of Hidden form field, instead of Cookie. |
| 6 | Write a Servlet to validate the username and password entered by the user.   * If the username and password are, abc’ and ‘def’ respectively, the Sevlet should forward the request to Welcome Servlet; otherwise, it should display an error message: “Incorrect username or password!” |

**Suggested Books/Resources:**

1. Java the Complete Reference, ninth edition by Herbert Schild, Publisher: McGraw Hills

2. Advanced Java Programming by Uttam K. Roy, Publisher: Oxford University Press

3. Head First Servlets and JSP by Bryan Basham, Kathy Sierra & Bert Bates, Publisher: O'Reilly Media

1. Java 2 Unleashed (Techmedia – SAMS) By Jamie Jaworski
2. Professional Java Server Programming (a Press) By Allamaraju
3. Developing Java Servlets (Techmedia – SAMS) By James Goodwill
4. Using Java 1.2 Special Edition (PHI) By Webber

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | | **PO4** | **PO5** | | **PO6** | | **PO7** | | **PO8** | **PO9** | | **P10** | **PO11** | | **PO12** | **PSO1** | | **PSO2** | **PSO3** | | **PSO4** |
| **CO1** | 3 | - | - | | 1 | - | | - | | - | | - | - | | - | - | | - | 3 | | - | - | | - |
| **CO2** | - | 3 | - | | - | - | | - | | 3 | | - | - | | - | 1 | | - | 2 | | - | - | | 1 |
| **CO3** | - | - | 2 | | - | - | | 2 | | - | | - | 2 | | - | - | | - | - | | 2 | 3 | | 2 |
| **CO4** | - | 2 | - | | - | 2 | | - | | - | | 3 | - | | - | - | | 3 | 1 | | - | - | | - |
| **Program:** B.Tech CSE | | | | | | | | | | | | | | **Semester:** VI | | | | | | | | |
| **Course Title:** Computer Graphics Lab | | | | | | | | | | | | | | **Course Code:** CSE-652 | | | | | | | | |
| **L** | | | | **T** | | | **P** | | CH | | **CP** | | | **Int. A** | | | **ESE** | | | **Total** | | |
| - | | | | - | | | 2 | | 2 | | 1 | | | 30 | | | 20 | | | 50 | | |

**Course Description:** This course will provide basic concepts of computer graphics including necessary mathematics and algorithms. Primary focus of this course will be to understand the basics of 2D/3D rendering. The course will also cover various aspects of the rendering pipeline and realistic image synthesis using ray tracing. Implementation of a project based on learned concepts.

**Course Outcomes**

**CO1:** Using OpenGL for Graphics.

**CO2:** Programming User-Interface Issues, Implementation of a project using learned models.

**CO3:** Concepts of 2D & 3D object representation & 2 D Modeling.

**CO4:** Implementation of various scan and clipping algorithms.

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **S. No.** | **Description** |
| 1 | Write a program for 2D line drawing as Raster Graphics Display. |
| 2 | Write a program for circle drawing as Raster Graphics Display. |
| 3 | Write a program for polygon filling as Raster Graphics Display |
| 4 | Write a program for line clipping. |
| 5 | Write a program for polygon clipping. |
| 6 | Write a program for displaying 3D objects as 2D display using perspective transformation. |
| 7 | Write a program for rotation of a 3D object about arbitrary axis. |
| 8 | Write a program for Hidden surface removal from a 3D object. |
| 9 | Implement Cohen Sutherland Line clipping algorithm |
| 10 | Implement Sutherland-Hodgman polygon clipping algorithm |

Suggested Books/Resources:

1. Donald Hearn and M. Pauline Baker. “Computer Graphics with OPENGL” 3rd Edition Pearson Publishers, 2011.
2. James D. Foley, Van Adams, K.Fenier and F. Hughes, “Computer Graphics-Principle and Practices”, 3rd Edition Pearson Publishers, 2002.
3. Harrington, S. “Computer Graphics: A Programming Approach” Mc-Graw Hill Book Co.

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks )**
* **Attendance = 10 Marks**

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | - | - | 1 | - | - | - | - | - | - | - | - | 3 | - | - | - |
| **CO2** | - | 3 | - | - | - | - | 3 | - | - | - | 1 | - | 2 | - | - | 1 |
| **CO3** | - | - | 2 | - | - | 2 | - | - | 2 | - | - | - | - | 2 | 3 | 2 |
| **CO4** | - | 2 | - | - | 4 | - | - | 3 | - | - | - | 3 | 1 | - | - | - |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VI | | |
| **Course Title:** Analytics for IoT | | | | | **Course Code:** CSE-653 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:** This subject introduces students to a fundamental understanding of sensor data, systems, and innovative and novel analytical approaches. Machine learning methods are used for data analysis, which is similar to data mining, but the main goal of machine learning is to automate decision models. Algorithms are the heart and soul of machine learning, and they help computers find hidden insights.

**Course Outcomes**

**CO1:** Brainstorming IoT Utilization

**CO2:** IoT Sensor Utilization and Data Collection

**CO3:** IoT Data Collection in the Cloud

**CO4:** Implementing a Multi-Node IoT Solution IoT Data Analysis in the Cloud

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **S. No.** | **Description** |
| 1 | Getting started with mbed environment   * IDE * Sample programs and uploading binaries to the device * Creating an empty project * Different ways of importing |
| 2 | Attaching sensors and actuators |
| 3 | Connecting a communication module   * Nucleo board pinout |
| 4 | Creating a virtual device and communicating with it through DeviceHub.net   * Creating a project |

**Assessment Process (Internal)**

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks )**
* **Attendance = 10 Marks**

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | | **PO4** | **PO5** | | **PO6** | | **PO7** | | **PO8** | **PO9** | | **PO10** | **PO11** | | **PO12** | **PSO1** | | **PSO2** | **PSO3** | | **PSO4** |
| **CO1** | 3 | - | - | | 1 | - | | - | | - | | - | - | | - | - | | - | 3 | | - | - | | - |
| **CO2** | - | 3 | - | | - | - | | - | | 3 | | - | - | | - | 1 | | - | 2 | | - | - | | 1 |
| **CO3** | - | - | 2 | | - | - | | 2 | | - | | - | 2 | | - | - | | - | - | | 2 | 3 | | 2 |
| **CO4** | - | 2 | - | | - | 1 | | - | | - | | 3 | - | | - | - | | 3 | 1 | | - | - | | - |
| **Program:** B.Tech CSE | | | | | | | | | | | | | | **Semester:** VI | | | | | | | | |
| **Course Title:** Smarter City | | | | | | | | | | | | | | **Course Code:** CSE-654 | | | | | | | | |
| **L** | | | | **T** | | | **P** | | CH | | **CP** | | | **Int. A** | | | **ESE** | | | **Total** | | |
| - | | | | - | | | 2 | | 2 | | 1 | | | 30 | | | 20 | | | 50 | | |

**Course Description: This subject** provides knowledge of different Smart System applications. To familiarize students with Arduino as IDE, programming language & platform. To provide knowledge of Arduino boards and basic components. Develop skills to design and implement various smart system applications.

**Course Outcomes**

**CO1:** Familiar with Arduino environment and its applications.

**CO2:** Able to understand Arduino programming with C++.

**CO3:**  Able to Design Smart systems applications.

**CO4:** Learn and understand about any new IDE, compiler, and MCU chip in Arduino, any new IDE, compiler, and MCU chip in Arduino compatible boards or similar types.

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **S. No.** | **Description** |
| 1 | List of experiments to be carried out using Arduino boards and other peripheral devices   * Digital Input & Digital Output * Experiments on digital input and digital output on Arduino Mega board and using LED and Buzzer. * Analog Input & Analog Input * Experiments on analog input and analog output on Arduino Mega board using PWM. Different outputs on LED. |
| 2 | LCD Display - Experiment on LCD display:-Print numbers, Name, Time etc |
| 3 | Serial Port - Serial Communication between Arduino board and PC:-character send and received, Read and display voltage |
| 4 | TV Remote - Experiments on TV Remote with LCD |
| 5 | Timer - Experiments with Timer:-play tones, time interval measurement etc. |
| 6 | Bluetooth & Wi-Fi - Experiments on Blue tooth and Wi-Fi |

**Assessment Process (Internal)**

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks )**
* **Attendance = 10 Marks**

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **P111** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 2 | - | - | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - |
| **CO2** | - | 3 | - | - | - | - | 3 | - | - | - | 1 | - | 2 | - | - | 3 |
| **CO3** | - | - | 3 | - | - | 1 | - | - | 2 | - | - | - | - | - | - | 2 |
| **CO4** | - | 2 | - | - | 1 | - | - | 2 | - | - | - | 3 | 2 | - | - | - |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VI | | |
| **Course Title:** Digital Image Processing Lab | | | | | **Course Code:** CSE-655 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:** Deterministic and stochastic modeling of images, linear and nonlinear filtering, and image transformations for coding and restoration. A variety of web based laboratory experiments based on a combination of Matlab and C programming environments will be used.

**Course Outcomes**

**CO1:** Review the fundamental concepts of a digital image processing system.

**CO2:** Analyze images in the frequency domain using various transforms

**CO3:** Evaluate the techniques for image enhancement and image restoration

**CO4:** To learn about enhancing images through techniques like filtering and equalization, image restoration, segmentation and de-noising. implement graph theory in vector space models and coloring methodologies for images in MATLAB

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **S. No.** | **Description** |
| 1 | Implement the spatial image enhancement functions on a bitmap image –  (a) Mirroring (Inversion) (b) Rotation  (Clockwise) (c) Enlargement (Double Size) |
| 2 | Implement (a) Low Pass Filter (b) High Pass Filter |
| 3 | Write a program for polygon filling as Raster Graphics Display Implement (a) Arithmetic Mean Filter (b) Geometric Mean Filter |
| 4 | Implement Smoothing and Sharpening of an eight bit color image |
| 5 | Implement (a) Boundary Extraction Algorithm (b) Graham's Scan Algorithm |
| 6 | Implement (a) Edge Detection (b) Line Detection |

**Assessment Process (Internal)**

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks )**
* **Attendance = 10 Marks**

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 2 | - | - | 1 | - | - | - | - | - | - | - | - | 1 | - | - | - |
| **CO2** | - | 2 | - | - | - | - | 3 | - | - | - | 1 | - | 2 | - | - | 3 |
| **CO3** | - | - | 3 | - | - | 1 | - | - | 2 | - | - | - | - | 4 | 4 | 2 |
| **CO4** | - | 2 | - | - | 4 | - | - | 3 | - | - | - | 3 | 2 | - | - | - |

**SEMESTER VII**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VII | | |
| **Course Title:** Artificial Intelligence | | | | | **Course Code:** CSE-701 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 2 | 4 | 60 | 40 | 100 |

**Course Description:** In this course, students will get a basic introduction to the building blocks and components of artificial intelligence, learning about concepts like algorithms, machine learning, and neural networks. Students will also explore how AI is already being used, and evaluate problem areas of AI, such as bias. The course also contains a balanced look at AI’s impact on existing jobs, as well as its potential to create new and exciting career fields in the future. Students will leave the course with a solid understanding of what AI is, how it works, areas of caution, and what they can do with the technology.

**Course Outcomes**

**CO1:** To gain the knowledge of artificial Intelligence

**CO2:** To understand the principles of problem solving and be able to apply them successfully

**CO3:** To be familiar with techniques for computer-based representation and manipulation of complex information, knowledge, and uncertainty

**CO4:** To gain awareness of several advanced AI applications and topics such as intelligent agents, planning and scheduling, ma-chine learning, etc.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Introduction to Artificial intelligence:**. Introduction to artificial intelligence, background and applications, turing test and rational agent approaches, introduction to intelligent agents, their structure, behavior and environment.  **Heuristic Search:** Problem characteristics, production systems, breadth first search, depth first search, heuristics search techniques. Production systems, predicate calculus and planning the black board architecture for problems solving. | 14 |
| 2 | **LISP and PROLOG:** Knowledge representation languages issues in knowledge representation, network representation language, structured representations, introduction to LISP, Search in LISP: a functional approach to the farmer, Wolf, Goat and cabbage problem, higher order functions & procedural abstraction, search strategies in LISP. | 11 |
| 3 | **Overview of biological neurons:** Structure of biological neurons relevant to ANNs. **Fundamental concepts of Artificial Neural Networks:** Models of ANNs; Feedforward & feedback networks; learning rules; Hebbian learning rule, perception learning rule, delta learning rule, Widrow-Hoff learning rule, correction learning rule, Winner –lake all elarning rule, etc | 11 |
| 4 | **Single layer Perception Classifier:** Classification model, Features & Decision regions; training & classification using discrete perceptron, algorithm, single layer continuous perceptron networks for linearlyseperable classifications.  **Multi-layer Feed forward Networks:** linearly non-seperable pattern classification, Delta learning rule for multi-perceptron layer, Generalized delta learning rule, Error back-propagation training, learning factors, Examples | 09 |
|  | | |

**Text Books:**

1. Efrain Turban and Jay E Aranson: Decision support systems & intelligent systems (5th Edn.) Prentice hall, 1998.

2. Donald A Waterman: A Guide to expert Systems, Addison -Wesley 1995

3. G.F. Luger & W.A Stubble Field -Artificial Intelligence structures and Strategies for complex problem solving, 3 rd Edn. Addision Wesley 1998.

4. E.Rich and Knight, Artificial Intelligence, Second Edn, Tata Mc. Graw Hill Publishing, 1981.

5. Introduction to artificial Neural systems by Jacek M. Zurada, 1994, Jaico Publ. House.

**Reference Books:**

* Efrain Turban and Jay E Aranson: Decision support systems & intelligent systems (5th Edn.) Prentice hall, 1998.
* Neural Networks :A Comprehensive formulation”, Simon Haykin, 1998, AW

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | - | 3 | 1 | - | - | - | 1 | - | - | 2 | 2 | 1 | 3 | 3 | 2 |
| **CO2** | 1 | - | - | 3 | 3 | 1 | - | 2 | - | 2 | 2 | 3 | 2 | 1 | 3 | 2 |
| **CO3** | 3 | 1 | 3 | - | - | - | 2 | - | 2 | 3 | 1 | 2 | 3 | 2 | - | 3 |
| **CO4** | 2 | - | 2 | 3 | 2 | 1 | 2 | 3 | 3 | - | - | 2 | 3 | 3 | 1 | 1 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VII | | |
| **Course Title:** Dot Net Technology | | | | | **Course Code:** CSE-702 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 2 | 4 | 60 | 40 | 100 |

**Course Description:** It **helps build both Windows Applications and Web Applications**. It is amongst top market leaders in developing web projects as it provides inbuilt MVC & ORM Framework. MVC - Build on top of MVC & ASP.Net to provide MVC Implementation in Dot Net Web Applications.

**Course Outcomes**

**CO1:** List the major elements of the .NET frame work

**CO2:** Explain how C# fits into the .NET platform.

**CO3:** Analyze the basic structure of a C# application

**CO4:** Develop programs using C# on .NET

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | Introduction to .NET Technology, Introduction to VB.NET, Software development and Visual Basic .NET, Visual Basic .NET and .NET frame. Visual Basic fundamentals: The Visual Basic .NET Development Environment, The element of VB.NET, VB.NET operators, Software design, Conditional structure and control flow, Methods. | 14 |
| 2 | Classes and Objects: Types, Structure and Enumeration, Classes, Interfaces, Exception handling and Classes, Collections, Arrays and other Data Structure. | 10 |
| 3 | Development Environment Setup, ISS, SQL Server and Visual Studio, Advance design concepts, Patterns, Roles and Relationships, Advanced Interface Patterns: Adapters and Delegates and Events Data Processing and I/O. NET Framework Class Library (FCL): System, Collections, I/O, Networking, Threading, Transactions, Exceptions | 09 |
| 4 | Writing Software with Visual Basic .NET, Interfacing with the End User, Introduction to ASP.NET and C#.NET and their features. Advanced C#: OOP, Delegates, Events, Attributes, unsafe code, .NET Interop | 08 |

**Text Books:**

1.      Jeffrey R. Shapiro “The Complete Reference Visual Basic .NET” Tata Mcgraw Hill

2.      Rox “Beginner and Professional Edition VB.NET” Tata Mcgraw Hill.

3.      Steven Holzner “Visual Basic .NET Black Book” Wiley Dreamtech Publication.

4.      Alex Homer, Dave Sussman “Professional ASP.NET1.1” Wiley Dreamtech

5.      Bill Evzen,Bill Hollis “Professional VB.NET 2003” Wiley Dreamtech

6.      Tony Gaddis “Starting Out VB.NET PROG.2nd Edition” Wiley Dreamtech

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | - | - | 3 | 1 | - | 2 | - | - | - | 3 | 2 | 2 | 1 | 3 | 3 | 2 |
| **CO2** | - | 2 | 1 | - | 3 | 1 | - | 2 | - | - | - | 3 | 2 | - | - | 2 |
| **CO3** | 3 | 1 | - | - | - | 3 | 2 | - | 2 | - | 1 | 2 | 3 | - | - | 3 |
| **CO4** | 2 | - | 2 | 3 | 2 | 1 | - | - | 3 | 2 | - | 2 | - | - | 1 | 1 |

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| **Program:** B.Tech CSE | | | | | **Semester:** VII | | |
| **Course Title:** IOT for Industries | | | | | **Course Code:** CSE-703 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | - | - | 3 | 3 | 60 | 40 | 100 |

**Course Description:** Students will learn the new evolution in hardware, software, and data. While the promise of the Industrial Internet of Things (IIoT) brings many new business prospects, it also presents significant challenges ranging from technology architectural choices to security concerns. Students acquire upcoming Industrial IoT: Roadmap to the Connected World Course offers important insights on overcoming the challenges and thrive in this exciting space.

**Course Outcomes**

**CO1:** Explore IoT technologies, architectures, standards, and regulation

**CO2:** Realize the value created by collecting, communicating, coordinating, and leveraging the data from connected devices

**CO3:** Examine technological developments that will likely shape the industrial landscape in the future

**CO4:** Understand how to develop and implement own IoT technologies, solutions, and applications

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Introduction & Architecture:** What is IIoT and connected world? the difference between IoT and IIoT,  Architecture of IIoT, IOT node, Challenges of IOT. | 07 |
| 2 | **IIOT Components:** Fundamentals of Control System, introductions, components, closed loop & open loop system.  Introduction to Sensors (Description and Working principle): What is sensor? Types of sensors, working principle of basic  Sensors -Ultrasonic Sensor, IR sensor,   MQ2, Temperature and Humidity Sensors (DHT-11).Digital switch, Electro  Mechanical switches. | 19 |
| 3 | **Communication Technologies of IIoT:** Communication Protocols: IEEE 802.15.4, ZigBee, Z Wave, Bluetooth, BLE, NFC, RFID Industry standards communication technology (LoRAWAN, OPC UA, MQTT), connecting into existing Modbus and Profibus  technology, wireless network communication. | 08 |
| 4 | **Retrieving Data:**  Extraction from Web: Grabbing the content from a web page, Sending data on  the web, Troubleshooting basic Arduino issues, Types of IoT interaction, Machine to Machine interaction (M2M).  **Application of IIOT:**  Case study: Health monitoring, Iot smart city, Smart irrigation, Robot surveillance. | 09 |

**Text Books**

1. The Internet of Things in the Industrial Sector, Mahmood, Zaigham (Ed.)   (Springer Publication)
2. Industrial Internet of Things: Cybermanufacturing System**,**Sabina Jeschke, Christian Brecher, Houbing Song, Danda B. Rawat  (Springer Publication)
3. Industrial IoT Challenges, Design Principles, Applications, and Security by Ismail Butun (editor)

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | - | 2 | - | 1 | - | - | - | - | 2 | 3 | 2 | - | 1 | - | 3 | - |
| **CO2** | - | - | - | 3 | 3 | 1 | - | 2 | - | 2 | 2 | 3 | 2 | 1 | 3 | - |
| **CO3** | 3 | 1 | 3 | 2 | - | 3 | - | - | 2 | 3 | 1 | 2 | 3 | - | - | 3 |
| **CO4** | 2 | - | 2 | 3 | 2 | 1 | 2 | 2 | 3 | 2 | 3 | 2 | - | 3 | 1 | 1 |

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| **Program:** B.Tech CSE | | | | | **Semester:** VII | | |
| **Course Title:** Advanced Computer Architecture | | | | | **Course Code:** CSE-704 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** It will introduce students to advanced aspects of processor design and will specifically focus on out-of-order pipelines, GPUs, and compiler techniques for enhancing ILP. The course will subsequently move on to cache design and main memory technologies such as DDR-4.

**Course Outcomes**

**CO1:** Demonstrate concepts of parallelism in hardware/software.

**CO2:** Discuss memory organization and mapping techniques

**CO3:** Describe architectural features of advanced processors.

**CO4:** Interpret performance of different pipelined processors.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Architecture And Machines:** Some definition and terms, interpretation and microprogramming. The instruction set, Basic data types, Instructions, Addressing and Memory. Virtual to real mapping. Basic Instruction Timing.  **Time, Area And Instruction Sets:** Time, cost-area, technology state of the Art, The Economics of a processor project: A study, Instruction sets, Professor Evaluation Matrix  **Computer Arithmetic:** Unsigned, signed and floating point data representation, addition, subtraction, multiplication and division algorithms. booths multiplication algorithm. | 07 |
| 2 | **Cache Memory Notion:** Basic Notion, Cache Organization, Cache Data, adjusting the data for cache organization, write policies, strategies for line replacement at miss time, Cache Environment, other types of Cache. Split I and D-Caches, on chip caches, Two level Caches, write assembly Cache, Cache references per instruction, technology dependent Cache considerations, virtual to real translation, overlapping the Tcycle in V-R Translation, studies. Design summary. | 14 |
| 3 | **Memory System Design:** The physical memory, models of simple processor memory interaction, processor memory modeling using queuing theory, open, closed and mixed-queue models, waiting time, performance, and buffer size, review and selection of queueing models, processors with cache. | 10 |
| 4 | **Concurrent Processors:** Vector Processors, Vector Memory, Multiple Issue Machines, Comparing vector and Multiple Issue processors.  **Shared Memory Multiprocessors:** Basic issues, partitioning, synchronization and coherency, Type of shared Memory multiprocessors, Memory Coherence in shared Memory Multiprocessors. | 11 |

**Text Book:**

• Advance computer architecture by Hwang & Briggs, 1993, TMH.

• Pipelined and Parallel processor design by Michael J. Fiynn – 1995, Narosa.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | - | - | - | 2 | 2 | 1 | 2 | 3 | 2 | 2 | 1 | 3 | 3 | 2 |
| **CO2** | 1 | 2 | - | 3 | 3 | 1 | - | 2 | - | 2 | 2 | 3 | 2 | 1 | - | 2 |
| **CO3** | 3 | 1 | 3 | 2 | - | 3 | 2 | 3 | 2 | 3 | 1 | 2 | 3 | - | 1 | 3 |
| **CO4** | 2 | 4 | 2 | - | 2 | 1 | - | - | - | 2 | 3 | 2 | 3 | 3 | 1 | 1 |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VII | | |
| **Course Title:** Software Project Management | | | | | **Course Code:** CSE-708 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** The Subject focuses on understanding Project Management Concepts, Project Planning, Project Monitoring, Risk Management, Resource Management, Project Metrics Analysis, Subcontract Management, Quality Management and Models, Tools and Frameworks for Project Management.

**Course Outcomes**

**CO1:** Develop the model from the conventional software product to the modern.

**CO2:** Analyze and design the software architecture.

**CO3:** Apply, analyze, design and develop the software project.

**CO4:** Design various estimation levels of cost and effort.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Introduction to Software Project Management (SPM):** Definition of a Software Project (SP), SP Vs. other types of projects activities covered by SPM, categorizing SPs, project as a system, management control, requirement specification, information and control in organization.  **Stepwise Project planning:** Introduction, selecting a project, identifying project scope and objectives, identifying project infrastructure, analyzing project characteristics, identifying project products and activities, estimate efforts each activity, identifying activity risk, allocate resources, review/ publicize plan. | 10 |
| 2 | **Project Evaluation & Estimation:** Cost benefit analysis, cash flow forecasting, cost benefit evaluation techniques, risk evaluation. Selection of an appropriate project report; Choosing technologies, choice of process model, structured methods, rapid application development, water fall-, V-process-, spiral- models. Prototyping, delivery. Albrecht function point analysis, estimate of project effort (COCOMO)  **Activity planning & Risk Management**: Objectives of activity planning, project schedule, projects and activities, sequencing and scheduling activities, network planning model, representation of lagged activities, adding the time dimension, backward and forward pass, identifying critical path, activity throat, shortening project , precedence networks.  **Risk Management**: Introduction, the nature of risk, managing risk, risk identification, risk analysis, reducing the risks, evaluating risks to the schedule, calculating the z values. | 17 |
| 3 | **Resource allocation &Monitoring the control**: Introduction, the nature of resources, identifying resource requirements, scheduling resources creating critical paths, counting the cost, being specific, publishing the resource schedule, cost schedules, the scheduling sequence.  **Monitoring the control**: Introduction, creating the frame work, collecting the data, visualizing progress, cost monitoring, earned value, prioritizing monitoring, getting the project back to target, change control.  **Managing contracts and people**: Introduction, types of contract, stages in contract, placement, typical terms of a contract, contract management, acceptance, Managing people and organizing terms: Introduction, understanding behavior, organizational behavior: a back ground, selecting the right person for the job, instruction in the best methods, motivation, working in groups, becoming a team, decision making, leadership, organizational structures, conclusion, further exercises. | 10 |
| 4 | **Concurrent Processors:** Vector Processors, Vector Memory, Multiple Issue Machines, Comparing vector and Multiple Issue processors.  **Shared Memory Multiprocessors:** Basic issues, partitioning, synchronization and coherency, Type of shared Memory multiprocessors, Memory Coherence in shared Memory Multiprocessors. | 06 |

**Text Book:**

• Software Project Management (2nd Edition), by Bob Hughes and Mike Cotterell, 1999, TMH

**Reference Books:**

• Software Engineering – A Practitioner’s approach, Roger S. Pressman (5th edi), 2001, MGH

• Software Project Management, Walker Royce, 1998, Addison Wesley.

Project Management 2/c. Maylor

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

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|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | **3** | **2** | **3** | **-** | **-** | **2** | **-** | **3** | **2** | **3** | **2** | **2** | **1** | **-** | **3** | **-** |
| **CO2** | **1** | **2** | **-** | **3** | **3** | **1** | **3** | **-** | **-** | **2** | **-** | **-** | **2** | **-** | **3** | **2** |
| **CO3** | **3** | **1** | **3** | **2** | **-** | **3** | **-** | **-** | **2** | **-** | **1** | **2** | **-** | **2** | **-** | **3** |
| **CO4** | **2** | **3** | **2** | **3** | **2** | **-** | **-** | **3** | **3** | **2** | **3** | **1** | **-** | **3** | **1** | **1** |

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| **Program:** B.Tech CSE | | | | | **Semester:** VII | | |
| **Course Title:** Fuzzy Logic | | | | | **Course Code:** CSE-709 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** Fuzzy Logic theory is based on the empirical aspect of the human reasoning, and is used in the manipulation of imperfect, imprecise or approximate knowledge. It allows the modelling and processing of very complex systems in which, for example, human factors are present. Theory and applications concerning fuzzy logic exit for more than fifty years. They cover several fields such as artificial intelligence, identification and control of dynamic systems, automatic excision-making in complex systems, and fault diagnosis in industrial processes. On the other hand, Artificial Neural Networks are based on the biological aspect of the human brain.

**Course Outcomes**

**CO1:** Comprehend the concepts of feed forward neural networks

**CO2:** Analyze the various feedback networks

**CO3:** Understand the concept of fuzziness involved in various systems and fuzzy set theory.

**CO4:** Comprehend the fuzzy logic control and adaptive fuzzy logic and to design the fuzzy control using genetic algorithm.

**Theory 3 Hrs/Week**

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| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Classical and Fuzzy Sets**: Overview of Classical Sets, Membership Function, a-cuts, Properties of a-cuts, Decomposition, Theorems, Extension Principle,  **Operations on Fuzzy Sets**: Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations | 10 |
| 2 | **Fuzzy Arithmetic**: Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations.  **Fuzzy Relations**: Crisp & Fuzzy Relations, Projections & Cylindric Extensions, Binary Fuzzy Relations, Binary Relations on single set, Equivalence, Compatibility & Ordering Relations, Morphisms, Fuzzy Relation Equations. | 17 |
| 3 | **Possibility Theory**: Fuzzy Measures, Evidence & Possibility Theory, Possibility versus Probability Theory. **Fuzzy Logic**: Classical Logic, Multivalued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Hedges. | 10 |
| 4 | **Uncertainty based Information**: Information & Uncertainty, No specificity of Fuzzy & Crisp sets, Fuzziness of Fuzzy Sets.  **Applications of Fuzzy Logic** in soft computing. | 06 |

**Text / Reference books :**

**•** Fuzzy Sets, Uncertainty & Information by G.J.Klir & T.A. Folyger, PHI, 1988.

• Fuzzy sets & Fuzzy logic by G.J.Klir & B.Yuan, PHI, 1995

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | 3 | - | - | - | 2 | 1 | 2 | 3 | 2 | 2 | 1 | 3 | - | - |
| **CO2** | 1 | 2 | 1 | - | 3 | - | - | 2 | - | - | 2 | - | - | - | 3 | 2 |
| **CO3** | 3 | 1 | 3 | 2 | - | 3 | - | - | 2 | - | 1 | - | - | 2 | - | 3 |
| **CO4** | 2 | 4 | 2 | - | 2 | 1 | 2 | - | 3 | 2 | - | - | 3 | 3 | - | 1 |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VII | | |
| **Course Title:** Neural Networks | | | | | **Course Code:** CSE-707 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** Neural networks provide a model of computation drastically different from traditional computers. Typically, neural networks are not explicitly programmed to perform a given task; rather, they learn to do the task from examples of desired input/output behavior. The networks automatically generalize their processing knowledge into previously unseen situations, and they perform well even when the input is noisy, incomplete or inaccurate. These properties are well-suited for modeling tasks in ill-structured domains such as face recognition, speech recognition and motor control.

**Course Outcomes**

**CO1:** Model Neuron and Neural Network, and to analyze ANN learning, and its applications.

**CO2:** Perform Pattern Recognition, Linear classification

**CO3:** Develop different single layer/multiple layer Perception learning algorithms

**CO4:** Design of another class of layered networks using deep learning principles.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Overview of biological neurons:** Structure of biological neurons relevant to ANNs.  **Fundamental concepts of Artificial Neural Networks:** Models of ANNs; Feedforward & feedback networks; learning rules; Hebbian learning rule, perception learning rule, delta learning rule, Widrow-Hoff learning rule, correction learning rule, Winner –lake all elarning rule, etc. | 10 |
| 2 | **Single layer Perception Classifier:** Classification model, Features & Decision regions; training & classification using discrete perceptron, algorithm, single layer continuous perceptron networks for linearlyseperable classifications.  **Multi-layer Feed forward Networks:** linearly non-seperable pattern classification, Delta learning rule for multi-perceptron layer, Generalized delta learning rule, Error back-propagation training, learning factors, Examples. | 17 |
| 3 | **Single layer feed back Networks:** Basic Concepts, Hopfield networks, Training & Examples. **Associative memories:** Linear Association, Basic Concepts of recurrent Auto associative memory: rentrieval algorithm, storage algorithm; By directional associative memory, Architecture, Association encoding & decoding, Stability. | 10 |
| 4 | **Self organizing networks:** UN supervised learning of clusters, winner-take-all learning, recall mode, Initialisation of weights, seperability limitations | 06 |

**Text Books:**

• Introduction to artificial Neural systems by Jacek M. Zurada, 1994, Jaico Publ. House.

• “Neural Networks :A Comprehensive formulation”, Simon Haykin, 1998, AW

• “Neural Networks”, Kosko, 1992, PHI.

• “Neural Network Fundamentals” – N.K. Bose , P. Liang, 2002, T.M.H

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 2 | 3 | 1 | - | - | 1 | - | 2 | 3 | 2 | 3 | 1 | 3 | 3 | 2 |
| **CO2** | 1 | - | 1 | - | 3 | 1 | 3 | 2 | - | - | 2 | 3 | 2 | - | - | 2 |
| **CO3** | 3 | 1 | 3 | 2 | - | 3 | 2 | - | 2 | 3 | 1 | 2 | 3 | 2 | - | 3 |
| **CO4** | 2 | - | 2 | 3 | - | - | 2 | 3 | 3 | 2 | - | 2 | 3 | - | 1 | 1 |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VII | | |
| **Course Title:** Cryptography & Network Security | | | | | **Course Code:** CSE-705 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3.5 | 60 | 40 | 100 |

**Course Description:** This Course focuses towards the introduction of network security using various cryptographic algorithms. Underlying network security applications. It also focuses on the practical applications that have been implemented and are in use to provide email and web security.

**Course Outcomes**

**CO1:** Understand the most common type of cryptographic algorithm

**CO2:** Understand the Public-Key Infrastructure

**CO3:** Understand security protocols for protecting data on networks

**CO4:** Be able to digitally sign emails and files

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **ENCRYPTION AND DECRYPTION :** Attackers and Types of Threats, challenges for information security, Encryption Techniques, Classical Cryptographic Algorithms: Monoalphabetic Substitutions such as the Caesar Cipher, Cryptanalysis of Monoalphabetic ciphers, Polyalphabetic Ciphers such as Vigenere, Vernam Cipher, Stream and Block Ciphers.  **Cryptanalysis:** Introduction of cryptanalysis, cryptanalysis of monoalphabetic ciphers such as affine cipher, cryptanalysis of polyalphabetic ciphers such as vigenere cipher | 10 |
| 2 | **SYMMETRIC KEY SYSTEMS :** The Data encryption Standard (DES), Analyzing and Strengthening of DES, TDES, Advance Encryption Standard (AES)  **KEY MANAGEMENT PROTOCOLS** Solving Key Distribution Problem, Diffie-Hellman Algorithm, Key Exchange with Public Key Crypotography.  Digital Signature: Introduction to digital signature algorithms, RSA digital signature scheme algorithm, the digital signature standard (DSA). | 17 |
| 3 | **PUBLIC KEY ENCRYPTION SYSTEMS** Concept and Characteristics of Public Key Encryption system, Introduction to Merkle-Hellman Knapsacks, Rivets – Shamir-Adlman (RSA) Encryption, introduction to Digital Signature Algorithms, The Digital Signature Standard (DSA)  **HASH ALGORITHMS** Hash concept, description of Hash Algorithms, Message Digest Algorithms such as MD4 and MD5, Secure Hash Algorithms such as SHA1 and SHA2. | 10 |
| 4 | **NETWORK SECURITY**  Network Security Issues such as Impersonation, Message Confidentiality, Message Integrity, Code Integrity, Denial of Service Attacks, Securing Switches and Routers, Firewalls, DMZs, Virtual Private Networks, Network Monitoring and Diagnostic Devices, Virtual LANs, IPSec Secure Communication Mechanism, PKI based authentication and Kerberos.  **WEB SECURITY**  Secure socket Layer Protocol, Pretty Good Privacy, Public Key Cryptography Standards. | 06 |

**Recommended Books:**

1. Principles of Cryptography, William Stallings, Pearson Education.
2. “Security in Computing (Second Edition)” , Charles P.Pfleeger, 1996, Prentice Hall Internation, Inc.
3. Cryptography & Network Security, Atul Kahate, TMH
4. Applied Cryptography: Protocols, Algorithms, and Source Code in C, Bruce Schneier, John Willey and Sons.
5. Firewalls and Internet Security, Bill Cheswick and Steve Bellovin,  Addison-Wesley
6. “Security Technologies for the world wide web”, Rolf Oppliger, Artech  House, Inc.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 2 | 2 | - | 1 | 3 | 2 | - | 1 | 2 | 3 | 2 | 3 | 1 | - | - | 2 |
| **CO2** | 1 | 2 | 1 | - | 3 | 1 | - | - | - | 2 | 2 | 3 | 2 | 1 | 3 | - |
| **CO3** | 4 | 1 | 3 | 2 | 1 | 3 | 2 | - | 2 | - | 1 | 2 | - | 2 | - | - |
| **CO4** | 2 | 3 | - | - | - | 1 | 2 | 3 | - | - | 3 | 2 | 3 | - | 1 | 1 |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VII | | |
| **Course Title:** Software Testing | | | | | **Course Code:** CSE-706 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3 | 60 | 40 | 100 |

**Course Description:** Our society is built on software. It powers our homes, it manages our private information, it controls our cars, it automates our factories and it even regulates our bodies. It is incredibly important that we construct robust, operational systems, especially given growing demand for features, limited development budgets and strict time constraints. The key to delivering such software is by conducting a thorough verification and validation process.

**Course Outcomes**

**CO1:** To study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.

**CO2:** To discuss various software testing issues and solutions in software unit test; integration, regression, and system testing.

**CO3:** To learn how to planning a test project, design test cases and data, conduct testing operations, manage software problems and defects, generate a testing report.

**CO4:** To gain the techniques and skills on how to use modern software testing tools to support software testing projects.

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | **Fundamentals of Testing:** Human and errors, Testing and Debugging, Software Quality, Requirement Behavior and Correctness, Fundamentals of Test Process, Psychology of Testing, General Principles of Testing, Test Metrics  **Role of Testing in SDLC:** Review of software development models (Waterfall Models, Spiral Model, W Model, V Model) Agile Methodology and Its Impact on testing, Test Levels (Unit, Component, Module, Integration, System, Acceptance, Generic) | 10 |
| 2 | **Approaches to Testing – I:** Static Testing ,Structured Group Examinations, Static Analysis ,Control flow & Data flow, Determining Metrics ,Dynamic Testing ,Black Box Testing ,Equivalence Class Partitioning, Boundary Value Analysis, State Transition Test, Cause Effect Graphing and Decision Table Technique and Used Case Testing and Advanced black box techniques ,White Box Testing, Statement Coverage, Branch Coverage, Test of Conditions, Path Coverage, Advanced White Box Techniques, Instrumentation and Tool Support ,Gray Box Testing, Intuitive and Experience Based Testing | 17 |
| 3 | **Test Management:** Test Organization ,Test teams, tasks and Qualifications ,Test Planning ,Quality Assurance Plan, Test Plan, Prioritization Plan, Test Exit Criteria ,Cost and economy Aspects ,Test Strategies ,Preventive versus Reactive Approach, Analytical versus heuristic Approach, Test Activity Management, Incident Management, Configuration Management Test Progress Monitoring and Control Specialized Testing: Performance, Load, Stress & Security Testing | 10 |
| 4 | **Testing Tools:** Automation of Test Execution, Requirement tracker, High Level Review ,Types of test Tools, Tools for test management and Control, Test Specification, Static Testing, Dynamic Testing, Non functional testing ,Selection and Introduction of Test Tools, Tool Selection and Introduction, Cost Effectiveness of Tool Introduction  **Testing Object Oriented Software:** Introduction to OO testing concepts, Differences in OO testing | 6 |

**References:**

1. Software Testing Foundations, Andreas Spillner, Tilo Linz, Hans Schaefer, Shoff Pub.

2. Software Testing: Principles and Practices by Srinivasan D and Gopalswamy R, PearsonEd,

3. Foundations of Software Testing by Aditya P. Mathur – Pearson Education custom edition

4. Testing Object Oriented Systems: models, patterns and tools, Robert V Binder, Addison Wesley, 1996

5. Software Engineering – A practitioner’s approach by Roger S. Pressman, 5th Ed, McGraw Hill

6. The art of software testing by GJ Myers, Wiley.

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 2 | - | - | - | - | 2 | - | 1 | 2 | 3 | 2 | - | 1 | 3 | 3 | 2 |
| **CO2** | 1 | 2 | 1 | 3 | - | 1 | - | 2 | - | - | - | 3 | - | 1 | - | - |
| **CO3** | 3 | 1 | 3 | - | - | 3 | 2 | - | 2 | 2 | 1 | 2 | - | 2 | 1 | 3 |
| **CO4** | 2 | - | 2 | 3 | 2 | 1 | 2 | 3 | 1 | 2 | 3 | 2 | 3 | 2 | 1 | 1 |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VII | | |
| **Course Title:** Natural Language Processing | | | | | **Course Code:** CSE-710 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3 | 60 | 40 | 100 |

**Course Description:** This course introduces the fundamental concepts and techniques of natural language processing (NLP). Students will gain an in-depth understanding of the computational properties of natural languages and the commonly used algorithms for processing linguistic information. The course examines NLP models and algorithms using both the traditional symbolic and the more recent statistical approaches.

**Course Outcomes**

**CO1:** Understand approaches to syntax and semantics in NLP.

**CO2:** Understand approaches to discourse, generation, dialogue and summarization within NLP.

**CO3:** Understand current methods for statistical approaches to machine translation.

**CO4:** Understand machine learning techniques used in NLP, including hidden Markov models and probabilistic context-free grammars, clustering and unsupervised methods, log-linear and discriminative models, and the EM algorithm as applied within NLP

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | Introduction: Origin of natural language processing (NLP), challenges of NLP, NLP applications, processing Indian languages.  Components of natural language processing: lexicography, syntax, semantics, and pragmatics: word level representation of natural languages prosoty & natural languages. Formal languages and grammars: chomsky hierarchy, Left-Associative grammars, ambiguous grammars, resolution of ambiguities. | 10 |
| 2 | Computation linguistics: recognition and parsing of natural language structures: ATN & RTN, General techniques of parsing: CKY, Earley & Tomitas algorithm. | 17 |
| 3 | Semantics-knowledge representation semantic networks logic and inference pragmatics, graph models and optimization, prolog for natural language semantic. | 10 |
| 4 | Application of NLP: intelligent work processors: Machine translation, user interfaces, Man-Machine interfaces, natural language querying, tutoring and authoring systems, speech recognition, commercial use of NLP. | 06 |

**Text Book**:

•“Natural Language Understanding” James Allen ,Benjamin-1995, cummings Pub. Comp. Ltd.,

**Reference Books**:

•“Language as a cognitive process”, Terry Winograd 1983, AW

•“Natural Language processing in prolog” G. Gazder, 1989, Addison Wesley.

•“ Introduction of Formal Language Theory, Mdlj Arbib & Kfaury, 1988, Springer Verlog

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | - | 3 | 1 | 3 | -2 | 1 | - | - | - | 2 | 3 | 1 | 2 | 3 | 2 |
| **CO2** | 1 | 2 | - | 3 | - | 1 | 3 | 2 | - | - | 2 | 3 | - | 1 | - | 2 |
| **CO3** | 3 | 1 | 3 | 2 | - | 2 | 2 | - | 2 | 3 | - | - | - | 2 | - | 3 |
| **CO4** | 2 | - | - | - | 2 | 1 | - | 3 | 3 | 2 | - | - | - | - | 1 | 1 |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VII | | |
| **Course Title:** Nano Technology | | | | | **Course Code:** CSE-711 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3 | 60 | 40 | 100 |

**Course Description:** Nanotechnology is the study of manipulating matter on an atomic and molecular scale. Nanotechnology is very diverse, ranging from extensions of conventional device physics to completely new approaches based upon molecular self-assembly, from developing new materials with dimensions on the nanoscale to investigating whether we can directly control matter on the atomic scale. Nanotechnology entails the application of fields of science as diverse as surface science, organic chemistry, molecular biology, semiconductor physics, microfabrication, etc

**Course Outcomes**

**CO1:** Understand fundamental of Nano Technology

**CO2:** Understand Preparation And Characterization Of Nano particles

**CO3:** Understand Nano scale lithography

**CO4:** Understand Synthesis of semiconductor nano cluster

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | Introduction To Nanotech Crystalline non crystalline materials, fundamental of Nano Technology & Nano-materials in metals, other materials & Bio system molecular recognition, quantum mechanics and quantum idea in nanotechnology, semiconductor nano particles. | 10 |
| 2 | Preparation And Characterization Of Nano particles Nano scale litho graphy,dip pen litho graphy,e-beam litho graphy, nano sphere life off, litho graphy,molecular synthesis, nanocrystal growth, polymerization nano bricks & building block: tool for measuring nanostructures-scanning probe instrument, spectroscopy, electro chemistry, electro n-microscopy tools to make nanostructure. | 17 |
| 3 | Properties & Application Of Nano Crystalline Materials Application in sensors, nano scale bio structure electronics, magnets, optics, fabrication medical application, smart materials self healling structures, heterogeneous nano structure & composites encapsulation carbon nano tubes. | 10 |
| 4 | Synthesis of semiconductor nano cluster, processing of nano materials, nano business-boom,bust & Nano technology, nano ethics | 06 |

**Text Books**

1.Camarata. R.C. Nanomaterials synthesis, properties and application Institute of Physics Publication.

2.Madou. Fundamentals of microfabrication, Mcgraw Hill.

3.Sibelia, J.P. A Guide to material characterization, Prentice Hall.

4.Mark Ratner, Deniel Ratner – Nano Technology – A gentle Introduction to the Next Big Idea.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 1 | - | - | 2 | 1 | - | 1 | 2 | - | - | - | - | - | 3 | 2 |
| **CO2** | - | 2 | - | - | 3 | - | - | 3 | - | 2 | 2 | 3 | - | 1 | 3 | 2 |
| **CO3** | 3 | 1 | - | 2 | - | 3 | 2 | - | 2 | - | 1 | 1 | 3 | 2 | - | 3 |
| **CO4** | 2 | - | 2 | - | - | 1 | 2 | - | 3 | - | 3 | 2 | - | 3 | 1 | 1 |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VII | | |
| **Course Title:** Internet Technology | | | | | **Course Code:** CSE-712 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| 3 | 1 | - | 4 | 3 | 60 | 40 | 100 |

**Course Description:** This subject aims to introduce the basic concepts and essential knowledge of the applications and technology of the Internet and World Wide Web. It provides a conceptual framework to understand the operation of the Internet and to understand how computers connect and communicate with each other. This subject also helps to develop students’ analytical ability in network technology.

**Course Outcomes**

**CO1:** Understand the concepts of communication theory and compare functions of  OSI and TCP/IP model

**CO2:** Understand the concepts of IPv4 and IPv6.

**CO3:** Understand the services and protocols used at transport layer.

**CO4:** Apply the skills of subnetting, supernetting and routing mechanisms

**Theory 3 Hrs/Week**

|  |  |  |
| --- | --- | --- |
| **Unit** | **Topic** | **Hours** |
| 1 | Binding Protocol Address- Address Resolution Protocol & RARP, ARP & RARP, packet format, Encapsulation. Internet protocol: Introduction, Ipv4 header, Ipv4Datagrams, Encapsulation, Fragmentation and Reassembly, IP routing, Subnet addressing, Subnet mask, Super netting- special case of IP addresses IPv6-Motivation, frame format and addressing, comparison of IPv4 and IPv6. | 10 |
| 2 | ICMP: Introduction, ICMP Header, ICMP message types, ICMP timestamp request and reply, trace route, ping program. Intra & inter domain routing-distance vector routing, RIP, Link State Routing, OSPF, Path Vector Routing, BGP. Unicast Routing protocols. IGMP message, operation, encapsulation. | 17 |
| 3 | Basic Networking Issues, Network Interoperability and Standards, TCP/IP, connections, sockets, and client/server structures. TCP: Introduction, services, headers, connection establishment and termination, timeout of connection establishment, maximum segment size- half, close, state transition diagram, port no. and socket addresses , TCP timers UDP: Introduction, UDP header, UDP checksum, UDP operations, encapsulation & de-capsulation, queuing, SCTP-Services, transmission sequence number, stream identifier, stream sequence number, packet format.  BOOTP:-operation, packet format. DHCP:-Address allocation, configuration & packet Format, DNS: Distribution of name spaces, DNS in the Internet. | 10 |
| 4 | The World Wide Web, HTML, HTTP, and server side programming with CGI and servlets. Standards, network effects and inertia, spam, security and privacy. FTP:-Connection, Communication, command processing, TFTP. E-Mail:-SMTP, POP & IMAP. SNMP:-Management components, SMI, MIB, Internet Search Engines and client side applets | 06 |

**Recommended Books:**

1. Deitel, Deitel, and Nieto, Internet & World Wide Web How to Program", Third Edition
2. Preston Gralla, How the Internet Works,    
   Que, Paperback, 8th edition, ISBN 0789736260
3. Douglas E.Comer, Computer Networks and Internets with Internet Applications 3rd Edition, Prentice Hall, 2001, ISBN: 0-13-091449-5
4. Elizabeth Castro, HTML for the World Wide Web with XHTML and CSS: Visual QuickStart Guide,  5th Edition, Peachpit Press, ISBN: 0321130073
5. Robert W. Sebesta, Programming the World Wide Web, 2/e, Addison-Wesley,    
   ISBN: 0-321-14945-9

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Mid-Term Exams (MSE) = 40 Marks**
* **Continuous Assessment (CA)= 20 Marks in the form of:-**

(i) Assignments = 15 Marks (ii) Attendance = 05 Marks

|  |  |
| --- | --- |
| **Attendance percentage** | **Marks** |
| Below75% | 0 |
| 75% - 80% | 1 |
| 81% - 85% | 2 |
| 86% - 90% | 3 |
| 91% - 95% | 4 |
| 96% - 100% | 5 |

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | **3** | **-** | **3** | **1** | **3** | **2** | **-** | **1** | **2** | **-** | **-** | **-** | **1** | **-** | **3** | **-** |
| **CO2** | **1** | **-** | **-** | **-** | **-** | **-** | **3** | **2** | **-** | **2** | **-** | **-** | **-** | **1** | **-** | **2** |
| **CO3** | **-** | **-** | **-** | **-** | **-** | **3** | **-** | **-** | **-** | **3** | **1** | **2** | **3** | **-** | **-** | **3** |
| **CO4** | **-** | **-** | **2** | **-** | **2** | **1** | **2** | **3** | **-** | **-** | **-** | **2** | **-** | **3** | **1** | **1** |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VII | | |
| **Course Title:** AI Lab | | | | | **Course Code:** CSE-751 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:** AI is an introductory course in Artificial Intelligence. The goal is to acquire knowledge on intelligent systems and agents, formalization of knowledge, reasoning with and without uncertainty, machine learning and applications at a basic level.

**Course Outcomes**

**CO1:** Elicit, analyze and specify software requirements.

**CO2:** Simulate given problem scenario and analyze its performance.

**CO3:** Develop programming solutions for given problem scenario

**CO4:** Apply AI techniques to real-world problems to develop intelligent systems.

|  |  |
| --- | --- |
| **Sr No.** | **Experiment Title** |
| **1** | Study of Prolog. |
| **2** | Write simple fact for the statements using PROLOG |
| **3** | Write predicates One converts centigrade temperatures to Fahrenheit, the other checks if a temperature is below freezing. |
| **4** | Write a program to solve the Monkey Banana problem. |
| **5** | WAP in turbo prolog for medical diagnosis and show t he advantage and disadvantage of green and red cuts. |
| **6** | WAP to implement factorial, fibonacci of a given number |
| **7** | Write a program to solve 4-Queen problem. |

**Assessment Process (Internal)**

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks )**
* **Attendance = 10 Marks**

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 2 | 2 | 1 | - |  | 2 | 1 | 3 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 1 |
| **CO2** | 1 | 2 | 2 | - | 2 | - | 1 | 2 | 1 | 1 | 2 | 1 | - | 1 | 2 | 2 |
| **CO3** | 1 | - | 2 | - | 1 | 1 | - | 2 | - | 1 | 1 | 2 | 1 | 1 | - | 2 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VII | | |
| **Course Title:** Dot Net Lab | | | | | **Course Code:** CSE-752 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 2 | 2 | 1 | 30 | 20 | 50 |

**Course Description:** .Net is a platform that allows developers to create intelligent applications that are interoperable with other platforms and do it within a shorter timeframe. The .Net platform, also known as the .Net Framework, enables innovation in enterprise application development and deployment. .Net Technologies are in fact gaining popularity, leading to a rise in .Net courses that are designed to help developers acquire skills in this environment.

**Course Outcomes**

**CO1:** Create user interactive web pages using ASP.Net

**CO2:** Create to simple calculator using windows application**.**

**CO3:** Performing Database operations for Windows Form and web applications.

**CO4:** Working with Page using ASP.Net.

**Practical 2 Hrs/Week**

|  |  |
| --- | --- |
| **Sr No.** | **Experiment Title** |
| **1** | Program to display the addition, subtraction, multiplication and division of two number using console applications. |
| **2** | Program to display the first 10 natural numbers and their sum using console application |
| **3** | Program to display the addition using the windows application. |
| **4** | Write a program to convert input string from lower to upper and upper to lower case. |
| **5** | Write a program to simple calculator using windows application. |
| **6** | Write a program working with Page using ASP.Net. |
| **7** | Write a program working with forms using ASP.NET. |

**Assessment Process (Internal)**

**Internal assessment = 30 Marks**

* **Practical work Performance = 20 Marks. (Practical File = 10 Marks , Viva-Voce = 10 Marks )**
* **Attendance = 10 Marks**

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | **2** | **-** | **1** | **-** | **1** | **2** | **1** | **3** | **1** | **2** | **2** | **2** | **1** | **2** | **1** | **1** |
| **CO2** | **-** | **2** | **2** | **1** | **2** | **-** | **1** | **2** | **1** | **1** | **2** | **1** | **2** | **1** | **2** | **2** |
| **CO3** | **1** | **-** | **2** | **-** | **1** | **1** | **-** | **2** | **-** | **1** | **-** | **2** | **-** | **1** | **-** | **2** |
| **CO4** | **-** | **-** | **-** | **2** | **-** | **2** | **1** | **2** | **3** | **-** | **-** | **-** | **2** | **-** | **3** | **1** |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program:** B.Tech CSE | | | | | **Semester:** VII | | |
| **Course Title:** Major Project | | | | | **Course Code:** CSE-753 | | |
| **L** | **T** | **P** | CH | **CP** | **Int. A** | **ESE** | **Total** |
| - | - | 4 | 4 | 3 | 30 | 20 | 50 |

**Course Description:** Course will help the students to learn about to implement the principles of engineering learnt by them in practical applications with innovative ideas and thus enable them to have a practical exposure.

**Course Outcomes:** Students will be able to understand and solve following particular problems by the end of this course:-

**CO1:** To provide an opportunity to work in group on a topic / problem / experimentation.

**CO2:** To encourage creative thinking process.

**CO3:** To acquire and apply fundamental principles of planning and carrying out the work plan of the project through observations, discussions and decision making process.

**CO4:** To provide an opportunity to analyze and discuss the results to draw conclusions.

**Assessment Process (Internal)**

**Internal assessment = 60 Marks**

* **Project Performance = 60 Marks. (Project Work = 40 Marks , Viva-Voce = 20 Marks )**

**CO-PO Mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **CO1** | 3 | 3 | 1 | - | 2 | 3 | 1 | - | - | - | - | 3 | 2 | 2 | 2 | 2 |
| **CO2** | 3 | 3 | 1 | - | 3 | - | 1 | - | - | - | - | - | 2 | - | - | - |
| **CO3** | 3 | 3 | 1 | - | 2 | - | 1 | - | 3 | - | - | - | 2 | 2 | - | - |
| **CO4** | 3 | 3 | 1 | - | 2 | - | 1 | - | - | 1 | - | - | 2 | 2 | 2 | 2 |