SHARDA UNIVERSITY
Beyond Boundaries

# SCHOOL OF ENGINEERING AND TECHNOLOGY
## Bachelor of Technology- Information Technology

**Programme Code: SET0102**
**Duration- 4 Years Full Time**

# PROGRAM STRUCTURE
# AND
# CURRICULUM & SCHEME OF EXAMINATION
# 2020

## 1. Standard Structure of the Program at University Level

### 1.1 Vision, Mission and Core Values of the University

**Vision of the University**

**To serve the society by being a global University of higher learning in pursuit of academic excellence, innovation and nurturing entrepreneurship.**

**Mission of the University**

1. **Transformative educational experience**
2. **Enrichment by educational initiatives that encourage global outlook**
3. **Develop research, support disruptive innovations and accelerate entrepreneurship**
4. **Seeking beyond boundaries**

**Core Values**

- **Integrity**
- **Leadership**
- **Diversity**
- **Community**

**Note: Detailed Mission Statements of University can be used for developing Mission Statements of Schools/ Departments.**

## 1.2 Vision and Mission of the School

### Vision of the School

**To become a globally acclaimed institution of higher learning in engineering and technology promoting excellence in research, innovation and entrepreneurship**

### Mission of the School

1. **To impart quality education with strong industry & academic connectivity in the expanding fields of Engineering and Technology in a conductive and enriching learning environment.**
2. **To product technocrats equipped with technical & soft skills and experiential learning required to stay current with the modern tools in emerging technologies to fulfill professional responsibilities and uphold ethical values.**
3. **To inculcate a culture of interdisciplinary research, innovation and entrepreneurship to provide sustainable solutions to meet the growing challenges and societal needs.**
4. **To foster collaborative learning and to play adaptive leadership role in professional career and pursuit of higher education through effective mentoring and counseling.**

### Core Values

- **Competency**
- **Analytical learning**
- **Interdisciplinary research**
- **Global**

## 1.3 Programme Educational Objectives (PEO)

### 1.3.1 Writing Programme Educational Objectives (PEO)

Program educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.

The Program Educational Objectives (PEOs) of UG Program in Computer Science & Engineering are:

**PEO-1** The graduates will establish themselves as professionals by solving real-life problems using exploratory and analytical skills acquired in the field of Computer Science and Engineering.

**PEO-2** The graduates will provide sustainable solutions to ever changing interdisciplinary global problems through their Research & Innovation capabilities.

**PEO-3** The graduates will become employable, successful entrepreneur as an outcome of Industry-Academia collaboration.

**PEO-4** The graduates will embrace professional code of ethics while providing solution to multidisciplinary social problems in industrial, entrepreneurial and research environment to demonstrate leadership qualities

**Methods of Forming PEO's**

STEP 1 : The needs of the Nation and society are identified through scientific publications, industry interaction and media.

STEP 2. Taking the above into consideration, the PEOs are established by the Coordination Committee of the department.

STEP 3. The PEOs are communicated to the alumni and their suggestions are obtained.

STEP 4. The PEOs are communicated to all the faculty members of the department and their feedback is obtained.

STEP 5. The PEOs are then put to the Board of Studies of the department for final approval.

***[Note: Prepare a file for the same, how you arrive for PEO's]***

### 1.3.2 Map PEOs with Mission Statements:

| DEPARTMENT PEOs / DEPT OF CSE MISSION STATEMENTS | 1. The graduates will establish themselves as professionals by solving real-life problems using exploratory and analytical skills acquired in the field of Computer Science and Engineering. | 2. The graduates will be able to provide sustainable solutions to ever changing interdisciplinary global problems through their Research & Innovation capabilities. | 3. The graduates will become employable, successful entrepreneur and innovator as an outcome of Industry-Academia collaboration. | 4. The graduates will be able to embrace professional code of ethics while providing solution to multidisciplinary social problems in industrial, entrepreneurial and research environment to demonstrate leadership qualities. | |
|---|---|---|---|---|---|
| 1. To strengthen core competency of students to be successful, ethical, effective problem solver in Computer Science & Engineering through analytical learning. | 3 | 3 | 2 | 2 | 10/12 |
| 2. To promote interdisciplinary research & innovation based activities in emerging areas of technology globally. | 2 | 3 | 2 | 2 | 9/12 |
| 3. To facilitate and foster the industry-academia collaboration to enhance entrepreneurship skills and acquaintance with corporate culture. | 2 | 2 | 3 | 3 | 10/12 |
| 4: To inculcate in them a higher degree of social consciousness and moral values towards solving interdisciplinary societal problems using industry-academia collaboration | 2 | 2 | 2 | 3 | 9/12 |
| | 9/12 | 10/12 | 9/12 | 10/12 | 83% |

Enter correlation levels 1, 2, or 3 as defined below:

**1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)**

If there is no correlation, put "-"

### 1.3.3 Program Outcomes (PO's)

| | | |
|---|---|---|
| **PO1:** | **Engineering knowledge:** | Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems. |
| **PO2:** | **Problem analysis:** | Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. |
| **PO3:** | **Design/development of solutions:** | Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. |
| **PO4:** | **Conduct investigations of complex problems:** | Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. |
| **PO5:** | **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. |
| **PO6:** | **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. |
| **PO7:** | **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. |
| **PO8:** | **Ethics:** | Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. |
| **PO9:** | **Individual and team work:** | Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. |
| **PO10:** | **Communication:** | Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. |
| **PO11:** | **Project management and finance:** | Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. |
| **PO12:** | **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. |
| **PSO1:** | | Experiment and prepare programming concepts and provide new ideas and innovations towards research and societal issues. |
| **PSO2:** | | Analyse and develop computer programs in the areas related to algorithms, system software, cloud computing, artificial intelligence & machine learning, bioinformatics, big data analytics, block chain, cyber security and networking for efficient design of computer-based systems of varying complexity. |
| **PSO3:** | | Apply standard Software Engineering practices and strategies in software project development using open-source programming environment to deliver a quality product for business success. |

### 1.3.4 Mapping of Program Outcome Vs Program Educational Objectives

| Mapping | PEO1 | PEO2 | PEO3 | PEO4 |
|---|---|---|---|---|
| PO1 | 3 | 3 | 2 | 1 |
| PO2 | 3 | 3 | 3 | 1 |
| PO3 | 2 | 2 | 3 | 3 |
| PO4 | 2 | 2 | 3 | 2 |
| PO5 | 2 | 3 | 2 | 2 |
| PO6 | 1 | 2 | 2 | 3 |
| PO7 | 1 | 1 | 2 | 3 |
| PO8 | 1 | 1 | 2 | 3 |
| PO9 | 1 | 2 | 3 | 1 |
| PO10 | 1 | 1 | 3 | 2 |
| PO11 | 3 | 2 | 3 | 1 |
| PO12 | 2 | 3 | 1 | 1 |
| PSO1 | 2 | 3 | 1 | 3 |
| PSO2 | 3 | 3 | 2 | 2 |
| PSO3 | 3 | 3 | 2 | 2 |

***1. Slight (Low)*** ***2. Moderate (Medium)*** ***3. Substantial (High)***

### 1.3.5 Program Outcome Vs Courses Mapping Table[1]:

| Course Code | Course Name | Course Outcome Statement | PO-1 Engineering knowledge | PO-2 Problem analysis | PO-3 Design/development of solutions | PO-4 Conduct investigations of complex problems | PO-5 Modern tool usage | PO-6 The engineer and society | PO-7 Environment and sustainability | PO-8 Ethics | PO-9 Individual and team work | PO-10 Communication: | PO-11 Project management and finance | PO-12 Life-long learning | PSO1 Familiarity and practical proficiency | PSO2 Understand, analyse and develop | PSO 3 Apply standard Software |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE113 | Programming for Problem Solving | CO-1 | 1 | 2 | 2 | _ | _ | - | _ | _ | 2 | _ | _ | _ | 1 | 2 | _ |
| | | CO-2 | 2 | _ | 3 | 2 | 2 | - | _ | _ | 1 | _ | 1 | _ | 2 | 2 | _ |
| | | CO-3 | 3 | _ | 2 | 1 | _ | _ | _ | _ | 3 | _ | _ | _ | _ | 2 | _ |
| | | CO-4 | 1 | _ | 2 | 1 | _ | _ | _ | _ | 1 | _ | _ | _ | _ | 3 | _ |
| | | CO-5 | 1 | _ | 1 | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | 1 | _ |
| | | CO-6 | 3 | 3 | 3 | 2 | - | - | _ | _ | 2 | _ | 2 | _ | 2 | 3 | 1 |
| MTH142 | Calculus and Abstract Algebra | CO-1 | 3 | 3 | 2 | 2 | 3 | 1 | - | - | - | 1 | 1 | 1 | | | |
| | | CO-2 | 3 | 3 | 3 | 2 | 2 | 2 | - | - | - | 1 | 1 | 2 | | | |
| | | CO-3 | 3 | 3 | 2 | 2 | 2 | 1 | - | - | - | 1 | 1 | 1 | | | |
| | | CO-4 | 3 | 3 | 2 | 2 | 2 | 1 | - | - | - | 1 | 1 | 1 | | | |
| | | CO-5 | 3 | 3 | 2 | 2 | 2 | 1 | - | - | - | 1 | 1 | 2 | | | |
| | | CO-6 | 3 | 3 | 2 | 3 | 2 | 2 | - | - | - | 1 | 1 | 2 | | | |
| PHY117 | Semiconductor Physics | CO-1 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | | | |
| | | CO-2 | 3 | 3 | 2 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| | | CO-3 | 3 | 3 | 2 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| | | CO-4 | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | | | |

[1] Cel value will contain the correlation value of respective course with PO.

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CO-5 | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| | | CO-6 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| EEE112 | Principles of Electrical and Electronics Engineering | CO-1 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | - |
| | | CO-2 | 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| | | CO-3 | 2 | 2 | 1 | - | - | - | - | - | -- | - | - | - | - | - | - |
| | | CO-4 | 2 | 1 | 2 | - | - | - | - | - | - | - | 1 | - | - | - | - |
| | | CO-5 | 3 | 2 | 1 | - | - | - | - | - | - | - | 1 | - | - | - | - |
| | | CO-6 | 2 | 2 | 3 | 1 | - | - | - | - | - | - | 1 | - | - | - | - |
| EVS112 | Environmental Studies | CO-1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | - | 1 | 1 | 1 | - | 1 | - |
| | | CO-2 | 1 | 2 | 2 | 1 | - | 1 | 2 | - | - | 1 | 1 | - | - | 1 | - |
| | | CO-3 | 1 | 2 | 2 | 1 | - | 2 | 2 | - | - | 1 | 2 | - | - | 2 | 2 |
| | | CO-4 | 1 | 2 | 2 | 1 | - | 2 | 2 | - | - | 1 | 2 | - | - | 2 | 2 |
| | | CO-5 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | - | 1 | 2 | - | - | 2 | 1 |
| | | CO-6 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | - | 1 | 2 | 1 | - | 2 | 1 |
| ARP101 | Communicative English-1 | CO-1 | - | - | - | - | - | - | - | - | - | 3 | - | - | | | |
| | | CO-2 | - | - | - | - | - | - | - | 1 | 1 | 2 | - | - | | | |
| | | CO-3 | - | - | - | 1 | - | - | - | 1 | 2 | - | - | - | | | |
| | | CO-4 | - | 1 | 1 | - | - | - | - | - | - | 1 | 2 | - | | | |
| | | CO-5 | | | | | | | | | | | | | | | |
| | | CO-6 | | | | | | | | | | | | | | | |
| CSP113 | Programming for Problem Solving Lab | CO-1 | 2 | - | 3 | 2 | 2 | - | - | - | 2 | - | - | - | 3 | 2 | 2 |
| | | CO-2 | 3 | - | 3 | 2 | 2 | - | - | - | 3 | - | - | - | 3 | 3 | 1 |
| | | CO-3 | 2 | - | 3 | 1 | 2 | - | - | - | 2 | - | - | - | 2 | 3 | 2 |
| | | CO-4 | 1 | - | 2 | 1 | 1 | - | - | - | 2 | - | - | - | 2 | 2 | - |
| | | CO-5 | 2 | - | 3 | 2 | 2 | - | - | - | 3 | - | - | - | 3 | 2 | 2 |
| | | CO-6 | 3 | - | 3 | 3 | 1 | - | - | - | 2 | - | - | - | 2 | 3 | 2 |
| CSP101 | Introduction to Computer Science and Engineering | CO-1 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | 3 | - | 3 |
| | | CO-2 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | - | 3 | 2 |
| | | CO-3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | - | 2 | 3 |
| | | CO-4 | 3 | - | - | - | - | - | - | - | - | - | - | 3 | - | 3 | 2 |
| | | CO-5 | 3 | - | - | - | - | 2 | - | 2 | - | - | - | 3 | - | 3 | 3 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CO-6 | | | | | | | | | | | | | | | |
| MEP106 | Computer Aided Design & Drafting | CO-1 | 2 | 2 | 2 | - | 3 | - | - | - | - | - | - | 3 | 3 | 3 | |
| | | CO-2 | 2 | 2 | 2 | - | 3 | - | - | - | - | - | - | 3 | 3 | 3 | |
| | | CO-3 | 2 | 2 | 2 | - | 3 | - | - | - | - | - | - | 3 | 3 | 3 | |
| | | CO-4 | 2 | 2 | 2 | 2 | 3 | - | - | - | 2 | 2 | - | 3 | 3 | 3 | |
| | | CO-5 | 2 | 2 | 2 | 2 | 3 | - | - | - | 2 | 2 | - | 3 | 3 | 3 | |
| | | CO-6 | 2 | 2 | 2 | 2 | 3 | - | - | - | 2 | 2 | - | 3 | 3 | 3 | |
| EEP112 | Principles of Electrical and Electronics Engineering | CO-1 | | | | | | | | | | | | | | | |
| | | CO-2 | | | | | | | | | | | | | | | |
| | | CO-3 | | | | | | | | | | | | | | | |
| | | CO-4 | | | | | | | | | | | | | | | |
| | | CO-5 | | | | | | | | | | | | | | | |
| | | CO-6 | | | | | | | | | | | | | | | |
| PHY161 | Physics Lab – I | CO-1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | | | |
| | | CO-2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | | | |
| | | CO-3 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | | | |
| | | CO-4 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | | | |
| | | CO-5 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | | | |
| | | CO-6 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | | | |
| Semester II | | | | | | | | | | | | | | | | | |
| CSE114 | Application based Programming in Python | CO-1 | 2 | 1 | 1 | - | - | - | - | 2 | - | - | - | 2 | - | 1 | - |
| | | CO-2 | 2 | 2 | 2 | 1 | - | - | - | 2 | - | - | - | 2 | - | 2 | 1 |
| | | CO-3 | 2 | 2 | 1 | - | - | - | - | 2 | - | - | - | 2 | 1 | 2 | 1 |
| | | CO-4 | 2 | 2 | 2 | 2 | 1 | 2 | - | 2 | - | - | - | 2 | 1 | 2 | 2 |
| | | CO-5 | 2 | 2 | 2 | 2 | 3 | 2 | - | 2 | - | - | - | 2 | 2 | 2 | 1 |
| | | CO-6 | 3 | 3 | 2 | 2 | 2 | 2 | - | 2 | - | - | - | 2 | 2 | 3 | 2 |
| MTH145 | Probability and Statistics | CO-1 | 3 | 3 | 2 | 2 | 3 | 1 | - | - | - | 1 | 1 | 1 | | | |
| | | CO-2 | 3 | 2 | 3 | 2 | 2 | 2 | - | - | - | 1 | 1 | 2 | | | |
| | | CO-3 | 3 | 3 | 2 | 2 | 2 | 1 | - | - | - | 1 | 1 | 1 | | | |
| | | CO-4 | 3 | 2 | 2 | 2 | 2 | 1 | - | - | - | 1 | 1 | 1 | | | |
| | | CO-5 | 3 | 3 | 2 | 2 | 2 | 1 | - | - | - | 1 | 1 | 2 | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CO-6 | 3 | 3 | 2 | 3 | 2 | 2 | - | - | - | 1 | 1 | 2 | | | |
| CHY111 | Engineering Chemistry | CO-1 | 3 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | | CO-2 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | | CO-3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | | CO-4 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | | CO-5 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | | CO-6 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| HMM111 | Human Value & Ethics | CO-1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | | | 2 | 3 | 1 | 1 | 3 | |
| | | CO-2 | 1 | 3 | 2 | 2 | 1 | 3 | 1 | 1 | 2 | | 3 | 3 | 2 | 2 | 1 |
| | | CO-3 | | 2 | 2 | 2 | | 2 | 2 | | 1 | | 1 | | 1 | 3 | 2 |
| | | CO-4 | 1 | | 1 | 2 | 3 | | | | 2 | 3 | | 2 | | | 1 |
| | | CO-5 | | 3 | | 1 | 2 | 3 | 2 | 1 | | 2 | 2 | 1 | 3 | 1 | |
| | | CO-6 | 2 | | 1 | | | 1 | | | 1 | 1 | | | | 2 | 3 |
| PHY116 | Engineering Physics | CO-1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | | | |
| | | CO-2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | | | |
| | | CO-3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | - | 2 | 2 | 1 | 1 | | | |
| | | CO-4 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | - | 2 | 2 | 1 | 1 | | | |
| | | CO-5 | 3 | 3 | 3 | 2 | 1 | 2 | 2 | - | 2 | 3 | 2 | 3 | | | |
| | | CO-6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | 2 | 2 | 1 | 3 | | | |
| ARP102 | Communicative English -2 | CO-1 | - | - | - | - | 1 | 1 | 1 | 1 | 1 | - | - | - | | | |
| | | CO-2 | - | - | 1 | - | - | - | - | - | - | - | 1 | - | | | |
| | | CO-3 | - | - | - | - | - | - | - | - | - | 1 | - | - | | | |
| | | CO-4 | - | - | - | - | - | - | - | - | - | 1 | - | - | | | |
| | | CO-5 | | | | | | | | | | | | | | | |
| | | CO-6 | | | | | | | | | | | | | | | |
| CSP103 | Multimedia Application Lab | CO-1 | 3 | 3 | 2 | 2 | 3 | 2 | - | - | - | 3 | - | - | 2 | 2 | - |
| | | CO-2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | 2 | 3 | - | - | 2 | 2 | - |
| | | CO-3 | 2 | 2 | 3 | 3 | - | 3 | 3 | 3 | - | 3 | - | - | 1 | 2 | - |
| | | CO-4 | 2 | 2 | 3 | 3 | - | - | - | 3 | 3 | 3 | - | - | 2 | 3 | - |
| | | CO-5 | 2 | 2 | 3 | - | - | - | - | 3 | 3 | 3 | - | - | 1 | 1 | - |
| | | CO-6 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | - | - | - | - | - | 2 | 1 | - |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP114 | Application based Programming in Python | CO-1 | 1 | 1 | 1 | 1 | - | - | - | 2 | - | - | - | 2 | - | 1 | - |
| | | CO-2 | 2 | 2 | 1 | 1 | 2 | - | - | 2 | - | - | - | 2 | - | 1 | 1 |
| | | CO-3 | 2 | 2 | 1 | 1 | 1 | 1 | - | 2 | - | - | - | 2 | 1 | 2 | 1 |
| | | CO-4 | 2 | 2 | 2 | 2 | 1 | 1 | - | 2 | - | - | - | 2 | 2 | 2 | 1 |
| | | CO-5 | 2 | 2 | 2 | 2 | 2 | 2 | - | 2 | - | - | - | 2 | 2 | 2 | 2 |
| | | CO-6 | 3 | 3 | 2 | 2 | 2 | 3 | - | 2 | - | - | - | 2 | 2 | 2 | 2 |
| MEP105 | Mechanical Workshop | CO-1 | 1 | - | - | - | - | 2 | - | - | - | - | - | 2 | - | - | - |
| | | CO-2 | 1 | - | - | - | 1 | 2 | - | - | - | - | - | 1 | 1 | - | 1 |
| | | CO-3 | 2 | - | 1 | - | 1 | 2 | - | - | - | - | - | 2 | 1 | - | 1 |
| | | CO-4 | 2 | - | 1 | - | 2 | 2 | - | - | - | - | - | 2 | 1 | - | 1 |
| | | CO-5 | 2 | - | 1 | - | 2 | 2 | - | - | - | - | - | 2 | 2 | - | 1 |
| | | CO-6 | 2 | - | 1 | - | 2 | 2 | - | - | - | - | - | 2 | 2 | - | 1 |
| CHY161 | Engineering Chemistry | CO-1 | 2 | - | 1 | - | 2 | 2 | - | - | - | - | - | 2 | 2 | - | 1 |
| | | CO-2 | 2 | 3 | 1 | - | 2 | 1 | 2 | - | 3 | 3 | 2 | 2 | - | - | |
| | | CO-3 | 2 | 3 | 1 | - | 2 | 1 | 2 | - | 3 | 3 | 2 | 2 | - | - | |
| | | CO-4 | 2 | 3 | 1 | - | 2 | 1 | 2 | - | 3 | 3 | 2 | 2 | - | - | |
| | | CO-5 | 2 | 2 | 2 | - | 2 | 1 | 1 | - | 3 | 3 | 1 | 2 | - | - | |
| | | CO-6 | 2 | 2 | 2 | - | 2 | 1 | 1 | - | 3 | 3 | 1 | 2 | - | - | |
| PHY162 | Physics Lab-II | CO-1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | | |
| | | CO-2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | | |
| | | CO-3 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | | |
| | | CO-4 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | | |
| | | CO-5 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | | |
| | | CO-6 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | | |
| Semester III | | | | | | | | | | | | | | | | | |
| BTY223 | Introduction to Biology for Engineers | CO-1 | 3 | 1 | - | - | - | 1 | 3 | - | - | - | - | 3 | - | - | - |
| | | CO-2 | 3 | 2 | - | - | - | 2 | - | - | - | - | - | 3 | - | - | - |
| | | CO-3 | 3 | 3 | 3 | 1 | 1 | 3 | 3 | 2 | 1 | 3 | - | 3 | 1 | 1 | - |
| | | CO-4 | 3 | 2 | - | - | - | 2 | 2 | 3 | 1 | 2 | - | 3 | 1 | - | - |
| | | CO-5 | 3 | 1 | 1 | 1 | 3 | 1 | 3 | 2 | 1 | 2 | 1 | 3 | 1 | 1 | - |
| | | CO-6 | 3 | 3 | 1 | 1 | 2 | 3 | 5 | 1 | 1 | 1 | - | 3 | 1 | - | - |

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| CSE242 | Data Structures | CO-1 | 2 | - | 2 | - | - | - | - | - | 2 | - | - | - | 2 | 2 | - |
| | | CO-2 | 1 | 2 | 3 | - | - | - | - | - | 1 | - | - | - | 3 | 1 | 2 |
| | | CO-3 | 2 | 3 | 3 | 2 | - | - | - | - | 2 | - | - | - | 2 | 3 | - |
| | | CO-4 | - | - | 2 | - | - | - | - | - | 3 | - | - | 1 | 2 | 2 | - |
| | | CO-5 | 3 | 2 | 3 | 2 | 1 | - | - | - | 2 | - | -- | - | 3 | 2 | 2 |
| | | CO-6 | 2 | - | 3 | 3 | 2 | - | - | - | 1 | - | - | - | 2 | 3 | 3 |
| CSE243 | Object Oriented Programming Using Java | CO-1 | - | - | - | - | 2 | - | - | - | - | - | - | 2 | - | - | - |
| | | CO-2 | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - |
| | | CO-3 | 2 | 3 | 3 | - | 2 | - | - | - | 3 | - | - | 2 | 2 | 3 | - |
| | | CO-4 | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - |
| | | CO-5 | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - |
| | | CO-6 | 3 | 3 | 3 | - | 2 | 3 | 2 | - | 3 | - | 2 | 3 | 3 | 3 | 2 |
| CSE244 | Principles of Operating System | CO-1 | 3 | 3 | 3 | 3 | -- | -- | -- | 2 | 2 | 1 | 2 | 1 | 3 | 2 | 2 |
| | | CO-2 | 3 | 2 | 3 | 3 | -- | -- | -- | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 |
| | | CO-3 | 3 | 3 | 3 | 3 | -- | -- | -- | 1 | 1 | 1 | 3 | 2 | 3 | 2 | 1 |
| | | CO-4 | 2 | 2 | 2 | 2 | 1 | -- | -- | 2 | 3 | 3 | 3 | 1 | 2 | 2 | 2 |
| | | CO-5 | 2 | 2 | 3 | - | - | - | - | 3 | 3 | 1 | 2 | - | 3 | - | - |
| | | CO-6 | 3 | 2 | - | - | - | - | - | - | - | 2 | 3 | - | 2 | 2 | - |
| CSE245 | Discrete Structures | CO-1 | 2 | 3 | 3 | 1 | - | 3 | - | - | 3 | - | - | 3 | 3 | 3 | - |
| | | CO-2 | 2 | 2 | 3 | - | - | 2 | - | - | - | - | - | 3 | 3 | 2 | - |
| | | CO-3 | 3 | 2 | 3 | 3 | 3 | - | - | - | 2 | - | - | - | - | 3 | 2 |
| | | CO-4 | 2 | 2 | 3 | 3 | 3 | - | - | - | - | - | 3 | 3 | 3 | - | 3 |
| | | CO-5 | 2 | 2 | 2 | 3 | - | 3 | - | - | 3 | - | 3 | 3 | - | 2 | 3 |
| | | CO-6 | 1 | 2 | 1 | 2 | 3 | - | - | - | 3 | - | 3 | - | 3 | 3 | 2 |
| CSE247 | Computer Organization and Architecture | CO-1 | 3 | 1 | 1 | - | - | 2 | - | - | - | - | - | 2 | - | 1 | 3 |
| | | CO-2 | 3 | 3 | 3 | - | - | 3 | - | - | - | - | - | 3 | - | 2 | 3 |
| | | CO-3 | 3 | 2 | 3 | - | - | 2 | - | - | - | - | - | 3 | - | 2 | 3 |
| | | CO-4 | 3 | 2 | 2 | - | - | 1 | - | - | - | - | - | 3 | - | 3 | 2 |
| | | CO-5 | 3 | 3 | 3 | - | - | 2 | - | - | - | - | - | 3 | - | 2 | 2 |
| | | CO-6 | 3 | 3 | 3 | - | - | 2 | - | - | - | - | - | 3 | - | 1 | 2 |
| ARP203 | Aptitude | CO-1 | | 1 | 1 | | | | | | | | | | | | |

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| | Reasoning and Business Communication Skills - Basic | CO-2 | | | | | | 1 | | 1 | 1 | | | | | | |
| | | CO-3 | | | | | | | | 1 | 1 | | | | | | |
| | | CO-4 | | | | | | | | | 1 | | | 1 | | | |
| | | CO-5 | | | | | | | | | | 1 | | | | | |
| | | CO-6 | | 1 | | | | | | | | | | | | | |
| CSP242 | Data Structures Lab | CO-1 | 2 | 2 | 3 | - | - | - | - | - | 3 | - | - | 2 | 3 | 2 | 2 |
| | | CO-2 | 3 | 2 | 2 | 2 | 2 | - | - | - | 2 | - | - | - | 2 | 3 | 3 |
| | | CO-3 | 3 | 1 | 3 | 3 | - | - | - | - | 3 | - | - | 1 | 3 | 2 | 2 |
| | | CO-4 | 3 | 2 | 3 | 2 | - | - | - | - | 2 | - | - | 2 | 2 | 3 | 2 |
| | | CO-5 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - | 1 | 2 | 2 |
| | | CO-6 | 3 | 3 | 2 | 3 | - | - | - | - | 3 | - | - | - | 2 | 3 | 2 |
| CSP243 | Object Oriented Programming Using Java | CO-1 | - | - | - | - | 2 | - | - | - | - | - | - | 2 | - | - | - |
| | | CO-2 | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - |
| | | CO-3 | 2 | 3 | 3 | - | 2 | - | - | - | 3 | - | - | 2 | 2 | 3 | - |
| | | CO-4 | - | - | - | - | 2 | - | - | - | - | - | - | - | - | | - |
| | | CO-5 | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - |
| | | CO-6 | 3 | 3 | 3 | - | 2 | 3 | 2 | - | 3 | - | 2 | 3 | 3 | 3 | 2 |
| CSP244 | Principles of Operating System Lab | CO-1 | 3 | 3 | 3 | 3 | -- | -- | -- | 2 | 2 | 1 | 2 | 1 | 3 | 2 | 2 |
| | | CO-2 | 3 | 2 | 3 | 3 | -- | -- | -- | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 |
| | | CO-3 | 3 | 3 | 3 | 3 | -- | -- | -- | 1 | 1 | 1 | 3 | 2 | 3 | 2 | 1 |
| | | CO-4 | 2 | 2 | 2 | 2 | 1 | -- | -- | 2 | 3 | 3 | 3 | 1 | 2 | 2 | 2 |
| | | CO-5 | 2 | 2 | 3 | - | - | - | - | 3 | 3 | 1 | 2 | - | 3 | - | - |
| | | CO-6 | 3 | 2 | - | - | - | - | - | - | - | 2 | 3 | - | 2 | 2 | - |
| CSP251 | Project Based Learning (PBL) -1 | CO-1 | 3 | 3 | - | 3 | - | - | - | - | 3 | 3 | 2 | 3 | 2 | 2 | 1 |
| | | CO-2 | 3 | 2 | - | 3 | - | - | 2 | - | 3 | 3 | 2 | 3 | - | - | 1 |
| | | CO-3 | 3 | 2 | - | - | 2 | - | - | - | 3 | 3 | 2 | 3 | 2 | 2 | - |
| | | CO-4 | 3 | 3 | - | - | - | 2 | - | - | 3 | 3 | 2 | 3 | - | 2 | - |
| | | CO-5 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | - |
| | | CO-6 | 3 | 3 | - | 3 | - | - | - | - | 3 | 3 | 2 | 3 | - | - | 1 |
| CSP294 | Summer Internship-I | CO-1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | CO-2 | | 3 | 2 | - | 2 | - | - | - | - | - | - | - | 2 | 2 | - |

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| | | CO-3 | 2 | 2 | 3 | - | - | - | - | - | 3 | - | - | - | 1 | - | - |
| | | CO-4 | - | - | - | - | - | - | - | - | - | 3 | - | - | - | - | - |
| | | CO-5 | - | - | - | - | - | 2 | - | 3 | - | - | - | - | - | - | - |
| | | CO-6 | - | - | - | - | - | - | - | - | - | - | - | 2 | 1 | - | - |
| Semester IV | | | | | | | | | | | | | | | | | |
| CSE249 | Data Base Management System | CO-1 | 3 | - | - | - | - | 2 | - | - | - | - | - | 3 | 3 | 3 | - |
| | | CO-2 | 2 | - | - | - | 3 | 2 | - | - | 2 | - | - | 3 | 3 | 3 | - |
| | | CO-3 | 3 | 3 | 3 | - | 3 | 2 | - | - | - | - | - | 2 | 2 | 3 | - |
| | | CO-4 | 3 | 3 | 3 | 3 | - | 2 | - | 2 | 3 | - | - | 2 | - | - | 3 |
| | | CO-5 | 2 | 3 | 2 | - | 2 | 2 | - | 2 | - | - | - | 1 | - | 3 | - |
| | | CO-6 | 3 | 3 | 3 | 3 | 3 | 3 | - | 3 | 3 | 3 | 2 | 3 | - | - | 3 |
| INT248 | Human computer interaction | CO-1 | 1 | - | | - | 1 | 1 | 1 | 2 | 1 | 2 | 3 | - | 3 | 1 | - |
| | | CO-2 | 1 | 1 | | - | 1 | 1 | 1 | 2 | 2 | 2 | 3 | - | 3 | 1 | - |
| | | CO-3 | 1 | 1 | | - | 1 | 1 | 1 | 2 | 2 | 2 | 3 | - | 3 | 2 | - |
| | | CO-4 | 1 | 2 | | - | 1 | 1 | 1 | 2 | 2 | 2 | 3 | - | 3 | 1 | - |
| | | CO-5 | 3 | 3 | | 3 | 3 | 2 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 1 | - |
| | | CO-6 | 2 | 3 | | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 |
| CSE252 | Computer Networks | CO-1 | | 2 | - | - | - | - | - | - | - | - | 2 | 3 | - | 3 | - |
| | | CO-2 | 2 | - | 2 | 2 | 3 | - | - | - | - | - | 2 | 3 | | 3 | - |
| | | CO-3 | 3 | 2 | - | 2 | - | 2 | - | - | - | - | - | - | 2 | - | 2 |
| | | CO-4 | - | 2 | 2 | - | - | - | - | - | - | - | - | - | - | 2 | 2 |
| | | CO-5 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 | - |
| | | CO-6 | 2 | - | - | 2 | - | - | - | 2 | - | - | 2 | - | - | 2 | - |
| CSE011 | Mathematical Techniques | CO-1 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | 2 | - | - |
| | | CO-2 | 2 | 3 | 1 | 1 | 1 | - | 1 | - | - | 1 | 2 | 1 | 1 | 1 | - |
| | | CO-3 | 3 | 1 | 1 | 1 | - | - | 1 | - | - | 2 | 1 | 1 | 3 | 1 | - |
| | | CO-4 | 2 | 3 | 2 | 1 | 1 | - | 1 | - | - | 1 | 1 | 1 | 2 | 1 | - |
| | | CO-5 | 1 | 1 | 1 | 2 | 2 | - | 1 | - | - | 1 | 2 | 1 | 2 | 1 | - |
| | | CO-6 | 3 | 1 | 3 | 1 | 2 | - | 2 | - | - | 2 | 2 | 3 | 3 | 1 | - |
| CSE012 | Introduction to Graph | CO-1 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | - | - | 2 | 1 | 2 | 3 | 1 | - |
| | | CO-2 | 3 | 3 | 3 | 2 | - | 1 | 1 | - | - | 1 | - | 2 | 3 | 1 | - |

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| | Theory and its Applications | CO-3 | 1 | 3 | 1 | 3 | 2 | 2 | - | - | - | 1 | - | 2 | 2 | 2 | - |
| | | CO-4 | 1 | 3 | 1 | 3 | 1 | 1 | - | - | - | 2 | - | 1 | 3 | 2 | - |
| | | CO-5 | 2 | 2 | 2 | 3 | 2 | 1 | - | - | - | 1 | - | 2 | 1 | 2 | - |
| | | CO-6 | 1 | 1 | 2 | 3 | 1 | 2 | - | - | - | 2 | - | 2 | 1 | 2 | 2 |
| CSP249 | Data Base Management System Lab | CO-1 | 3 | - | - | - | 2 | - | - | - | - | - | - | - | 2 | 3 | 2 |
| | | CO-2 | - | 3 | 3 | 3 | 2 | - | - | - | 3 | - | - | - | 2 | 3 | 3 |
| | | CO-3 | - | 2 | 2 | 2 | 2 | - | - | - | 3 | - | - | - | 2 | 2 | 3 |
| | | CO-4 | - | 2 | 2 | 2 | 2 | - | - | - | 3 | - | - | - | 2 | 2 | 3 |
| | | CO-5 | - | 2 | 2 | 2 | 2 | - | - | - | 3 | - | - | - | 2 | 2 | 3 |
| | | CO-6 | - | 2 | 3 | 2 | 3 | - | - | - | 3 | - | - | 2 | 3 | 3 | 3 |
| CSP252 | Computer Networks Lab | CO-1 | - | 2 | - | - | - | - | - | - | - | - | 2 | 3 | - | 3 | - |
| | | CO-2 | 2 | - | 2 | 2 | 3 | - | - | - | - | - | 2 | 3 | | 3 | - |
| | | CO-3 | 3 | 2 | - | 2 | - | 2 | - | - | - | - | - | - | 2 | - | 2 |
| | | CO-4 | - | 2 | 2 | - | - | - | - | - | - | - | - | - | - | 2 | 2 |
| | | CO-5 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 | - |
| | | CO-6 | 2 | - | - | 2 | - | - | - | 2 | - | - | 2 | - | - | 2 | - |
| CSP298 | Project Based Learning (PBL) -2 | CO-1 | 3 | 3 | - | 3 | - | - | - | - | 3 | 3 | 2 | 3 | 2 | 2 | 1 |
| | | CO-2 | 3 | 2 | - | 3 | - | - | 2 | - | 3 | 3 | 2 | 3 | - | - | 1 |
| | | CO-3 | 3 | 2 | - | - | 2 | - | - | - | 3 | 3 | 2 | 3 | 2 | 2 | |
| | | CO-4 | 3 | 3 | - | - | - | 2 | - | - | 3 | 3 | 2 | 3 | | 2 | |
| | | CO-5 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | |
| | | CO-6 | 3 | 3 | - | 3 | - | - | - | - | 3 | 3 | 2 | 3 | - | - | 1 |
| INP248 | Human computer interaction Lab | CO-1 | 2 | 1 | 1 | 1 | 3 | 1 | - | - | 1 | 3 | 3 | 3 | 2 | 2 | 1 |
| | | CO-2 | 2 | 1 | 2 | 2 | 3 | 1 | - | - | 1 | 3 | 3 | 3 | 2 | 2 | 1 |
| | | CO-3 | 2 | 1 | 2 | 2 | 3 | 1 | - | - | 1 | 3 | 3 | 3 | 2 | 2 | 1 |
| | | CO-4 | 2 | 1 | 2 | 2 | 3 | 1 | - | - | 1 | 3 | 3 | 3 | 2 | 2 | 1 |
| | | CO-5 | 2 | 2 | 2 | 2 | 3 | 1 | - | - | 2 | 3 | 3 | 3 | 2 | 2 | 1 |
| | | CO-6 | 3 | 2 | 3 | 3 | 3 | 2 | - | - | 3 | 3 | 3 | 3 | 2 | 2 | 1 |
| ARP204 | Aptitude Reasoning and Business | CO-1 | | | | | | | | 1 | | 1 | | 1 | | | |
| | | CO-2 | | | | | | | | | | 1 | | | | | |
| | | CO-3 | | | | | | | | | 1 | 1 | | | | | |

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| | Communication Skills-Intermediate | CO-4 | | | | | | | | | | 1 | | | | | |
| | | CO-5 | | | | | | | | | | 1 | | | | | |
| | | CO-6 | | 1 | 1 | | | | | | 1 | | | | | | |
| Semester V | | | | | | | | | | | | | | | | | |
| CSE350 | Design and Analysis of Algorithm | CO-1 | 2 | 3 | 1 | 2 | - | -- | -- | - | 2 | - | - | - | 3 | 2 | 2 |
| | | CO-2 | 2 | 2 | 2 | 2 | - | -- | -- | - | 3 | - | - | - | 2 | 3 | 2 |
| | | CO-3 | 2 | 1 | 2 | - | - | -- | -- | - | 1 | - | - | - | 3 | 2 | - |
| | | CO-4 | 1 | 2 | 2 | 3 | - | -- | -- | - | 2 | - | - | - | 2 | 2 | 2 |
| | | CO-5 | 3 | 3 | 1 | 3 | - | - | - | - | 3 | - | - | - | 2 | 1 | 3 |
| | | CO-6 | 2 | 2 | 3 | 2 | 2 | - | - | -- | 2 | - | - | - | 3 | 2 | - |
| CSE351 | Software Engineering and Testing Methodologies | CO-1 | 3 | - | 2 | - | - | - | - | 1 | 2 | 3 | - | 3 | 1 | - | 2 |
| | | CO-2 | 3 | 3 | 2 | 3 | 3 | - | - | 1 | 2 | 3 | 2 | 3 | 2 | - | 3 |
| | | CO-3 | 3 | 2 | 3 | 3 | 3 | - | - | 1 | 2 | 3 | 1 | 2 | 2 | - | 3 |
| | | CO-4 | 3 | 1 | - | 1 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 1 | - | 3 |
| | | CO-5 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | 1 | - | 3 |
| | | CO-6 | 2 | - | - | 1 | 3 | - | - | 1 | 2 | 2 | 2 | - | - | - | 3 |
| CSE021 | Introduction to Cloud Computing | CO-1 | 2 | 3 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - |
| | | CO-2 | 2 | 2 | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - |
| | | CO-3 | 1 | 3 | 1 | 2 | - | - | - | - | - | - | - | - | - | 2 | 3 |
| | | CO-4 | 3 | 1 | 2 | 2 | - | - | - | - | - | - | - | - | - | 3 | 2 |
| | | CO-5 | 2 | 2 | 3 | 1 | - | - | - | - | - | - | - | - | - | 2 | 2 |
| | | CO-6 | 1 | 3 | 1 | 2 | - | - | - | - | - | - | - | - | 2 | 3 | 3 |
| INT021 | Ethical Hacking | CO-1 | 3 | 3 | - | - | 2 | - | - | 3 | - | - | - | 3 | - | - | 3 |
| | | CO-2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | 3 |
| | | CO-3 | 3 | 3 | 2 | - | 2 | - | - | - | 2 | - | - | 2 | 3 | - | - |
| | | CO-4 | 3 | 3 | - | 3 | 2 | 3 | - | 2 | - | - | - | - | - | 3 | - |
| | | CO-5 | 3 | 2 | 3 | - | - | - | - | 3 | 3 | - | - | - | - | 3 | - |
| | | CO-6 | 3 | 3 | - | 3 | 3 | 3 | 3 | - | - | 3 | 3 | - | 3 | - | - |
| CSE023 | Quantum Computing | CO-1 | 3 | 3 | - | - | 2 | - | - | 3 | - | - | - | 3 | - | - | 3 |
| | | CO-2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | 3 |
| | | CO-3 | 3 | 3 | 2 | - | 2 | - | - | - | 2 | - | - | 2 | 3 | - | - |

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| | | CO-4 | 3 | 3 | - | 3 | 2 | 3 | - | 2 | - | - | - | - | - | 3 | - |
| | | CO-5 | 3 | 2 | 3 | - | - | - | - | 3 | 3 | - | - | - | - | 3 | - |
| | | CO-6 | 3 | 3 | - | 3 | 3 | 3 | 3 | - | - | 3 | 3 | - | 3 | - | - |
| CSE024 | Parallel Computing Algorithms | CO-1 | 3 | 3 | - | - | 2 | - | - | 3 | - | - | - | 3 | - | - | 3 |
| | | CO-2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | 3 |
| | | CO-3 | 3 | 3 | 2 | - | 2 | - | - | - | 2 | - | - | 2 | 3 | - | - |
| | | CO-4 | 3 | 3 | - | 3 | 2 | 3 | - | 2 | - | - | - | - | - | 3 | - |
| | | CO-5 | 3 | 2 | 3 | - | - | - | - | 3 | 3 | - | - | - | - | 3 | - |
| | | CO-6 | 3 | 3 | - | 3 | 3 | 3 | 3 | - | - | 3 | 3 | - | 3 | - | - |
| CSE025 | 3D Printing and Software Tools | CO-1 | 3 | 3 | - | - | 2 | - | - | 3 | - | - | - | 3 | - | - | 3 |
| | | CO-2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | 3 |
| | | CO-3 | 3 | 3 | 2 | - | 2 | - | - | - | 2 | - | - | 2 | 3 | - | - |
| | | CO-4 | 3 | 3 | - | 3 | 2 | 3 | - | 2 | - | - | - | - | - | 3 | - |
| | | CO-5 | 3 | 2 | 3 | - | - | - | - | 3 | 3 | - | - | - | - | 3 | - |
| | | CO-6 | 3 | 3 | - | 3 | 3 | 3 | 3 | - | - | 3 | 3 | - | 3 | - | - |
| ECC001 | Community Connect | CO-1 | | | | | | | | | | | | | | | |
| | | CO-2 | | | | | | | | | | | | | | | |
| | | CO-3 | | | | | | | | | | | | | | | |
| | | CO-4 | | | | | | | | | | | | | | | |
| | | CO-5 | | | | | | | | | | | | | | | |
| | | CO-6 | | | | | | | | | | | | | | | |
| ARP301 | Quantitative Aptitude Behavioral and Interpersonal Skills | CO-1 | | | | | | 1 | | | 1 | | | 1 | | | |
| | | CO-2 | | | | | | 1 | | | 1 | | | 1 | | | |
| | | CO-3 | | | | | | | | | 1 | 1 | | 1 | | | |
| | | CO-4 | | | | | | 1 | 1 | | 1 | | | 1 | | | |
| | | CO-5 | | | | | | 1 | 1 | | 1 | | | 1 | | | |
| | | CO-6 | | 1 | 1 | | | | | | | | | | | | |
| CSP350 | Design and Analysis of Algorithm Lab | CO-1 | 3 | 3 | 2 | 3 | 1 | -- | -- | - | 2 | - | - | - | 2 | 3 | 3 |
| | | CO-2 | 2 | 3 | 3 | 2 | 2 | -- | -- | - | 2 | - | - | - | 3 | 2 | 2 |
| | | CO-3 | 3 | 2 | 2 | - | 3 | -- | -- | - | 1 | - | - | - | 2 | 1 | - |
| | | CO-4 | 2 | 3 | 3 | 3 | 1 | -- | -- | - | 3 | - | - | - | 3 | 3 | 1 |

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| | | CO-5 | 3 | 2 | 2 | 3 | 2 | - | - | - | 2 | - | - | - | 2 | 3 | 2 |
| | | CO-6 | 2 | 3 | 3 | 1 | 3 | - | - | -- | 1 | - | - | - | 3 | 2 | 3 |
| CSP395 | Technical Skill Enhancement Course-1 Simulation Lab | CO-1 | 1 | - | 1 | - | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| | | CO-2 | 1 | - | 1 | - | 2 | - | - | - | - | 2 | - | 1 | 1 | 2 | 1 |
| | | CO-3 | 1 | 2 | 1 | - | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| | | CO-4 | 1 | - | 1 | - | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| | | CO-5 | 1 | - | 1 | - | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| | | CO-6 | 2 | 2 | 3 | 3 | 2 | 2 | 1 | - | 2 | 3 | 2 | 2 | 2 | 3 | 1 |
| CSP351 | Project Based Learning (PBL) -3 | CO-1 | 3 | 3 | - | 2 | - | 1 | - | 1 | 2 | - | 2 | 1 | 2 | 2 | 3 |
| | | CO-2 | 3 | 2 | 2 | 2 | 2 | - | - | 1 | 2 | - | 2 | 1 | 2 | 1 | 1 |
| | | CO-3 | 3 | 2 | 2 | 2 | 2 | 3 | - | 1 | 2 | - | 2 | 1 | 2 | 2 | - |
| | | CO-4 | 3 | 3 | 2 | 2 | 3 | - | - | 1 | 2 | - | - | 1 | 2 | 2 | 2 |
| | | CO-5 | 3 | 2 | - | - | 3 | - | - | 1 | 2 | - | - | 1 | 2 | 2 | - |
| | | CO-6 | | 1 | - | 1 | - | - | - | 2 | 2 | 3 | 3 | 3 | 1 | - | 1 |
| CSP398 | Summer Internship-II | CO-1 | 3 | 3 | - | 2 | - | 1 | - | 1 | 2 | - | 2 | 1 | 2 | 2 | 3 |
| | | CO-2 | 3 | 2 | 2 | 2 | 2 | - | - | 1 | 2 | - | 2 | 1 | 2 | 1 | 1 |
| | | CO-3 | 3 | 2 | 2 | 2 | 2 | 3 | - | 1 | 2 | - | 2 | 1 | 2 | 2 | - |
| | | CO-4 | 3 | 3 | 2 | 2 | 3 | - | - | 1 | 2 | - | - | 1 | 2 | 2 | 2 |
| | | CO-5 | 3 | 2 | - | - | 3 | - | - | 1 | 2 | - | - | 1 | 2 | 2 | - |
| | | CO-6 | - | 1 | - | 1 | - | - | - | 2 | 2 | 3 | 3 | 3 | 1 | - | 1 |
| Semester VI | | | | | | | | | | | | | | | | | |
| HMM305 | Management for Engineers | CO-1 | 2 | 1 | 2 | 2 | 2 | 2 | - | 2 | 1 | 3 | - | - | 1 | 1 | 2 |
| | | CO-2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | - | - | 2 | 2 | 1 | 1 | 1 | 2 |
| | | CO-3 | 3 | 1 | 1 | 2 | 3 | 2 | - | 2 | - | - | 1 | 2 | 1 | 2 | 2 |
| | | CO-4 | - | 2 | 2 | 1 | - | 1 | - | 1 | - | 2 | 1 | - | 1 | 1 | 2 |
| | | CO-5 | - | 1 | 2 | 2 | - | 2 | 3 | 1 | 2 | - | - | 1 | 2 | 2 | 1 |
| | | CO-6 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | - | 1 | - | - | 1 | 2 | 2 | 2 |
| CSE352 | Web Technologies | CO-1 | | | | | 1 | | | | | | | | | 1 | |
| | | CO-2 | | | | | 3 | | | | | | | 1 | | 1 | |
| | | CO-3 | | 1 | 3 | | 2 | 1 | | | 2 | | | | 1 | 2 | 2 |
| | | CO-4 | | 1 | 3 | | 1 | 1 | | | 2 | | | | 1 | 2 | 2 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CO-5 | | | | | 2 | | | | | | | | | 1 | |
| | | CO-6 | 2 | 3 | 3 | 1 | 3 | 3 | 1 | | 3 | | 2 | 2 | 1 | 2 | 3 |
| CSE022 | Android Application Development | CO-1 | - | - | - | - | 3 | - | - | - | 2 | - | - | 1 | - | - | 2 |
| | | CO-2 | - | - | - | - | 3 | - | - | - | 2 | - | - | 1 | - | - | 2 |
| | | CO-3 | - | - | 2 | - | 3 | - | - | - | 2 | - | - | 1 | 2 | - | 2 |
| | | CO-4 | - | - | - | - | 3 | - | - | - | 2 | - | 2 | 1 | - | - | 2 |
| | | CO-5 | - | - | 2 | 3 | 3 | | 2 | - | 2 | - | 2 | 1 | - | - | 2 |
| | | CO-6 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | - | 3 | - | 3 | 1 | 3 | 3 | 3 |
| CSE031 | Digital Image Processing | CO-1 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 2 | 3 | 1 |
| | | CO-2 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 2 | 3 | 2 |
| | | CO-3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 3 | 3 | 2 |
| | | CO-4 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 3 | 3 | 3 | 2 |
| | | CO-5 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 3 | 3 | 3 | 2 |
| | | CO-6 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | 2 | 1 | 3 | 3 | 3 | 3 |
| CSE032 | Cryptography and Network Security | CO-1 | 3 | 2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3 | 1 | -- |
| | | CO-2 | 2 | 3 | 2 | 1 | -- | -- | -- | -- | -- | -- | -- | -- | 2 | 3 | -- |
| | | CO-3 | 2 | - | 2 | - | 3 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| | | CO-4 | 2 | - | - | 2 | - | 2 | 2 | | - | - | - | - | 2 | 2 | - |
| | | CO-5 | - | - | - | - | 2 | - | 2 | 2 | 2 | - | - | - | 1 | - | - |
| | | CO-6 | - | - | - | - | - | - | - | - | - | 2 | 2 | 2 | 2 | | 2 |
| CSE041 | Software Project Management | CO-1 | 3 | - | 1 | - | 1 | - | - | - | 3 | 2 | 3 | 2 | - | - | 2 |
| | | CO-2 | 2 | - | 2 | - | 2 | - | - | - | 3 | 3 | 3 | 3 | - | - | 2 |
| | | CO-3 | 2 | - | 3 | - | 2 | - | - | 1 | 3 | 2 | 3 | 3 | - | - | 3 |
| | | CO-4 | 2 | - | 2 | - | 2 | - | - | 1 | 3 | 2 | 3 | 3 | - | - | 3 |
| | | CO-5 | 1 | - | 3 | - | 2 | 3 | - | 1 | 3 | 3 | 3 | 3 | - | - | 3 |
| | | CO-6 | 2 | - | 3 | 3 | 2 | 2 | - | 1 | 3 | 3 | 3 | 2 | - | - | 2 |
| CSE042 | Software Testing | CO-1 | 2 | 1 | - | - | - | - | - | - | - | 3 | - | 2 | - | - | 3 |
| | | CO-2 | 3 | 3 | 3 | 2 | 3 | 1 | - | 1 | 2 | 3 | - | 2 | 2 | - | 3 |
| | | CO-3 | 3 | 3 | 3 | 2 | 2 | 2 | - | 1 | 2 | 3 | - | 2 | 2 | - | 3 |
| | | CO-4 | 3 | 3 | 3 | 2 | 3 | 1 | - | 1 | 2 | 3 | - | 2 | 2 | - | 3 |
| | | CO-5 | 3 | 3 | 2 | 2 | 2 | 2 | - | 1 | 2 | 3 | - | 2 | 2 | - | 3 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CO-6 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | - | 3 |
| ARP302 | Higher Order Mathematics and Advanced People Skills | CO-1 | | | | | | 1 | 1 | | 1 | 1 | | 1 | | | |
| | | CO-2 | | | | | | 1 | 1 | | 1 | 1 | | 1 | | | |
| | | CO-3 | | | | | | 1 | 1 | | 1 | 1 | | 1 | | | |
| | | CO-4 | | | | | | 1 | 1 | | 1 | 1 | | 1 | | | |
| | | CO-5 | | | | | | 1 | 1 | | 1 | 1 | | 1 | | | |
| | | CO-6 | | 1 | 1 | | | | | | | | | | | | |
| CSP352 | Web Technologies Lab | CO-1 | - | - | - | - | 1 | - | - | - | 2 | - | - | - | - | 1 | - |
| | | CO-2 | - | 1 | 1 | - | 3 | - | - | - | 2 | - | - | 1 | - | 1 | 2 |
| | | CO-3 | - | - | 1 | - | 2 | 1 | - | - | 2 | - | - | - | - | 1 | 2 |
| | | CO-4 | - | - | - | - | 1 | 1 | - | - | | - | - | - | - | - | - |
| | | CO-5 | | 1 | - | - | 2 | - | - | - | 2 | - | - | 1 | - | 1 | 2 |
| | | CO-6 | 2 | 3 | 3 | 1 | 3 | 3 | - | - | 3 | - | 2 | 2 | 1 | 2 | 3 |
| CSP022 | Android Application Development Lab | CO-1 | | | | | 3 | | | | 2 | | | 1 | | | 2 |
| | | CO-2 | | | | | 3 | | | | 2 | | | 1 | | | 2 |
| | | CO-3 | | | 2 | | 3 | | | | 2 | | | 1 | 2 | | 2 |
| | | CO-4 | | | | | 3 | | | | 2 | | 2 | 1 | | | 2 |
| | | CO-5 | | | 2 | 3 | 3 | | 2 | | 2 | | 2 | 1 | | | 2 |
| | | CO-6 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | | 3 | | 3 | 1 | 3 | 3 | 3 |
| CSP396 | Technical Skill Enhancement Course-2(Application Development Lab) | CO-1 | 1 | - | 1 | - | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| | | CO-2 | 1 | - | 1 | - | 2 | - | - | - | - | 2 | - | 1 | 1 | 2 | 1 |
| | | CO-3 | 1 | 2 | 1 | - | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| | | CO-4 | 1 | - | 1 | - | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| | | CO-5 | 1 | - | 1 | - | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| | | CO-6 | 2 | 2 | 3 | 3 | 2 | 2 | 1 | - | 2 | 3 | 2 | 2 | 2 | 3 | 1 |
| CSP392 | Project Based Learning (PBL) -4 | CO-1 | 3 | 3 | - | 2 | - | 1 | - | 1 | 2 | - | 2 | 1 | 2 | 2 | 3 |
| | | CO-2 | 3 | 2 | 2 | 2 | 2 | - | - | 1 | 2 | - | 2 | 1 | 2 | 1 | 1 |
| | | CO-3 | 3 | 2 | 2 | 2 | 2 | 3 | - | 1 | 2 | - | 2 | 1 | 2 | 2 | - |
| | | CO-4 | 3 | 3 | 2 | 2 | 3 | - | - | 1 | 2 | - | - | 1 | 2 | 2 | 2 |
| | | CO-5 | 3 | 2 | - | - | 3 | - | - | 1 | 2 | - | - | 1 | 2 | 2 | - |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CO-6 | - | 1 | - | 1 | - | - | - | 2 | 2 | 3 | 3 | 3 | 1 | - | 1 |
| Semester VII | | | | | | | | | | | | | | | | | |
| CSE451 | Artificial Intelligence | CO-1 | 1 | 2 | 3 | 2 | 2 | | | | | 2 | | 2 | 3 | 2 | 2 |
| | | CO-2 | 2 | 3 | 3 | 2 | 3 | | | | | 2 | | 2 | 3 | 3 | 2 |
| | | CO-3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | | | 1 | 2 | 3 | 3 | 2 | 3 |
| | | CO-4 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | | | 2 | 1 | 3 | 3 | 2 | 3 |
| | | CO-5 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 |
| | | CO-6 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 |
| CSE051 | Wireless Networks | CO-1 | 3 | - | 3 | - | - | - | - | 1 | - | - | - | - | - | - | 2 |
| | | CO-2 | 3 | 2 | 3 | - | - | - | - | 1 | - | - | - | - | - | - | 2 |
| | | CO-3 | 3 | 2 | 3 | - | - | - | - | 1 | - | - | - | - | - | - | 2 |
| | | CO-4 | 3 | 2 | 3 | - | - | - | - | 1 | - | - | - | - | - | - | 2 |
| | | CO-5 | 3 | 2 | 3 | 2 | 2 | - | - | 1 | - | - | - | - | - | - | 3 |
| | | CO-6 | 3 | 2 | 3 | 2 | 2 | - | - | 1 | - | - | - | - | - | - | 3 |
| CSE052 | Risk Management | CO-1 | 3 | - | - | - | - | - | 1 | - | - | - | - | 1 | 2 | - | - |
| | | CO-2 | 2 | 2 | - | 3 | 2 | - | - | 1 | 2 | 1 | 1 | 1 | - | - | 2 |
| | | CO-3 | 2 | - | - | - | - | - | - | - | 2 | - | - | 1 | 1 | - | - |
| | | CO-4 | 1 | - | 2 | - | 3 | - | - | - | 2 | 2 | 2 | - | - | - | 1 |
| | | CO-5 | 2 | 2 | - | 2 | 1 | - | 1 | - | 2 | 1 | 1 | - | - | - | 1 |
| | | CO-6 | 2 | 2 | 2 | - | - | - | 1 | - | 2 | 1 | 1 | 1 | - | 1 | - |
| CSE061 | Introduction to Internet of Things | CO-1 | | | | | | | | | | | | | | | |
| | | CO-2 | | | | | | | | | | | | | | | |
| | | CO-3 | | | | | | | | | | | | | | | |
| | | CO-4 | | | | | | | | | | | | | | | |
| | | CO-5 | | | | | | | | | | | | | | | |
| | | CO-6 | | | | | | | | | | | | | | | |
| CSE062 | Mobile Computing | CO-1 | 3 | 3 | - | 2 | 3 | - | - | - | - | 2 | - | - | 3 | 2 | - |
| | | CO-2 | 3 | 3 | - | 2 | 3 | - | - | - | - | 2 | - | - | 3 | 2 | - |
| | | CO-3 | 3 | 3 | - | 2 | 3 | - | - | - | - | 2 | - | - | 2 | 3 | - |
| | | CO-4 | 3 | 3 | - | 2 | 3 | - | - | - | - | 2 | - | - | 3 | 2 | - |
| | | CO-5 | 3 | 3 | - | 2 | 3 | - | - | - | - | 2 | - | - | 2 | 2 | - |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CO-6 | 3 | 3 | - | 2 | 3 | - | - | - | - | 2 | - | - | 2 | 2 | - |
| CSP451 | Artificial Intelligence Lab | CO-1 | 1 | 2 | 3 | 2 | 2 | | | | | 2 | | 2 | 3 | 2 | 2 |
| | | CO-2 | 2 | 3 | 3 | 2 | 3 | | | | | 2 | | 2 | 3 | 3 | 2 |
| | | CO-3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | | | 1 | 2 | 3 | 3 | 2 | 3 |
| | | CO-4 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | | | 2 | 1 | 3 | 3 | 2 | 3 |
| | | CO-5 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 |
| | | CO-6 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 |
| CSP497 | Major Project- 1 | CO-1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 3 | 3 |
| | | CO-2 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 3 | 3 | 3 |
| | | CO-3 | 3 | 1 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 3 | 3 | 3 |
| | | CO-4 | 1 | 1 | 2 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 1 | 2 | 3 |
| | | CO-5 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 3 |
| | | CO-6 | 2 | 1 | 2 | 1 | 3 | - | - | 1 | 2 | 3 | 1 | 2 | 3 | 3 | 3 |
| CSP499 | Summer Internship-III | CO-1 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 |
| | | CO-2 | - | 2 | 2 | 2 | 2 | - | - | 3 | 2 | - | - | 2 | 2 | 2 | 2 |
| | | CO-3 | 1 | 2 | 1 | 1 | 2 | - | - | - | 2 | 3 | 2 | 2 | 1 | 1 | 1 |
| | | CO-4 | - | - | - | - | -- | - | - | - | 2 | - | 3 | 2 | 1 | 1 | 1 |
| | | CO-5 | - | - | - | - | - | - | - | - | 2 | - | 3 | 2 | 2 | 1 | - |
| | | CO-6 | - | - | - | - | - | 2 | - | - | 1 | 1 | - | 2 | 1 | 3 | 2 |
| Semester VIII | | | | | | | | | | | | | | | | | |
| CSP498 | Major Project - 2 | CO-1 | 2 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 |
| | | CO-2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 11 | 3 | 3 |
| | | CO-3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 3 |
| | | CO-4 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 2 |
| | | CO-5 | 1 | 2 | 2 | 1 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 2 |
| | | CO-6 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

***1. Slight (Low)*** ***2. Moderate (Medium)*** ***3. Substantial (High)***

## 1.3.5.2 COURSE ARTICULATION MATRIX[2]

| Course Code | Course Name | PO-1 Engineering knowledge | PO-2 Problem analysis | PO-3 Design/development of solutions | PO-4 Conduct investigations of complex problems | PO-5 Modern tool usage | PO-6 The engineer and society | PO-7 Environment and sustainability | PO-8 Ethics | PO-9 Individual and team work | PO-10 Communication: | PO-11 Project management and finance | PO-12 Life-long learning | PSO 1 Familiarity and practical proficiency | PSO 2 Understand, analyse and develop | PSO 3 Apply standard Software |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE113 | Programming for Problem Solving | **1.83** | **2.50** | **2.17** | **1.50** | **2.00** | | | | **1.80** | | **1.50** | | **1.67** | **2.17** | **1.00** |
| MTH142 | Calculus and Abstract Algebra | **3.00** | **3.00** | **2.17** | **2.17** | **2.17** | **1.33** | | | | **1.00** | **1.00** | **1.50** | | | |
| PHY117 | Semiconductor Physics | **3.00** | **2.83** | **2.33** | **2.33** | **2.67** | **1.83** | **1.00** | **1.00** | **1.17** | **1.00** | **1.00** | **1.00** | | | |
| EEE112 | Principles of Electrical and Electronics Engineering | **2.17** | **1.83** | **1.83** | **1.50** | | | | | | | **1.00** | | | | |
| EVS112 | Environmental Studies | **1.00** | **1.83** | **1.83** | **1.17** | **1.00** | **1.67** | **1.83** | **1.33** | | **1.00** | **1.67** | **1.00** | | **1.67** | **1.50** |
| ARP101 | Communicative English-1 | | **1.00** | **1.00** | **1.00** | | | | **1.00** | **1.50** | **2.00** | **2.00** | | | | |
| CSP113 | Programming for Problem Solving Lab | **2.17** | | **2.83** | **1.83** | **1.67** | | | | **2.33** | | | | **2.50** | **2.50** | **1.80** |
| CSP101 | Introduction to Computer Science and Engineering | **3.00** | **2.00** | | | | **2.00** | | **2.00** | | | | **3.00** | **3.00** | **2.75** | **2.60** |
| MEP106 | Computer Aided Design & Drafting | **2.00** | **2.00** | **2.00** | **2.00** | **3.00** | | | | **2.00** | **2.00** | | **3.00** | **3.00** | **3.00** | |
| EEP112 | Principles of Electrical and Electronics Engineering | | | | | | | | | | | | | | | |
| PHY161 | Physics Lab –I | **2.00** | **2.00** | **2.00** | **1.00** | **1.00** | **1.00** | **2.00** | **3.00** | **3.00** | **3.00** | **2.00** | **3.00** | | | |
| Semester II | | | | | | | | | | | | | | | | |

[2] Each course outcome (Based on Blooms Taxanomy-CO1, CO2, CO3, CO4, CO5, and CO6) of the course needs to map with PO. This table evolves once faculty has mapped each course outcomes of their respective course with PO's.

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE114 | Application based Programming in Python | **2.17** | **2.00** | **1.67** | **1.75** | **2.00** | **2.00** | | **2.00** | | | | **2.00** | **1.50** | **2.00** | **1.40** |
| MTH145 | Probability and Statistics | **3.00** | **2.67** | **2.17** | **2.17** | **2.17** | **1.33** | | | | **1.00** | **1.00** | **1.50** | | | |
| CHY111 | Engineering Chemistry | **3.00** | **1.00** | **1.33** | **1.17** | **1.33** | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** | |
| HMM111 | Human Value & Ethics | **1.25** | **2.25** | **1.40** | **1.60** | **2.00** | **2.00** | **1.75** | **1.00** | **1.50** | **2.00** | **2.25** | **1.75** | **1.75** | **2.20** | **1.75** |
| PHY116 | Engineering Physics | **3.00** | **2.67** | **2.67** | **2.50** | **2.33** | **2.50** | **2.00** | **1.67** | **2.33** | **2.33** | **1.33** | **2.17** | | | |
| ARP102 | Communicative English -2 | | | **1.00** | | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** | | | | |
| CSP103 | Multimedia Application Lab | **2.33** | **2.50** | **2.67** | **2.80** | **3.00** | **2.75** | **3.00** | **3.00** | **2.67** | **3.00** | | | **1.67** | **1.83** | |
| CSP114 | Application based Programming in Python | **2.00** | **2.00** | **1.50** | **1.50** | **1.60** | **1.75** | | **2.00** | | | | **2.00** | **1.75** | **1.67** | **1.40** |
| MEP105 | Mechanical Workshop | **1.67** | | **1.00** | | **1.60** | **2.00** | | | | | | **1.83** | **1.40** | | **1.00** |
| CHY161 | Engineering Chemistry | **2.00** | **2.60** | **1.33** | | **2.00** | **1.17** | **1.60** | | **3.00** | **3.00** | **1.60** | **2.00** | **2.00** | | **1.00** |
| PHY162 | Physics Lab-II | **2.00** | **2.00** | **2.00** | **1.00** | **1.00** | **1.00** | **2.00** | **3.00** | **3.00** | **3.00** | **2.00** | **3.00** | **2.00** | | |
| Semester III | | | | | | | | | | | | | | | | |
| BTY223 | Introduction to Biology for Engineers | **3.00** | **2.00** | **1.67** | **1.00** | **2.00** | **2.00** | **3.20** | **2.00** | **1.00** | **2.00** | **1.00** | **3.00** | **1.00** | **1.00** | |
| CSE242 | Data Structures | **2.00** | **2.33** | **2.67** | **2.33** | **1.50** | | | | **1.83** | | | **1.00** | **2.33** | **2.17** | **2.33** |
| CSE243 | Object Oriented Programming Using Java | **2.50** | **3.00** | **3.00** | | **2.00** | **3.00** | **2.00** | | **3.00** | | **2.00** | **2.33** | **2.50** | **3.00** | **2.00** |
| CSE244 | Principles of Operating System | **2.67** | **2.33** | **2.80** | **2.75** | **1.00** | | | **2.00** | **2.20** | **1.67** | **2.33** | **1.25** | **2.50** | **2.20** | **1.75** |
| CSE245 | Discrete Structures | **2.00** | **2.17** | **2.50** | **2.40** | **3.00** | **2.67** | | | **2.75** | | **3.00** | **3.00** | **3.00** | **2.60** | **2.50** |
| CSE247 | Computer Organization and Architecture | **3.00** | **2.33** | **2.50** | | | **2.00** | | | | | | **2.83** | | **1.83** | **2.50** |
| ARP203 | Aptitude Reasoning and Business Communication Skills - Basic | | **1.00** | **1.00** | | | **1.00** | | **1.00** | **1.00** | **1.00** | | **1.00** | | | |
| CSP242 | Data Structures Lab | **2.67** | **2.00** | **2.50** | **2.50** | **2.00** | | | | **2.60** | | | **1.67** | **2.17** | **2.50** | **2.17** |
| CSP243 | Object Oriented Programming Using Java | **2.50** | **3.00** | **3.00** | | **2.00** | **3.00** | **2.00** | | **3.00** | | **2.00** | **2.33** | **2.50** | **3.00** | **2.00** |
| CSP244 | Principles of Operating System Lab | **2.67** | **2.33** | **2.80** | **2.75** | **1.00** | | | **2.00** | **2.20** | **1.67** | **2.33** | **1.25** | **2.50** | **2.20** | **1.75** |
| CSP251 | Project Based Learning (PBL) -1 | **3.00** | **2.67** | **2.00** | **2.75** | **2.00** | **2.00** | **2.50** | **3.00** | **3.00** | **3.00** | **2.00** | **3.00** | **2.00** | **2.00** | **1.00** |
| CSP294 | Summer Internship-I | **2.00** | **2.50** | **2.50** | | **2.00** | **2.00** | | **3.00** | **3.00** | **3.00** | | **2.00** | **1.33** | **2.00** | |
| Semester IV | | | | | | | | | | | | | | | | |
| CSE249 | Data Base Management System | **2.67** | **3.00** | **2.75** | **3.00** | **2.75** | **2.17** | | **2.33** | **2.67** | **3.00** | **2.00** | **2.33** | **2.67** | **3.00** | **3.00** |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INT248 | Human computer interaction | **1.50** | **2.00** | | **3.00** | **1.67** | **1.33** | **1.17** | **2.17** | **1.83** | **2.00** | **3.00** | **3.00** | **3.00** | **1.50** | **2.00** |
| PE-1 | Program Elective-1 | | | | | | | | | | | | | | | |
| CSE011 | Mathematical Techniques | **2.33** | **1.83** | **1.60** | **1.20** | **1.50** | | **1.20** | | | **1.40** | **1.60** | **1.40** | **2.17** | **1.00** | |
| CSE012 | Introduction to Graph Theory and its Applications | **1.83** | **2.50** | **1.83** | **2.67** | **1.40** | **1.50** | **1.50** | | | **1.50** | **1.00** | **1.83** | **2.17** | **1.67** | **2.00** |
| CSP249 | Data Base Management System Lab | **3.00** | **2.20** | **2.40** | **2.20** | **2.17** | | | | **3.00** | | | **2.00** | **2.17** | **2.50** | **2.83** |
| CSP252 | Computer Networks Lab | **2.25** | **2.00** | **2.00** | **2.00** | **3.00** | **2.00** | | **2.00** | | | **2.00** | **3.00** | **2.00** | **2.40** | **2.00** |
| CSP298 | Project Based Learning (PBL) -2 | **3.00** | **2.67** | **2.00** | **2.75** | **2.00** | **2.00** | **2.50** | **3.00** | **3.00** | **3.00** | **2.00** | **3.00** | **2.00** | **2.00** | **1.00** |
| INP248 | Human computer interaction Lab | **2.17** | **1.33** | **2.00** | **2.00** | **3.00** | **1.17** | | | **1.50** | **3.00** | **3.00** | **3.00** | **2.00** | **2.00** | **1.00** |
| ARP204 | Aptitude Reasoning and Business Communication Skills- Intermediate | | **1.00** | **1.00** | | | | | **1.00** | **1.00** | **1.00** | | **1.00** | | | |
| Semester V | | | | | | | | | | | | | | | | |
| CSE350 | Design and Analysis of Algorithm | **2.00** | **2.17** | **1.83** | **2.40** | **2.00** | | | | **2.17** | | | | **2.50** | **2.00** | **2.25** |
| CSE351 | Software Engineering and Testing Methodologies | **2.83** | **1.75** | **2.50** | **2.20** | **3.00** | **2.50** | **2.50** | **1.33** | **2.33** | **2.83** | **1.60** | **2.80** | **1.40** | | **2.83** |
| CSE021 | Introduction to Cloud Computing | **1.83** | **2.33** | **1.67** | **2.00** | | | | | | | | | **2.00** | **2.50** | **2.50** |
| INT021 | Ethical Hacking | **3.00** | **2.83** | **2.33** | **3.00** | **2.25** | **3.00** | **3.00** | **2.67** | **2.50** | **3.00** | **3.00** | **2.50** | **3.00** | **3.00** | **3.00** |
| CSE023 | Quantum Computing | **3.00** | **2.83** | **2.33** | **3.00** | **2.25** | **3.00** | **3.00** | **2.67** | **2.50** | **3.00** | **3.00** | **2.50** | **3.00** | **3.00** | **3.00** |
| CSE024 | Parallel Computing Algorithms | **3.00** | **2.83** | **2.33** | **3.00** | **2.25** | **3.00** | **3.00** | **2.67** | **2.50** | **3.00** | **3.00** | **2.50** | **3.00** | **3.00** | **3.00** |
| CSE025 | 3D Printing and Software Tools | **3.00** | **2.83** | **2.33** | **3.00** | **2.25** | **3.00** | **3.00** | **2.67** | **2.50** | **3.00** | **3.00** | **2.50** | **3.00** | **3.00** | **3.00** |
| ECC001 | Community Connect | | | | | | | | | | | | | | | |
| ARP301 | Quantitative Aptitude Behavioral and Interpersonal Skills | | **1.00** | **1.00** | | | **1.00** | **1.00** | | **1.00** | **1.00** | | **1.00** | | | |
| CSP350 | Design and Analysis of Algorithm Lab | **2.50** | **2.67** | **2.50** | **2.40** | **2.00** | | | | **1.83** | | | | **2.50** | **2.33** | **2.20** |
| CSP395 | Technical Skill Enhancement Course-1 Simulation Lab | **1.17** | **2.00** | **1.33** | **3.00** | **2.00** | **2.00** | **1.00** | | **2.00** | **2.50** | **2.00** | **1.17** | **1.17** | **2.17** | **1.00** |
| CSP351 | Project Based Learning (PBL) -3 | **3.00** | **2.17** | **2.00** | **1.80** | **2.50** | **2.00** | | **1.17** | **2.00** | **3.00** | **2.25** | **1.33** | **1.83** | **1.80** | **1.75** |
| CSP398 | Summer Internship-II | **3.00** | **2.17** | **2.00** | **1.80** | **2.50** | **2.00** | | **1.17** | **2.00** | **3.00** | **2.25** | **1.33** | **1.83** | **1.80** | **1.75** |
| Semester VI | | | | | | | | | | | | | | | | |
| HMM305 | Management for Engineers | **1.75** | **1.33** | **1.67** | **1.67** | **2.00** | **1.83** | **2.00** | **1.50** | **1.33** | **2.33** | **1.33** | **1.25** | **1.33** | **1.50** | **1.83** |
| CSE352 | Web Technologies | **2.00** | **1.67** | **3.00** | **1.00** | **2.00** | **1.67** | **1.00** | | **2.33** | | **2.00** | **1.50** | **1.00** | **1.50** | **2.33** |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE022 | Android Application Development | **1.00** | **2.00** | **2.33** | **3.00** | **3.00** | **3.00** | **2.50** | | **2.17** | | **2.33** | **1.00** | **2.50** | **3.00** | **2.17** |
| CSE031 | Digital Image Processing | **3.00** | **3.00** | **3.00** | **3.00** | **1.83** | **1.67** | **1.33** | **1.00** | **1.33** | **2.00** | **1.00** | **3.00** | **2.67** | **3.00** | **2.00** |
| CSE032 | Cryptography and Network Security | **2.25** | **2.50** | **2.00** | **1.50** | **2.50** | **2.00** | **2.00** | **2.00** | **2.00** | **2.00** | **2.00** | **2.00** | **2.00** | **2.00** | **1.50** |
| CSE041 | Software Project Management | **2.00** | | **2.33** | **3.00** | **1.83** | **2.50** | | **1.00** | **3.00** | **2.50** | **3.00** | **2.67** | | | **2.50** |
| CSE042 | Software Testing | **2.83** | **2.67** | **2.80** | **2.00** | **2.60** | **1.60** | **3.00** | **1.20** | **2.20** | **3.00** | **3.00** | **2.17** | **2.00** | | **3.00** |
| ARP302 | Higher Order Mathematics and Advanced People Skills | | **1.00** | **1.00** | | | **1.00** | **1.00** | | **1.00** | **1.00** | | **1.00** | | | |
| CSP352 | Web Technologies Lab | **2.00** | **1.67** | **1.67** | **1.00** | **2.00** | **1.67** | | | **2.20** | | **2.00** | **1.33** | **1.00** | **1.20** | **2.25** |
| CSP022 | Android Application Development Lab | **1.00** | **2.00** | **2.33** | **3.00** | **3.00** | **3.00** | **2.50** | | **2.17** | | **2.33** | **1.00** | **2.50** | **3.00** | **2.17** |
| CSP396 | Technical Skill Enhancement Course-2(Application Development Lab) | **1.17** | **2.00** | **1.33** | **3.00** | **2.00** | **2.00** | **1.00** | | **2.00** | **2.50** | **2.00** | **1.17** | **1.17** | **2.17** | **1.00** |
| CSP392 | Project Based Learning (PBL) -4 | **3.00** | **2.17** | **2.00** | **1.80** | **2.50** | **2.00** | | **1.17** | **2.00** | **3.00** | **2.25** | **1.33** | **1.83** | **1.80** | **1.75** |
| Semester VII | | | | | | | | | | | | | | | | |
| CSE451 | Artificial Intelligence | **2.17** | **2.83** | **3.00** | **2.67** | **2.50** | **1.75** | **1.50** | **2.00** | **3.00** | **1.83** | **1.75** | **2.33** | **3.00** | **2.50** | **2.33** |
| CSE051 | Wireless Networks | **3.00** | **2.00** | **3.00** | **2.00** | **2.00** | | | **1.00** | | | | | | | **2.33** |
| CSE052 | Risk Management | **2.00** | **2.00** | **2.00** | **2.50** | **2.00** | | **1.00** | **1.00** | **2.00** | **1.25** | **1.25** | **1.00** | **1.50** | **1.00** | **1.33** |
| CSE061 | Introduction to Internet of Things | | | | | | | | | | | | | | | |
| CSE062 | Mobile Computing | **3.00** | **3.00** | | **2.00** | **3.00** | | | | | **2.00** | | | **2.50** | **2.17** | |
| CSP451 | Artificial Intelligence Lab | **2.17** | **2.83** | **3.00** | **2.67** | **2.50** | **1.75** | **1.50** | **2.00** | **3.00** | **1.83** | **1.75** | **2.33** | **3.00** | **2.50** | **2.33** |
| CSP497 | Major Project- 1 | **2.17** | **1.83** | **2.50** | **1.83** | **2.17** | **1.60** | **1.60** | **1.00** | **2.00** | **1.83** | **1.00** | **2.00** | **2.17** | **2.67** | **3.00** |
| CSP499 | Summer Internship-III | **2.00** | **2.33** | **2.00** | **2.00** | **2.33** | **2.00** | **1.00** | **2.00** | **1.83** | **2.00** | **2.25** | **1.83** | **1.50** | **1.67** | **1.60** |
| Semester VIII | | | | | | | | | | | | | | | | |
| CSP498 | Major Project - 2 | **1.83** | **2.00** | **2.33** | **2.00** | **2.83** | **2.00** | **2.00** | **2.00** | **2.00** | **2.33** | **2.00** | **1.50** | **3.17** | **2.50** | **2.50** |

**1-Slight (Low)**
**2-Moderate (Medium)**
**3-Substantial (High)**

**Course Outcome**

- **Course Outcomes**–What is it?
  - Course outcomes (COs) are clear statements of what a student should be able to demonstrate on completion of a course.
  - COs should be assessable and measurable knowledge, skills, abilities and attitudes that student attains by the end of the course.
  - It is generally good idea to identify between 4 and 7 outcomes.
  - All courses in a particular programme shall have their own PO.
  - Each CO is mapped to relevant PO.
  - The teaching learning process and assessment process are to be designed in a way to achieve the COs.

**Beginning words for Course Outcome:**

Active verbs developed based on Bloom's Taxonomy

| Knowledge | Understand | Apply | Analyze | Evaluate | Create |
|---|---|---|---|---|---|
| define | explain | solve | analyze | reframe | design |
| identify | describe | apply | compare | criticize | compose |
| describe | interpret | illustrate | classify | evaluate | create |
| label | paraphrase | modify | contrast | order | plan |
| list | summarize | use | distinguish | appraise | combine |
| name | classify | calculate | infer | judge | formulate |
| state | compare | change | separate | support | invent |
| match | differentiate | choose | explain | compare | hypothesize |
| recognize | discuss | demonstrate | select | decide | substitute |
| select | distinguish | discover | categorize | discriminate | write |
| examine | extend | experiment | connect | recommend | compile |
| locate | predict | relate | differentiate | summarize | construct |
| memorize | associate | show | discriminate | assess | develop |
| quote | contrast | sketch | divide | choose | generalize |
| recall | convert | complete | order | convince | integrate |
| reproduce | demonstrate | construct | point out | defend | modify |
| tabulate | estimate | dramatize | prioritize | estimate | organize |
| tell | express | interpret | subdivide | find errors | prepare |
| copy | Identify | Manipulate | survey | grade | produce |
| discover | indicate | Paint | advertise | measure | rearrange |
| duplicate | Infer | Prepare | appraise | predict | rewrite |
| enumerate | relate | produce | Break down | rank | role-play |

(Reference: Retrieved from http://www.teachthought.com/learning/249-blooms-taxonomy-verbs-for-critical-thinking/)

| School of Engineering and Technology | | | | | | | |
|---|---|---|---|---|---|---|---|
| Department Of Computer Science & Engineering | | | | | | | |
| B.Tech-Information Technology | | | | | | | |
| Batch: 2019 Onwards | | | | | | TERM: I | |
| S. No. | Course Code | Course | Teaching Load | | | Credits | Pre-Requisite/Co Requisite |
| | | | L | T | P | | |
| **THEORY SUBJECTS** | | | | | | | |
| 1 | CSE113 | Programming for Problem Solving | 3 | 0 | 0 | 3 | |
| 2 | MTH142 | Calculus and Abstract Algebra | 3 | 1 | 0 | 4 | |
| 3 | PHY117 | Semiconductor Physics | 2 | 1 | 0 | 3 | |
| 4 | EEE112 | Principles of Electrical and Electronics Engineering | 2 | 1 | 0 | 3 | |
| | **OR** | | | | | | |
| | CHY111 | Engineering Chemistry | 3 | 0 | 2 | | |
| 5 | EVS112 | Environmental Studies | 3 | 0 | 0 | 3 | |
| | **OR** | | | | | | |
| | HMM111 | Human Value & Ethics | 2 | 0 | 0 | 2 | |
| **Practical/Viva-Voce/Jury** | | | | | | | |
| 6 | ARP101 | Communicative English-1 | 1 | 0 | 2 | 2 | |
| 7 | CSP113 | Programming for Problem Solving Lab | 0 | 0 | 2 | 1 | |
| 8 | CSP101 | Introduction to Computer Science and Engineering | 0 | 0 | 2 | 1 | |
| 9 | MEP106 | Computer Aided Design & Drafting | 0 | 0 | 3 | 1.5 | |
| | **OR** | | | | | | |
| | MEP105 | Mechanical Workshop | 0 | 0 | 3 | | |
| 10 | EEP112 | Principles of Electrical and Electronics Engineering | 0 | 0 | 2 | 1 | |
| | **OR** | | | | | | |
| | CHY161 | Engineering Chemistry Lab | 0 | 0 | 2 | | |
| 11 | PHY161/162 | Physics Lab –I / Physics Lab-II | 0 | 0 | 2 | 1 | |
| **TOTAL CREDITS** | | | | | | **23.5/22.5** | |

| School of Engineering and Technology | | | | | | | |
|---|---|---|---|---|---|---|---|
| Department Of Computer Science & Engineering | | | | | | | |
| B.Tech-Information Technology | | | | | | | |
| Batch: 2019 Onwards | | | | | | TERM: II | |
| S. No. | Course Code | Course | Teaching Load | | | Credits | Pre-Requisite/Co Requisite |
| | | | L | T | P | | |
| THEORY SUBJECTS | | | | | | | |
| 1 | CSE114 | Application based Programming in Python | 3 | 0 | 0 | 3 | |
| 2 | MTH145 | Probability and Statistics | 3 | 1 | 0 | 4 | |
| 3 | CHY111 | Engineering Chemistry | 3 | 0 | 0 | 3 | |
| | OR | | | | | | |
| | EEE112 | Principles of Electrical and Electronics Engineering | 2 | 1 | 0 | | |
| 4 | HMM111 | Human Value & Ethics | 2 | 0 | 0 | 2 | |
| | OR | | | | | | |
| | EVS112 | Environmental Studies | 3 | 0 | 0 | 3 | |
| 5 | PHY116 | Engineering Physics | 2 | 1 | 0 | 3 | |
| Practical/Viva-Voce/Jury | | | | | | | |
| 6 | ARP102 | Communicative English -2 | 1 | 0 | 2 | 2 | |
| 7 | CSP103 | Multimedia Application Lab | 0 | 0 | 2 | 1 | |
| 8 | CSP114 | Application based Programming in Python | 0 | 0 | 2 | 1 | |
| 9 | MEP105 | Mechanical Workshop | 0 | 0 | 3 | 1.5 | |
| | OR | | | | | | |
| | MEP106 | Computer Aided Design & Drafting | 0 | 0 | 3 | | |
| 10 | CHY161 | Engineering Chemistry | 0 | 0 | 2 | 1 | |
| | OR | | | | | | |
| | EEP112 | Principles of Electrical and Electronics Engineering | 0 | 0 | 2 | | |
| 11 | PHY161/162 | Physics Lab –I / Physics Lab-II | 0 | 0 | 2 | 1 | |
| TOTAL CREDITS | | | | | | 22.5/23.5 | |

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| **Department Of Computer Science & Engineering** | | | | | | | |
| **B.Tech-Information Technology** | | | | | | | |
| **Batch: 2019 Onwards** | | | | | | TERM: III | |
| **S. No.** | **Course Code** | **Course** | **Teaching Load** | | | **Credits** | **Pre-Requisite/Co Requisite** |
| | | | **L** | **T** | **P** | | |
| **THEORY SUBJECTS** | | | | | | | |
| 1 | BTY223 | Introduction to Biology for Engineers | 2 | 0 | 0 | 2 | |
| 2 | CSE242 | Data Structures | 3 | 0 | 0 | 3 | |
| 3 | CSE243 | Object Oriented Programming Using Java | 3 | 0 | 0 | 3 | |
| 4 | CSE244 | Principles of Operating System | 3 | 0 | 0 | 3 | |
| 5 | CSE245 | Discrete Structures | 3 | 1 | 0 | 4 | |
| 6 | CSE247 | Computer Organization and Architecture | 3 | 0 | 0 | 3 | |
| **Practical/Viva-Voce/Jury** | | | | | | | |
| 7 | ARP203 | Aptitude Reasoning and Business Communication Skills - Basic | 1 | 0 | 2 | 2 | |
| 8 | CSP242 | Data Structures Lab | 0 | 0 | 2 | 1 | |
| 9 | CSP243 | Object Oriented Programming Using Java | 0 | 0 | 2 | 1 | |
| 10 | CSP244 | Principles of Operating System Lab | 0 | 0 | 2 | 1 | |
| 11 | CSP251 | Project Based Learning (PBL) -1 | 0 | 0 | 2 | 1 | |
| 12 | CSP294 | Summer Internship-I | - | - | - | 1 | |
| **TOTAL CREDITS** | | | | | | **25** | |

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| **Department Of Computer Science & Engineering** | | | | | | | |
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| **Batch: 2019 Onwards** | | | | | | TERM: IV | |
| **S. No.** | **Course Code** | **Course** | **Teaching Load** | | | **Credits** | **Pre-Requisite/Co Requisite** |
| | | | **L** | **T** | **P** | | |
| **THEORY SUBJECTS** | | | | | | | |
| 1 | CSE249 | Data Base Management System | 3 | 0 | 0 | 3 | |
| 2 | INT248 | Human computer interaction | 3 | 0 | 0 | 3 | |
| 3 | CSE252 | Computer Networks | 3 | 0 | 0 | 3 | |
| 4 | PE-1 | Program Elective-1 | 3 | 0 | 0 | 3 | |
| | CSE011 | Mathematical Techniques | | | | | |
| | CSE012 | Introduction to Graph Theory and its Applications | | | | | |
| 5 | OE1 | Open Elective – 1 | 2 | 0 | 0 | 2 | |
| **Practical/Viva-Voce/Jury** | | | | | | | |
| 6 | CSP249 | Data Base Management System Lab | 0 | 0 | 2 | 1 | |
| 7 | CSP252 | Computer Networks Lab | 0 | 0 | 2 | 1 | |
| 8 | INP248 | Human computer interaction Lab | 0 | 0 | 2 | 1 | |
| 9 | CSP298 | Project Based Learning (PBL) -2 | 0 | 0 | 2 | 1 | PBL-I |
| 10 | ARP204 | Aptitude Reasoning and Business Communication Skills-Intermediate | 1 | 0 | 2 | 2 | |
| **TOTAL CREDITS** | | | | | | **20** | |

| School of Engineering and Technology | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Department Of Computer Science & Engineering** | | | | | | | |
| **B.Tech-Information Technology** | | | | | | | |
| **Batch: 2019 Onwards** | | | | | | TERM: V | |
| **S. No.** | **Course Code** | **Course** | **Teaching Load** | | | **Credits** | **Pre-Requisite/Co Requisite** |
| | | | **L** | **T** | **P** | | |
| **THEORY SUBJECTS** | | | | | | | |
| 1 | CSE350 | Design and Analysis of Algorithm | 3 | 1 | 0 | 4 | Data Structure |
| 2 | CSE351 | Software Engineering and Testing Methodologies | 3 | 0 | 0 | 3 | |
| 3 | CSE021 | Introduction to Cloud Computing | 3 | 0 | 0 | 3 | Operating System |
| | INT021 | Ethical Hacking | | | | | OOP using Java |
| | CSE023 | Quantum Computing | | | | | |
| | CSE024 | Parallel Computing Algorithms | | | | | |
| | CSE025 | 3D Printing and Software Tools | | | | | |
| 4 | OE-2 | Open Elective – 2 | 3 | 0 | 0 | 3 | |
| **Practical/Viva-Voce/Jury** | | | | | | | |
| 5 | ECC301 | Community Connect | - | - | - | 2 | |
| 6 | ARP301 | Quantitative Aptitude Behavioral and Interpersonal Skills | 1 | 0 | 2 | 2 | |
| 7 | CSP350 | Design and Analysis of Algorithm Lab | 0 | 0 | 2 | 1 | Data Structure Lab |
| 8 | CSP395 | Technical Skill Enhancement Course-1 Simulation Lab | 0 | 0 | 2 | 1 | Operating system, Database Management system |
| 9 | CSP351 | Project Based Learning (PBL) -3 | 0 | 0 | 2 | 1 | PBL-2 |
| 10 | CSP394 | Summer Internship-II | - | - | - | 1 | Summer Internship-I |
| **TOTAL CREDITS** | | | | | | **21** | |

| School of Engineering and Technology | | | | | | | |
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| **Department Of Computer Science & Engineering** | | | | | | | |
| **B.Tech-Information Technology** | | | | | | | |
| **Batch: 2019 Onwards** | | | | | | TERM: VI | |
| **S. No.** | **Course Code** | **Course** | **Teaching Load** | | | **Credits** | **Pre-Requisite/Co Requisite** |
| | | | **L** | **T** | **P** | | |
| **THEORY SUBJECTS** | | | | | | | |
| 1 | HMM305 | Management for Engineers | 3 | 0 | 0 | 3 | |
| 2 | CSE352 | Web Technologies | 2 | 0 | 0 | 2 | |
| 3 | CSE022 | Android Application Development | 3 | 0 | 0 | 3 | |
| 4 | PE3 | Program Elective-3 | 3 | 0 | 0 | 3 | |
| | CSE031 | Digital Image Processing | | | | | |
| | CSE032 | Cryptography and Network Security | | | | | |
| 5 | PE4 | Program Elective-4 | 3 | 0 | 0 | 3 | |
| | CSE041 | Software Project Management | | | | | |
| | CSE042 | Software Testing | | | | | |
| 6 | OE-3 | Open Elective – 3 | 3 | 0 | 0 | 3 | |
| **Practical/Viva-Voce/Jury** | | | | | | | |
| 7 | ARP302 | Higher Order Mathematics and Advanced People Skills | 1 | 0 | 2 | 2 | |
| 8 | CSP352 | Web Technologies Lab | 0 | 0 | 2 | 1 | Java |
| 9 | CSE022 | Android Application Development Lab | 0 | 0 | 2 | 1 | |
| 10 | CSP396 | Technical Skill Enhancement Course-2(Application Development Lab) | 0 | 0 | 2 | 1 | |
| 11 | CSP392 | Project Based Learning (PBL) -4 | 0 | 0 | 2 | 1 | PBL-3 |
| **TOTAL CREDITS** | | | | | | **23** | |

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| **Department Of Computer Science & Engineering** | | | | | | | |
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| **Batch: 2019 Onwards** | | | | | | TERM: VII | |
| **S. No.** | **Course Code** | **Course** | **Teaching Load** | | | **Credits** | **Pre-Requisite/Co Requisite** |
| | | | **L** | **T** | **P** | | |
| **THEORY SUBJECTS** | | | | | | | |
| 1 | CSE451 | Artificial Intelligence | 3 | 0 | 0 | 3 | |
| 2 | | Program Elective-5 | 3 | 0 | 0 | 3 | |
| | CSE051 | Wireless Networks | | | | | |
| | CSE052 | Risk Management | | | | | |
| 3 | | Program Elective-6 | 3 | 0 | 0 | 3 | |
| | CSE061 | Introduction to Internet of Things | | | | | |
| | CSE062 | Mobile Computing | | | | | |
| 4 | | Comprehensive Examination | 0 | 0 | 0 | 0 | Audit |
| 5 | OE4 | Open Elective - 4 | 3 | 0 | 0 | 3 | |
| **Practical/Viva-Voce/Jury** | | | | | | | |
| 6 | CSP451 | Artificial Intelligence Lab | 0 | 0 | 2 | 1 | |
| 7 | CSP497 | Major Project- 1 | - | - | - | 3 | PBL-4 |
| 8 | CSP499 | Summer Internship-III | - | - | - | 1 | Summer Internship-II |
| **TOTAL CREDITS** | | | | | | **17** | |

| School of Engineering and Technology | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Department Of Computer Science & Engineering** | | | | | | | |
| **B.Tech-Information Technology** | | | | | | | |
| **Batch: 2019 Onwards** | | | | | | TERM: VIII | |
| **S. No.** | **Course Code** | **Course** | **Teaching Load** | | | **Credits** | **Pre-Requisite/Co Requisite** |
| | | | **L** | **T** | **P** | | |
| **THEORY SUBJECTS** | | | | | | | |
| **Practical/Viva-Voce/Jury** | | | | | | | |
| 1 | CSP498 | Major Project - 2 | - | - | - | 8 | Major Project - 1 |
| **TOTAL CREDITS** | | | | | | **8** | |
| | | | | | | | |
| | | | | | | | |
| | | Term | L | T | P | **Credits** | |
| | | TERM-I. | 19 | 3 | 20 | 23.5/22.5 | |
| | | TERM-II. | 19 | 3 | 18 | 22.5/23.5 | |
| | | TERM-III. | 18 | 1 | 10 | 25 | |
| | | TERM-IV. | 15 | 1 | 8 | 20 | |
| | | TERM-V. | 13 | 1 | 8 | 21 | |
| | | TERM-VI. | 18 | 0 | 10 | 23 | |
| | | TERM-VII. | 12 | 0 | 2 | 17 | |
| | | TERM-VIII. | - | - | - | 8 | |
| | | **TOTAL CREDITS** | | | | 160 | |

# *C. Course Syllabuses*

# TERM-I

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch :** | |
| **Program: B.Tech** | | **Current Academic Year:** | |
| **Branch: ALL** | | **Semester:1** | |
| 1 | Course Code | **CSE113** | Course Name: Programming for problem solving |
| 2 | Course Title | Programming for problem solving | |
| 3 | Credits | 3 | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | |
| | Course Status | Core | |
| 5 | Course Objective | 1. Learn basic programming constructs –data types, decision structures, control structures in C<br>2. learning logic aptitude programming in c language<br>3. Developing software in c programming | |
| 6 | Course Outcomes | Students will be able to:<br>CO1: **demonstrate** the algorithm, Pseudo-code and flow chart for the given problem.<br>CO2**: develop** better understanding of basic concepts of C programming.<br>CO3: **create** and implement logic using array and function.<br>CO4: **construct** and implement the logic based on the concept of strings and pointers.<br>CO5: **apply** user-defined data types and I/O operations in file.<br>CO6: **design** and develop solutions to real world problems using C. | |
| 7 | Course Description | Programming for problem solving gives the Understanding of C programming and implement code from flowchart or algorithm | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Logic Building** | |
| | A | Flowchart: Elements, Identifying and understanding input/ output, Branching and iteration in flowchart | CO1, |
| | B | Algorithm design: Problem solving approach(top down/bottom up approach) | CO1 |
| | C | Pseudo Code : Representation of different construct, writing pseudo-code from algorithm and flowchart | CO1 |
| | **Unit 2** | **Introduction to C Programming** | |
| | A | Introduction to C programming language, Data types, Variables, Constants, Identifiers and keywords, Storage classes | CO2, CO6 |
| | B | Operators and expressions, Types of Statements: Assignment, Control, jumping. | CO2, CO6 |

| | | | |
|---|---|---|---|
| | C | Control statements: Decisions, Loops, break, continue | CO2, CO6 |
| | **Unit 3** | **Arrays and Functions** | |
| | A | Arrays: One dimensional and multi dimensional arrays: Declaration, Initialization and array manipulation (sorting, searching). | CO3, CO6 |
| | B | Functions: Definition, Declaration/Prototyping and Calling, Types of functions, Parameter passing: Call by value, Call by reference. | CO3, CO6 |
| | C | Passing and Returning Arrays from Functions, Recursive Functions. | CO3, CO6 |
| | **Unit 4** | **Pre-processors and Pointers** | |
| | A | Pre-processors: Types, Directives, Pre-processors Operators (#,##,\) , Macros: Types, Use, predefined Macros | CO4, CO6 |
| | B | Pointer: Introduction, declaration of pointer variables, Operations on pointers: Pointer arithmetic, Arrays and pointers, Dynamic memory allocation. | CO4, CO6 |
| | C | String: Introduction, predefined string functions, Manipulation of text data, Command Line Arguments. | CO4, CO6 |
| | **Unit 5** | **User Defined Data Types and File Handling** | |
| | A | Structure and Unions: Introduction, Declaration, Difference, Application, Nested structure, self-referential structure, Array of structures, Passing structure in function. | CO5, CO6 |
| | B | Files: Introduction, concept of record, I/O Streaming and Buffering, Types of Files: Indexed file, sequential file and random file, | CO5, CO6 |
| | C | Creating a data file, Opening and closing a data file, Various I/O operations on data files: Storing data or records in file, adding records, Retrieving, and updating Sequential file/random file. | CO5, CO6 |
| | Mode of examination | Theory | |
| | Weightage Distribution | CA / MTE / ETE | |
| | | 30% / 20% / 50% | |
| | Text book/s* | Kernighan, Brian, and Dennis Ritchie. *The C Programming Language* | |
| | Other References | 1. B.S. Gottfried - Programming With C - Schaum's Outline Series - Tata McGraw Hill 2nd Edition - 2004.<br>2. E. Balagurusamy - Programming in ANSI C - Second Edition - Tata McGraw Hill- 1999 | |

## CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|

| | | |
|---|---|---|
| **1.** | **CO1:** demonstrate the algorithm, Pseudo-code and flow chart for the given problem. | **PO1,PO2,PO3, PO9, PSO1,PSO2** |
| **2.** | **CO2:** develop better understanding of basic concepts of C programming. | **PO1,PO3, PO4, PO5, PO9, PO11,PSO1,PSO2** |
| **3.** | **CO3:** : create and implement logic using array and function. | **PO1,PO3,PO4, PO9, PSO2** |
| **4.** | **CO4:** construct and implement the logic based on the concept of strings and pointers. | **PO1,PO3,PO4, PO9, PSO2** |
| **5.** | **CO5:** apply user-defined data types and I/O operations in file. | **PO1,PO3,PSO2** |
| **6** | **CO6:** design and develop solutions to real world problems using C. | **PO1,PO2,PO3,PO4,PO9, PO11,PSO1 PSO2,PSO3** |

**PO and PSO mapping with level of strength for Course Name Programming for problem solving (Course Code CSE 113)**

| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | **1** | **2** | **2** | **_** | **_** | **-** | **_** | **_** | **2** | **_** | **_** | **_** | **1** | **2** | **_** |
| **CO2** | **2** | **_** | **3** | **2** | **2** | **-** | **_** | **_** | **1** | **_** | **1** | **_** | **2** | **2** | **_** |
| **CO3** | **3** | **_** | **2** | **1** | **_** | **_** | **_** | **_** | **3** | **_** | **_** | **_** | **_** | **2** | **_** |
| **CO4** | **1** | **_** | **2** | **1** | **_** | **_** | **_** | **_** | **1** | **_** | **_** | **_** | **_** | **3** | **_** |
| **CO5** | **1** | **_** | **1** | **_** | **_** | **_** | **_** | **_** | **_** | **_** | **_** | **_** | **_** | **1** | **_** |
| **CO6** | **3** | **3** | **3** | **2** | **-** | **-** | **_** | **_** | **2** | **_** | **2** | **_** | **2** | **3** | **1** |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE 113 | Programming for problem solving | 1.83 | 2.50 | 2.17 | 1.50 | 2.00 | | | | 1.80 | | 1.50 | | 1.67 | 2.17 | 1.00 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2018- 2021** | |
| **Program: B.Tech.** | | **Current Academic Year: 2018-19** | |
| **Branch: CSE** | | **Semester: 1** | |
| 1 | Course Code | **MTH 142** | |
| **2** | Course Title | **Calculus and Abstract Algebra** | |
| 3 | Credits | 4 | |
| 4 | Contact Hours (L-T-P) | 3-1-0 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | The objective of this course is to familiarize the prospective engineers with techniques in basic calculus and linear algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines. | |
| 6 | Course Outcomes | CO1: Explain the concept of differential calculus, illustrate thecurvature and Maxima, minima and saddle point. (K2, K3, K4)<br>CO2: Explain the basic concepts matrices and determinate, evaluate system of linear equation by using rank and inverse method. (K2, K3, K5)<br>CO3: Explain the basic concept of sets, relation, functions, groups Rings and Field. (K2, K4)<br>CO4: Discuss the basic of Vector spaces. (K1, K3)<br>CO5: Describe and use the linear transformation and evaluate nullity and kernel. (K1, K2, K3, K5)<br>CO6:Explain the concept of Eigen values and Eigen vectors; evaluate the diagonalization of matrices,explain the basic introduction of Inner product spaces.(K2, K3, K4, K5) | |
| 7 | Course Description | This course is an introduction to the fundamental of Mathematics. The primary objective of the course is to develop the basic understanding of differential and integral calculus, linear Algebra and Abstract Algebra. | |
| 8 | **Outline syllabus:Calculus and Abstract Algebra** | | **CO Mapping** |
| | **Unit 1** | **Calculus** | |
| | A | Differentiation, Taylor's and Maclaurin theorems with remainders; indeterminate forms, L' Hospital's rule. | CO1 |
| | B | Maxima and minima, Partial derivatives, Euler's theorem. | CO1 |
| | C | Total derivative. Evaluation of double integration. Applications of double integral (to calculate area). | CO1 |
| | **Unit 2** | **Matrices** | |
| | A | Matrices, vectors: addition and scalar multiplication, matrix multiplication. | CO2 |
| | B | Linear systems of equations, linear Independence, rank | CO2 |

| | | | | | |
|---|---|---|---|---|---|
| | | of a matrix, determinants, Cramer's Rule | | | |
| | C | Inverse of a matrix, Gauss elimination and Gauss-Jordan elimination. | | | CO2 |
| | **Unit 3** | **Basic Algebra** | | | |
| | A | Sets, relations and functions. | | | CO3 |
| | B | Basics of groups, cyclic groups. | | | CO3 |
| | C | Subgroups, basics of Rings and Field. | | | CO3 |
| | **Unit 4** | **Vector spaces** | | | |
| | A | Vector Space, linear dependence of vectors, basis, dimension. | | | CO4, CO5 |
| | B | Linear transformations (maps), range and kernel of a linear map, rank and nullity. | | | CO4, CO5 |
| | C | Inverse of a linear transformation, Matrix associated with a linear map. | | | CO4, CO5 |
| | **Unit 5** | **Vector spaces (Prerequisite Module 2 –Matrices & Module-4 Vector spaces)** | | | |
| | A | Eigenvalues, Eigenvectors | | | CO6 |
| | B | Symmetric, skew-symmetric, and orthogonal Matrices, Diagonalization | | | CO6 |
| | C | Basic introduction of Inner product spaces, Gram-Schmidt orthogonalization. | | | CO6 |
| | Mode of examination | Theory | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.<br>2. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006. | | | |
| | Other References | 1. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.<br>2. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.<br>3. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.<br>4. V. Krishnamurthy, V.P. Mainra and J.L. Arora, An introduction to Linear Algebra, Affiliated East–West press, Reprint 2005. | | | |

**COURSE OUTCOMES – PROGRAMME OUTCOMES MAPPING TABLE**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C142.1 | 3 | 3 | 2 | 2 | 3 | 1 | - | - | - | 1 | 1 | 1 |
| C142.2 | 3 | 3 | 3 | 2 | 2 | 2 | - | - | - | 1 | 1 | 2 |
| C142.3 | 3 | 3 | 2 | 2 | 2 | 1 | - | - | - | 1 | 1 | 1 |
| C142.4 | 3 | 3 | 2 | 2 | 2 | 1 | - | - | - | 1 | 1 | 1 |
| C142.5 | 3 | 3 | 2 | 2 | 2 | 1 | - | - | - | 1 | 1 | 2 |
| C142.6 | 3 | 3 | 2 | 3 | 2 | 2 | - | - | - | 1 | 1 | 2 |

| | | |
|---|---|---|
| **School: School of Basic Sciences and Research** | | **Batch:2019-2023** |
| **Program: B.TECH .** | | **Current Academic Year: 2019-20** |
| **Branch: CSE/EC/EEE** | | **Semester: I** |
| 1 | Course Code | PHY 117 |
| 2 | Course Title | Semiconductor Physics |
| 3 | Credits | 4 |
| 4 | Contact Hours (L-T-P) | 3-1-0 |
| | Course Status | Compulsory |
| 5 | Course Objective | To make students proverbial with the fundamental concepts of Semiconductors materials and their real life applications for configuring various electronics devices. |
| 6 | Course Outcomes | After the completion of this course,<br><br>CO1: Students will learn the various fundamental theory of materials and concept of solid classification.<br>CO2: Students will learn the fundamental concepts of mobility, conductivity, electrons and holes in an intrinsic semiconductors, Donor and Acceptor impurities (n-type and p-type semiconductor), Fermi levels etc.<br>CO3: Students will gain knowledge about the formation of depletion region, barrier potential, Zener diode, Characteristics of Zener diode etc.<br><br>CO4: Students will have a clear understanding of Coherent sources, interaction of radiation with matter (spontaneous and stimulated emission), Einstein's relation, population inversion and pumping, etc.<br><br>CO5: Students will learn the concept of optical sources: Light emitting diode (construction, basic working principle), semiconductor laser (construction, basic working principle), and optical detectors.<br><br>CO6: Student will be familiar with the essential concepts of Semiconductors materials technology and their applications in industries. |
| 7 | Course Description | This course provides the basic foundation for understanding electronic semiconductor devices and their applications and limitations. It has introductory elements of various concept of material science. This course is essential for students who desire to specialize their engineering in Computer Sciences, Electronics, and Electronics and Electrical engineering. |

| | | | |
|---|---|---|---|
| 8 | Outline Syllabus | | CO Mapping |
| | **Unit 1** | **Physics of Semiconductor** | |
| | A | Introduction, classical free electron theory (Lorentz-Drude theory and limitations), Quantum theory of free electron | CO1, CO6 |
| | B | (Fermi energy, effect of temperature on Fermi-Dirac distribution) (qualitative analysis) | CO1 |
| | C | Energy bands, Classification of Solids on the basis of energy band. | CO1 |

| | | | |
|---|---|---|---|
| | **Unit 2** | **Transport phenomena in semiconductors** | |
| | A | Mobility, conductivity, electrons and holes in an intrinsic semiconductors, Donor and Acceptor impurities (n-type and p-type semiconductor) | CO2, CO6 |
| | B | Fermi levels , carrier densities in semiconductor | CO2 |
| | C | Concentration of electrons in conduction band and holes in valence band, Drift and diffusion current, Hall effect. | CO2 |
| | **Unit 3** | **p-n Junction** | |
| | A | p-n junction, types of p-n junction (step-graded and Linearly-graded junction) | CO3 |
| | B | formation of depletion region, barrier potential, Zener diode, Characteristics of Zener diode | CO3 |
| | C | Avalanche and Zener breakdown, comparison of Zener diode and pn junction diode, concept of tunneling, I-V characteristics of tunnel diode. | CO3, CO6 |
| | **Unit 4** | **Laser Physics** | |
| | A | Coherent sources, interaction of radiation with matter (spontaneous and stimulated emission), Einstein's relation | CO4 |
| | B | population inversion and pumping, active components of laser, optical amplification or gain | CO4 |
| | C | threshold condition for laser action, three and four level lasers, Ruby and He-Ne lasers. | CO4 |
| | **Unit 5** | **Optoelectronic Devices** | |
| | A | optical sources: Light emitting diode (construction, basic working principle), semiconductor laser (construction, basic working principle) | CO5 |
| | B | optical detectors: photodiode (working principle), p-i-n photodiode (working principle), | CO5, CO6 |
| | C | Photovoltaic effect, p-n junction solar cell (basic working idea). | CO5, CO6 |
| | Mode of Examination | Theory | |
| | Weightage Distribution | CA: 30% / MTE: 20% / ETE: 50% | |
| | Text books | Integrated Electronics- Millman - Halkias, Tata Mc Graw Hill | |
| | Other References | 1. Semiconductor Devices Physics and Technology- S M Sze, John Wiley & Sons<br>2. Semiconductor Device Fundamentals- Robert F. Pierret Addison Wesley Longman.<br>3. Semiconductor Devices- Kanaan Kano, Pearson Education.<br>4. Basic Electronics by B.L Thareja<br>5. Principles of Electronics by V.K Mehta | |

**Instructional Plan**

Academic Year: 2019-20 (Even Semester)

| | |
|---|---|
| **School: School of Basic Sciences and Research** | **Subject: Physics** |
| **Program: B.TECH** | **Subject Code: PHY 118** |
| **Branch: CSE/EC/EEE** | **Instructor:** |

| **Scheme** | | | **Scheme of Examination** | | |
|---|---|---|---|---|---|
| L | P | T | Internal Assessment | Mid Term Examination | End Term Examination |
| 3 | 0 | 1 | 30% | 20% | 50% |

**Course Outline**

In combination with basic knowledge of various concepts of semiconductors physics and their applications, the course discusses profound knowledge of real life applications.

| **Course Evaluation** | |
|---|---|
| Attendance | None |
| Homework | 5 assignments (may vary) **5 Marks** |
| Quizzes | 5 (may vary) **15 Marks** |
| Presentations | Can be a presentation/Study/MOOC etc. **10 Marks** |
| Labs | None |
| Any Other | None |
| References: | |
| Text book | Integrated Electronics- Millman - Halkias, Tata Mc Graw Hill |
| Other References | 1. Semiconductor Devices Physics and Technology- S M Sze, John Wiley & Sons<br>2. Semiconductor Device Fundamentals- Robert F. Pierret Addison Wesley Longman.<br>3. Semiconductor Devices- Kanaan Kano, Pearson Education.<br>4. Basic Electronics by B.L Thareja<br>5. Principles of Electronics by V.K Mehta |
| Software's | None |

| Session No. | Unit | Outline Syllabus | Evaluation Parameter | Pedagogy * |
|---|---|---|---|---|
| 1 | Unit 1 A | **Physics of Semiconductor** | | |
| 2 | A | Introduction, classical free electron theory (Lorentz-Drude theory and limitations), | | |
| 3 | A | Quantum theory of free electron | | |
| 4 | B | (Fermi energy, | | |
| 5 | B | effect of temperature on Fermi-Dirac distribution) (qualitative analysis) | | |
| 7 | C | Energy bands,. | | |
| 8 | C | Classification of Solids on the basis of energy band | I Assignment and 1 Quiz | |
| 10 | Unit 2 A | **Transport Phenomena in semiconductors** | | |
| 11 | A | Mobility, conductivity, electrons and holes in an intrinsic semiconductors, | | |
| 12 | A | Donor and Acceptor impurities (n-type | | |

| | | | | |
|---|---|---|---|---|
| | | and p-type semiconductor) | | |
| 13 | B | Fermi levels. | | |
| 14 | B | carrier densities in semiconductor | | |
| 15 | C | concentration of electrons in conduction band and holes in valence band | | |
| 16 | C | Drift and diffusion current, Hall effect. | II Assignment and 2 Quiz | |
| 17 | Unit 3 A | **p-n Junction** | | |
| 18 | A | p-n junction, | | |
| 19 | A | Types of p-n junction (step-graded and Linearly-graded junction) | | |
| 20 | B | Formation of depletion region, barrier potential, | | |
| 21 | B | Zener diode, Characteristics of Zener diode | | |
| 22 | C | Avalanche and Zener breakdown, comparison of Zener diode and pn junction diode, | | |
| 23 | C | Concept of tunneling, I-V characteristics of tunnel diode. | III Assignment and 3 Quiz | |
| 24 | Unit 4 A | **Laser Physics** | | |
| 25 | A | Coherent sources, interaction of radiation with matter (spontaneous and stimulated emission), | | |
| | A | Einstein's relation | | |
| 26 | B | Population inversion and pumping, active components of laser, | | |
| 27 | B | Optical amplification or gain | | |
| 28 | C | Threshold condition for laser action, three and four level lasers, | | |
| 29 | C | Ruby and He-Ne lasers. | | |
| 30 | Unit 5 A | **Optoelectronic Devices** | | |
| 31 | A | Optical sources: Light emitting diode (construction, basic working principle)**,** | | |
| 32 | A | Semiconductor laser (construction, basic working principle) | | |
| 33 | B | Optical detectors: photodiode (working principle), | | |
| 34 | B | p-i-n photodiode (working principle), | | |
| 35 | C | Photovoltaic effect, | | |
| 36 | C | p-n junction solar cell (basic working idea). | IV Assignment and 4 Quiz | |

**Mapping of Course Outcomes vs. Topics**

| Outcome no. → / Syllabus topic ↓ | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| Unit 1 A | X | | | | | X |
| Unit 1 B | X | | | | | |
| Unit 1 C | X | | | | | |
| Unit 2 A | | X | | | | X |
| Unit 2 B | | X | | | | |
| Unit 2 C | | X | | | | |
| Unit 3 A | | | X | | | X |
| Unit 3 B | | | X | | | |
| Unit 3 C | | | X | | | |
| Unit 4 A | | | | X | | X |
| Unit 4 B | | | | X | | |
| Unit 4 C | | | | X | | |
| Unit 5 A | | | | | X | X |
| Unit 5 B | | | | | X | |
| Unit 5 C | | | | | X | |

**Mapping of CO Vs Pos:**

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COPHY117.1 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| COPHY117.2 | 3 | 3 | 2 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| COPHY117.3 | 3 | 3 | 2 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| COPHY117.4 | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| COPHY117.5 | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| COPHY117.6 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2018-2022** | |
| **Program: B.Tech** | | **Current Academic Year: 2018-2019** | |
| **Branch:** | | **Semester: I/II** | |
| 1 | Course Code | EEE112 | |
| 2 | Course Title | Principles of Electrical and Electronics Engineering | |
| 3 | Credits | 3 | |
| 4 | Contact Hours (L-T-P) | 2-1-0 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | To provide the students with an introductory concept in the field of electrical and electronics engineering to facilitate better understanding of the devices, techniques and equipments used in engineering applications. | |
| 6 | Course Outcomes | CO1: To analyze and solve basic electrical circuits<br>CO3: To understand the working principle of transformer and identify its applications.<br>CO3: To understand the working principle of dc and ac motors and identify the starting methods of single phase induction motor<br>CO4: To apply the basics of diode to describe the working of rectifier circuits such as half and full wave rectifiers<br>CO5: To apply the concepts of basic electronic devices to design various circuits<br>CO6: Apply the basic concepts in Electrical and Electronics Engineering for multi-disciplinary tasks | |
| 7 | Course Description | This initial course introduces the concepts and fundamentals of electrical and electronic circuits and devices. Topics include basic circuit analysis, diode and transistor fundamentals and applications. This course also introduces working principle and applications of dc/ac motors and transformers. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **DC & AC Circuits ( 6 lectures )** | |
| | A | Electrical circuit elements (R, L and C), series and parallel circuits, concept of equivalent resistance, Kirchhoff current and voltage laws, star-delta conversion | CO1,CO6 |
| | B | Analysis of simple circuits with dc excitation and Superposition Theorem, Representation of sinusoidal waveforms, peak and rms values, real power, reactive power, apparent power, power factor | CO1,CO6 |
| | C | Introduction to three phase system, relationship between phase voltages and line voltages, | CO1,CO6 |
| | **Unit 2** | **Transformer( 4 lectures )** | |
| | A | Working principle and construction of transformer, EMF equation | CO2,CO6 |

| | | | |
|---|---|---|---|
| | B | Efficiency of transformer, Power and distribution transformer and difference between them | CO2,CO6 |
| | C | Transformer applications in transmission and distribution of electrical power | CO2,CO6, |
| | **Unit 4** | **Electrical Motors ( 6 lectures )** | |
| | A | Construction, working principle, torque-speed characteristic and applications of dc motor. | CO3,CO6 |
| | B | Construction, working principle and applications of a three-phase induction motor, significance of torque-slip characteristic | CO3,CO6 |
| | C | Working principle starting methods and applications of single phase induction motor | CO3,CO6 |
| | **Unit 4** | **Semiconductor Diode and Rectifier ( 5 lectures )** | |
| | A | PN junction and its biasing | CO4,CO6 |
| | B | Semiconductor diode, ideal versus practical diode , VI characteristics of diode | CO4,CO6 |
| | C | Half wave and full wave rectifiers with and without filters. | CO4,CO6 |
| | **Unit 5** | **Transistors ( 5 lectures )** | |
| | A | Bipolar Junction Transistor (BJT) – Construction, working principle and input-output characteristics | CO5,CO6 |
| | B | BJT as CE amplifier and as a switch | CO5,CO6 |
| | C | Introduction to JFET | CO5,CO6 |
| | Mode of examination | Theory | |
| | Weightage Distribution | CA: 30% / MTE: 20% / ETE: 50% | |
| | Text book/s* | D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.<br>2. S. K. Bhattacharya, "Basic Electrical and Electronics Engineering", Pearson Publication.<br>3. Robert L Boylestad, "Electronic Devices and Circuit Theory" Pearson Education, 2009 | |
| | Other References | 1. V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989. | |

**Course Articulation Matrix:**

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO112.1 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | - |
| CO112.2 | 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| CO112.3 | 2 | 2 | 1 | - | - | - | - | - | -- | - | - | - | - | - | - |
| CO112.4 | 2 | 1 | 2 | - | - | - | - | - | - | - | 1 | - | - | - | - |
| CO112.5 | 3 | 2 | 1 | - | - | - | - | - | - | - | 1 | - | - | - | - |
| CO112.6 | 2 | 2 | 3 | 1 | - | - | - | - | - | - | 1 | - | - | - | - |

**INSTRUCTIONAL PLAN**
**Academic Year: 2018-22 (Odd Semester)**

| | |
|---|---|
| **School: SET** | **Subject: Principles of Electrical and Electronics Engineering** |
| **Program: B.Tech** | **Subject Code: EEE112** |
| **Branch: Electrical and Electronics Engineering** | **Instructor:** |

**Course Evaluation**

| **Scheme** | | | **Scheme of Examination** | | |
|---|---|---|---|---|---|
| L | P | T | Internal Assessment | Mid Term Examination | End Term Examination |
| 3 | 2 | 1 | 30% | 20% | 50% |

**Course outline**
This initial course introduces the concepts and fundamentals of electrical and electronic circu and devices. Topics include basic circuit analysis, diode and transistor fundamentals a applications. This course also introduces working principle and applications of dc/ac motors a transformers.

| | |
|---|---|
| Attendance | None |
| Homework | 10 (Three Assignments) |
| Quizzes | 15 ( Three out of Four Quizzes) |
| labs | None |
| Presentations | 5 (one) |
| **References :** | |
| Text book | 1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.<br>2. S. K. Bhattacharya, "Basic Electrical and Electronics Engineering", Pearson Publication.<br>3. Robert L Boylestad, "Electronic Devices and Circuit Theory" Pearson Education, 2009 |
| Other References | 1. V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989. |
| Softwares | MATLAB<br>MATLAB Simulink. |

| **Session No.** | **Unit** | **Outline syllabus** | **Evaluation Parameter** | **Pedagogy** |
|---|---|---|---|---|
| | **I** | **DC and AC Circuits (6)** | | 1. Power Point Presentations, videos through LCD Projector.<br>2. Use of white board |
| 1 | 1a | Introduction to subject | | |
| 2 | 1a | Electrical circuit elements (R, L and C), series and parallel circuits, concept of equivalent resistance, | | |
| 3 | 1a | Kirchhoff current and voltage laws | | |
| 4 | 1a | star-delta conversion, Analysis of simple circuits with dc excitation, Superposition Theorem | Assignment I | |
| 5 | 1b | Representation of sinusoidal waveforms, peak and rms values | | |
| 6 | 1c | Real power, reactive power, apparent power, power factor Introduction to three phase system, | Assignment II and Quiz I | |

| | | | | |
|---|---|---|---|---|
| | | relationship between phase voltages and line voltages. | | |
| | **II** | **Transformer( 4 lectures )** | | 1. Power Point Presentations, videos through LCD Projector. 2. Use of white board |
| 7 | 2a | Working principle and construction of transformer | | |
| 8 | 2a | EMF equation of transformer | | |
| 9 | 2b | Efficiency of transformer, Power and distribution transformer and difference between them | | |
| 10 | 2c | Transformer applications in transmission and distribution of electrical power | Quiz II | |
| | **III** | **Electrical Motors ( 6 lectures )** | | 1. Power Point Presentations, videos through LCD Projector. 2. Use of white board |
| 11 | 3a | Construction and working principle of dc motor | | |
| 12 | 3a | Torque-speed characteristic and applications of dc motor. | Mid Term Examination | |
| 13 | 3b | Construction of three phase induction motor | | |
| 14 | 3b | working principle and applications of a three-phase induction motor | | |
| 15 | 3c | significance of torque-slip characteristics | | |
| 16 | 3c | Working principle starting methods and applications of single phase induction motor | Quiz III | |
| | **IV** | **Semiconductor Diode and Rectifier (5 lectures )** | | Videos through LCD Projectors and Use of White Board |
| 17 | 4a | Introduction to PN junction diode | | |
| 18 | 4a | Biasing of PN junction diode | | |
| 19 | 4b | VI characteristics of diode, ideal versus practical diode | | |
| 20 | 4c | Half and full wave rectifiers without filters | | |
| 21 | 4c | Half and full wave rectifiers wit filters | Assignment III | |
| | **V** | **Transistors ( 5 lectures )** | | Videos through LCD Projectors and Use of White Board |
| 22 | 5a | Construction of BJT | | |
| 23 | 5b | Working Principle of BJT | Assignment IV | |
| 24 | 5b | input-output characteristics of BJT | | |
| 25 | 5b | BJT as CE amplifier and as a switch | | |
| 26 | 5c | Introduction to JFET | Quiz IV | |

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2019-2020** | |
| **Program: B. Tech** | | **Current Academic Year: 2019-2020** | |
| **Branch: All** | | **Semester: I** | |
| 1 | Course Code | EVS-112 | |
| 2 | Course Title | Environmental Science | |
| 3 | Credits | 03 | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | 1. Enable students to learn the concepts, principles and importance of environmental science<br>2. Provide knowledge of layers of atmosphere with an insight of role of climatic elements in dispersion of pollutants<br>3. Provide detailed knowledge of causes, effects and control of different types of environmental pollution, solid waste management and its effect on climate change, global warming and ozone layer depletion<br>4. Provide knowledge about ecosystem and biodiversity conservation<br>5. Provide and enrich the students about social issues such as R&R, water conservation and sustainability.<br>6. Overall understanding of environmental components and its protection and management. | |
| 6 | Course Outcomes | CO1.Understand the principles and scope of environmental science<br>CO2.Knowledge about various types of natural resources and its conservation<br>CO3.Study about the structure and composition of atmosphere and factors affecting weather and climate<br>CO4.Study about pollution causes, effects and control and solid waste management and various policies to curb pollution problem<br>CO5.About ecosystem and biodiversity and various strategies for biodiversity conservation.<br>CO6.Overall understanding of the concepts of various elements of environment and related phenomenon. | |
| 7 | Course Description | Environmental Science emphasises on various factors as<br>1. Importance and scope of environmental science<br>2. Natural resource conservation<br>3. Pollution causes, effects and control methods and solid waste management<br>4. Social issues associated with environment | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **General Introduction** | |
| | A | Definition, principles and scope of environmental science | CO1/CO6 |
| | B | Water Resources, Land Resources, Food Resources | CO1/CO6 |
| | C | Mineral Resources, Energy Resources, Forest Resources | CO1/CO6 |
| | **Unit 2** | **Atmosphere and meteorological parameters** | |
| | A | Structure and composition of atmosphere | CO2/CO6 |
| | B | Meteorological parameters: Pressure, Temperature, Precipitation, Humidity, | CO2/CO6 |

| | | | | | |
|---|---|---|---|---|---|
| | C | Radiation, Wind speed and direction, Wind Rose | | | CO2/CO6 |
| | **Unit 3** | **Environmental Pollution (Cause, effects and control measures) and climate change** | | | |
| | A | Air, water, Noise and Soil pollution and Case studies | | | CO3/CO6 |
| | B | Solid waste management: Causes, effects and control measures of urban and industrial wastes. | | | CO3/CO6 |
| | C | Concept of Global Warming, green house effect, ozone layer depletion, Kyoto, IPCC concerns | | | CO3/CO6 |
| | **Unit 4** | **Ecosystem and Biodiversity conservation** | | | |
| | A | Structure and Function of ecosystem, Energy flow in ecosystem, food chain, food web, and ecological succession | | | CO4/CO6 |
| | B | Hot spots, Endangered and endemic species of India, Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions | | | CO4/CO6 |
| | C | Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value. | | | CO4/CO6 |
| | **Unit 5** | **Social Issues and the Environment** | | | |
| | A | Concept of sustainable development, Water conservation | | | CO5/CO6 |
| | B | Resettlement and rehabilitation of people; its problems and concerns, Case studies | | | CO5/CO6 |
| | C | Population explosion and its consequences | | | CO5/CO6 |
| | Mode of examination | Theory | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | **1.** Joseph, Benny, "Environmental Studies", Tata Mcgraw Hill.<br>**2.** .Howard S. Peavy, Donald R. Rowe, George Tchobanoglous. Environmental engineering Mc Graw-Hill, 1985 | | | |
| | Other References | | | | |

CO and PO Mapping

| | |
|---|---|
| CO1 | Understand the principles and scope of environmental science |
| CO2 | Knowledge about various types of natural resources and its conservation |
| CO3 | Study about the structure and composition of atmosphere and factors affecting weather and climate |
| CO4 | Study about pollution causes, effects and control and solid waste management and various policies to curb pollution problem |
| CO5 | About ecosystem and biodiversity and various strategies for biodiversity conservation |
| CO6 | Overall understanding of the concepts of various elements of environment and related phenomenon |

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO112.1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | - | 1 | 1 | 1 | - | 1 | - |
| CO112.2 | 1 | 2 | 2 | 1 | - | 1 | 2 | - | - | 1 | 1 | - | - | 1 | - |
| CO112.3 | 1 | 2 | 2 | 1 | - | 2 | 2 | - | - | 1 | 2 | - | - | 2 | 2 |
| CO112.4 | 1 | 2 | 2 | 1 | - | 2 | 2 | - | - | 1 | 2 | - | - | 2 | 2 |
| CO112.5 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | - | 1 | 2 | - | - | 2 | 1 |
| CO112.6 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | - | 1 | 2 | 1 | - | 2 | 1 |

| | | | |
|---|---|---|---|
| **Schools:** SET | | **Batch :** 2019-20 | |
| | | **Current Academic Year:** 2019-20 | |
| | | **Semester:** 1st | |
| 1 | Course Code | **ARP101** | |
| 2 | Course Title | Communicative English-1 | |
| 3 | Credits | 2 | |
| 4 | Contact Hours (L-T-P) | 1-0-2 | |
| 5 | Course Objective | To minimize the linguistic barriers that emerge in varied socio-linguistic environments through the use of English. Help students to understand different accents and standardise their existing English. Guide the students to hone the basic communication skills - listening, speaking, reading and writing while also uplifting their perception of themselves, giving them self-confidence and building positive attitude. | |
| 6 | Course Outcomes | CO1 Learn to use correct sentence structure and punctuation as well as different parts of speech. Learning new words its application and usage in different contexts helpful in building meaning conversations and written drafts. Develop over all comprehension ability, interpret it and describe it in writing. Very useful in real life situations and scenarios.<br><br>CO2 A recognition of one's self and abilities through language learning and personality development training leading up to greater employability chances. Learn to express oneself through writing while also developing positive perception of self. To be able to speak confidently in English<br><br>CO3 To empower them to capitalise on strengths, overcome weaknesses, exploit opportunities, and counter threats. To ingrain the spirit of Positive attitude in students through a full length feature film followed by a storyboarding activity. Create a Self Brand, identity and self esteem through various interesting and engaging classroom activity<br><br>CO4 Exposing students to simulataions and situations wherein students learn to describe people and situations and handle such situations effectively and with ease. Teaching students how to engage in meaningful dialogues and active conversational abilities to navigate through challenging situations in life and make effective conversations. Learn how to transform adverse beginnings into positive endings – through writing activities like story completion. | |
| 7 | Course Description | The course is designed to equip students, who are at a very basic level of language comprehension, to communicate and work with ease in varied workplace environment. The course begins with basic grammar structure and pronunciation patterns, leading up to apprehension of oneself through written and verbal expression as a first step towards greater employability. | |
| 8 | Outline syllabus – ARP 101 | | |
| | **Unit A** | **Sentence Structure** | **CO Mapping** |
| | Topic 1 | Subject Verb Agreement | CO1 |

| | | | |
|---|---|---|---|
| | Topic 2 | Parts of speech | |
| | Topic 3 | Writing well-formed sentences | |
| | | | |
| | **Unit B** | **Vocabulary Building & Punctuation** | |
| | Topic 1 | Homonyms/ homophones, Synonyms/Antonyms | CO1 |
| | Topic 2 | Punctuation/ Spellings (Prefixes-suffixes/Unjumbled Words) | CO1, CO1 |
| | Topic 3 | Conjunctions/Compound Sentences | CO1, CO2 |
| | | | |
| | **Unit C** | **Writing Skills** | |
| | Topic 1 | Picture Description – Student Group Activity | CO3 |
| | Topic 2 | Positive Thinking - Dead Poets Society-Full-length feature film - Paragraph Writing inculcating the positive attitude of a learner through the movie \| SWOT Analysis – Know yourself | CO3, CO2, CO3 |
| | Topic 3 | Story Completion Exercise –Building positive attitude - The Man from Earth (Watching a Full length Feature Film ) | CO2, CO3 CO4 |
| | | | |
| | **Unit D** | **Speaking Skill** | |
| | Topic 1 | Self-introduction/Greeting/Meeting people – Self branding | CO2, CO3 |
| | Topic 2 | Describing people and situations - To Sir With Love ( Watching a Full length Feature Film ) | CO3, CO4 |
| | Topic 3 | Dialogues/conversations (Situation based Role Plays) | CO2, CO4 CO4 |
| 9 | Evaluations | *Class Assignments/Free Speech Exercises / JAM Group Presentations/Problem Solving Scenarios/GD/Simulations ( 60% CA and 40% ETE* | *N/A* |
| 10 | Texts & References \| Library Links | • Blum, M. Rosen. *How to Build Better Vocabulary*. London: Bloomsbury Publication<br>• Comfort, Jeremy(et.al). *Speaking Effectively*. Cambridge University Press | |

**Observations**:

1. A Single Consolidated Syllabus has now replaced the Previous Functional English Beginners -1 and Functional English Intermediate -1
2. Credits previously allocated to FEN 01 Lab Sessions have been dissolved
3. The Pearson Voice Labs have been completely eliminated
4. Max Students Size =80/Batch

| CO | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | | | | | | | | | | 3 | | |
| CO2 | | | | | | | | 1 | 1 | 2 | | |
| CO3 | | | | 1 | | | | 1 | 2 | | | |
| CO4 | | 1 | 1 | | | | | | | 1 | 2 | |

**Syllabus:** CSP 113: Programming for problem solving Lab

| | | | |
|---|---|---|---|
| **School:** SET | | **Batch: 2018** | |
| **Program: B.Tech.** | | **Current Academic Year: 2018-19** | |
| **Branch: CSE** | | **Semester: I** | |
| 1 | Course Code | CSP113 | |
| 2 | Course Title | Programming for problem solving Lab | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | 1. Learn basic programming constructs –data types, decision structures, control structures in C<br>2. learning logic aptitude programming in c language<br>3. Developing software in c programming | |
| 6 | Course Outcomes | Students will be able to:<br>CO1: **Implement** core concept of c Programming<br>CO2: **develop** programs using Array and String<br>CO3: **create** Functions for any problem<br>CO4: **Use** Union and Structure to write any program<br>CO5: **implement** concept of Pointers<br>CO6**: design** a real world problem with the help of c programming | |
| 7 | Course Description | Programming for problem solving gives the Understanding of C programming and implement code from flowchart or algorithm | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Logic Building** | **CO1, CO6** |
| | | Draw flowchart for finding leap year | |
| | | Write a c Program to Add Two Integers | |
| | | Write a program to create a calculator | |
| | **Unit 2** | **Introduction to C Programming** | **CO2, CO6** |
| | | Write a c program to convert length meter to cm | |
| | | Write a c program to convert temp | |
| | | Write a c program to swap two numbers | |
| | **Unit 3** | **Arrays and Functions** | **CO3, CO6** |
| | | Write a c program to calculate the average using arrays | |
| | | Write a c program to find the largest element of the array | |
| | **Unit 4** | **Pre-processors and Pointers** | **CO4, CO6** |
| | | Write a c program to swap two values using pointers | |
| | | Write a c program to find largest number from array using pointers | |
| | **Unit 5** | **User Defined Data Types and File Handling** | **CO5, CO6** |
| | | Write a c program to store information of a student using structure | |
| | | Write a c program to store information of a student using union | |
| | Mode of examination | Practical | |

| | | | | | |
|---|---|---|---|---|---|
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | 0% | 40% | |
| | Text book/s* | Kernighan, Brian, and Dennis Ritchie. *The C Programming Language* | | | |
| | Other References | 4. B.S. Gottfried - Programming With C - Schaum's Outline Series - Tata McGraw Hill 2nd Edition - 2004.<br>5. E. Balagurusamy - Programming in ANSI C - Second Edition - Tata McGraw Hill- 1999 | | | |

**Course outline**

This course implements array and pointer and Recursive applications. The course talks primarily about Array, string, functions, structure & union and Pointers etc.

| **Course Evaluation** | |
|---|---|
| Attendance | None |
| Any other | CA judged on the practicals conducted in the lab , weightage may be specified |
| References | |
| Text book | Kernighan, Brian, and Dennis Ritchie. *The C Programming Language* |
| Other References | 1. B.S. Gottfried - Programming With C - Schaum's Outline Series - Tata McGraw Hill 2nd Edition - 2004.<br>2. E. Balagurusamy - Programming in ANSI C - Second Edition - Tata McGraw Hill- 1999 |
| Softwares | Turbo C |

**PO and PSO mapping with level of strength for Course Name** Programming for problem solving Lab **(Course Code CSP113)**

| Course Code_ Course Name | CO's | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CSP113_** Programming for problem solving Lab | CO1 | 2 | - | 3 | 2 | 2 | - | - | - | 2 | - | - | - | 3 | 2 | 2 |
| | CO2 | 3 | - | 3 | 2 | 2 | - | - | - | 3 | - | - | - | 3 | 3 | 1 |
| | CO3 | 2 | - | 3 | 1 | 2 | - | - | - | 2 | - | - | - | 2 | 3 | 2 |
| | CO4 | 1 | - | 2 | 1 | 1 | - | - | - | 2 | - | - | - | 2 | 2 | - |
| | CO5 | 2 | - | 3 | 2 | 2 | - | - | - | 3 | - | - | - | 3 | 2 | 2 |
| | CO6 | 3 | - | 3 | 3 | 1 | - | - | - | 2 | - | - | - | 2 | 3 | 2 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP113 | Programming for problem solving Lab | 2.17 | | 2.83 | 1.83 | 1.67 | - | - | - | 2.33 | - | - | - | 2.50 | 2.50 | 1.80 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

**Syllabus:** CSP 101:Introduction to Computer Science and Engineering

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2018** | |
| **Program:B.Tech** | | **Current Academic Year:** | |
| **Branch: CSE** | | **Semester:I** | |
| 1 | Course Code | CSP101 \| Course Name | |
| 2 | Course Title | Introduction to Computer Science and Engineering | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | UG | |
| 5 | Course Objective | 1. To familiarize the students about the importance of Undergraduate course on Computer Science & Engineering.<br>2. To discuss recent developments in hardware and software environments.<br>3. To focus future application areas of Computer Science and Engineering.<br>4. To discuss various research and development options in Computer Science and Engineering. | |
| 6 | Course Outcomes | **The student should be able to:**<br>CO1: Understand the technical aspects of Computer Science & Engineering Course.<br>CO2: Perceive some knowledge about programming in various applications.<br>CO3: Acquire basic understanding about computer networking and related technology.<br>CO4: Enhance some fundamental knowledge of DBMS including application areas.<br>CO5: Understand the current trends in computing in discovering wisdom/knowledge and future prediction. | |
| 7 | Course Description | This course focuses application areas of Computer Science and Engineering for students admitted in undergraduate program. The purpose of B. Tech. in Computer Science & Engineering is to be given through this course to students. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Hardware aspect of Computer Science & Engineering** | |
| | A | History of Computing Systems, Computer Basics and Computer Organization. | CO1 |
| | B | Computer Architecture, Introduction to various connecting devices. | |
| | C | Recent additions – IoT, Robotics and new alternate architectures. | |
| | **Unit 2** | **Programming Aspects** | |
| | A | Basics of Programming, Programming Paradigms, System Software versus Application Software. | CO2 |
| | B | Hard Computing versus Soft Computing, Data | |

| | | | | | |
|---|---|---|---|---|---|
| | | Structures and Algorithms. | | | |
| | C | Computer Graphics, Multimedia, Computer Vision. | | | |
| | **Unit 3** | **Computer Networking** | | | |
| | A | Introduction to Networking, Various terminologies, Client Server Technology, Web Technology. | | | CO3 |
| | B | Introduction to data/network security and current trends. | | | |
| | C | Concept of Cloud Computing and Virtualization, Real life applications. | | | |
| | **Unit 4** | **Database Management Systems** | | | |
| | A | Introduction to DBMS, DBMS versus File System, Relational DBMS. | | | CO4 |
| | B | Information Processing and Retrieval | | | |
| | C | Big Data Analytics & Scientific Computing | | | |
| | **Unit 5** | **Artificial Intelligence** | | | |
| | A | Basics of Artificial Intelligence | | | CO5 |
| | B | Basics of Pattern Recognition | | | |
| | C | Basics of Machine Learning | | | |
| | Mode of examination | Practical | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | NIL | 40% | |
| | Text book/s* | 1. Introduction to Computer, Peter Norton, 7/e, 2017, Tata McGraw Hill Publishing. | | | |
| | Other References | 2. Foundations of Computer Science, B A Forouzan& F Mosharraf, 2/e, 2008, Delmar Learning. | | | |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: Understand the technical aspects of Computer Science &Engineering Course. | PO1, PO2, PO12, PSO3 |
| 2. | **CO2:**Perceive some knowledge about programming in various applications. | PO1, PO12, PSO1, PSO3 |
| 3. | **CO3:** Acquire basic understanding about computer networking and related technology. | PO1, PO2, PO12, PSO2, PSO3 |
| 4. | **CO4:**Enhance some fundamental knowledge of DBMS including application areas. | PO1, PO12, PSO2, PSO3 |
| 5. | **CO5:** Understand the current trends in computing in discovering wisdom/knowledge and future prediction. | PO1, PO6, PO8, PO12, PSO2, PSO3 |

| Cos | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO1 0 | PO1 1 | PO1 2 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | 3 | - | 3 |
| CO 2 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | - | 3 | 2 |
| CO 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 3 | - | 2 | 3 |
| CO 4 | 3 | - | - | - | - | - | - | - | - | - | - | 3 | - | 3 | 2 |
| CO 5 | 3 | - | - | - | - | 2 | - | 2 | - | - | - | 3 | - | 3 | 3 |

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2018-2022** | |
| **Program: B.Tech** | | **Current Academic Year: 2018** | |
| **Branch: ALL** | | **Semester: I** | |
| 1 | Course Code | MEP 106 | |
| 2 | Course Title | Computer Aided Design & Drafting Laboratory | |
| 3 | Credits | 1.5 | |
| 4 | Contact Hours (L-T-P) | 0-0-3 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | The objective of this introductory course is to make students familiar with computer-aided drafting/ design, introduce them about the basic commands, tools and dimension techniques for creation and presentation of various engineering drawing by using AutoCAD software which helps in visualization and problem solving in engineering disciplines. | |
| 6 | Course Outcomes | After successful completion of this course the student will be able to<br>CO1: Understand the fundamental features of AutoCAD workspace and user interface.<br>CO2: Apply the fundamental tools such as draw, edit, and view for creating two dimensional engineering drawings in AutoCAD.<br>CO3: Choose advance features to present an engineering drawing in AutoCAD.<br>CO4: Apply text and dimension features in the engineering drawing.<br>CO5: Create different orthographic projections from a pictorial view.<br>CO6: Analyze an engineering drawing and use the software packages for drafting and modeling. | |
| 7 | Course Description | This introductory course is offered to students to make them proficient in design, layout, product development, and other careers that require technical drawing. Using the current version of the AutoCAD software, students will learn a variety of drawing techniques and be able to replicate specific drawings in multiple perspectives. The pinnacle of the class is to empower and enable students to create using the software provided. Career opportunities in 3D modeling, manufacturing, and engineering will also be explored. No drafting or computer experience is necessary. | |
| 8 | Outline syllabus | | CO Mapping |
| | **List of Experiments** | | |
| | **Experiment 1** | Introduction to AutoCAD and its interface | CO1 |
| | **Experiment 2** | Working with coordinates, Drawing offline, circle, arc, polygon and creating sketches | CO2 |
| | **Experiment 3** | Editing of drawing by using editing Tools and Power tools | CO2 |
| | **Experiment 4** | Creating of advanced feature like fillet, chamfer, hatch and using of block | CO3 |
| | **Experiment 5** | Representing text and dimensioning in AutoCAD | CO4 |
| | **Experiment 6** | Creating the drawings of mechanical components by using AutoCAD features. | CO2, CO3 |
| | **Experiment 7** | Creating the electrical circuit drawings in AutoCAD. | CO2 |
| | **Experiment 8** | Drawing plan and elevation of various buildings in AutoCAD. | CO2, CO4 |

| | | | | | |
|---|---|---|---|---|---|
| | **Experiment 9** | Creating the drawing of renowned constructions such as Taj Mahal in AutoCAD | | | CO3 |
| | **Experiment 10** | Creating of orthographic projections from a pictorial views | | | CO5 |
| | | | | | |
| | Mode of examination | Practical | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | 0% | 40% | |
| | Text book/s* | 1. Ibrahim Zaid,"CAD/CAM- Theory and Practice", McGraw Hill, International Edition. | | | |
| | Software | AutoCAD | | | |

### 1.3.5.1 COURSE ARTICULATION MATRIX

| COs | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO10 | PO11 | PO12 | PSO 1 | PSO 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO106.1 | 2 | 2 | 2 | - | 3 | - | - | - | - | - | - | 3 | 3 | 3 |
| CO106.2 | 2 | 2 | 2 | - | 3 | - | - | - | - | - | - | 3 | 3 | 3 |
| CO106.3 | 2 | 2 | 2 | - | 3 | - | - | - | - | - | - | 3 | 3 | 3 |
| CO106.4 | 2 | 2 | 2 | 2 | 3 | - | - | - | 2 | 2 | - | 3 | 3 | 3 |
| CO106.5 | 2 | 2 | 2 | 2 | 3 | - | - | - | 2 | 2 | - | 3 | 3 | 3 |
| CO106.6 | 2 | 2 | 2 | 2 | 3 | - | - | - | 2 | 2 | - | 3 | 3 | 3 |

**1-Slight (Low)**
**2-Moderate (Medium)**
**3-Substantial (High)**

| | | | |
|---|---|---|---|
| **School: School of Engineering and Technology** | | **Batch: 2019-2023** | |
| **Program: B.Tech.** | | **Current Academic Year: 2019-20** | |
| **Branch: Physics** | | **Semester: I,II** | |
| 1 | Course Code | PHY 161 | |
| 2 | Course Title | Physics Lab 1 | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | To gain practical knowledge by applying the experimental methods to correlate with the Physics theory. | |
| 6 | Course Outcomes | On successful completion of the course the students will have:<br>CO1: Knowledge and study of basic physics experiments based on simple harmonic motion<br>CO2: Use the concept of stress, strain to calculate modulus of rigidity, Young's modulus.<br>CO3: Understand how to determine moment of inertia of different bodies.<br>CO4: Understand how to draw characteristic curves of different electronic components<br>CO5: Understand how to calculate frequency using Melde's Experiment<br>CO6: Apply the mathematical concepts/equations to obtain quantitative results and ability to conduct, analyze and interpret experiments | |
| 7 | Outline Syllabus | | CO Mapping |
| | Unit 1 | | |
| | A<br>B<br>C | 1. To verify the relation of time period using simple pendulum.<br>2. To determine the acceleration due to gravity and radius of Gyration of compound pendulum and compare with theoretical value. | CO1<br>CO2,CO6 |
| | Unit 2 | | |
| | A<br>B<br>C | 3. To measure the moment of inertia of a flywheel.<br>4. To determine the Young's modulus of a beam using cantilever beam experiment apparatus.<br>5. To determine vertical distance between two points using sextant. | CO2,CO6 |
| | Unit3 | | |
| | A<br>B<br>C | 6. To determine the modulus of rigidity of a material of a given wire with an inertia table (torsion pendulum) by dynamical method.<br>7. To calculate Moment of inertia of different irregular shapes. | CO3,CO6<br>CO4,CO6 |
| | Unit 4 | | |
| | A<br>B<br>C | 8. To determine the frequency of an electrically maintained tuning fork using Melde's Apparatus. (i) Transverse mode of vibration (ii) Longitudinal mode of vibration.<br>9. To determine the coefficient of viscosity of water by Poiseuille's method. | CO4,CO6 |
| | Unit 5 | | |
| | A<br>B<br>C | 10. To draw the characteristic curve of a PN junction diode.<br>11. To trace the circuit of a Half Wave Rectifier circuit and determine efficiencies and ripple factors with capacitor and inductor filters. | CO5,CO6 |

| | | | |
|---|---|---|---|
| | | 12. To trace the circuit of a Full Wave Rectifier circuit and determine efficiencies and ripple factors with capacitor and inductor filters. | CO5,CO6 |
| | Mode of Examination | Practical/Viva | |
| | Weightage Distribution | CA: 60% | MTE: 0% / ETE: 40% |
| | Text books | 1. B.Sc. Practical Physics- Harnam Singh, S. Chand Publishing.<br>2. B.Sc. Practical Physics- C L Arora, S. Chand Publishing. | |
| | Other References | 1. Geeta Sanon, BSc Practical Physics, 1st Edn. (2007), R. Chand & Co.<br>2. B. L. Worsnop and H. T. Flint, Advanced Practical Physics, Asia Publishing House, New | |

**Instructional Plan**

Academic Year: 2019-20 (Odd Semester)

| | |
|---|---|
| **School: School of Engineering and Technology** | **Subject: Physics Lab 1** |
| **Program: B.Tech.** | **Subject Code: PHY161** |
| **Branch: Physics** | **Instructor:** |

| **Scheme** | | | **Scheme of Examination** | | |
|---|---|---|---|---|---|
| L | P | T | Internal Assessment | Mid Term Examination | End Term Examination |
| 0 | 0 | 1 | 60% | 0% | 40% |

**Course Outline**

The list of experiments provides closure between the theoretical results and experimental readings taken in the physics laboratory. The Demonstration of each and every experiment helps the students to take up data independently and work on various research problems of physics.

| **Course Evaluation** | |
|---|---|
| Attendance | None |
| Any Other | CA judged on the practical conducted in the lab, weight age may be specified |
| References: | |
| Text book | 1. B.Sc. Practical Physics- Harnam Singh, S. Chand Publishing.<br>2. B.Sc. Practical Physics- C L Arora, S. Chand Publishing. |
| Other References | 1. GeetaSanon, BSc Practical Physics, 1st Edn. (2007), R. Chand & Co.<br>2. B. L. Worsnop and H. T. Flint, Advanced Practical Physics, Asia Publishing House, New |
| Softwares | None |

| | | | |
|---|---|---|---|
| Week 1 | **Unit 1** | **Practical related to** | |
| | a, b, c | Lab expt. 1 | To verify the relation of time period using simple pendulum. |
| Week 2 | **Unit 1** | **Practical related to--** | |
| | a, b, c | Lab expt. 1 | To verify the relation of time period using simple pendulum. |
| Week 3 | **Unit 1** | **Practical related to—** | |
| | a, b, c | Lab expt. 2 | To determine the acceleration due to gravity and radius of Gyration of compound pendulum and compare with theoretical value. |
| Week 4 | **Unit 1** | **Practical related to--** | |
| | a, b, c | Lab expt. 2 | To determine the acceleration due to gravity and radius of Gyration of compound pendulum |

| | | | |
|---|---|---|---|
| | | | and compare with theoretical value. |
| Week 5 | **Unit 2** | **Practical related to--** | |
| | a, b, c | Lab expt. 3 | To measure the moment of inertia of a flywheel. |
| Week 6 | **Unit 2** | **Practical related to-- Unit 2** | |
| | a, b, c | Lab expt. 4 | To determine the Young's modulus of a beam using cantilever beam experiment apparatus. |
| Week 7 | **Unit 2** | **Practical related to--Unit 2** | |
| | a, b, c | Lab expt. 5 | To determine vertical distance between two points using sextant. |
| Week 8 | **Unit 3** | **Practical related to--Unit 3** | |
| | a, b, c | Lab expt. 6 | To determine the modulus of rigidity of a material of a given wire with an inertia table (torsion pendulum) by dynamical method. |
| Week 9 | **Unit 3** | **Practical related to--Unit 3** | |
| | a, b, c | Lab expt. 7 | To calculate Moment of inertia of different irregular shapes. |
| Week 10 | **Unit 4** | **Practical related to-- Unit 3** | |
| | a, b, c | Lab expt. 8 | To determine the frequency of an electrically maintained tuning fork using Melde's Apparatus. (i) Transverse mode of vibration (ii) Longitudinal mode of vibration. |
| Week 11 | **Unit 4** | **Practical related to--Unit 4** | |
| | a, b, c | Lab expt. 9 | To determine the coefficient of viscosity of water by Poiseuille's method. |
| Week 12 | **Unit 4** | **Practical related to--Unit 4** | |
| | a, b, c | Lab expt. 9 | To determine the coefficient of viscosity of water by Poiseuille's method. |
| Week 13 | **Unit 5** | **Practical related to--Unit 5** | |
| | a, b, c | Lab expt. 10 | To draw the characteristic curve of a PN junction diode |
| Week 14 | **Unit 5** | **Practical related to--Unit 5** | |
| | a, b, c | Lab expt. 11 | To trace the circuit of a Half Wave Rectifier circuit and determine efficiencies and ripple factors with capacitor and inductor filters. |
| Week 15 | **Unit 5** | **Practical related to--Unit 5** | |
| | a, b, c | Lab expt. 12 | To trace the circuit of a Full Wave Rectifier circuit and determine efficiencies and ripple factors with capacitor and inductor filters. |
| Week 16 | **Unit 5** | **Practical related to--Unit 5** | |
| | a, b, c | Lab expt. 12 | To trace the circuit of a Full Wave Rectifier circuit and determine efficiencies and ripple factors with capacitor and inductor filters. |

Mapping of Course Outcomes vs. Topics

| Outcome no. → / Syllabus topic ↓ | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Unit 1 A | X | | | | | X |
| Unit 1 B | X | | | | | X |
| Unit 1 C | | X | | | | X |
| Unit 2 A | | X | | | | X |
| Unit 2 B | | X | | | | X |
| Unit 2 C | | X | | | | X |
| Unit 3 A | | | X | | | X |
| Unit 3 B | | | X | | | X |
| Unit 3 C | | | | X | | X |
| Unit 4 A | | | | X | | X |
| Unit 4 B | | | | X | | X |
| Unit 4 C | | | | X | | X |
| Unit 5 A | | | | | X | X |
| Unit 5 B | | | | | X | X |
| Unit 5 C | | | | | X | X |

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO 7 | PO 8 | PO 9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO161.1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO161.2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO161.3 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO161.4 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO161.5 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO161.6 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 |

# TERM-II

## Syllabus for Application Based Programming in Python

| | | | |
|---|---|---|---|
| **School:** | | **School of Engineering and technology** | |
| **Department** | | **Department of Computer Science and Engineering** | |
| **Program:** | | **B.Tech.** | |
| **Branch:** | | **CSE** | |
| 1 | Course Code | CSE114 | |
| 2 | Course Title | Application Based Programming in Python | |
| 3 | Credits | 3 | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | |
| | Course Status | Core | |
| 5 | Course Objective | Emphasis is placed on procedural programming, algorithm design, and language constructs common to most high-level languages through Python Programming. | |
| 6 | Course Outcomes | Upon successful completion of this course, the student will be able to:<br>CO1. Demonstrate program by using decision and repetition structures<br>CO2. Construct programs by using Python lists, tuples and dictionaries<br>CO3. Apply methods and functions to improve readability of programs.<br>CO4. Develop logical problem using object-oriented programming methodology.<br>CO5. Analyze and implement various tools, modules and packages for python.<br>CO6. Design efficient logical solution for any given real life problem by using concise and efficient algorithms | |
| 7 | Course Description | Python is a language with a simple syntax, and a powerful set of libraries. It is widely used in many scientific areas for data exploration. This course is an introduction to the Python programming language for students without prior programming experience. We cover data types, control flow, object-oriented programming. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Introduction** | CO1 |
| | A | Python Environment, Variables, Data Types, Operators. | |
| | B | **Conditional Statements:** If, If- else, Nested if-else.<br>**Looping:** For, While, Nested loops. | |
| | C | **Control Statements:** Break, Continue, And Pass. Comments | |
| | **Unit 2** | **List, Tuple and Dictionaries** | CO1, CO2 |
| | A | **Lists and Nested List:** Introduction, Accessing list, Operations, Working with lists, Library Function and Methods with Lists | |
| | B | Strings: Introduction, Accessing items of a string, Operations, Working, Library Functions and Methods with strings.<br>**Tuple:** Introduction, Accessing tuples, Operations, Working, Library Functions and Methods with Tuples. | |
| | C | Sets: Introduction, Operations, Working, functions with | |

| | | | |
|---|---|---|---|
| | | sets. Difference between set and lists.<br>**Dictionaries :**Introduction, Accessing values in dictionaries, Working with dictionaries, Library Functions | |
| | **Unit 3** | **Functions and Exception Handling** | CO3 |
| | A | **Functions:** Defining a function, Calling a function, Types of functions, Function Arguments | |
| | B | Anonymous functions, Global and local variables | |
| | C | **Exception Handling**: Definition, Except clause, Try, finally clause, User Defined Exceptions | |
| | **Unit 4** | **OOP and File Handling** | CO4 |
| | A | **OOPs concept** : Class and object, Attributes, Abstraction, Encapsulation, Polymorphism and Inheritance | |
| | B | Static and Final Keyword, Access Modifiers and specifiers, scope of a class | |
| | C | File Handling: Introduction, File Operations | |
| | **Unit 5** | **Application based programming** | CO5,CO6 |
| | A | **Modules& packages :**Importing module, Math module, Random module, creating Modules | |
| | B | Introduction to Numpy, pandas, Matplotlib | |
| | C | **Applications: Searching Linear Search, Binary Search. Sorting: Bubble Sort** | |
| | Mode of examination | Theory | |
| | Weightage Distribution | CA: 30% / MTE: 20% / ETE: 50% | |
| | Text book/s* | The Complete Reference Python, Martin C. Brown, McGraw Hill | |
| | Other References | 1. Introduction to computing in problem solving using Python, E Balahurusamy, McGraw Hill<br>2. Introduction to programming using Python, Y. Daniel Liang, Pearson<br>3. Mastering Python, Rick Van Hatten, Packet Publishing House<br>4. Starting out with Python, Tony Gaddis, Pearson | |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1. Demonstrate program by using decision and repetition structures | PO1,PO2,PO3,PO8,PO12,PSO2 |
| 2. | CO2. Apply methods and functions to improve readability of programs. | PO1,PO2,PO3,PO4,PO8,PO12,PSO2,PSO3 |
| 3. | CO3. Construct programs by using Python lists, tuples and dictionaries | PO1,PO2,PO3,PO8,PO12,PSO1, PSO2,PSO3 |

| | | |
|---|---|---|
| 4. | CO4. Develop logical problem using object-oriented programming methodology. | PO1,PO2,PO3, PO4,PO5,PO6,PO8, PO12,PSO1,PSO2,PSO3 |
| 5. | CO5. Analyze and implement various tools, modules and packages for python | PO1,PO2,PO3, PO4,PO5,PO6, PO8, PO12,PSO1,PSO2,PSO3 |
| 6. | CO6. Create efficient logical solution for any given real life problem by using concise and efficient algorithms. | PO1,PO2,PO3, PO4,PO5,PO6, PO8, PO12,PSO1,PSO2,PSO3 |

**PO and PSO mapping with level of strength for Course Name Application Based Programming in Python (Course Code CSE 114)**

| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PS O3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE114_Application Based programming in Python | CO 1 | 2 | 1 | 1 | | | | | 2 | | | | 2 | | 1 | |
| | CO 2 | 2 | 2 | 2 | 1 | | | | 2 | | | | 2 | | 2 | 1 |
| | CO 3 | 2 | 2 | 1 | | | | | 2 | | | | 2 | 1 | 2 | 1 |
| | CO 4 | 2 | 2 | 2 | 2 | 1 | 2 | | 2 | | | | 2 | 1 | 2 | 2 |
| | CO 5 | 2 | 2 | 2 | 2 | 3 | 2 | | 2 | | | | 2 | 2 | 2 | 1 |
| | CO 6 | 3 | 3 | 2 | 2 | 2 | 2 | | 2 | | | | 2 | 2 | 3 | 2 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE114 | Application Based programming in Python | 2.1 | 2 | 1.7 | 1.2 | 1 | 1 | - | 2 | - | - | - | 2 | 1 | 2 | 1.1 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2018- 2021** | |
| **Program: B.Tech.** | | **Current Academic Year: 2018-19** | |
| **Branch: CSE** | | **Semester: II** | |
| 1 | Course Code | **MTH 145** | |
| **2** | Course Title | **Probability and Statistics** | |
| 3 | Credits | 4 | |
| 4 | Contact Hours (L-T-P) | 3-1-0 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | The objective of this course is to familiarize the students with statistical techniques. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling various problems in the discipline. | |
| 6 | Course Outcomes | CO1: Explain the concept of probability and Random Variable. (K2,K3, K4)<br>CO2: Explain the concept of distribution functions, densities andprobability distributions; illustrate discrete and continuous probability distributions. (K1, K2, K3, K4)<br>CO3: Describe the concept of moments, skewness and Kurtosis; evaluate correlation and regression – Rank correlation; discuss bivariate distributions and their properties<br>. (K1, K2, K5)<br>CO4: Discuss the basic of Curve fitting by the method of least squares; evaluate straight lines, second degree parabolas and more general curves. (K1, K2, K5)<br>CO5: Describe and use the concepts test of significance: Large sample test for single proportion, difference of proportions; calculate single mean, difference of means, and difference of standard deviations. (K1,K2,K3)<br>CO6: Explain the basic concepts of tests of small samples- Student's T test, Chi-square test for goodness of fit, and evaluate the result. (K2, K4, K5) | |
| 7 | Course Description | This course is an introduction to the fundamental of Mathematics. The primary objective of the course is to develop the basic understanding of statistics including measures of central tendency, correlation and regression, statistical methods of data sampling, probability and random variables and various discrete andcontinuous probability distributions and their properties. | |
| 8 | **Outline syllabus :Probability and Statistics** | | **CO Mapping** |
| | **Unit 1** | **Basic Probability** | |
| | A | Probability spaces, conditional probability, Bayes' rule. | CO1 |
| | B | Discrete random variables, Independent random variables | CO1 |
| | C | Expectation of Discrete Random Variables, Chebyshev's Inequality | CO1 |
| | **Unit 2** | **Discrete and Continuous Probability Distributions** | |
| | A | Discrete Probability distributions: Binomial, Poisson. | CO2 |

| | | | | | |
|---|---|---|---|---|---|
| | B | Continuous random variables and their properties, distribution functions and densities. | | | CO2 |
| | C | Normal, exponential and gamma distribution. | | | CO2 |
| | **Unit 3** | **Statistics** | | | |
| | A | Moments, skewness and Kurtosis. | | | CO3 |
| | B | Correlation and regression – Rank correlation. | | | CO3 |
| | C | Bivariate distributions and their properties. | | | CO3 |
| | **Unit 4** | **Applied Statistics** | | | |
| | A | Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves. | | | CO4, CO5 |
| | B | Test of significance: Large sample test for single proportion, | | | CO4, CO5 |
| | C | Difference of proportions, single mean, difference of means, and difference of standard deviations. | | | CO4, CO5 |
| | **Unit 5** | **Testing Hypothesis** | | | |
| | A | Test for single mean, difference of means | | | CO6 |
| | B | test for ratio of variances | | | CO6 |
| | C | Chi-square test for goodness of fit and independence of attributes | | | CO6 |
| | Mode of examination | Theory | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.<br>2. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability Theory, Universal Book Stall, 2003 (Reprint).<br>3. S. Ross, A First Course in Probability, 6th Ed., Pearson Education India, 2002. | | | |
| | Other References | 1. W. Feller, An Introduction to Probability Theory and its Applications, Vol. 1, 3rd Ed., Wiley, 1968.<br>2. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000. Veerarajan T., Engineering Mathematics (for semester III), Tata McGraw-Hill, New Delhi, 2010. | | | |

**COURSE OUTCOMES – PROGRAMME OUTCOMES MAPPING TABLE**

| PO / CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **C145.1** | **3** | **3** | **2** | **2** | **3** | **1** | **-** | **-** | **-** | **1** | **1** | **1** |
| **C145.2** | **3** | **2** | **3** | **2** | **2** | **2** | **-** | **-** | **-** | **1** | **1** | **2** |
| **C145.3** | **3** | **3** | **2** | **2** | **2** | **1** | **-** | **-** | **-** | **1** | **1** | **1** |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **C145.4** | **3** | **2** | **2** | **2** | **2** | **1** | **-** | **-** | **-** | **1** | **1** | **1** |
| **C145.5** | **3** | **3** | **2** | **2** | **2** | **1** | **-** | **-** | **-** | **1** | **1** | **2** |
| **C145.6** | **3** | **3** | **2** | **3** | **2** | **2** | **-** | **-** | **-** | **1** | **1** | **2** |

**ENGINEERING CHEMISTRY (CHY 111) (TERM I/II)**

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2018-2022** | |
| **Program: B.Tech.** | | **Current Academic Year: 2018-2019** | |
| **Branch: CS/EC/IT/EEE** | | **Semester:2** | |
| 1 | Course Code | CHY 111 | |
| 2 | Course Title | **Chemistry for engineers** | |
| 3 | Credits | 4 | |
| 4 | Contact Hours (L-T-P) | 3-1-0 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | 1. Make it comprehended the importance of clean water.<br>2. Describe to the basic concepts of spectroscopy as described in the module content and is to teach getting of valuable information from the same to apply in various engineering applications.<br>3. To provide an introduction to the basic concepts in Electrochemistry and apply them to understand batteries and corrosion.<br>4. To equip the students with the knowledge of modern technologies i.e. nanotechnology and its various engineering applications. | |
| 6 | Course Outcomes | Students will be able to understand :<br>1. Realize the importance of clean and healthy water by giving knowledge about water quality parameters and cleaning measures.<br>2. In sighting the structural features of material by having the knowledge of spectroscopic techniques.<br>3. State the main cause of corrosion and prevention measures. Name the components of galvanic cell and applies these to the understand the batteries and corrosion of a metal.<br>4. Able to apply the basic information of engineering materials and their applications.<br>5. Able to have a basic knowledge of technology in modern days i.e. Nanotechnology and its various applications.<br>6. Have a thorough grounding in chemistry and a working knowledge of advanced chemistry. | |
| 7 | Course Description | • The course includes the fundamentals of Thermodynamics, Electrochemistry and batteries, corrosion, introduction to Chemistry of Materials, water technology and nanotechnology. This course satisfies the requirements of the Engineering program. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Water: Analysis and its treatment** | |

| | | | |
|---|---|---|---|
| | A | Water and water treatment: Drinking water standards, Water quality parameters and their measurement: pH (alkalinity and acidity –determination by titrimetry), Turbidity, Dissolved Oxygen (DO), biological oxygen demand (BOD), chemical oxygen demand (COD), chloride, fluoride, oil and fats, | CO1, CO6 |
| | B | hardness (definition and expression, estimation of hardness (EDTA method), nutrients (N, P, etc.), nitrate, dissolved metals. | CO1, CO6 |
| | C | Municipal water treatment process - screening, sedimentation, flocculation;Coagulation, Filtration (Slow sand and rapid sand), disinfaction-chlorination. | CO1, CO6 |
| | **Unit 2** | **Spectroscopic studies of materials** | |
| | A | Principles of spectroscopy and selection rules. Electronic spectroscopy: basic principle, 'Lamberts Beer's law, | CO2, CO6 |
| | B | chromophore, effect of conjugation on chromophore and applications, Fluorescence and its applications in medicine. | CO2, CO6 |
| | C | Basic principle and applications of Nuclear magnetic resonance and magnetic resonance imaging spectroscopy. | CO2, CO6 |
| | **Unit 3** | **Electrochemistry, energy storage devices and corrosion** | |
| | A | Electrochemistry: Redox reactions, Nernst Equation, relation of e.m.f. with thermodynamic functions (ΔH, ΔF and Δ S). Electrochemical cells- | CO3, CO6 |
| | B | Galvanic cells and Concentration cell, electrode potentials and its relevance to oxidation and reduction, measurement of EMF under standard conditions, determination of pH using Hydrogen electrode, | CO3, CO6 |
| | C | primary battery: dry cells, secondary battery: Lead acid accumulator and Li Ion, fuel cells: H 2- O 2 . Corrosion: Types of corrosion, mechanism of Electrochemical corrosion, galvanic corrosion and protection against electrochemical corrosion. | CO3, CO6 |
| | **Unit 4** | **Chemistry of materials** | |
| | A | :Structure, properties and application of carbon materials such as diamond, graphite, fullerenes, graphene. Liquid crystals: classification, Molecular ordering, identification, polymeric liquid crystals, and application of liquid crystals: displays and thermography. | CO4, CO6 |
| | B | Organic and inorganic semiconductors. Basic concepts of Conducting polymer, types,p-doping, n-doping, comparison with metallic conductors, examples and applications. | CO4, CO6 |

| | | | | | |
|---|---|---|---|---|---|
| | C | Biodegradable polymers: Basic information with common examples Polyglycolic acid (PGA), Polyhydroxy butyrate (PHB), Polyhydroxybutyrates-co-beta hydroxyl valerate( PHBV), Polycaprolactone(pcl). | | | CO4, CO6 |
| | **Unit 5** | **Nano science and technology** | | | |
| | A | Introduction to nanoscience and technology, bio-nanoinformation, | | | CO5, CO6 |
| | B | lithography, soft lithography, Dip pen nanolithography, CNT's | | | CO5, CO6 |
| | C | Application of nanotechnology in microelectronics and in memory devices. | | | CO5, CO6 |
| | Mode of examination | Theory | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | i. Puri, B.R., Sharma, L.R., and Pathania, M.S., "Principles of Physical Chemistry", Vishal publishing company.<br>ii. Bahl Arun, Bahl B.S. and J.D Tuli, "Essentials of Physical Chemistry", S.Chand & Co.<br>iii. University chemistry, by B. H. Mahan<br>iv. Chemistry: Principles and Applications, by M. J. Sienko and R. A.Plane<br>v. Fundamentals of Molecular Spectroscopy, by C. N. Banwell<br>vi. Engineering Chemistry (NPTEL Web-book), by B. L. Tembe, Kamaluddin and M. S. Krishnan<br>vii. Physical Chemistry, by P. W. Atkins<br>viii. Introduction to nanotechnology: C.P poole,Jr. F.J. Owens, willeyinterscience 2003.<br>Nanotechnology, science, innovation and opportunity, LE foster, Pearson education 2007. | | | |
| | Other References | i. Collings, P.J., "Liquid Crystals", Princeton University Press.<br>O.P. Vermani, A.K. Narula, "Industrial chemistry", Galgotia Publications. | | | |

**CO-PO MAPPING CS/IT**

| CO/PO | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **CO2** | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **CO3** | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **CO4** | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **CO5** | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **CO6** | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

| | |
|---|---|
| **School:** | **School of Engineering and technology** |
| **Department** | **Department of Computer Science and Engineering** |
| **Program:** | **B.Tech** |
| **Branch:** | **Computer Science** |

| | | |
|---|---|---|
| 1 | Course No. | HMM111 |
| 2 | Course Title | **Human** Value and Ethics |
| 3 | Credits | 2 |
| 4 | Contact Hours (L-T-P) | (2-0-0)2 |
| 5 | Course Objective | To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of Existence |
| 6 | Course Outcomes | **On a successful completion of this course students will be able to**<br>1. Understand that the technical education without study of human values can generate more problems than solutions.<br>2. Define the principles and ideals, which help in making the judgement of what is more important.<br>3. See that 'I' and 'Body' are two realities, and most of their desires are related to 'I' and not body, while their efforts are mostly centered on the fulfilment of the needs of the body assuming that it will meet the needs of 'I' too.<br>4. Appreciate the importance of harmony in the self, family and the society for mutual fulfilment.<br>5. Understand the importance of harmony among human beings, other living beings and entire nature for universal equilibrium and mutual co-existence.<br>6. Know and practice the ethical approach in profession for continuous happiness and sustained prosperity. |
| 7 | Outline of syllabus: | |
| **7.01** | **Unit A** | **The Need and Process for Value Education** |
| 7.02 | Unit A Topic 1 | The need, basic guidelines, content and process for Value Education |
| 7.03 | Unit A Topic 2 | Concept of 'Natural Acceptance' and Experiential Validation- as the mechanism for self exploration; Continuous Happiness and Prosperity- A look at basic Human Aspirations |
| 7.04 | Unit A Topic 3 | Right understanding, Relationship and Physical Facilities- the basic requirements for fulfilment of aspirations of every human being with their correct priority |
| **7.05** | **Unit B** | **Understanding Harmony in the Human Being - Harmony in Myself** |
| 7.06 | Unit B Topic 1 | Human being as a co-existence of the sentient 'I' and the material 'Body' |
| 7.07 | Unit B Topic 2 | The needs of Self ('I') and 'Body' ; Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer) |
| 7.08 | Unit B Topic 3 | The characteristics and activities of 'I' and harmony in 'I' ; Understanding the harmony of I with the Body: Correct appraisal of Physical needs, meaning of Prosperity in detail |
| **7.09** | **Unit C** | **Harmony in the Family and Society** |
| 7.10 | Unit C Topic 1 | Values in human-human relationship; Trust and Respect as the foundational values of relationship |
| 7.11 | Unit C Topic 2 | Understanding the meaning of Trust; Difference between intention and competence; The meaning of Respect; Difference between respect and differentiation; the other salient values in relationship |
| 7.12 | Unit C Topic 3 | Harmony in the society (society being an extension of family; Visualizing a universal harmonious order in society - from family to world family |
| **7.13** | **Unit D** | **Harmony in the Nature and Existence** |
| 7.14 | Unit D Topic 1 | The harmony in the Nature |
| 7.15 | Unit D Topic 2 | Interconnectedness and mutual fulfilment among the four orders of nature |

| | | |
|---|---|---|
| | | recyclability and self-regulation in nature |
| 7.16 | Unit D Topic 3 | Understanding Existence as Co-existence of mutually interacting units in all-pervasive space |
| **7.17** | **Unit E** | **Competence in professional ethics** |
| 7.18 | Unit E Topic 1 | Ability to utilize the professional competence for augmenting universal human order |
| 7.19 | Unit E Topic 2 | Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems, |
| 7.20 | Unit E Topic 3 | Ability to identify and develop appropriate technologies and management patterns for above production systems. |
| 8 | Course Evaluation | |
| 8.1 | Course work: 30 marks | |
| 8.11 | Attendance | None |
| 8.12 | Homework | 4 assignments, no weight |
| 8.13 | Quizzes/Class Tests | Two |
| 8.14 | Projects | None |
| 8.15 | Presentations | None |
| 8.16 | Any other | None |
| 8.2 | MTE | one, 20 marks |
| 8.3 | End-term examination: 50 marks | |
| 9.1 | Text books | 1. R.R Gaur, R Sangal, G P Bagaria, "A foundation course in Human Values and professional Ethics", Excel books, New Delhi |
| 9.2 | Other references | 1. B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow.<br>2. A.N. Tripathy, 2003, Human Values, New Age International Publishers.<br>3. PL Dhar, RR Gaur, Science and Humanism, Commonwealth Purblishers. |

**Mapping of Outcomes vs. Topics**

| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HMM 111 | CO1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | | | 2 | 3 | 1 | 1 | 3 | |
| | CO2 | 1 | 3 | 2 | 2 | 1 | 3 | 1 | 1 | 2 | | 3 | 3 | 2 | 2 | 1 |
| | CO3 | | 2 | 2 | 2 | | 2 | 2 | | 1 | | 1 | | 1 | 3 | 2 |
| | CO4 | 1 | | 1 | 2 | 3 | | | | 2 | 3 | | 2 | | | 1 |
| | CO5 | | 3 | | 1 | 2 | 3 | 2 | 1 | | 2 | 2 | 1 | 3 | 1 | |
| | CO6 | 2 | | 1 | | | 1 | | | 1 | 1 | | | | 2 | 3 |

**PHY116 Engineering Physics**

| | | | |
|---|---|---|---|
| **School: School of Science and engineering** | | **Batch: 2019-2023** | |
| **Program: B.Tech** | | **Current Academic Year: 2019-20** | |
| **Branch: CS** | | **Semester: II** | |
| 1 | Course Code | PHY116 | |
| 2 | Course Title | Engineering Physics | |
| 3 | Credits | 3 | |
| 4 | Contact Hours (L-T-P) | 2-1-0 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | 1. To provide students an understanding of fundamentals of fibre optics and holography.<br>2. To provide knowledge of electricity and magnetism in line with phenomenon of electromagnetism and Maxwells equations.<br>3. To demonstrate Quantum mechanics in line with physics principles and theories. | |
| 6 | Course Outcomes | After the completion of this course,<br><br>CO1: Students will show that they have learned the basics of fiber optics and its applications.<br>CO2: Students will gain knowledge of principle of holography and its working phenomenon.<br>CO3: Students will learn the concepts of electricity and magnetism.<br>CO4: Students will be able to understand the significance and applications of Maxwell's equations.<br>CO5: Students will be able to know about the short comings of classical physics and will learn various quantum mechanical principles.<br>CO6: Students will have understanding of various concepts of physics and their applications in day to today life. | |
| 7 | Course Description | This course will help students to have deeper understanding of various fields of physics and their correlation with each other. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Fiber Optics and Holography** | |

| | | | |
|---|---|---|---|
| | A | Introduction, structure of optical fibre, Light guidance through optical fibre, Acceptance angle and Acceptance cone, Numerical aperture, | CO1, CO6 |
| | B | Types of optical fibres, Attenuation and Dispersion in optical fibre, Applications of optical fibres. | CO1, CO6 |
| | C | Basic principle of holography, Recording of holograms, Reconstruction process, Applications of holography. | CO2, CO6 |
| | **Unit 2** | **Electrostatics and Magnetostatics** | |
| | A | Coulomb's law, Electric field, electric field due to a point charge, electric flux, Gauss's theorem and its applications to find field due to infinitely long straight wire, | CO3, CO6 |
| | B | Electric potential, and potential difference, Biot-Savart law and its application to current carrying circular loop, | CO3 |
| | C | Ampere's law and its applications to infinitely long straight wire, and solenoids. | CO3 |
| | **Unit 3** | **Electromagnetism** | |
| | A | Electromagnetic induction; Faraday's law, induced emf and induced current; Lenz's Law, displacement current, | CO4, CO6 |
| | B | Maxwell's Equations in differential and integral form and their physical significance, | CO4 |
| | C | Application of Maxwell's equation in finding speed of light. | CO4 |
| | **Unit 4** | **Quantum Mechanics** | |
| | A | Inadequacy of classical Physics, Wave particle duality, de-Broglie wavelength, | CO5, CO6 |
| | B | Davisson-Germer experiment, Schrodinger wave equation, particle in a 1 dimensional box, | CO5 |
| | C | Quantum Entanglement and Quantum Cryptography (qualitative). | CO5 |
| | Mode of examination | Theory | |

| | | | | | |
|---|---|---|---|---|---|
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 1. Fundamentals of Electricity and Magnetism, D. N. Vasudeva, S. Chand & Co. New Delhi<br>2. Fundamentals of Physics, Halliday, Resnick and Walker, John Wiley. | | | |
| | Other References | 1. Electricity and Magnetism, J. Yarwood and J. H. Fewkes. University Tutorial Press (1991).<br>2. Lasers (Theory and Application): K.Thyagarajan & A.K.Ghatak<br>3. Introduction to fiber: A.K.Ghatak & K.Thyagarajan | | | |

**INSTRUCTIONAL PLAN**
**Academic Year: 2019-20 (Even Semester)**

| | |
|---|---|
| **School: School of Science and Engineering** | **Subject: Engineering Physics** |
| **Program: B.Tech** | **Subject Code: PHY116** |
| **Branch: CS** | **Instructor:** |

| **Scheme** | | | **Scheme of Examination** | | |
|---|---|---|---|---|---|
| L<br>2 | P<br>0 | T<br>1 | Internal Assessment<br>30% | Mid Term Examination<br>20% | End Term Examination<br>50% |

**Course outline**
In Conjunction with basic knowledge of various phenomenon of physics, the course discusses about the applications of new research areas such as fibre optics and holography. It also involves the brief study about quantum entanglement and quantum cryptography and their relevance with the subatomic particles.

| **Course Evaluation** | |
|---|---|
| Attendance | None |
| Homework | 4 Assignments -5 Marks |
| Quizzes | 4 Quizzes in Tutorial class -15 Marks |
| labs | None |
| Presentations | Presentation/Case Study/Project, 10 Marks |
| Any other | None |

| References : | |
|---|---|
| Text book | 1. Fundamentals of Electricity and Magnetism, D. N. Vasudeva, S. Chand & Co. New Delhi<br>2. Fundamentals of Physics, Halliday, Resnick and Walker, John Wiley. |
| Other References | 1. Electricity and Magnetism, J. Yarwood and J. H. Fewkes. University Tutorial Press (1991).<br>2. Lasers (Theory and Application): K.Thyagarajan & A.K.Ghatak<br>3. Introduction to fiber: A.K.Ghatak & K.Thyagarajan |
| Softwares | None |

| **Session No.** | **Unit** | **Outline syllabus** | **Evaluation Parameter** | **Pedagogy *** |
|---|---|---|---|---|
| 1 | Unit 1 A | Introduction, structure of optical fibre, | | |
| 2 | A | Light guidance through optical fibre, | | |
| 3 | A | Acceptance angle and Acceptance cone, Numerical aperture, | | |
| 4 | B | Types of optical fibres, | | |
| 5 | B | Attenuation and Dispersion in optical fibre, | | |
| 6 | B | Applications of optical fibres. | | |
| 7 | C | Basic principle of holography, | | |
| 8 | C | Recording of holograms, Reconstruction process, | | |
| 9 | C | Applications of holography. | 1 Assignment and 1 Quiz | |
| 10 | Unit 2 A | Coulomb's law, Electric field, | | |
| 11 | A | electric field due to a point charge, electric flux, | | |
| 12 | A | Gauss's theorem and its applications to find field due to infinitely long straight wire, | | |
| 13 | B | Electric potential, and potential difference, | | |

| | | | | |
|---|---|---|---|---|
| 14 | B | Biot-Savart law and its application to current carrying circular loop, | | |
| 15 | C | Ampere's law and its applications to infinitely long straight wire, | | |
| 16 | C | and solenoids. | 1 Assignment and 1 Quiz | |
| 17 | Unit 3 A | Electromagnetic induction; Faraday's law, | | |
| 18 | A | induced emf and induced current; | | |
| 19 | A | Lenz's Law, displacement current, | | |
| 20 | B | Maxwell's Equations in differential and integral form and their physical significance, | | |
| 21 | C | Application of Maxwell's equation in finding speed of light. | 1 Assignment and 1 Quiz | |
| 22 | Unit 4 A | Inadequacy of classical Physics, | | |
| 23 | A | Wave particle duality, de-Broglie wavelength, | | |
| 24 | B | Davisson-Germer experiment, | | |
| 25 | B | Schrodinger wave equation, | | |
| 26 | B | particle in a 1 dimensional box, | | |
| 27 | C | Quantum Entanglement and | | |
| 28 | C | Quantum Cryptography (qualitative). | 1 Assignment and 1 Quiz | |

*** Learning Centered, Learner Centered, Teaching Centered**

**Mapping of Course Outcomes vs. Topics**

| Outcome no. → Syllabus topic↓ | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **UNIT 1** | | | | | | |
| a | X | | | | | X |

| | | | | | | |
|---|---|---|---|---|---|---|
| b | X | | | | | X |
| c | | X | | | | X |
| **UNIT 2** | | | | | | |
| a | | | X | | | X |
| b | | | X | | | |
| c | | | X | | | |
| **UNIT 3** | | | | | | |
| a | | | | X | | X |
| b | | | | X | | |
| c | | | | X | | |
| **UNIT4** | | | | | | |
| a | | | | | X | X |
| b | | | | | X | |
| c | | | | | X | |

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO116.1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 |
| CO116.2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 2 |
| CO116.3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | - | 2 | 2 | 1 | 1 |
| CO116.4 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | - | 2 | 2 | 1 | 1 |
| CO116.5 | 3 | 3 | 3 | 2 | 1 | 2 | 2 | - | 2 | 3 | 2 | 3 |
| CO116.6 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | 2 | 2 | 1 | 3 |

| Schools: SET | | Batch : 2019-20<br>Current Academic Year: 2019-20<br>Semester: 2nd ( Second ) | |
|---|---|---|---|
| 1 | Course Code | **ARP102** | |
| 2 | Course Title | Communicative English -2 | |
| 3 | Credits | 2 | |
| 4 | Contact Hours (L-T-P) | 1-0-2 | |
| 5 | Course Objective | To Develop LSRW skills through audio-visual language acquirement, creative writing, advanced speech et al and MTI Reduction with the aid of certain tools like texts, movies, long and short essays. | |
| 6 | Course Outcomes | **CO1** Move from primary self-assessment to larger goal and vision statement realisation with the help of feature length films as enablers and multimedia as language facilitators.<br>**CO2** To develop a positive attitude through written expression of positive thought process and outlook with the help of writing activities like story completion et al.<br>**CO3** Learn advanced writing skills in English like full length essays et al.<br>**CO4** Master the science of speech and correct pronunciation through the accent-neutralisation program followed by reading sessions applying the lessons learnt. | |
| 7 | Course Description | The course takes the learnings from the previous semester to an advanced level of language learning and self-comprehension through the introduction of audio-visual aids as language enablers. It also leads learners to an advanced level of writing, reading, listening and speaking abilities, while also reducing the usage of L1 to minimal in order to increase the employability chances. | |
| 8 | Outline syllabus – ARP 102 | | |
| | **Unit A** | **Acquiring Vision, Goals and Strategies through Audio-visual Language Texts** | **CO Mapping** |
| | Topic 1 | Pursuit of Happiness / Goal Setting & Value Proposition in life | CO1 |
| | Topic 2 | 12 Angry Men / Ethics & Principles | |
| | Topic 3 | The King's Speech / Mission statement in life \| strategies & Action Plans in Life | |
| | | | |
| | **Unit B** | **Creative Writing** | |
| | Topic 1 | Story Reconstruction - Positive Thinking | CO2 |
| | Topic 2 | Theme based Story Writing - Positive attitude | |
| | Topic 3 | Learning Diary Learning Log – Self-introspection | |
| | | | |
| | **Unit C** | **Writing Skills 1** | |
| | Topic 1 | Precis | CO3 |
| | Topic 2 | Paraphrasing | |
| | Topic 3 | Essays (Simple essays) | |
| | | | |

| | | | |
|---|---|---|---|
| | **Unit D** | **MTI Reduction/Neutral Accent through Classroom Sessions & Practice** | |
| | Topic 1 | Vowel, Consonant, sound correction, speech sounds, Monothongs, Dipthongs and Tripthongs | CO4 |
| | Topic 2 | Vowel Sound drills , Consonant Sound drills, Affricates and Fricative Sounds | |
| | Topic 3 | Speech Sounds \| Speech Music\| Tone \| Volume\| Diction \|Syntax \|Intonation \| Syllable Stress \| | |
| | | | |
| | **Unit E** | **Gauging MTI Reduction Effectiveness through Free Speech** | |
| | Topic 1 | Jam sessions | *N/A* |
| | Topic 2 | Extempore | |
| | Topic 3 | Situation-based Role Play | |
| 9 | Evaluations | *Class Assignments/Free Speech Exercises / JAM Group Presentations/Problem Solving Scenarios/GD/Simulations ( 60% CA and 40% ETE* | *N/A* |
| 10 | Texts & References \| Library Links | • Wren, P.C.&Martin H. *High English Grammar and Composition*, S.Chand& Company Ltd, New Delhi.<br>• Blum, M. Rosen. *How to Build Better Vocabulary*. London: Bloomsbury Publication<br>• Comfort, Jeremy(et.al). *Speaking Effectively*. Cambridge University Press.<br>The Luncheon by W.Somerset Maugham - http://mistera.co.nf/files/sm_luncheon.pdf | |

**Observations**:

1. A Single Consolidated Syllabus has now replaced the Previous Functional English Beginners -2 and Functional English Intermediate -2
2. Credits previously allocated to FEN 02 the Lab Sessions have been dissolved
3. The Pearson Voice Labs have been completely eliminated
4. Max Students Size =80/Batch

| CO | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | | | | | 1 | 1 | 1 | 1 | 1 | | | |
| CO2 | | | 1 | | | | | | | | 1 | |
| CO3 | | | | | | | | | | 1 | | |
| CO4 | | | | | | | | | | 1 | | |

# Multimedia Application Lab

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2019** | |
| **Program: B.Tech/BCA** | | **Current Academic Year: 2020** | |
| **Branch: CSE** | | **Semester:** | |
| **1** | **Course Code** | **CSP103** | **Multimedia Application Lab** |
| **2** | **Course Title** | **Multimedia Application Lab** | |
| **3** | **Credits** | **1** | |
| **4** | **Contact Hours (L-T-P)** | **0-0-2** | |
| | **Course Status** | **CORE** | |
| 5 | Course Objective | The objective of this course is to teach the principles of how different types of media can be processed and presented by computers with applications. It introduces how multimedia can be used in various application areas. It provides a solid foundation to the students so that they can identify the proper applications of multimedia, evaluate the appropriate multimedia systems and develop effective multimedia applications. In this Students will understand multimedia in respect to many applications, hardware and software needed to create projects using creativity and organization to create them, develop multimedia skills understanding the principal players of individual players in multimedia teams in developing projects, work with all aspects of images, sound, video, multimedia planning, designing, producing and present their multimedia projects. | |
| 6 | Course Outcomes | Students will be able to have thorough Understanding of:<br><br>CO1-***Define:*** Fundamentals of Multimedia with software tools<br>CO2- ***Illustrate:*** Different Graphics designing techniques with open software<br>CO3- ***Apply:*** Software tools for web page design and animation<br>CO4- ***Analyze:*** the Software tools of Multimedia applications<br>CO5- ***Compare:*** various tools available for Multimedia applications<br>CO6- ***Choose:*** The appropriate techniques for designing graphics designing and Animation of multimedia. | |
| 7 | Course Description | In this course students will learn basic introduction of Flash, Dreamweaver, and image, audio and video editing with animation techniques. | |
| 8 | Outline syllabus | | CO Mapping |
| | 1 | Introduction to Flash | CO1, CO2, CO3 |
| | 2 | Introduction to Corel draw and Dreamweaver | CO1, CO2, CO3 |
| | 3 | Fundamentals of design & drawing | CO1, CO2, CO3 |
| | 4 | Concepts of graphic & illustration | CO2, CO3, |
| | 5 | Graphic design | CO2, CO3, |
| | 6 | Image editing | CO2, CO3, |
| | 7 | Page layout | CO3, CO4, |
| | 8 | Concepts of web design | CO3, CO4, |
| | 9 | Web page designing | CO3, CO4, |
| | 10 | Interactive design | CO3, CO4, CO5 |
| | 11 | Video editing | CO4, CO5, CO6 |
| | 12 | Sound editing | CO4, CO5, CO6 |
| | 13 | Responsive web design | CO4, CO5, CO6 |
| | 14 | Animation & interactivity for web | CO4, CO5, CO6 |

| | | | | | |
|---|---|---|---|---|---|
| | 15 | Basics of 2D animation, Digital storyboarding, Digital 2D animation | | | CO4, CO5, CO6 |
| | | | | | |
| | Weightage Distribution | | MTE | ETE | |
| | | | 20% | 50% | |
| | **Text book/s*** | | | | |
| | **Reference Books** | Multimedia: Computing, Communications and Applications By Ralf Steinmetz | | | |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | ***Define:*** Fundamentals of Modelling and Animation | PO1, PO2, PO3, PO10 |
| 2. | ***Illustrate:*** Different techniques to create objects | PO1, PO2, PO3, PO4, PO6, PO9, PO10 |
| 3. | ***Apply:*** Rendering and animation | PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8 |
| 4. | ***Analyze:*** the objects using modifiers in Animation | PO1, PO2, PO3, PO4, PO8, PO9, PO10 |
| 5. | ***Measure:*** the objects in animation | PO1, PO2, PO3, PO8, PO9, PO10 |
| 6. | ***Choose:*** The appropriate techniques for designing Animation | PO1, PO2,PO3, PO4, PO5, PO6, PO7 |

**PO and PSO mapping with level of strength for Computer Modeling and Animation (Course Code CSP103)**

| Course Objectives | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 2 | 3 | 2 | - | - | - | 3 | 2 | 2 |
| CO2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | 2 | 3 | 2 | 2 |
| CO3 | 2 | 2 | 3 | 3 | - | 3 | 3 | 3 | - | 3 | 1 | 2 |
| CO4 | 2 | 2 | 3 | 3 | - | - | - | 3 | 3 | 3 | 2 | 3 |
| CO5 | 2 | 2 | 3 | - | - | - | - | 3 | 3 | 3 | 1 | 1 |
| CO6 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | - | - | - | 2 | 1 |
| | 2.4 | 2.5 | 2.6 | 2.3 | 1.5 | 1.8 | 1.5 | 1.5 | 1.3 | 2.5 | 1.6 | 1.8 |

- **Note: Software Required CorelDRAW, Adobe Illustrator, HTML & HTML5, Dreamweaver, Animate CC, CSS, Muse, Layar, Wordpress, Storyboard Pro Harmony**

**Syllabus:** CSP 114: Application based programming in Python Lab

| | | | |
|---|---|---|---|
| **School:** | | **School of Engineering and technology** | |
| **Department** | | **Department of Computer Science and Engineering** | |
| **Program:** | | **B.Tech.** | |
| **Branch:** | | **CSE** | |
| 1 | Course Code | CSP114 | |
| 2 | Course Title | Application Based Programming in Python Lab | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | Emphasis is placed on procedural programming, algorithm design, and language constructs common to most high level languages through Python Programming. | |
| 6 | Course Outcomes | Upon successful completion of this course, the student will be able to:<br>CO1: Develop program based on procedural statements like assignments, conditional statements and loops.<br>CO2: Compare and implement different data types of python.<br>CO3: Create programs by using function and function call.<br>CO4: Formulate clear and accurate logical solution by using OOPS<br>CO5: Apply different modules, packages available in python.<br>CO6: Design real life situational problems and think creatively about solutions of them. | |
| 7 | Course Description | Python is a language with a simple syntax, and a powerful set of libraries. It is widely used in many scientific areas for data exploration. This course is an introduction to the Python programming language for students without prior programming experience. We cover data types, control flow, object-oriented programming. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Practical based on conditional statements and control structures** | |
| | | 1. Program to implement all conditional statements<br>2. Program to implement different control structures | CO1,C06 |
| | **Unit 2** | **Practical related to List, Tuples and dictionaries** | |
| | | 1. Program to implement operations on lists<br>2. Program to implement operations on Dictionary<br>**3.** Program to implement operations on Tuple | CO2,CO6 |
| | **Unit 3** | **Practical related to Functions and Exception Handling** | |
| | | 1. Program to implement Exception Handling<br>**2.** Program to use different functions | CO3,CO6 |
| | **Unit 4** | **Practical related to Object Oriented Programming** | |
| | | 1. Program to use object oriented concepts like inheritance, overloading polymorphism etc.<br>2.Program for file handling | CO4,CO6 |

| | | | | | |
|---|---|---|---|---|---|
| | **Unit 5** | **Practical related to Modules and Applications** | | | |
| | | 1.Program to use modules and package<br>2.Program to implement searching and sorting | | | CO5,CO6 |
| | Mode of examination | Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | 0% | 40% | |
| | Text book/s* | 2. The Complete Reference Python, Martin C. Brown, McGraw Hill | | | |
| | Other References | 5. Introduction to computing in problem solving using Python, E Balagurusamy, McGraw Hill<br>6. Introduction to programming using Python, Y. Daniel Liang, Pearson<br>7. Mastering Python, Rick Van Hatten, Packet Publishing House<br>Starting out with Python, Tony Gaddis, Pearson | | | |

## CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: Develop program based on procedural statements like assignments, conditional statements and loops. | PO1,PO2,PO3,PO4,PO8,PO12,PSO2 |
| 2. | CO2: Compare and implement different data types of python. | PO1,PO2,PO3,PO4,PO5,PO8,PO12,PSO2,PSO3 |
| 3. | CO3: Create programs by using function and function call. | PO1,PO2,PO3,PO4,PO5,PO6,PO8,PO12, PSO1,PSO2,PSO3 |
| 4. | CO4: Formulate clear and accurate logical solution by using OOPS | PO1,PO2,PO3,PO4,PO5,PO6,PO8,PO12, PSO1,PSO2,PSO3 |
| 5. | CO5: Apply different modules, packages available in python. | PO1,PO2,PO3,PO4,PO5,PO6,PO8,PO12, PSO1,PSO2,PSO3 |
| 6. | CO6: Design real life situational problems and think creatively about solutions of them. | PO1,PO2,PO3,PO4,PO5,PO6,PO8,PO12, PSO1,PSO2,PSO3 |

**PO and PSO mapping with level of strength for Course Name-**Application Based Programming in Python Lab **(Course Code CSP 114)**

| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP114_Application Based programming in Python Lab | CO1 | 1 | 1 | 1 | 1 | | | | 2 | | | | 2 | | 1 | |
| | CO2 | 2 | 2 | 1 | 1 | 2 | | | 2 | | | | 2 | | 1 | 1 |
| | CO3 | 2 | 2 | 1 | 1 | 1 | 1 | | 2 | | | | 2 | 1 | 2 | 1 |
| | CO4 | 2 | 2 | 2 | 2 | 1 | 1 | | 2 | | | | 2 | 2 | 2 | 1 |
| | CO5 | 2 | 2 | 2 | 2 | 2 | 2 | | 2 | | | | 2 | 2 | 2 | 2 |
| | CO6 | 3 | 3 | 2 | 2 | 2 | 3 | | 2 | | | | 2 | 2 | 2 | 2 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP114 | Application Based programming in Python Lab | 2 | 2 | 1.5 | 1.5 | 1.3 | 1.2 | - | 2 | - | - | - | 2 | 1.2 | 1.7 | 1.2 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

| School: SET | | Batch : 2018-2022 |
|---|---|---|
| Program: B.Tech | | Current Academic Year: 2018 |
| Branch: Mechanical Engineering | | Semester: II |
| 1 | Course Code | MEP 105 |
| 2 | Course Title | **Mechanical Workshop** |
| 3 | Credits | 1.5 |
| 4 | Contact Hours (L-T-P) | 0-0-3 |
| | Course Status | Compulsory |
| 5 | Course Objective | The objective of this course is to make the students, familiar with the modern day manufacturing processes, introduce them to various hand tools and equipment, acclimatize with the measuring devices, and perform basic machine tool operations in various machine tools. |
| 6 | Course Outcomes | After successful completion of this course, students will be able to<br>CO1: Apply 5S (Seiri, Seiton, Seiso, Seiketsu and Shitsuke ) methodology at workplace.<br>CO2: Select the various hand tools used in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc.<br>CO3: Choose different measuring devices according to the job<br>CO4: Differentiate between various machine tools and their operation<br>CO5: Classify and select suitable tools for machining processes including turning, facing, thread cutting and tapping, milling, drilling and shaping.<br>CO6: Apply the knowledge for advance manufacturing experiments. |
| 7 | Course Description | **Black Smithy Shop:** Simple exercises based on black smithy operations such as upsetting, practice of S -Hook from circular bar using hand forging operations.<br>**Carpentry Shop :** Study of different types of wood , Carpentry Tools, Equipment and different joints, Practice of T joint, cross lap joint, Mortise and Tenon T joint, Bridle T joint<br>**Fitting Shop:** Preparation of Square joint, V joint, half round joint, dovetail jointas per the given specifications, which contains: Sawing, Filing, Grinding, and Practice marking operations.<br>**Sheet Metal Shop:** Study of galvanized Iron (G.I.) Sheet material properties, hand tools and sheet metal machines, and projective geometry, demonstration of different sheet metal operations and practice of development of Tray, cylinder, hopper, funnel etc.<br>**Welding Shop:** Introduction, Study of Tools and welding Equipment (Gas and Arc welding), Selection of welding electrode and current, Bead practice and Practice of Butt Joint, Lap Joint.<br>**Machine Shop:** Study of machine tools in particular Lathe machine (different parts, different operations, study of cutting tools), Demonstration of different operations on Lathe machine, Practice of Facing, Plane Turning, step turning, taper turning, knurling and parting and Study of Quick return mechanism of Shaper.<br>**Foundry Shop:** Introduction to foundry, Patterns, pattern allowances, ingredients of moulding sand and melting furnaces. Foundry tools and their purposes, Demo of mould preparation and Practice – Preparation of mould by using split pattern. |
| 8 | Outline syllabus | CO Mapping |

| | | | | | |
|---|---|---|---|---|---|
| | **List of Experiments** | | | | |
| | **Experiment 1** | To make a S shaped hook from a given circular rod using hand forging technique. | | | CO4 |
| | **Experiment 2** | To make a dovetail lap joint in Carpentry shop. | | | CO2,CO3 |
| | **Experiment 3** | To make a cross-half lap joint in Carpentry shop. | | | CO2,CO3 |
| | **Experiment 4** | To make a square fit from the given mild steel pieces in fitting shop. | | | CO3,CO5 |
| | **Experiment 5** | To prepare a V-Fit from the given mild steel pieces in fitting shop. | | | CO3, CO5 |
| | **Experiment 6** | To make a rectangular tray of specified dimensions in sheet metal shop. | | | CO2, CO5 |
| | **Experiment 7** | To make a Lap joint, using the given mild steel pieces using arc welding. | | | CO3, CO5 |
| | **Experiment 8** | To perform step turning and taper turning operations on the given work piece | | | CO5 |
| | **Experiment 9** | To prepare a sand mold, using the given single piece pattern | | | CO2 |
| | **Experiment 10** | To prepare a sand mold, using the given Split-piece pattern. | | | CO2 |
| | Mode of examination | Practical | | | |
| | Weight- age Distribution | CA | MTE | ETE | |
| | | 60% | 0% | 40% | |
| | Text book/s* | 1. Raghuwanshi B.S., Workshop Technology Vol. I & II, DhanpathRai& Sons.<br>2. Kannaiah P. and Narayana K.L., Workshop Manual, 2nd Edn, Scitech publishers.<br>3. John K.C., Mechanical Workshop Practice. 2nd Edn. PHI 2010.<br>4. JeyapoovanT.andPranitha S., Engineering Practices Lab Manual, 3rd Edn. Vikas Pub.2008. | | | |

**Program Outcome Vs Courses Mapping Table:**

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO105.1 | 1 | - | - | - | - | 2 | - | - | - | - | - | 2 | - | - | - |
| CO105.2 | 1 | - | - | - | 1 | 2 | - | - | - | - | - | 1 | 1 | - | 1 |
| CO105.3 | 2 | - | 1 | - | 1 | 2 | - | - | - | - | - | 2 | 1 | - | 1 |
| CO105.4 | 2 | - | 1 | - | 2 | 2 | - | - | - | - | - | 2 | 1 | - | 1 |
| CO105.5 | 2 | - | 1 | - | 2 | 2 | - | - | - | - | - | 2 | 2 | - | 1 |
| CO105.6 | 2 | - | 1 | - | 2 | 2 | - | - | - | - | - | 2 | 2 | - | 1 |
| **CO105** | **2** | **-** | **1** | **-** | **2** | **2** | **-** | **-** | **-** | **-** | **-** | **2** | **2** | **-** | **1** |

**1-Slight (Low)** **2-Moderate (Medium)** **3-Substantial (High)**

# Engineering Chemistry Lab (CHY-161)

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch: 2018 – 22** | |
| **Program: BTech** | | **Current Academic Year: 2018 – 19** | |
| **Branch: All** | | **Semester: I** | |
| 1 | Course Code | CHY-161 \| Course Name: Engineering Chemistry Lab | |
| 2 | Course Title | Engineering Chemistry Lab | |
| 3 | Credits | 2 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Basic Engineering | |
| 5 | Course Objective | 1. To learn methods for preparation of solution of different concentration, their standardization<br>2. To learn quantitative estimation of different chemical species by various volumetric methods.<br>3. To understand the practical concepts of reaction kinetics<br>4. To understand the procedure for testing of COD of water samples. | |
| 6 | Course Outcomes | CO1.Prepare solutions of different strength and standardize them.<br>CO2.Estimate water alkalinity and hardness and hence water quality, the chloride ion/residual chlorine after disinfection<br>CO3.Understand the different order of reactions like Zero, First and Second order.<br>CO4.Prepare simple thermosetting polymers at small scale in laboratory.<br>CO5.Understand the importance of microbial free water by testing for COD.<br>CO6.Understand the basics of analytical chemistry which may be helpful to perform major engineering applications. | |
| 7 | Course Description | This course include various titration methods like acid-base titration, complexometric titration, precipitation titration etc. It also describe various calculations and units frequently used in analytical chemistry. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Preparation of standard solution** | **06** |
| | A | To prepare N/10 normality solution of sodium carbonate and use it to standardize the given hydrochloric acid solution. | CO1, CO6 |
| | B | To prepare N/30 normality solution of potassium dichromate and use it to standardize the given hypo solution. | |
| | C | To determine the strength of given HCl solution by titrating with standard NaOH solution by (a)Indicator method (b) pH metrically | |
| | **Unit 2** | **Analysis of water** | **08** |
| | A | To determine the amount and constituents of alkalinity of given water sample. | CO2, CO6 |

| | | | | | |
|---|---|---|---|---|---|
| | B | To determine the hardness of water by EDTA method. | | | |
| | C | To determine the chloride content in water by Mohr's Method. | | | |
| | D | To determine the residual chlorine in the given water sample. | | | |
| | **Unit 3** | **Synthesis of polymer** | | | **02** |
| | A | Preparation of Bakelite and Urea formaldehyde resin. | | | CO3, CO6 |
| | **Unit-4** | **Determination of kinetic parameters** | | | **04** |
| | | To determine the rate constant and order of the reaction of hydrolysis of an ester catalyzed by an acid. | | | CO4, CO6 |
| | | To determine the rate constant of hydrolysis of ethyl acetate with NaOH and show that the reaction is of second order. | | | |
| | **Unit-5** | **Determination of COD** | | | **02** |
| | | To determine the chemical oxygen demand (COD) in the given water sample. | | | CO5,CO6 |
| | | | | | |
| | | **Total Hours** | | | **22** |
| | Mode of examination | Practical | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | None | 40% | |
| | Text book/s* | Text book | | | |
| | Other References | Other References | | | |

**CO and PO Mapping**

| | |
|---|---|
| CO1 | Prepare solutions of different strength and standardize them. |
| CO2 | the chloride ion/residual chlorine after disinfection |
| CO3 | Understand the different order of reactions like Zero, First and Second order. |
| CO4 | Prepare simple thermosetting polymers at small scale in laboratory. |
| CO5 | Understand the importance of microbial free water by testing for COD. |
| CO6 | Understand the basics of analytical chemistry which may be helpful to perform major engineering applications. |

**Note: Up to Unit 2C to be covered in the MTE.**
Mapping with Pos and PSOs of CS and IT

| **COs** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 2 | 3 | 1 | - | 2 | 1 | 2 | - | 3 | 3 | 2 | 2 | - | - |
| **CO2** | 2 | 3 | 1 | - | 2 | 1 | 2 | - | 3 | 3 | 2 | 2 | - | - |
| **CO3** | 2 | 3 | 1 | - | 2 | 1 | 2 | - | 3 | 3 | 2 | 2 | - | - |
| **CO4** | 2 | 3 | 1 | - | 2 | 1 | 2 | - | 3 | 3 | 2 | 2 | - | - |
| **CO5** | 2 | 2 | 2 | - | 2 | 1 | 1 | - | 3 | 3 | 1 | 2 | - | - |
| **CO6** | 2 | 2 | 2 | - | 2 | 1 | 1 | - | 3 | 3 | 1 | 2 | - | - |

| | | | |
|---|---|---|---|
| **School: School of Engineering and Technology** | | **Batch: 2019-2023** | |
| **Program: B.Tech.** | | **Current Academic Year: 2019-20** | |
| **Branch: Physics** | | **Semester: I, II** | |
| 1 | Course Code | PHY 162 | |
| 2 | Course Title | Physics Lab 2 | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | To gain practical knowledge by applying the experimental methods to correlate with the Physics theory. | |
| 6 | Course Outcomes | On successful completion of the course the students will have:<br>CO1: Knowledge and study of basic physics experiments based on Semiconductors, energy band gap, planck constant etc.<br>CO2: Use the concept of electricity and magnetism to find out variation of magnetic field through a current carrying coil and hall effect<br>CO3: Understand and learn how to determine specific resistance<br>CO4: Understand and perform laser-based experiments.<br>CO5: Knowledge and study of various optical experiments.<br>CO6: Apply the mathematical concepts/equations to obtain quantitative results and ability to conduct, analyze and interpret experiments | |
| 7 | Outline Syllabus | | CO Mapping |
| | Unit 1 | | |
| | A<br>B<br>C | 13. To determine Energy band gap of a semiconductor using Four Probe method.<br>14. To determine the variation of magnetic field along the axis of a current carrying coil and estimate the radius of the coil.<br>15. To study Hall effect and determine the Hall coefficient, carrier density and the mobility of a semiconductor material | CO1<br>CO2,CO6 |
| | Unit 2 | | |
| | A<br>B<br>C | 16. To draw hysteresis curve (B-H curve) of a specimen in the form of a transformer on a C.R.O. And to determine its hysteresis loss<br>17. To determine the Planck's constant by measuring radiation in a fixed spectral range.<br>18. To determine the specific resistance of the material of a given wire using Carey Foster's bridge. | CO2,CO6 |
| | Unit3 | | |
| | A<br>B<br>C | 19. To determine the diameter of thin wire by diffraction using laser.<br>20. To determine the wavelength of laser light by diffraction at a single slit.<br>21. To determine slit width of single and double slit by using Laser. | CO3,CO6<br>CO4,CO6 |
| | Unit 4 | | |
| | A | 22. To determine the wavelength of prominent lines of | |

| | | | |
|---|---|---|---|
| | B<br>C | mercury by plane diffraction grating.<br>23. To determine the wavelength of monochromatic light by Newton's Ring method. | CO4,CO6 |
| | Unit 5 | | |
| | A<br>B<br>C | 24. To determine the focal length of the combination of two lenses separated by a distance with the help of a nodal slide and to verify the formula.<br>25. To verify Stefan's Law. | CO5,CO6<br><br>CO5,CO6 |
| | Mode of Examination | Practical/Viva | |
| | Weightage Distribution | CA: 60% / MTE: 0% / ETE: 40% | |
| | Text books | 3. B.Sc. Practical Physics- Harnam Singh, S. Chand Publishing.<br>4. B.Sc. Practical Physics- C L Arora, S. Chand Publishing. | |
| | Other References | 3. Geeta Sanon, BSc Practical Physics, 1st Edn. (2007), R. Chand & Co.<br>4. B. L. Worsnop and H. T. Flint, Advanced Practical Physics, Asia Publishing House, New | |

**Instructional Plan**

Academic Year: 2019-20 (Odd Semester)

| | |
|---|---|
| **School: School of Engineering and Technology** | **Subject: Physics Lab 2** |
| **Program: B.Tech.** | **Subject Code: PHY162** |
| **Branch: Physics** | **Instructor:** |

| **Scheme** | | | **Scheme of Examination** | | |
|---|---|---|---|---|---|
| L | P | T | Internal Assessment | Mid Term Examination | End Term Examination |
| 0 | 0 | 1 | 60% | 0% | 40% |

**Course Outline**

The list of experiments provides closure between the theoretical results and experimental readings taken in the physics laboratory. The Demonstration of each and every experiment helps the students to take up data independently and work on various research problems of physics.

| **Course Evaluation** | |
|---|---|
| Attendance | None |
| Any Other | CA judged on the practical conducted in the lab, weight age may be specified |
| References: | |
| Text book | 3. B.Sc. Practical Physics- Harnam Singh, S. Chand Publishing.<br>4. B.Sc. Practical Physics- C L Arora, S. Chand Publishing. |
| Other References | 3. GeetaSanon, BSc Practical Physics, 1st Edn. (2007), R. Chand & Co.<br>4. B. L. Worsnop and H. T. Flint, Advanced Practical Physics, Asia Publishing House, New |
| Softwares | None |

| | | | |
|---|---|---|---|
| Week 1 | **Unit 1** | **Practical related to** | |
| | a, b, c | Lab expt. 1 | To determine Energy band gap of a semiconductor using Four Probe method. |
| Week 2 | **Unit 1** | **Practical related to--** | |
| | a, b, c | Lab expt. 1 | To determine Energy band gap of a semiconductor using Four Probe method. |

| | | | |
|---|---|---|---|
| Week 3 | **Unit 1** | **Practical related to—** | |
| | a, b, c | Lab expt. 2 | To determine the variation of magnetic field along the axis of a current carrying coil and estimate the radius of the coil. |
| Week 4 | **Unit 1** | **Practical related to--** | |
| | a, b, c | Lab expt. 3 | To study Hall effect and determine the Hall coefficient, carrier density and the mobility of a semiconductor material. |
| Week 5 | **Unit 2** | **Practical related to--** | |
| | a, b, c | Lab expt. 4 | To draw hysteresis curve (B-H curve) of a specimen in the form of a transformer on a C.R.O. And to determine its hysteresis loss. |
| Week 6 | **Unit 2** | **Practical related to-- Unit 2** | |
| | a, b, c | Lab expt. 5 | To determine the Planck's constant by measuring radiation in a fixed spectral range. |
| Week 7 | **Unit 2** | **Practical related to-- Unit 2** | |
| | a, b, c | Lab expt. 6 | To determine the specific resistance of the material of a given wire using Carey Foster's bridge. |
| Week 8 | **Unit 3** | **Practical related to-- Unit 3** | |
| | a, b, c | Lab expt. 7 | To determine the diameter of thin wire by diffraction using laser |
| Week 9 | **Unit 3** | **Practical related to-- Unit 3** | |
| | a, b, c | Lab expt. 8 | To determine the wavelength of laser light by diffraction at a single slit. |
| Week 10 | **Unit 3** | **Practical related to-- Unit 3** | |
| | a, b, c | Lab expt. 9 | To determine slit width of single and double slit by using Laser. |
| Week 11 | **Unit 4** | **Practical related to-- Unit 4** | |
| | a, b, c | Lab expt. 10 | To determine the wavelength of prominent lines of mercury by plane diffraction grating. |
| Week 12 | **Unit 4** | **Practical related to-- Unit 4** | |
| | a, b, c | Lab expt. 11 | To determine the wavelength of monochromatic light by Newton's Ring method. |
| Week 13 | **Unit 4** | **Practical related to-- Unit 4** | |
| | a, b, c | Lab expt. 11 | To determine the wavelength of monochromatic light by Newton's Ring method. |
| Week 14 | **Unit 5** | **Practical related to-- Unit 5** | |
| | a, b, c | Lab expt. 12 | To determine the focal length of the combination of two lenses separated by a distance with the help of a nodal slide and to verify the formula. |
| Week 15 | **Unit 5** | **Practical related to-- Unit 5** | |
| | a, b, c | Lab expt. 12 | To determine the focal length of the combination of two lenses separated by a distance with the help of a nodal slide and to |

| | | | |
|---|---|---|---|
| | | | verify the formula. |
| Week 16 | **Unit 5** | **Practical related to-- Unit 5** | |
| | a, b, c | Lab expt. 13 | To verify Stefan's Law. |

Mapping of Course Outcomes vs. Topics

| Outcome no. → / Syllabus topic ↓ | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Unit 1 A | X | | | | | X |
| Unit 1 B | X | | | | | X |
| Unit 1 C | | X | | | | X |
| Unit 2 A | | X | | | | X |
| Unit 2 B | | X | | | | X |
| Unit 2 C | | X | | | | X |
| Unit 3 A | | | X | | | X |
| Unit 3 B | | | X | | | X |
| Unit 3 C | | | | X | | X |
| Unit 4 A | | | | X | | X |
| Unit 4 B | | | | X | | X |
| Unit 4 C | | | | X | | X |
| Unit 5 A | | | | | X | X |
| Unit 5 B | | | | | X | X |
| Unit 5 C | | | | | X | X |

| Cos | PO 1 | PO2 | PO3 | PO4 | PO5 | PO 6 | PO 7 | PO 8 | PO 9 | PO10 | PO11 | PO12 | PSO1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO162.1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO162.2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO162.3 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO162.4 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO162.5 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO162.6 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |

# TERM-III

## BTY 223 INTRODUCTIONS TO BIOLOGY FOR ENGINEERS

| | | | |
|---|---|---|---|
| 1 | Course number | **BTY 223** | |
| 2 | Course Title | **Introduction to Biology for Engineers** | |
| 3 | Credits | 2 | |
| 4 | Contact Hours (L-T-P) | 2-0-0 | |
| 5 | Course Objective | Students will be introduced to the functions and interactions of biological systems from a quantitative perspective. To provide a foundation in biology with engineering of living systems and to apply various tools of traditional engineering fields. To harness potential of living systems for the benefit of human mankind. | |
| 6 | Course Outcomes | After successfully completion of this course students will be able to:<br>1. To understand the fundamentals of living things, their classification, cell structure and biochemical constituents.<br>2. To apply the concept of plant, animal and microbial systems and growth in real life situations.<br>3. To comprehend genetics and the immune system.<br>4. To know the cause, symptoms, diagnosis and treatment of common diseases.<br>5. To give a basic knowledge of the applications of biological systems in relevant industries.<br>6. Understand importance of biological components in everyday life | |
| 7 | Outline syllabus: | | |
| 7.01 | XXXNNN.A | **Unit A** | **UNIT I: INTRODUCTION TO LIFE** |
| 7.02 | XXXNNN.A1 | Unit A Topic 1 | Characteristics of living organisms |
| 7.03 | XXXNNN.A2 | Unit A Topic 2 | Cell theory |
| 7.04 | XXXNNN.A3 | Unit A Topic 3 | Structure of prokaryotic and eukaryotic cell |
| 7.05 | XXXNNN.B | **Unit B** | **UNIT II: Biomolecules** |
| 7.06 | XXXNNN.B1 | Unit B Topic 1 | General classification and important functions of carbohydrates and lipids |
| 7.07 | XXXNNN.B2 | Unit B Topic 2 | General classification and important functions of proteins |
| 7.08 | XXXNNN.B3 | Unit B Topic 3 | General classification and important functions of DNA and RNA |
| 7.09 | XXXNNN.C | **Unit C** | **UNIT III: Genetics and Immune system** |
| 7.10 | XXXNNN.C1 | Unit C Topic 1 | Theories of Evolution |
| 7.11 | XXXNNN.C2 | Unit C Topic 2 | Mendel's laws of inheritance |
| 7.12 | XXXNNN.C3 | Unit C Topic 3 | Immune system and Immunity |
| 7.13 | XXXNNN.D | **Unit D** | **UNIT IV: Human Diseases** |
| 7.14 | XXXNNN.D1 | Unit D Topic 1 | Genetic diseases and Infectious diseases |
| 7.15 | XXXNNN.D2 | Unit D Topic 2 | AIDS and Diabetes |
| 7.16 | XXXNNN.D3 | Unit D Topic 3 | Cancer and its causes |
| 7.17 | XXXNNN.E | **Unit E** | **UNIT V: Biology and its industrial application** |
| 7.18 | XXXNNN.E1 | Unit E Topic 1 | Vaccines and their types |
| 7.19 | XXXNNN.E2 | Unit E Topic 2 | Bioremediation and biofertilizers |
| 7.20 | XXXNNN.E3 | Unit E | Bioreactors |

| | | | |
|---|---|---|---|
| | | Topic 3 | |
| 8 | Course Evaluation | | |
| 8.1 | Course work: 30% marks | | |
| 8.11 | Attendance | None | |
| 8.12 | Assignments | 5 marks | |
| 8.13 | Quizzes | 20 marks | |
| 8.14 | Presentations | 5 marks | |
| 8.15 | Any other | None | |
| 8.16 | MTE | 20 marks | |
| 8.18 | End-term examination: 50 marks | | |
| 8.19 | References | | |
| 8.20 | Text book | 1. Karp, G. *Cell and Molecular Biology, 5th ed.*, John Wiley and Sons, Inc. | |
| 8.21 | Other References | 1. Alberts, B. et al. *Essential Cell Biology*, Garland Publishing, Inc. (ISBN: 081533480X) 4.<br>2. Berger, S. et al. *Introduction to Bioengineering*, Oxford University Press (ISBN: 978-0-19-856515-4) | |

**Mapping of Outcomes vs. Topics**

CSE mapping

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 1 | - | - | - | 1 | 3 | - | - | - | - | 3 | - | - | - |
| CO2 | 3 | 2 | - | - | - | 2 | - | - | - | - | - | 3 | - | - | - |
| CO3 | 3 | 3 | 3 | 1 | 1 | 3 | 3 | 2 | 1 | 3 | - | 3 | 1 | 1 | - |
| CO4 | 3 | 2 | - | - | - | 2 | 2 | 3 | 1 | 2 | - | 3 | 1 | - | - |
| CO5 | 3 | 1 | 1 | 1 | 3 | 1 | 3 | 2 | 1 | 2 | 1 | 3 | 1 | 1 | - |
| CO6 | 3 | 3 | 1 | 1 | 2 | 3 | 5 | 1 | 1 | 1 | - | 3 | 1 | - | - |

## Syllabus: CSE242, Data Structures

| | | | |
|---|---|---|---|
| **School:** SET | | **Batch :**2019-23 | |
| **Program:** B.Tech. | | **Current Academic Year:** 2019-20 | |
| **Branch:**CSE/IT | | **Semester:**III | |
| 1 | Course Code | CSE242 | |
| 2 | Course Title | Data Structures | |
| 3 | Credits | 3 | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | |
| | Course Status | Core | |
| 5 | Course Objective | 1. Learn the basic concepts of Data Structures and algorithms.<br>2. Design and Implementation of Various Basic and Advanced Data Structures.<br>3. Learn the concepts of various searching, Sorting and Hashing Techniques.<br>4. Choose the appropriate data structures and algorithm design method for a specified application. | |
| 6 | Course Outcomes | CO1: **Select** appropriate data structures as applied to specified problem definition.<br>CO2: **Choose** the suitable data structures like arrays, linked list, stacks and queues to solve real world problems efficiently.<br>CO3 **Represent** and manipulate data using nonlinear data structures like trees and graphs to design algorithms for various applications.<br>CO4: **Compare** various techniques for searching and sorting.<br>CO5: **Design** and implement an appropriate hashing function for an application<br>CO6: **Formulate** new solutions for programing problems or improve existing code using learned algorithms and data structures | |
| 7 | Course Description | This course starts with an introduction to data structures with its classification, efficiency of different algorithms, array and pointer based implementations and Recursive applications. As the course progresses the study of Linear and Non-Linear data structures are studied in details. The course talks primarily about Linked list, stacks, queue, Tree structure, Graphs etc. This Course also deals with the concept of searching, sorting and hashing methods. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Introduction** | |
| | A | Data Structure – Definition, Operations and Applications, Abstract Data Types, Algorithm – Definition, Introduction to Complexity, Big OH notation, Time and Space tradeoffs. | CO1 |
| | B | Dynamic Memory Allocation( Malloc, calloc, realloc, free), Recursion – Definition, Examples- Tower of Hanoi problem, Tail Recursion | CO1 |
| | C | Arrays: Implementation of One Dimensional Arrays, Multidimensional Arrays, Applications of Arrays, Address Calculation, Matrix Operations, Sparse martices | CO1 |

| | | | | | |
|---|---|---|---|---|---|
| | **Unit 2** | **Linked List** | | | |
| | A | Concept of Linked List, Garbage Collection, Overflow and Underflow, Array Implementation and Dynamic Implementation of Singly Linked Lists | | | CO2 |
| | B | Array Implementation and Dynamic Implementation of Doubly Linked List, Circularly Linked List | | | CO3 |
| | C | Operations on a Linked List- Insertion, Deletion, Traversal, Polynomial Representation and Addition | | | CO2 |
| | **Unit 3** | **Stack and Queue** | | | |
| | A | Stacks: Definitions, Primitive operations, Application of stacks – Conversion of Infix Expression to Postfix form, Evaluation of Postfix Expressions | | | CO3 |
| | B | Queues: Definition, Primitive Operations, Implementation of Circular Queues, Priority Queues | | | CO3 |
| | C | Deques, Application of Queues. Implementation - Linked Stacks, Linked Queues. | | | CO3 |
| | **Unit 4** | **Tree and Graphs** | | | |
| | A | Trees: Terminologies, Binary tree, Representation, Applications, Binary search Tree – Operations on Binary Search Trees (Traversing, Insertion, deletion etc.), Binary Search Algorithm, AVL Tree | | | CO4, CO6 |
| | B | Graph: Terminology, Representation, Traversals- Depth First Search, Breadth First Search. | | | CO4, CO6 |
| | C | Graph Applications – Minimum Spanning Trees – Prim's and Kruskal's Algorithms | | | CO4, CO6 |
| | **Unit 5** | **Searching, Sorting and Hashing** | | | |
| | A | Implementation and Analysis - Linear search, Binary Search | | | CO5, CO6 |
| | B | Implementation and Analysis- Bubble Sort, Insertion Sort, Selection Sort, Tree sort | | | CO5, CO6 |
| | C | Hashing: Concepts and Applications, Hash Functions, Collisions, Methods of Resolving Collisions | | | CO5, CO6 |
| | Mode of examination | Theory | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 1. Lipschutz, "Data Structures" Schaum's Outline Series, TMH | | | |
| | Other References | 1. Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein "Data Structures Using C and C++" , PHI<br>2. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publication<br>3. Jean Paul Trembley and Paul G. Sorenson, "An Introduction to Data Structures with applications", McGraw Hill<br>4. R. Kruse etal, "Data Structures and Program Design in C", Pearson Education<br>5. G A V Pai, "Data Structures and Algorithms", TMH | | | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | **Select** appropriate data structures as applied to specified problem definition. | PO1, PO3, PO9, PSO1, PSO2 |
| 2. | **Choose** the suitable data structures like arrays, linked list, stacks and queues to solve real world problems efficiently. | PO1, PO2, PO3, PO9, PSO1, PSO2, PSO3 |
| 3. | **Represent** and manipulate data using nonlinear data structures like trees and graphs to design algorithms for various applications. | PO1, PO2, PO3, PO4, PO9, PSO1, PSO2 |
| 4. | **Compare** various techniques for searching and sorting. | PO3, PO9, PO12, PSO1, PSO2 |
| 5. | **Design** and implement an appropriate hashing function for an application | PO1, PO2, PO3, PO4, PO5, PO9, PSO1, PSO2, PSO3 |
| 6. | **Formulate** new solutions for programing problems or improve existing code using learned algorithms and data structures | PO1, PO3, PO4, PO5, PO9, PSO1, PSO2, PSO3 |

**PO and PSO mapping with level of strength for Course Name Data Structures (Course Code CSE 242)**

| Cos | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO1 0 | PO1 1 | PO1 2 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1 | 2 | - | 2 | - | - | - | - | - | 2 | - | - | - | 2 | 2 | - |
| CO 2 | 1 | 2 | 3 | - | - | - | - | - | 1 | - | - | - | 3 | 1 | 2 |
| CO 3 | 2 | 3 | 3 | 2 | - | - | - | - | 2 | - | - | - | 2 | 3 | - |
| CO 4 | - | - | 2 | - | - | - | - | - | 3 | - | - | 1 | 2 | 2 | - |
| CO 5 | 3 | 2 | 3 | 2 | 1 | - | - | - | 2 | - | -- | - | 3 | 2 | 2 |
| CO 6 | 2 | - | 3 | 3 | 2 | - | - | - | 1 | - | - | - | 2 | 3 | 3 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE 242 | Data structures | 2 | 2.33 | 2.67 | 2.33 | 1.5 | - | - | - | 1.83 | - | - | 1 | 2.33 | 2.17 | 2.33 |

## 2.1 Template A1: Syllabus for Theory Courses

| | | | |
|---|---|---|---|
| **School:** | | **School of Engineering and technology** | |
| **Department** | | **Department of Computer Science and Engineering** | |
| **Program:** | | **B-Tech** | |
| **Branch:** | | **Computer Science and Engineering** | |
| 1 | Course Code | CSE 243 | |
| 2 | Course Title | Object Oriented Programming Using Java | |
| 3 | Credits | 4 | |
| 4 | Contact Hours (L-T-P) | 3-0-2 | |
| | Course Status | Core /Elective/Open Elective | |
| 5 | Course Objective | To learn Java language syntax and semantics and concepts such as classes, objects, inheritance, polymorphism, packages and multithreading. | |
| 6 | Course Outcomes | CO1. Define Object oriented programming concepts by identifying classes, objects, members of a class and relationships among them needed for a specific problem.<br>CO2: Illustrate different features of java.<br>CO3: Develop Java programs to solve problems of applications using OOP principles such as abstraction, polymorphism and inheritance.<br>CO4:Categorize runtime errors thrown in the application software or generated runtime by applying the methods of exception handling and File I/O<br>CO5. Explain the concept of multithreading.<br>CO6. Design real life application using Java | |
| 7 | Course Description | Basic Object Oriented Programming (OOP) concepts including objects, classes, methods, parameter passing, information hiding, inheritance and polymorphism are discussed. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Introduction to Object Oriented Paradigm** | |
| | A | Introduction to OOP, Characteristics of OOP, Difference between OOP and procedural languages | CO1, CO2 |
| | B | Byte Code, Architecture of JVM, Class Loader Execution Engine. | CO1, CO2 |
| | C | Java development Kit (JDK), Introduction to IDE for java development, Setting java environment (steps for path and CLASS PATH setting), Garbage collection. | CO1, CO2 |
| | **Unit 2** | **Introduction to Java** | |
| | A | Features of Java, Constants, Variables, Data Types, Operators, Expressions. | CO1,CO2 |
| | B | Classes, Objects ,Constructors, Methods ,Input from user | CO1, CO2 |
| | C | Decision Making Branching, Loops, command line argument and static keyword | CO1, CO2 |
| | **Unit 3** | **Polymorphism** | |
| | A | Arrays ,Strings and String handling, | CO1,CO2 |
| | B | Polymorphism, method overloading | CO1,CO2,CO3 |
| | C | Constructors overloading , Wrapper class ,Type | CO2 |

| | | | | | |
|---|---|---|---|---|---|
| | | conversion & casting, | | | |
| | **Unit 4** | **Inheritance, package and Interface Inheritance Implementation** | | | |
| | A | Types of inheritance, Overriding methods, use of this and super, Constructor call in inheritance, Abstract class and method overriding. | | | CO2,CO3,CO6 |
| | B | Final class, method and variable, Concept of multiple inheritance in Java, Implementing Interface, Access Modifiers, | | | CO2,CO3,CO6 |
| | C | Packages: User defined packages, built-in packages (java.langpackage). | | | CO2,CO3,CO6 |
| | **Unit 5** | **Exception and Multithreading** | | | |
| | A | Input/output: Exploring java.io, File, Stream Classes Byte Stream Classes and Character stream Classes, Reading and writing in file | | | CO4,CO6 |
| | B | Introduction to Exception Handling, Introduction to try, catch, Finally , throw and throws, Checked and Unchecked exceptions, User define exception | | | CO4,CO6 |
| | C | Introduction to Multithreading: multithreading advantages and issues, Creating thread using Runnable interface and Thread class, Thread life cycle, Thread priorities, sleep method. | | | CO5,CO6 |
| | Mode of examination | Theory/Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 1.Schildt H, "The Complete Reference JAVA2", TMH | | | |
| | Other References | 1. Balagurusamy E, "Programming in JAVA", TMH<br>2. Professional Java Programming: BrettSpell, WROX Publication | | | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | Define Object oriented programming concepts by identifying classes, objects, members of a class and relationships among them needed for a specific problem. | PO5,PO12 |
| 2. | Illustrate different features of java. | PO5 |
| 3. | Develop Java programs to solve problems of applications using OOP principles such as abstraction, polymorphism and inheritance. | PO1,PO2,PO3,PO5,PO9, PO12,PSO1,PSO2 |
| 4. | Categorize runtime errors thrown in the application software or generated runtime by applying the methods of exception handling and File I/O | PO5 |
| 5. | Explain the concept of multithreading. | PO5 |
| 6. | Design real life application using Java. | PO1,PO2,PO3,PO5,PO6, PO7,PO9,PO11,PO12,P SO1,PSO2,PSO3 |

**PO and PSO mapping with level of strength for Course Name** Object Oriented Programming Using Java **(Course Code CSE243)**

| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MCA164_ Object Oriented Programming Using Java | CO1 | | | | | 2 | | | | | | | 2 | | | |
| | CO2 | | | | | 2 | | | | | | | | | | |
| | CO3 | 2 | 3 | 3 | | 2 | | | | 3 | | | 2 | 2 | 3 | |
| | CO4 | | | | | 2 | | | | | | | | | | |
| | CO5 | | | | | 2 | | | | | | | | | | |
| | CO6 | 3 | 3 | 3 | | 2 | 3 | 2 | | 3 | | 2 | 3 | 3 | 3 | 2 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE 243 | Object Oriented Programming Using Java | 2.5 | 3 | 3 | 0 | 2 | 3 | 2 | 0 | 3 | 0 | 2 | 2.3 | 2.5 | 3 | 2 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

## Syllabus: CSE 244, Principles of Operating System

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2018-2022** | |
| **Program: B.Tech** | | **Current Academic Year: 2018-19** | |
| **Branch: CSE** | | **Semester: IV** | |
| 1 | Course Code | **CSE 244** | Course Name: Principles of Operating System |
| 2 | Course Title | Principles of Operating System | |
| 3 | Credits | 4 | |
| 4 | Contact Hours (L-T-P) | 3-0-2 | |
| | Course Status | Core | |
| 5 | Course Objective | 1. This course introduces the challenges for designing the operating systems.<br>2. Includes different design principles and algorithms.<br>3. Evaluation of algorithms proposed.<br>4. Implementation of algorithms and utilities. | |
| 6 | Course Outcomes | Students will be able :<br>**CO1:**To Understand the basic concept of Operating system.<br>**CO2:**Explore process management concepts including scheduling, synchronization, deadlocks<br>**CO3:** To understand and implement algorithms in resource allocation and utilization.<br>**CO4:** To integrate and interpret effectiveness, efficiency of algorithms used for resource management of operating systems.<br>**CO5:** Analyze various memory management and virtual memory techniques<br>**CO6:** To Understand file and disk management and analyzing them | |
| 7 | Course Description | This course introduces the design principles of operating systems, resource management, identifying challenges and applying respective algorithms. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Introduction** | |
| | A | Operating System Concepts and functions, Comparison of different Operating system | CO1 |
| | B | Types of Operating Systems (Batch, Multiprogramming ,Multi Tasking , Multiprocessing, Distributed and Real Time Operating System) | CO1 |
| | C | Operating System Structure(Monolithic, Layered and Microkernel ), Operating System Services | CO1 |
| | **Unit 2** | **Process Synchronization** | |
| | A | Process Concepts (PCB, Process States , Process Operations, Inter process communication) | CO1, CO2 |
| | B | Critical Section problem & their solutions, Introduction to Semaphores | CO1, CO2 |
| | C | Classical Problems of Synchronization(Producer Consumer Problem, Readers Writer Problem, Dining philosophers problem) | CO1, CO2 |
| | **Unit 3** | **CPU Scheduling** | |
| | A | Concept , Types of schedulers( Short term, Long term, Middle term), Dispatcher, Performance Criteria | CO1,CO2 |
| | B | CPU Scheduling Algorithms( FCFS, SJF, Priority, | CO1,CO2,CO3,CO4 |

| | | | | | |
|---|---|---|---|---|---|
| | | Round Robin, Multilevel Queue, Multilevel feedback Queue) | | | |
| | C | Deadlock concepts & Handling Techniques(Avoidance, Prevention and Detection & Recovery) | | | CO1,CO2,CO3,CO4 |
| | **Unit 4** | **Memory Management** | | | |
| | A | Memory Hierarchy, Memory Management Unit | | | CO1,CO2,CO3,CO5 |
| | B | Paging, Segmentation | | | CO1,CO2,CO3,CO5 |
| | C | Virtual memory concept, demand paging, Page replacement algorithms(FCFS, Optimal, LRU) | | | CO1,CO2,CO3,CO5 |
| | **Unit 5** | **INPUT-OUTPUT Management** | | | |
| | A | Input –Output interface, Modes of data transfer(Programmed, interrupt and DMA) | | | CO1,CO2,CO3,CO6 |
| | B | Disk structure , Disk scheduling(FCFS,SSTF, SCAN, LOOK,C-SCAN, C-LOOK) | | | CO1,CO2,CO3,CO4,CO6 |
| | C | File Concept ,File operations, File Directories, Case study of Windows Operating System | | | CO1,CO2,CO3,CO6 |
| | Mode of examination | Theory | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 6. Silberschatz G, *Operating System Concepts*, Wiley | | | |
| | Other References | 1. W. Stalling, "Operating System", Maxwell Macmillan<br>2. Tannenbaum A S, *Operating System Design and Implementation*, Prentice Hall India<br>3. Milenkovic M, *Operating System Concepts*, McGraw Hill | | | |
| | | | | | |

## CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | **CO1:** To identify the challenges and apply suitable algorithms for them. | PO1,PO2,PO3,PO4,PSO1 |
| 2. | **CO2:** To assess the strengths and weaknesses of the algorithms. | PO1, PO3, PO4, PSO2 |
| 3. | **CO3:** To understand and implement algorithms in resource allocation and utilization. | PO1,PO2,PO3,PO4 |
| 4. | **CO4:** To integrate and interpret effectiveness, efficiency of algorithms used for resource management of operating systems. | PO9, PO10,PO11, PSO3 |
| 5. | **CO5:** Analyze various memory management and virtual memory techniques. | PO1,PO2,PO8,PO9,PO10,PSO1 |
| 6. | **CO6:** To Understand file and disk management and analyzing them. | PO1,PO2,PO10,PO11,PSO1,PSO2 |

**PO and PSO mapping with level of strength for Course Name Principles of Operating System (Course Code CSE 244)**

| CSE244 | Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CO1 | 3 | 3 | 3 | 3 | -- | -- | -- | 2 | 2 | 1 | 2 | 1 | 3 | 2 | 2 |
| | CO2 | 3 | 2 | 3 | 3 | -- | -- | -- | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 |
| | CO3 | 3 | 3 | 3 | 3 | -- | -- | -- | 1 | 1 | 1 | 3 | 2 | 3 | 2 | 1 |
| | CO4 | 2 | 2 | 2 | 2 | 1 | -- | -- | 2 | 3 | 3 | 3 | 1 | 2 | 2 | 2 |
| | Co5 | 2 | 2 | 3 | - | - | - | - | 3 | 3 | 1 | 2 | - | 3 | - | - |
| | CO6 | 3 | 2 | - | - | - | - | - | - | - | 2 | 3 | - | 2 | 2 | - |

## CSE245: Discrete Structures

| | | | |
|---|---|---|---|
| **School:SET** | | **Batch:2019-20** | |
| **Program: B.Tech** | | **Current Academic Year:2019-20** | |
| **Branch:CSE** | | **Semester:** | |
| 1 | Course Code | CSE245 | Course Name: Discrete Structures |
| 2 | Course Title | Discrete Structures | |
| 3 | Credits | 4 | |
| 4 | Contact Hours(L-T-P) | 3-1-0 | |
| | Course Status | | |
| 5 | Course Objective | This course provides a mathematical foundation for subsequent study in Computer Science, as well as developing the skills necessary to solve practical problems. | |
| 6 | Course Outcomes (CO) | After the completion of this course, students will be able to:<br>CO-1. ***Apply the*** basic principles of sets and operations in sets**.**<br>CO-2. ***Classify*** logical notation and determine if the argument is or is not valid.<br>CO-3. ***Construct*** and prove models by using algebraic structures.<br>CO-4. ***Analyze*** basic principles of Boolean algebra with mathematical description.<br>CO-5. ***Construct*** Permutations and combinations in counting techniques and applications of Graph Theory.<br>CO-6. ***Compose*** computer programs in a formal mathematical manner. | |
| **7** | **Prerequisite** | Concepts of algebra | |
| **8** | **Course Contents** | | CO-Mapping |
| | Unit 1 | **Introduction to Set Theory, Relations and Functions.** | |
| | A | Set Theory: Introduction, Combination of sets, Multi sets, ordered pairs, Set Identities. | CO1 |
| | B | Relations: Definition, Operations on relations, Properties of relations, Composite Relations, Equality of relations, Order of relations. | CO1 |
| | C | Functions: Definition, Classification of functions, Operations on functions, Recursively defined functions. | CO1 |
| | Unit 2 | **Logics and Mathematical Induction** | |
| | A | Propositional Logic: Proposition, well formed formula, Truth tables, Tautology, Satisfiability, Contradiction, Algebra of proposition, Theory of Inference, Natural Deduction. | CO1,CO2 |
| | B | Predicate Logic: First order predicate, well formed formula of predicate, quantifiers, Inference theory of predicate logic. | CO1,CO2 |
| | C | Natural Numbers: Introduction, Mathematical Induction, Variants of Induction, Induction with Nonzero Base cases. | CO1,CO2 |
| | Unit 3 | **Algebraic Structures** | |
| | A | Definition, Groups, Subgroups and order, Cyclic Groups, Cosets, Lagrange's theorem, Normal Subgroups, | CO3 |
| | B | Homomorphism's, Definition and elementary properties of Rings and Fields, Integers Modulo n. | CO3 |
| | C | Partial order sets: Definition, Partial order sets, Combination of partial order sets, Hasse diagram. | CO3 |

| | | | |
|---|---|---|---|
| | Unit 4 | **Lattices and Applications** | |
| | A | Definition, Properties of lattices – Bounded, Complemented, Modular and Complete Lattice, Morphisms of lattices. | CO4 |
| | B | Boolean Algebra: Introduction, Axioms and Theorems of Boolean algebra, Algebraic manipulation of Boolean expressions. Simplification of Boolean Functions, Karnaugh maps, Logic gates, Digital circuits and Boolean algebra. Combinational and sequential Circuits. | CO4 |
| | C | Recurrence Relation & Generating function: Recursive definition of functions, Recursive algorithms, Method of solving recurrences. | CO4 |
| | Unit 5 | **Graph Theory and Applications.** | |
| | A | Trees: Definition, Binary tree, Binary tree traversal, Binary search tree. | CO4,CO5 |
| | B | Graphs: Definition and terminology, Representation of graphs, Multi graphs, Bipartite graphs, Planar graphs, Isomorphism and Homeomorphism of graphs, Euler and Hamiltonian paths, Graph colouring. | CO4,CO5 |
| | C | Combinatory: Introduction, Counting Techniques, Pigeonhole Principle | CO4,CO5 |
| | Mode of examination | Theory | |
| | Weightage Distribution | CA / MTE / ETE | |
| | | 30% / 20% / 50% | |
| | Text book* | 1) *1. C. L. Liu, Elements of Discrete Mathematics, second edition 1985, McGraw-Hill Book Company. Reprinted 2000.*<br>2) Jean Paul Trembley, R Manohar, "Discrete Mathematical Structures with Application to Computer Science", McGraw-Hill.<br>3) *K. H. Rosen, Discrete Mathematics and applications, fifth edition 2003, Tata McGraw Hill Publishing Company.* | |
| | other references | 1) *J .L. Mott, A. Kandel, T.P .Baker, Discrete Mathematics for Computer Scientists and Mathematicians, second edition 1986, Prentice Hall of India.*<br>2) *W.K. Grassmann and J.P.Trembnlay, Logic and Discrete Mathematics, A Computer Science* | |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | **CO1:** ***Apply the*** basic principles of sets and operations in sets**.** | **PO1,PO2,PO3,PO4,PO6,PO12, PSO1,PSO2** |
| 2. | **CO2:** ***Classify*** logical notation and determine if the argument is or is not valid. | **PO1,PO2,PO3,PO6,PO9,PO12 PSO1,PSO2** |
| 3. | **CO3:** ***Construct*** and prove models by using algebraic structures. | **PO1,PO2,PO3,PO4,PO5,PO9,PSO 2,PSO3** |

| | | |
|---|---|---|
| **4.** | **CO4:** ***Analyze*** basic principles of Boolean algebra with mathematical description. | **PO1,PO2,PO3,PO4,PO5,PO11,PO 12 PSO1, PSO3** |
| **5.** | **CO5:** ***Construct*** Permutations and combinations in counting techniques and applications of Graph Theory. | **PO1,PO2,PO3,PO4,PO6,PO9,PO1 1,PO12, PSO2,PSO3** |
| **6** | **CO6:** ***Compose*** computer programs in a formal mathematical manner. | **PO1,PO2,PO3, PO4, PO5,PO9, PO11, PSO1,PSO2,PSO3** |

**PO and PSO mapping with level of strength for Course Name Discrete Structures (Course Code CSE245)**

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 3 | 3 | 1 | _ | 3 | _ | _ | 3 | _ | _ | 3 | 3 | 3 | _ |
| CO2 | 2 | 2 | 3 | _ | _ | 2 | _ | _ | _ | _ | _ | 3 | 3 | 2 | _ |
| CO3 | 3 | 2 | 3 | 3 | 3 | _ | _ | _ | 2 | _ | _ | _ | _ | 3 | 2 |
| CO4 | 2 | 2 | 3 | 3 | 3 | _ | _ | _ | _ | _ | 3 | 3 | 3 | _ | 3 |
| CO5 | 2 | 2 | 2 | 3 | _ | 3 | _ | _ | 3 | _ | 3 | 3 | _ | 2 | 3 |
| CO6 | 1 | 2 | 1 | 2 | 3 | _ | _ | _ | 3 | _ | 3 | _ | 3 | 3 | 2 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE245 | DS | 2 | 2.1 | 2.5 | 2 | 1.5 | 1.3 | 0 | 0 | 1.8 | 0 | 1.8 | 2 | 2 | 2.1 | 1.6 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***

***3.*** Addressed to ***Substantial (High=3) extent***

## Syllabus: CSE 247, Computer organization and architecture

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch: 2019-2023** | |
| **Program: B.Tech** | | **Current Academic Year: 2019-2020** | |
| **Branch: CSE/IT** | | **Semester: III** | |
| 1 | Course Code | CSE247 Course Name | |
| 2 | Course Title | Computer Organization and Architecture | |
| 3 | Credits | 3 | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | To impart an understanding of the internal organization and operations of a computer and to introduce the concepts of processor logic design and control logic design. | |
| 6 | Course Outcomes | Upon successful completion of this course, the student will be able to:<br>**CO1:** Identify the basic structure and functional units of a digital computer<br>CO2:Study the architecture of Bus and registers<br>. **CO3:**Study the design of arithmetic and logic unit and implementation of fixed point and floating-point arithmetic operations<br>**CO4:**Understand basic processing unit and organization of simple processor including instruction sets, instruction formats and various addressing modes<br>**CO5:**Study the two types of control unit techniques<br>**CO6:** Describe hierarchical memory systems including cache memories and select appropriate interfacing standards for I/O devices. | |
| 7 | Course Description | This course discusses the basic structure of a digital computer and used for understanding the organization of various units such as control unit, Arithmetic and Logical unit and Memory unit and I/O unit in a digital computer. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Computer Organization and Design** | |
| | A | Functional units of digital system and their interconnections, buses, bus architecture, types of buses and bus arbitration. Register bus and memory transfer | CO1 |
| | B | Register transfer Language, Registertransfer, Bus & memory transfer, Logic micro operations, Shift micro operation. | CO1 |
| | C | Adder-Subtractor- Incrementor, Arithmetic unit, Logic unit. | CO1 |
| | **Unit 2** | **Computer Arithmetic** | |
| | A | Representation of numbers in 1's and 2's complement, Addition and subtractionofs i g n e d numbers. | CO1, CO2 |
| | B | Binary Multiplier, Multiplication: Signed operand multiplication, Booth algorithm | CO1, CO2 |
| | C | Floating point arithmetic representation: addition and subtraction. | CO1, CO2 |
| | **Unit 3** | **Processor Organization** | |
| | A | General register organization, stack organization | CO3 |
| | B | Instruction set architecture of a CPU - registers, Instruction types, formats, instruction execution cycle | CO3 |
| | C | Addressing modes, RISC/CISC | CO3 |
| | **Unit 4** | **Control Unit** | |
| | A | Introduction to CPU design, Instruction interpretation and | CO3, CO4 |

| | | | |
|---|---|---|---|
| | | execution, Micro-operation and their register transfer language (RTL) specification | |
| | B | Hardwired control CPU design | CO3, CO4 |
| | C | Microprogrammed control CPU design | CO3, CO4 |
| | **Unit 5** | **Memory and I/O** | |
| | A | RAM/ROM/Flash memory, Designing Memory System using RAM and ROM chips | CO1, CO5 |
| | B | Cache memory: Memory hierarchy, performance Considerations, mapping techniques | CO1, CO5 |
| | C | Input Output: Isolated vs. Memory mapped I/O, Programmed I/O, Interrupt driven I/O, Direct Memory Access | CO1, CO5 |
| | Mode of examination | Theory | |
| | Weightage Distribution | CA / MTE / ETE<br>30% / 20% / 50% | |
| | Text book/s* | 1. M. Morris Mano, Computer System Architecture, Pearson | |
| | Other References | 1. C. Hamacher, Z. Vranesic and S. Zaky, "Computer Organization", McGrawHill, 2002.<br>2. W. Stallings, "Computer Organization and Architecture - Designing for Performance", Prentice Hall of India, 2002.<br>3. D. A. Patterson and J. L. Hennessy, "Computer Organization and Design - The Hardware/Software Interface", Morgan Kaufmann,1998.<br>4. J.P. Hayes, "Computer Architecture and Organization", McGraw-Hill, 1998. | |

## CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1. Identify the basic structure and functional units of a digital computer. | PO1, PO2, PO3, PO6, PO12, PSO3 |
| 2. | CO2:Study the architecture of Bus and registers | PO1, PO2, PO3, PO6, PO12, PSO3 |
| 3. | CO3. Study the design of arithmetic and logic unit and implementation of fixedpoint and floating-point arithmetic operations | PO1, PO2, PO3, PO6, PO12, PSO3 |
| 4. | CO4. Understand basic processing unit and organization of simple processor including instruction sets, instruction formats and various addressing modes | PO1, PO2, PO3, PO6, PO12, PSO3 |
| 5. | CO5. Study the two types of control unit techniques | PO1, PO2, PO3, PO4, PO6, PO12, PSO2, PSO3 |
| 6. | CO6. Describe hierarchical memory systems including cache memories and select appropriate interfacing standards for I/O devices | PO1, PO2, PO3, PO6, PO12, PSO2, PSO3 |

**PO and PSO mapping with level of strength for Course Name** Computer Organization and Architecture **(Course Code CSE 247)**

| | Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE247 | CO1 | 3 | 1 | 1 | - | - | 2 | - | - | - | - | - | 2 | - | 1 | 3 |
| | CO2 | 3 | 3 | 3 | - | - | 3 | - | - | - | - | - | 3 | - | 2 | 3 |
| | CO3 | 3 | 2 | 3 | - | - | 2 | - | - | - | - | - | 3 | - | 2 | 3 |
| | CO4 | 3 | 2 | 2 | - | - | 1 | - | - | - | - | - | 3 | - | 3 | 2 |
| | CO5 | 3 | 3 | 3 | - | - | 2 | - | - | - | - | - | 3 | - | 2 | 2 |
| | CO6 | 3 | 3 | 3 | - | - | 2 | - | - | - | - | - | 3 | - | 1 | 2 |

**1-Slight (Low)** **2-Moderate (Medium)** **3-Substantial (High)**

| | | | |
|---|---|---|---|
| **School:** SET | | **Batch :** 2018-19 | |
| **Program:** | | **Current Academic Year:** 2018-19 | |
| **Branch:** CSE | | **Semester:** III | |
| 1 | Course Code | **ARP203** | Course Name : **Aptitude Reasoning and Business Communication Skills-Basic** |
| 2 | Course Title | : **Aptitude Reasoning and Business Communication Skills-Basic** | |
| 3 | Credits | 2 | |
| 4 | Contact Hours (L-T-P) | 0-0-4 | |
| | Course Status | | |
| 5 | Course Objective | To enhance holistic development of students and improve their employability skills. To provide a 360 degree exposure to learning elements of Business English readiness program, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To step up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a student will have entered the threshold of his/her 1st phase of employability enhancement and skill building activity exercise. | |
| 6 | Course Outcomes | CO1: *At the end of the session this activity will help to ascertain a student's skill and competency level which will lead to effective mapping of his skills and competencies and an an effective training need identification and training need analysis model can be drawn*<br>CO2: *At the end of the session a student will have a heightened sense of self awareness, raised levels of self-esteem & self-effectiveness, will have developed a positive mental frame of mind helping a student become more evolved in his/her life .*<br>CO3: *At the end of the session the program would have instilled positive thinking and professional ethics in students and reinforce positive attitude building*<br>CO4: *At the end of the session a student would have learned how to build positive emotional competence in self and learn GOAL Setting and SMART Goals technique*<br>CO5: *At the end of the session a student would have enhanced LSRWG and P (Listening Speaking Reading Writing Grammar and Pronunciation) \| Verbal Abilities - 1*<br>CO6: *At the end of the session a student would have Understanding of AMCAT + ELITMUS Study patterns for Quantitative aptitude and Logical \| Analytical Reasoning* | |
| 7 | Course Description | This Level 1 blended training approach equips the students for Industry employment readiness and combines elements of soft skills and numerical abilities to achieve this purpose. | |
| 8 | Outline syllabus – ARP 203 | | |

| | | | |
|---|---|---|---|
| | **Unit 1** | **BELLS ( Building Essential Language and Life Skills)** | **CO Mapping** |
| | A | *Know Yourself*: Core Competence. A very unique and interactive approach through an engaging questionnaire to ascertain a student's current skill level to design, architect and expose a student to the right syllabus as also to identify the correct TNI/TNA levels of the student. | *CO1* |
| | B | Techniques of Self Awareness \| Self Esteem & Effectiveness\| Building Positive Attitude \| Building Emotional Competence | *CO2* |
| | C | Positive Thinking & Attitude Building \| Goal Setting and SMART Goals – Milestone Mapping \| Enhancing L S R W G and P (Listening Speaking Reading Writing Grammar and Pronunciation) \| Verbal Abilities - 1 | *CO3,CO4,CO5* |
| | **Unit 2** | **Introduction to APTITUDE TRAINING- Reasoning- Logical/** | |

| | | | |
|---|---|---|---|
| | | **Analytical** | |
| | A | Syllogism \| Letter Series \| Coding, Decoding , Ranking & Their Comparison Level-1 | *CO6* |
| | B | Number Puzzles | *CO6* |
| | C | Selection Based On Given Conditions | *CO6* |
| | **Unit 3** | **Quantitative Aptitude** | *CO6* |
| | A | Number Systems Level 1 \| Vedic Maths Level-1 | *CO6* |
| | B | Percentage ,Ratio & Proportion \| Mensuration - Area & Volume \|Algebra | *CO6* |
| | Weightage Distribution | *Class Assignment/Free Speech Exercises / JAM – 60% \| Group Presentations/Mock Interviews/GD/ Reasoning, Quant & Aptitude – 40%* | |
| | Text book/s* | *Wiley's Quantitative Aptitude-P Anand* \| ***Quantum CAT – Arihant Publications*** \| ***Quicker Maths- M. Tyra*** \| *Power of Positive Action (English, Paperback, Napoleon Hill)* \| *Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness – Nathaniel Brandon* \| *Goal Setting (English, Paperback, Wilson Dobson* | |

## Syllabus: CSP 242, Data Structure Lab

| | | | |
|---|---|---|---|
| **School:** SET | | **Batch: 2019-2023** | |
| **Program: B.Tech.** | | **Current Academic Year: 2019-2020** | |
| **Branch: CSE/IT** | | **Semester: III** | |
| 1 | Course Code | CSP242 | |
| 2 | Course Title | Data Structure Lab | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | 1. Learn the basic concepts of Data Structures and algorithms.<br>2. Design and Implementation of Various Basic and Advanced Data Structures.<br>3. Learn the concepts of various searching, Sorting and Hashing Techniques.<br>4. Choose the appropriate data structures and algorithm design method for a specified application. | |
| 6 | Course Outcomes | CO1: **Implement** operation like traversing, insertion, deletion, searching etc. on various data structures.<br>CO2 **apply** linear data structure(s) to solve various problems<br>CO3: **develop** the solution of any problem using non linear data structure(s)<br>CO4: **create** a solution of any problem using searching and sorting techniques<br>CO5: **Design** a hash function using any programming language<br>CO6: **Choose** the most appropriate data structure(s) for a given problem | |
| 7 | Course Description | This course starts with an introduction to data structures with its classification, efficiency of different algorithms, array and pointer based implementations and Recursive applications. As the course progresses the study of Linear and Non-Linear data structures are studied in details. The course talks primarily about Linked list, stacks, queue, Tree structure, Graphs etc. This Course also deals with the concept of searching, sorting and hashing methods. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Introduction** | **CO1** |
| | | Program to implement Operation on Array such as Traversing, Insertion & Deletion operation | **CO1** |
| | | Program based on Recursion such as Towers of Hanoi, Fibonacci series etc. | CO1 |
| | **Unit 2** | **Linked List** | **CO2** |
| | | Program to implement different operation on the following linked list: Singly, Doubly and circular linked list. | CO2 |
| | **Unit 3** | **Stack & Queue** | **CO3** |
| | | Program to Implement Stack operation using Array and | **CO3** |

| | | | | | |
|---|---|---|---|---|---|
| | | Linked list | | | |
| | | Program to convert infix expression to post fix expression | | | **CO3** |
| | | Program on Evaluation of Post fix expression | | | **CO3** |
| | | Program to implement queue operation using array and linked list | | | **CO3** |
| | | Program to implement circular queue and deque. | | | **CO3** |
| | **Unit 4** | **Tree & Graph** | | | **CO4, CO6** |
| | | Program to implement binary tree and BST. | | | **CO4, CO6** |
| | | Program to implement MST and shortest path algorithm. | | | CO4, CO6 |
| | **Unit 5** | **Searching, Sorting & Hashing** | | | **CO5** |
| | | Program on Searching and Hashing | | | **CO5** |
| | | Program on Sorting. | | | CO5 |
| | Mode of examination | Practical | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | 0% | 40% | |
| | Text book/s* | 1. Lipschutz, "Data Structures" Schaum's Outline Series, TMH | | | |
| | Other References | 1. Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein "Data Structures Using C and C++" , PHI<br>2. Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publication<br>3. Jean Paul Trembley and Paul G. Sorenson, "An Introduction to Data Structures with applications", McGraw Hill<br>4. R. Kruse etal, "Data Structures and Program Design in C", Pearson Education<br>5. G A V Pai, "Data Structures and Algorithms", TMH | | | |

**PO and PSO mapping with level of strength for Course Name Data Structures (Course Code CSE 242)**

| | **PO 1** | **PO 2** | **PO 3** | **PO 4** | **PO 5** | **PO 6** | **PO 7** | **PO 8** | **PO 9** | **PO 10** | **PO 11** | **PO 12** | **PSO1** | **PSO2** | **PSO3** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | **2** | **2** | **3** | **_** | **_** | **-** | **_** | **_** | **3** | **_** | **_** | **2** | **3** | **2** | **2** |
| **CO2** | **3** | **2** | **2** | **2** | **2** | **-** | **_** | **_** | **2** | **_** | **-** | **_** | **2** | **3** | **3** |
| **CO3** | **3** | **1** | **3** | **3** | **_** | **_** | **_** | **_** | **3** | **_** | **_** | **1** | **3** | **2** | **2** |
| **CO4** | **3** | **2** | **3** | **2** | **_** | **_** | **_** | **_** | **2** | **_** | **_** | **2** | **2** | **3** | **2** |
| **CO5** | **2** | **2** | **2** | **_** | **_** | **_** | **_** | **_** | **_** | **_** | **_** | **_** | **1** | **2** | **2** |
| **CO6** | **3** | **3** | **2** | **3** | **-** | **-** | **_** | **_** | **3** | **_** | **-** | **_** | **2** | **3** | **2** |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CSP 242** | **Data structures Lab** | 2.67 | 2 | 2.5 | 2.5 | 2 | - | - | - | 2.6 | - | - | 1.7 | 2.17 | 2.5 | 2.2 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

| | | | | | |
|---|---|---|---|---|---|
| **School:** | | **School of Engineering and technology** | | | |
| **Department** | | **Department of Computer Science and Engineering** | | | |
| **Program:** | | **B.Tech** | | | |
| **Branch:** | | **CSE** | | | |
| 1 | Course Code | CSP243 | | | |
| 2 | Course Title | Object Oriented Programming Using Java Lab | | | |
| 3 | Credits | 1 | | | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | | | |
| | Course Status | Compulsory/Elective | | | |
| 5 | Course Objective | To learn Java language syntax and semantics and concepts such as classes, objects, inheritance, polymorphism, packages and multithreading. | | | |
| 6 | Course Outcomes (must be 6 COs, following verbs given in Bloom's Taxonomy) | CO1. Define Object oriented programming concepts by identifying classes, objects, members of a class and relationships among them needed for a specific problem.<br>CO2: Illustrate different features of java.<br>CO3: Develop Java programs to solve problems of applications using OOP principles such as abstraction, polymorphism and inheritance.<br>CO4:Categorize runtime errors thrown in the application software or generated runtime by applying the methods of exception handling and File I/O<br>CO5. Explain the concept of multithreading.<br>CO6. Design real life application using Java | | | |
| 7 | Course Description | Basic Object Oriented Programming (OOP) concepts including objects, classes, methods, parameter passing, information hiding, inheritance and polymorphism are discussed. | | | |
| 8 | Outline syllabus | | | | CO Mapping |
| | **Unit 1** | **Introduction to Object Oriented Paradigm** | | | |
| | | Program related to garbage collection and OOPS | | | CO1,CO2 |
| | **Unit 2** | **Introduction to Java** | | | |
| | | Program to take input from user, decision making and branching | | | CO1,CO2 |
| | **Unit 3** | **Polymorphism** | | | |
| | | Program related to string handling and polymorphism | | | CO1,CO2 |
| | **Unit 4** | **Inheritance, package and Interface Inheritance Implementation** | | | |
| | | Program related to inheritance and interfaces | | | CO2,CO3,CO6 |
| | **Unit 5** | **Exception and Multithreading** | | | |
| | | Program related to exception handling | | | CO4,CO6 |
| | Mode of examination | Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | 0% | 40% | |

| | | | |
|---|---|---|---|
| | Text book/s* | 1.Schildt H, “The Complete Reference JAVA2”, TMH | |
| | Other References | 3. Balagurusamy E, “Programming in JAVA”, TMH Professional Java Programming: BrettSpell, WROX Publication | |

**PO and PSO mapping with level of strength for Course Name** Object Oriented Programming Using Java **(Course Code CSP243)**

| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP243_ Object Oriented Programming Using Java Lab | CO1 | | | | | 2 | | | | | | | 2 | | | |
| | CO2 | | | | | 2 | | | | | | | | | | |
| | CO3 | 2 | 3 | 3 | | 2 | | | | 3 | | | 2 | 2 | 3 | |
| | CO4 | | | | | 2 | | | | | | | | | | |
| | CO5 | | | | | 2 | | | | | | | | | | |
| | CO6 | 3 | 3 | 3 | | 2 | 3 | 2 | | 3 | | 2 | 3 | 3 | 3 | 2 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

## List of Experiments

| Unit No | S.No | Name of the Practical |
|---|---|---|
| 1 | 1.1 | Write a Java program to print 'Hello' on screen and then print your name on a separate line |
| | 1.2 | Write a Java program to print the sum (addition), multiply, subtract, divide and remainder of two numbers. |
| 2 | 2.1 | Write a Java program to accept a number and check the number is even or not. Prints 1 if the number is even or 0 if the number is odd. |
| | 2.2 | Write a Java program that accepts three integers from the user and return true if the second number is greater than first number and third number is greater than second number. If "abc" is true second number does not need to be greater than first number. |
| 3 | 3.1 | Write a Java program to find the maximum occurring character in a string |
| | 3.2 | Write a Java program to find first non repeating character in a string. |
| | 3.3 | Write a program in java to demonstrate method overloading |
| 4 | 4.1 | Write a program in java to demonstrate multilevel inheritance in java. |
| | 4.2 | Write a java program to create an abstract class named Shape that contains two integers and an empty method named print Area (). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method print Area () that prints the area of the given shape. |
| 5 | 5.1 | Write a program that creates a user interface to perform integer division. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 and Num2 were not integers, the program would throw a |

| | | |
|---|---|---|
| | | Number Format Exception. If Num2 were zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box. |
| | 5.2 | Write a java program that implements a multi-thread application that has three threads. First hread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number |

## Syllabus: CSP 244, Principles of Operating System Lab

| | | | |
|---|---|---|---|
| **School:** SET | | **Batch: 2018** | |
| **Program: B.Tech** | | **Current Academic Year: 2018-19** | |
| **Branch: CSE** | | **Semester: IV** | |
| 1 | Course Code | **CSP 244** | |
| 2 | Course Title | Principles of operating System Lab | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | | |
| 5 | Course Objective | Introduces different type operating systems, functions of operating systems, working in a Unix/Linux and Windows system, writing programs on Process management and file management. | |
| 6 | Course Outcomes | CO1: Working with single user multi task and multi-user multi-tasking environment.<br>CO2: Identify and use utilities of Windows & Unix operating systems<br>CO3: Use the resources of operating system i.e. process management and file management<br>CO4: Writing programs on Process creation, multiple process creation, process synchronization,<br>CO5: Writing program on basic file operations<br>CO6: Writing program on file buffering. | |
| 7 | Course Description | The course is designed to make the students research/industry ready as operating systems are indispensable for the systems used in industries/research organizations. New operating systems for different gadgets are launched in last few years. So the students will get the design principles operating system in this course. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Introduction** | |
| | | Illustration of Different types of operating system: Single user Multi task, Multi user Multi task | CO1 |
| | | Basic Windows features & Unix commands. | CO2 |
| | **Unit 2** | **Processes** | |
| | | Process basics: Creating processes using fork( ), the parent-child processes PID, PPID, process states: creating orphan, zombie processes. | CO2, CO3, CO4 |
| | **Unit 3** | **Process Synchronization** | |
| | | Creating multiple processes, Process table, use the command ps with –el, Synchronization of processes by using sleep( ) & wait( ), background process, | CO3, CO4 |
| | **Unit 4** | **Files** | |
| | | Basic file operations, Programs for File operations, sharing data between processes using files. | CO3, CO4,CO5 |

| | | | | | |
|---|---|---|---|---|---|
| | **Unit 5** | **File Buffering** | | | |
| | | File descriptor table, system file table, file pointer, buffer accessing block wise, use the functions: fopen( ), fread( ), ftell( ), lseek( ), fflush( ) etc. | | | CO3, CO4,CO6 |
| | Mode of examination | Practical | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | 0% | 40% | |
| | Text book/s* | 1. Sumitabha Das, "Unix Concepts and Applications", Tata McGraw Hill. | | | |
| | Other References | 1. Unix: The complete Reference, Kenneth Rosen et.al., TMH<br>2. Unix 'C' Odessey, Meeta Gandhi et.al. BPB | | | |

| **Course outline** |
|---|
| This course introduces the features of GUI i.e. Windows operating system as well as the CUI i.e. the commands used in Unix, so that the students will be familiar with both GUI & CUI environment of operating systems. As the course progresses the students will learn to write programs for process management and file operations. Further the students can implement the algorithms studied in theory by writing programs using the above principles and skills. |

| **Course Evaluation** | |
|---|---|
| Attendance | None |
| Any other | CA judged on the practical conducted in the lab , weightage may be specified |
| References | |
| Text book | 1. Sumitabha Das, "Unix Concepts and Applications", Tata McGraw Hill. |
| Other References | 1. Unix: The complete Reference, Kenneth Rosen et.al., TMH<br>2. Unix 'C' Odessey, Meeta Gandhi et.al. BPB |
| Software | Windows, Unix / Any Unix family OS i.e. Linux |

## CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: Working with single user multi task and multi-user multi-tasking environment. | PO1,PO2,PO3,PO4,PSO1 |
| 2. | CO2: Identify and use utilities of Windows & Unix operating systems | PO1, PO3, PO4, PSO2 |
| 3. | CO3: Use the resources of operating system i.e. process management and file management | PO1,PO2,PO3,PO4 |
| 4. | CO4: Writing programs on Process creation, multiple process creation, process synchronization, | PO9, PO10,PO11, PSO3 |

| | | |
|---|---|---|
| 5. | CO5: Writing program on basic file operations | PO1,PO2,PO8,PO9,PO10,PSO1 |
| 6. | CO6: Writing program on file buffering. | PO1,PO2,PO10,PO11,PSO1,PSO2 |

**PO and PSO mapping with level of strength for Course Name Principles of Operating System (Course Code CSP 244)**

| CSE244 | Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CO1 | 3 | 3 | 3 | 3 | -- | -- | -- | 2 | 2 | 1 | 2 | 1 | 3 | 2 | 2 |
| | CO2 | 3 | 2 | 3 | 3 | -- | -- | -- | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 |
| | CO3 | 3 | 3 | 3 | 3 | -- | -- | -- | 1 | 1 | 1 | 3 | 2 | 3 | 2 | 1 |
| | CO4 | 2 | 2 | 2 | 2 | 1 | -- | -- | 2 | 3 | 3 | 3 | 1 | 2 | 2 | 2 |
| | CO5 | 2 | 2 | 3 | | | | | 3 | 3 | 1 | 2 | | 3 | | |
| | CO6 | 3 | 2 | | | | | | | | 2 | 3 | | 2 | 2 | |

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2018 - 2022** | |
| **Program: B.tech** | | **Current Academic Year: 2019-2020** | |
| **Branch: CSE / IT** | | **Semester: 3rd** | |
| 1 | Course Code | **CSP251** Course Name: Project Based Learning -1 | |
| 2 | Course Title | Project Based Learning -1 | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | 4.To align student's skill and interests with a realistic problem or project<br>5.To understand the significance of problem and its scope<br>6.Students will make decisions within a framework | |
| 6 | Course Outcomes | Students will be able to:<br>CO1: Identify and formulate problem statement with systematic approach.<br>CO2: Develop teamwork and problem-solving skills, along with the ability to communicate effectively with others.<br>CO3: Design the problem solution as per the problem statement framed.<br>CO4: Classify and understand techniques for software verification and validation of project successfully.<br>CO5: Fabricate and implement the solution by using different aspects of programming language.<br>CO6: Develop a glory of the need to engage in life-long learning. | |
| 7 | Course Description | In PBL-1, the students will learn how to define the problem for developing projects, identifying the skills required for developing the project based on given a set of specifications and all subjects of that Semester. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | Problem Definition, Team/Group formation and Project Assignment. Finalizing the problem statement, resource requirement, if any. | CO1, CO2 |
| | **Unit 2** | Develop a work flow or block diagram for the proposed system / software. | CO2,CO3 |
| | **Unit 3** | Design algorithms for the proposed problem. | CO3 |
| | **Unit 4** | Implementation of work under the guidance of a faculty member and obtain the appropriate results. | CO3, CO4 |
| | **Unit 5** | Demonstrate and execute Project with the team. Validate and verify the project modules. | CO4, CO5, CO6 |
| | | Report should include Abstract, Hardware / Software Requirement, Problem Statement, Design/Algorithm, Implementation Detail. Validation Reports.<br>References if any.<br>The presentation, report, work done during the term supported by the documentation, forms the basis of | |

| | | | | | |
|---|---|---|---|---|---|
| | | assessment. | | | |
| | | | | | |
| | Mode of examination | Practical /Viva | | | |
| | Weight age Distribution | CA | MTE | ETE | |
| | | 60% | NA | 40% | |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) |
|---|---|---|
| 1. | CO1: Identify and formulate problem statement with systematic approach. | PO1, PO2, PO4, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3 |
| 2. | CO2: Develop teamwork and problem-solving skills, along with the ability to communicate effectively with others. | PO1, PO2, PO4, PO7, PO9, PO10, PO11, PO12 ,PSO3 |
| 3. | CO3: Design the problem solution as per the problem statement framed. | PO1, PO2, PO5, PO9, PO10, PO11, PO12, PSO1,PSO2 |
| 4. | CO4: Classify and understand techniques for software verification and validation of project successfully. | PO1, PO2, PO6, PO9, PO10, PO11, PO12,PSO2 |
| 5. | CO5: Fabricate and implement the solution by using different aspects of programming language. | PO1, PO2, PO3, PO4,PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12 PSO1,PSO2, PSO3 |
| 6. | CO6: Develop a glory of the need to engage in life-long learning. | PO1, PO2, PO4, PO9, PO10, PO11, PO12,PSO3 |

**PO and PSO mapping with level of strength for Course Name Project Based Learning -1 (Course Code CSP251)**

**CO/PO Mapping**

(1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Low

| Cos | Programme Outcomes(POs) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CO1 | 3 | 3 | - | 3 | - | - | - | - | 3 | 3 | 2 | 3 | 2 | 2 | 1 |
| CO2 | 3 | 2 | - | 3 | - | - | 2 | - | 3 | 3 | 2 | 3 | | | 1 |
| CO3 | 3 | 2 | - | - | 2 | - | - | - | 3 | 3 | 2 | 3 | 2 | 2 | |
| CO4 | 3 | 3 | - | - | - | 2 | - | - | 3 | 3 | 2 | 3 | | 2 | |
| CO5 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | |
| CO6 | 3 | 3 | - | 3 | - | - | - | - | 3 | 3 | 2 | 3 | | | 1 |
| AvgPO attained | 3 | 2.7 | 0.34 | 1.84 | 0.67 | 0.67 | 0.84 | 0.5 | 3 | 3 | 2 | 3 | 1 | 1.4 | 0.5 |

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2018 - 2022** | |
| **Program: B.tech** | | **Current Academic Year: 2019-2020** | |
| **Branch: CSE / IT** | | **Semester: 3rd** | |
| 1 | Course Code | **CSP294** Course Name: Summer Internship-I | |
| 2 | Course Title | Summer Internship-I | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | This course will expose students to apply theories learned in the classroom and provides current technological developments relevant to the subject area of training. Students will be able to identify the career preferences and professional goals. | |
| 6 | Course Outcomes | Students will be able to:<br>CO1: Get familiarize with industry principles and practices.<br>CO2: Identify and analyze an appropriate problem.<br>CO3: Develop teamwork and apply prior acquired knowledge in problem solving.<br>CO4: Demonstrate effective verbal and written communication skills.<br>CO5: Practice engineer's responsibilities, self-understanding, self-discipline and ethical standards.<br>CO6: Identify the career preferences and professional goals. | |
| 7 | Course Description | The Internship aims to offer students the opportunity to apply their prior acquired knowledge in problem solving. Students will acquire skills important for time management, discipline, self learning, and effective communication and so on. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | Define objectives and conditions for the internship, ensuring students that it is related to the study path carried out at the University | CO1,CO6 |
| | **Unit 2** | Problem Definition and identification, Team/Group formation and Project Assignment. Finalizing the problem statement, resource requirement, if any. | CO2,CO6, |
| | **Unit 3** | The internship work plan is drawn up by developing team work and applies prior acquired knowledge in problem solving. | CO3,CO6, |
| | **Unit 4** | Demonstrate and execute Project with the team. Submission of evaluation form and final report completed by the intern. | CO4,CO6 |
| | **Unit 5** | Final evaluation form completed by the supervisor at the Host Organization and final presentation before departmental committee. | CO5,CO6 |
| | Mode of examination | Theory | |
| | Weight age Distribution | CA | MTE |

| | | | | | |
|---|---|---|---|---|---|
| | | 60% | | | NA |
| | Text book/s* Other References | | | ETE | |
| | | | | 40% | |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) |
|---|---|---|
| 1. | CO1: Get familiarize with industry principles and practices. | PO1 |
| 2. | CO2: Identify and analyze an appropriate problem. | PO2,PO3,PO5,PSO1,PSO2 |
| 3. | CO3: Develop teamwork and apply prior acquired knowledge in problem solving. | PO1,PO2, PO3,PO9,PSO1 |
| 4. | CO4: Demonstrate effective verbal and written communication skills. | PO10 |
| 5. | CO5: Practice engineer's responsibilities, self-understanding, self-discipline and ethical standards. | PO6,PO8 |
| 6. | CO6: Identify the career preferences and professional goals. | PO12,PSO1 |

**PO and PSO mapping with level of strength for Course Name Summer Internship-I**

**CO/PO Mapping**

(1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Low

| Cos | Programme Outcomes(POs) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CO1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | 3 | 2 | - | 2 | - | - | - | - | - | - | - | 2 | 2 | - |
| CO3 | 2 | 2 | 3 | - | - | - | - | - | 3 | - | - | - | 1 | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | 3 | - | - | - | - | - |
| CO5 | - | - | - | - | - | 2 | - | 3 | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | 2 | 1 | - | - |
| Avg PO attained | 1 | 0.84 | 0.84 | 0 | 0.34 | 0.34 | 0 | 0.5 | 0.5 | 0.5 | 0 | 0.34 | 0.64 | 0.34 | 0 |

# TERM-IV

# Syllabus: CSP 249, Database management System

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch: 2019-2023** | |
| **Program: B.Tech** | | **Current Academic Year: 2019-2020** | |
| **Branch: CSE** | | **Semester: IV** | |
| 1 | Course Code | CSE249 Course Name | |
| 2 | Course Title | **Database Management System** | |
| 3 | Credits | 3 | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | |
| | Course Status | | |
| 5 | Course Objective | 1.Develop the ability to design,<br>2. Implement and manipulate databases.<br>3. Introduce students to build data base management systems.<br>4. Apply DBMS concepts to various examples and real life applications. | |
| 6 | Course Outcomes | Students will be able to:<br>**CO1:** Explain the basics concepts of data base.<br>**CO2:** Demonstrate the knowledge of databases to E-R modelling.<br>**CO3:** Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respective data.<br>**CO4:** Apply normalization techniques to reduce redundancy from the database.<br>**CO5:** To appraise the basic issues of Transaction processing, Serializability& concurrency control<br>**CO6:** Design & develop database for real life problems | |
| 7 | Course Description | This course introduces database design and creation using a DBMS product. Emphasis is on, normalization, data integrity, data modeling, and creation of simple tables, queries, reports, and forms. Upon completion, students should be able to design and implement normalized database structures by creating simple database tables, queries, reports, and forms. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Introduction to Databases:** | |
| | A | Introduction ofof DBMS, Characteristic of DBMS, Data Models, Database languages, Database Administrator, Database Users. | CO1,CO2,CO6 |
| | B | Three Schema architecture of DBMS, Data Models,Hierarchical, Network ,Data independence and database language, DDL, DML, Data Modeling using Entity Relationship Model | |
| | C | Strong Entity, Weak entity, Specialization and generalization, converting ER Model to relational tables. | |
| | **Unit 2** | **Relational Database Language and Interfaces:** | |
| | A | Relational data model concepts ,Concept of keys, Mapping Constraints | CO3 |
| | B | Null Values, Domain Constraints, Referential Integrity Constraints | |
| | C | Unary Relational Operations: SELECT and PROJECT Relational Algebra Operations from Set Theory ,Binary Relational Operations: JOIN and DIVISION ,SQL. | |
| | **Unit 3** | **Normalization in Design of Databases:** | |
| | A | Functional Dependency, Different anomalies in designing a Database, loss less join decompositions | CO1, CO4, CO6 |
| | B | Normalization : first second and third normal forms, BoyceCodd normal form, dependency preservation, | |

| | | | | | |
|---|---|---|---|---|---|
| | C | multi-valued dependencies , fourth normal forms, Inclusion dependencies, | | | |
| | **Unit 4** | **Transaction Management:** | | | |
| | A | Transaction processing system, schedule and recoverability, Testing of serializability, | | | CO5 |
| | B | Serializability of schedules, conflict & view serializable schedule | | | |
| | C | Recovery from transaction failures, deadlock handling. | | | |
| | **Unit 5** | **Concurrency Control** | | | |
| | A | Two-Phase Locking Techniques for Concurrency Control , Concurrency Control Based on Timestamp Ordering | | | CO5 |
| | B | Multiversion Concurrency Control Techniques ,Validation (Optimistic) Concurrency Control Techniques | | | |
| | C | Granularity of Data Items and Multiple Granularity Locking | | | |
| | Mode of examination | Theory | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 1. Korth , Silberschatz&Sudarshan, Data base Concepts, Tata McGraw-Hill, Latest Edition | | | |
| | Other References | 1.Elmasri, Navathe, Fundamentals of Database Systems, Pearson Education Inc.<br>2.Thomas Connolly, Carolyn Begg, Database Systems: A Practical Approach to design, Implementation and Management, Pearson Education, Third Edition. | | | |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | Understand the basics concepts of data base. | PO1, PO6, PO12, PSO1,PSO2 |
| 2. | Acquire the knowledge of databases to E-R modelling. | PO1 , PO5 , PO6 ,PO9, PO12, PSO1 PSO2 |
| 3. | Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respective data. | PO1, PO2, PO3, PO5, PO6, PO12 PSO1, PSO2 |
| 4 | Learn the basic concept of normalization & apply them to reduce redundancy from the database . | PO1, PO2, PO3, PO4, PO6 ,PO8 PO9 ,PO12 , PSO3 |
| 5 | To appraise the basic issues of Transaction processing ,Serializability& concurrency control | PO1, PO2, PO3, PO5, PO6, PO8 PO12 ,PSO2 |
| 6 | Design & develop database for real life problems | PO1, PO2, PO3, PO4, PO5, PO6 PO8 ,PO9 ,PO10 ,PO11, PO12 PSO3 |

**PO and PSO mapping with level of strength for Course Name Database Management System(Course Code CSE 249)**

| COs | PO1 Engineering knowledge | PO2 Problem analysis | PO3 Design/development of solutions | PO4 Conduct investigations of complex problems | PO5 Modern tool usage | PO6 The engineer and society | PO7 Environment and sustainability | PO8 Ethics | PO9 Individual and team work | PO10 Communication: | PO11 Project management and finance | PO12 Life-long learning | PSO1 Familiarity and practical proficiency | PSO2 Understand, analyse and develop | PSO3 Apply standard Software |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | - | - | - | 2 | - | - | - | - | - | 3 | 3 | 3 | - |
| CO2 | 2 | - | - | - | 3 | 2 | - | - | 2 | - | - | 3 | 3 | 3 | - |
| CO3 | 3 | 3 | 3 | - | 3 | 2 | - | - | - | - | - | 2 | 2 | 3 | - |
| CO4 | 3 | 3 | 3 | 3 | - | 2 | - | 2 | 3 | - | - | 2 | - | - | 3 |
| CO5 | 2 | 3 | 2 | - | 2 | 2 | - | 2 | - | - | - | 1 | - | 3 | - |
| CO6 | 3 | 3 | 3 | 3 | 3 | 3 | - | 3 | 3 | 3 | 2 | 3 | - | - | 3 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code/ Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE 249/ DBMS | 2.67 | 3 | 2.75 | 3 | 2.75 | 2.2 | - | 2.3 | 2.7 | 3 | 2 | 2.3 | 2.6 | 3 | 3 |

***Strength of Correlation:1.*** Addressed to ***Slight (Low=1) extent 2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

## INT248: Human Computer interaction

| | | | | |
|---|---|---|---|---|
| **School:** | | **School of Engineering and technology** | | |
| **Department** | | **Department of Computer Science and Engineering** | | |
| **Program:** | | **B.Tech** | | |
| **Branch:** | | | | |
| 1 | Course Code | INT248 | | |
| 2 | Course Title | Human Computer Interaction | | |
| 3 | Credits | 3 | | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | | |
| | Course Status | Core /Elective/Open Elective | | |
| 5 | Course Objective | The main objective is to make student think constructively and analytically about how to design and evaluate interactive technologies. | | |
| 6 | Course Outcomes | CO1: Define the capabilities of both humans and computers from the viewpoint of HCI.<br>CO2: Explain different types of User interfaces.<br>CO3: Describe and use HCI design principles, standards and guidelines.<br>CO4: Understand the fundamental aspects of designing and evaluating interfaces.<br>CO5: Analyse and identify user models, user support, socio-organizational issues, and stakeholder requirements of HCI systems.<br>CO6: Adapt methodologies to design, implement and evaluate a user interface for a project | | |
| 7 | Course Description | HCI is an interdisciplinary field that integrates theories and methodologies from computer science, cognitive psychology, design, and many other areas. This course is an introduction to the fundamentals of human-computer interaction, user interface design, and usability analysis. Students will learn principles and guidelines for usability and apply them through critiques of existing interfaces and development of new ones. | | |
| 8 | Outline syllabus | | | CO Mapping |
| | **Unit 1** | **Introduction** | | |
| | A | Introduction to HCI, CHI, MMI, Human System Interaction, Importance of User Interface, Importance of Good Design, Benefits of Good Design, Principles of User Interface Design | | CO1 |
| | B | Techniques and Tasks, Basic Interaction Tasks, Composite Interaction Task, Interaction Styles, Speech Recognition, Natural Language Processing, Fields of HCI | | CO1 |
| | C | The Contents of Human-Computer Interaction, Nature of Human-Computer Interaction, Applications , Goals and Aspects , HCI Groups | | CO1 |
| , | **Unit 2** | **Interfaces** | | |
| | A | Term Interface, Good and Bad Interfaces, Features of a Good Interface, | | CO2,CO6 |

| | | | | | |
|---|---|---|---|---|---|
| | B | User interface, Quality of User Interface, Types of User Interfaces, Command Line Interface, Advantages of Command Line Interface, Graphical User Interface | | | CO2,CO6 |
| | C | Document Interfaces and their types, Single Document Interface (SDI), Multiple Document Interface (MDI), Tabbed Document Interface. | | | CO2,CO6 |
| | **Unit 3** | **User Interface Design & GUI** | | | |
| | A | Understanding How User Interact With Computers, User Interface Models, Design Methodologies, Designing an Interface, Process of Interaction Design. | | | CO3,CO6 |
| | B | Human Interaction with Computers, Human Interaction Speeds, Human Characteristics in Design, Human Consideration in Design, Eight golden rules user interface design | | | CO3,CO6 |
| | C | Popularity of Graphics, Characteristics of Graphical User Interface, Concepts of Direct Manipulation, Graphical System Advantages and Disadvantages, Web User Interface Characteristics and Popularity | | | CO3,CO6 |
| | **Unit 4** | **Design Models and Ergonomics** | | | |
| | A | User interface models, User interface design methodologies, Efficacy of user interface design, Dialogue box design, Development and evaluation of user interface design, user centered design. | | | CO4,CO6 |
| | B | Factors in user interface design, HCI design models, Process of interface analysis, | | | CO4,CO6 |
| | C | User documentation, Ergonomics introduction, Human factors, Physical issues in ergonomics, cognitive issues in ergonomic | | | CO4,CO6 |
| | **Unit 5** | **Usability** | | | |
| | A | Usability introduction & its need, usability acceptability, | | | CO5,CO6 |
| | B | What to measure in Usability, Usability Engineering, | | | CO5,CO6 |
| | C | Life cycle, how to achieve high usability, Usability evaluation and testing, Learnability, Flexibility. | | | CO5,CO6 |
| | Mode of examination | Theory/Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | Alan Dix, Janet Finlay, Gregory Abowd. Ruel Beale "Human Computer Interaction",PHI. | | | |
| | Other References | 1. Kumar Rajendra, " Human Computer Interaction" Second Edition, Firewall Media New Delhi.<br>2. Ben Shneiderman, "Design the User Interface: Strategies for Effective Human-Computer Interaction" Pearson Education. | | | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: Define the capabilities of both humans and computers from the viewpoint of HCI. | PO1,PO4,PO5,PO6,PO7,PO8,PO9, PO10,PO12,PSO1 |
| 2. | CO2: Explain different types of User interfaces. | PO1,PO2,PO4,PO5,PO6,PO7,PO8, PO9,PO10,PO12,PSO1 |
| 3. | CO3: Describe and use HCI design principles, standards and guidelines. | PO1,PO2,PO4,PO5,PO6,PO7,PO8, PO9,PO10,PO12,PSO1 |
| 4. | CO4: Understand the fundamental aspects of designing and evaluating interfaces. | PO1,PO2,PO4,PO5,PO6,PO7, PO8,PO9,PO10,PO12,PSO1 |
| 5. | CO5: Analyze and identify user models, user support, socio-organizational issues, and stakeholder requirements of HCI systems. | PO1,PO2,PO3,PO4,PO5,PO6,PO7, PO8,PO9,PO10,PO11,PO12,PSO1 |
| 6. | CO6: Adapt methodologies to design, implement and evaluate a user interface for a project | PO1,PO2,PO3,PO4,PO5,PO6,PO7, PO8,PO9,PO10,PO11,PO12,PSO1, PSO2 |

**PO and PSO mapping with level of strength for Course Name Human Computer Interaction(Course Code INT 248)**

| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INT248_Human Computer Interaction | CO1 | 1 | - | - | 1 | 1 | 1 | 2 | 1 | 2 | 3 | - | 3 | 1 | - | - |
| | CO2 | 1 | 1 | - | 1 | 1 | 1 | 2 | 2 | 2 | 3 | - | 3 | 1 | - | - |
| | CO3 | 1 | 1 | - | 1 | 1 | 1 | 2 | 2 | 2 | 3 | - | 3 | 2 | - | - |
| | CO4 | 1 | 2 | - | 1 | 1 | 1 | 2 | 2 | 2 | 3 | - | 3 | 1 | - | - |
| | CO5 | 3 | 3 | 3 | 3 | 2 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 1 | - | - |
| | CO6 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | - |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INT248 | Human Computer Interaction | 1.5 | | | 1.6 | 1.3 | 1.1 | 2.1 | 1.8 | 2 | 3 | 3 | 3 | 1.5 | 2 | - |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

## Syllabus: CSE 252, Computer Networks

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch: 2019 onwards** | |
| **Program: B.Tech** | | **Current Academic Year: 2020-2021** | |
| **Branch:CSE** | | **Semester: 4** | |
| 1 | Course Code | CSE252 \| Course Name: B. Tech | |
| 2 | Course Title | **Computer Networks** | |
| 3 | Credits | 3 | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | Provide students with an overview of networking, insight into the issues, challenges and working at all level of reference models. Also practice on applying protocols in network design. | |
| 6 | Course Outcomes | Students will be able to:<br>**CO1:**Demonstrate and differentiate working of all layers of the OSI Reference Model and TCP/IP model.<br>**CO2:**Investigate and explore fundamental issues driving network design including error control.<br>**CO3:** Understand and building the skills of IP addressing, subnetting and routing protocols.<br>**CO4:** Discuss the flow control, elements and protocols of transport layer<br>**CO5:** Describe the connection management and application layer protocols.<br>**CO6:** Outline the basic knowledge of the use of cryptography and network security. | |
| 7 | Course Description | To familiarize with the basic taxonomy and terminology of computer networking area. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Introduction** | |
| | A | Introduction to computer networks, applications and uses, classification of Networks based on topologies, geographical distribution and communication techniques | CO1, CO2 |
| | B | **Reference models:** OSI model, TCP/IP model , Overview of Connecting devices (Hub, Repeaters, Switches, Bridges, Routers, Gateways) | CO1, CO2 |
| | C | **Transmission Media:**wired , wireless, Multiplexing techniques-FDM, TDM | CO1, CO2 |
| | **Unit 2** | **Data Link Layer** | |
| | A | Functions, Framing, Error Control-Error correction codes(Hamming code),Error Detection codes(Parity Bit, CRC) | CO1, CO2 |
| | B | Flow Control- Stop and Wait Protocol, Sliding window –Goback N and Selective repeat(ARQ) | CO1, CO2 |
| | C | MAC- Sub-layer Protocols: ALOHA, CSMA, CSMA/CD protocols, IEEE Standards 802.3, 802.4,802.5 | CO1, CO2 |
| | **Unit 3** | **Network Layer** | |
| | A | Design issues , IPV4addressing basics and Header format, CIDR, sub-netting and sub-masking | CO1,CO3 |
| | B | Routing, optimality Principle Routing protocols-, Shortest path, flooding, distance vector routing , link state routing | CO1,CO3 |
| | C | Congestion control-Leaky bucket , Token Bucket, jitter control | CO1,CO3,CO4 |
| | **Unit 4** | **Transport Layer** | |

| | | | | | |
|---|---|---|---|---|---|
| | A | Need of transport layer with its services, Quality of service, connection oriented and connection less | | | CO1,CO4 |
| | B | Transmission Control Protocol: Segment structure and header format, TCP Connection Management, Flow Control | | | CO1,CO4,CO5 |
| | C | TCP congestion control, Internet Congestion Control Algorithm, Overview of User Datagram Protocol (UDP) | | | CO1,CO4,CO5 |
| | **Unit 5** | **Application Layer** | | | |
| | A | Domain Name System (DNS), HTTP, FTP, SMTP | | | CO1,CO5 |
| | B | Network Security services, cryptography, Symmetric versus Asymmetric cryptographic algorithms- DES, and RSA | | | CO1,CO5,CO6 |
| | C | Application of Security in Networks: Digital signature | | | CO1,CO5,CO6 |
| | Mode of examination | Theory | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 1. Tanenbaum, A.S." Computer Networks", 4th Edition, PHI | | | |
| | Other References | 1. Forouzan, B.., "Communication Networks", TMH, Latest Edition<br>2. W. Stallings, "Data and Computer Communication" Macmillan Press | | | |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | **CO1:**Demonstrate and differentiate working of all layers of the OSI Reference Model and TCP/IP model. | PO2,PO11,PO12,PSO2 |
| 2. | **CO2:**Investigate and explore fundamental issues driving network design including error control. | PO1,PO3,PO4,PO5,PO11PO12,PSO2 |
| 3. | **CO3:** Understand and building the skills of IP addressing, subnetting and routing protocols. | PO1,PO2,PO4,PO6,PSO1,PSO3 |
| 4. | **CO4:** Discuss the flow control, elements and protocols of transport layer | PO2,PO3,PSO2,PSO3 |
| 5. | **CO5:** Describe the connection management and application layer protocols. | PO1, PO2,PO3, PO4, PSO2 |
| 6. | **CO6:** Outline the basic knowledge of the use of cryptography and network security. | PO1, PO2, PO4,PO8 PO11, PSO2 |

**PO and PSO mapping with level of strength for Course Name Computer Networks (Course Code CSE 252)**

| COs | PO1 Engineering knowledge | PO2 Problem analysis | PO3 Design/development of solutions | PO4 Conduct investigations of complex problems | PO5 Modern tool usage | PO6 The engineer and society | PO7 Environment and sustainability | PO8 Ethics | PO9 Individual and team work | PO10 Communication: | PO11 Project management and finance | PO12 Life-long learning | PSO1 Familiarity and practical proficiency | PSO2 Understand, analyse and develop | PSO3 Apply standard Software |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | | 2 | - | - | - | - | - | - | - | - | 2 | 3 | - | 3 | - |
| CO2 | 2 | - | 2 | 2 | 3 | - | - | - | - | - | 2 | 3 | | 3 | - |
| CO3 | 3 | 2 | - | 2 | - | 2 | - | - | - | - | - | - | 2 | - | 2 |
| CO4 | - | 2 | 2 | - | - | - | - | - | - | - | - | - | - | 2 | 2 |
| CO5 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 | - |
| CO6 | 2 | - | - | 2 | - | - | - | 2 | - | - | 2 | - | - | 2 | - |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code/ Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Computer Networks | 1.5 | 1.33 | 1 | 1.33 | 0.5 | 0.33 | - | 0.33 | - | - | 1 | 1 | 0.33 | 2 | 0.67 |

***Strength of Correlation:1.*** Addressed to ***Slight (Low=1) extent 2.*** Addressed to ***Moderate (Medium=2) extent 3.*** Addressed to ***Substantial (High=3) extent***

## Syllabus: CSE 011, Mathematical Techniques (Program Elective-1)

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch: 2019-2023** | |
| **Department** | | **Department of Computer Science and Engineering** | |
| **Program: B.Tech** | | **Current Academic Year: 2019-2020** | |
| **Branch:CSE** | | **Semester:V** | |
| 1 | Course Code | CSE 011 | |
| 2 | Course Title | Mathematical Techniques | |
| 3 | Credits | 3 | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | |
| | Course Status | Program Elective-I | |
| 5 | Course Objective | The objective of the course is to teach students the mathematical & statistical techniques that provide sound basis for research and application development in Computer Science. | |
| 6 | Course Outcomes | By the end of the course, students will be able to:<br>CO1: Identify and analyze computational errors in numerical computation and series approximation.<br>CO2: Make use of various Numerical techniques for interpolation.<br>CO3: Recall probability concepts and statistical terms to apply in various random situations<br>CO4: Identify various distributions for suitable scenario<br>CO5: Make use of various techniques for hypothesis testing<br>CO6: Apply mathematical and statistical methods in their research and application development | |
| 7 | Course Description | In this subject, the fundamental concepts and principles of Mathematical & Statistical Techniques together with the challenging issues in Computer Science software development will be introduced. Discussion on various topics related to mathematics and Computer Science will also be conducted. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Introduction, Computational Errors and their Analysis** | |
| | A | Accuracy of numbers, Errors and a general error formula, Errors in Numerical Computations. | CO1, CO6 |
| | B | Errors in a Series Approximation. | CO1, CO6 |
| | C | Precisions | CO1, CO6 |
| | **Unit 2** | **Numerical Techniques** | |
| | A | LU decomposition for systems of linear equations; | CO2, CO6 |
| | B | numerical solutions of non-linear algebraic equations by Secant, Bisection and Newton-Raphson Methods; | CO2, CO6 |
| | C | Numerical integration by trapezoidal and Simpson's rules. | CO2, CO6 |
| | **Unit 3** | **Probability** | |
| | A | Probability: Conditional Probability; | CO3,CO6 |
| | B | Mean, Median, Mode and Standard Deviation;. | CO3,CO6 |
| | C | Random Variables; Distributions; | CO3,CO6 |
| | **Unit 4** | **Permutation** | |
| | A | uniform, normal, exponential | CO4,CO6 |
| | B | Poisson, Binomial distribution | CO4,CO6 |
| | C | Permutations; Combinations; Counting; Summation; | CO4,CO6 |
| | **Unit 5** | **Hypothesis testing** | |
| | A | Generating functions; recurrence relations; | CO5,CO6 |

| | | | | | |
|---|---|---|---|---|---|
| | B | Techniques for statistical quality control, | | | CO5,CO6 |
| | C | Testing of hypothesis. | | | CO5,CO6 |
| | Mode of examination | Theory | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | M. Goyal, "Computer Based Numerical & Statistical Techniques", Infinity Science Press, LLC, MA, USA. | | | |
| | Other References | 1. Matheus Grasselli and Dimitry Pelinovsky, "Numerical Mathematics", Jones and Bartlet Publishers, USA.<br>2. Lars Elden, "Mattrix Methods in Data Mining and Pattern Recognition", SIAM (Society for Industrial and Applied Mathematics), USA.<br>3. Internet as a resource for references. | | | |

## CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: Identify and analyze computational errors in numerical computation and series approximation. | PO1, PO2, PSO1 |
| 2. | CO2: Make use of various Numerical techniques for interpolation. | PO1, PO2, PO3, PO7, PO10, PO11, PO12, PSO1, PSO2 |
| 3. | CO3: Recall probability concepts and statistical terms to apply in various random situations | PO1, PO2, PO3, PO4, PO7, PO10, PO11, PO12, PSO1,PSO2 |
| 4. | CO4: Identify various distributions for suitable scenario | PO1, PO2, PO3, PO4, PO5, PO7, PO10, PO11, PO12, PSO1, PSO2 |
| 5. | CO5: Make use of various techniques for hypothesis testing | PO1, PO2, PO3, PO4, PO5, PO7, PO10, PO11, PO12, PSO1, PSO2 |
| 6. | CO6: Apply mathematical and statistical methods in their research and application development | PO1, PO2, PO3, PO4, PO5, PO7, PO10, PO11, PO12, PSO1, PSO2 |

**PO and PSO mapping with level of strength for Course Name Mathematical techniques (Course Code CSE011 )**

| Course | Cos | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mathematical techniques (CSE011 )** | CO1 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | 2 | - | - |
| | CO2 | 2 | 3 | 1 | 1 | 1 | - | 1 | - | - | 1 | 2 | 1 | 1 | 1 | - |
| | CO3 | 3 | 1 | 1 | 1 | - | - | 1 | - | - | 2 | 1 | 1 | 3 | 1 | - |
| | CO4 | 2 | 3 | 2 | 1 | 1 | - | 1 | - | - | 1 | 1 | 1 | 2 | 1 | - |
| | CO5 | 1 | 1 | 1 | 2 | 2 | - | 1 | - | - | 1 | 2 | 1 | 2 | 1 | - |
| | CO6 | 3 | 1 | 3 | 1 | 2 | - | 2 | - | - | 2 | 2 | 3 | 3 | 1 | - |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE011 | Mathematical techniques | 2.3 | 1.8 | 1.3 | 1 | 1 | 0 | 1 | 0 | 0 | 1.1 | 1.3 | 1.1 | 2.1 | .8 | 0 |

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch :2018** | |
| **Program: B.Tech** | | **Current Academic Year: 2018-19** | |
| **Branch:CS/IT** | | **Semester:5** | |
| 1 | Course Code | CSE012 | Course Name: Introduction to Graph Theory and its Application |
| 2 | Course Title | Introduction to Graph Theory and its Application | |
| 3 | Credits | 3 | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | |
| | Course Status | Program Elective-I | |
| 5 | Course Objective | The objective of the course is to teach students the basic graph theory concepts and their applications in computer science. | |
| 6 | Course Outcomes | After successful completion of the course students will be able to<br>CO1: demonstrate some of the most important notions and types of graph theory and develop their skill in solving basic applications understanding societal needs.<br>CO2: interpret the fundamentals of graphs and trees and to apply these as computer science applications such as to find a minimal spanning tree for a given weighted graph etc.<br>CO3: Discover the advanced properties and concepts of graphs such as cut-sets and circuits in graph, planarity of graphs etc in addition to their application in real-world.<br>CO4: Examine a graph using matrices to communicate their application in real world.<br>CO5: Develop efficient graph-theoretic algorithms (mathematically) to explore the applications of coloring problem of graph theory.<br>**CO6: Relating the concepts to prepare grounds for project work and research interests.** | |
| 7 | Course Description | This course is to teach students the basic graph theory concepts and their applications in computer science. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Introduction** | |
| | A | Basic terminologies and concepts of Graph Theory, Fundamental types of graphs, Applications in various areas | CO1 |
| | B | Properties of graphs, theorems based on different types of graph and various operations on graphs | CO1,CO2 |
| | C | Special types of graphs (Hamiltonian, Euler), Travelling salesman problem | CO1, CO6 |
| | **Unit 2** | **TREES** | |
| | A | Fundamentals of trees and their types, Binary trees and their properties, importance of binary trees in data structure (searching algorithms) | CO2 |
| | B | fundamental circuits, spanning trees, algorithms to find spanning trees in a weighted graph (Kruskal& Prim) | CO2 |
| | C | Applications: Representation of the algebraic expressions as ordered binary trees, Huffman procedure for construction of an optimal tree for a given set of weights. | CO2, CO6 |
| | **Unit 3** | **CUT SETS** | |
| | A | a cut-set of a connected graph, the fundamental circuit | CO1, CO3 |

| | | | | | |
|---|---|---|---|---|---|
| | | ,Properties of circuits & cut–sets, Concept of connectivity and separability | | | |
| | B | Concept of Planar graphs with introduction to Kuratowski's non-planar graphs, Proof of Euler's formula | | | CO3 |
| | C | Detection of planarity , geometric duals of graph, thickness & Crossings, network flow | | | CO3, CO6 |
| | **Unit 4** | **Coloring and Covering** | | | |
| | A | Concept of proper coloring of vertices of a graph, chromatic number , Chromatic partitioning | | | CO5, CO6 |
| | B | Chromatic polynomial, finding chromatic polynomial of a given graph | | | CO5, CO6 |
| | C | Matching, Covering, Five color problem and its proof | | | CO5, CO6 |
| | **Unit 5** | **Matrix Representation of Graphs& Applications** | | | |
| | A | Incidence matrix, sub matrices of A(G), circuit matrix, fundamental circuit matrix and Rank of B | | | CO3, CO4 |
| | B | Cut set matrix , fundamental cut set matrix, path matrix, Adjacency matrix | | | CO4 |
| | C | Finding Rank of different matrices, Relationship among $A_f$, $B_f$, and$C_f$ | | | CO3, CO4 |
| | Mode of examination | Theory | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | **1.** Deo, N, *Graphtheory with applications to Engineering and Computer Science*, Prentice Hall India | | | |
| | Other References | **1.** Wilson R J, *Introduction to Graph Theory*, PearsonEducation<br>**2.** Harary, F, *Graph Theory*, Narosa<br>**3.** Bondy& Murthy, *Graph theory and application*. Addison Wesley | | | |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: : demonstrate some of the most important notions and types of graph theory and develop their skill in solving basic applications understanding societal needs. | PO1, PO2, PO6, PO7, PO10, PO11, PO12, PSO1 |
| 2. | CO2: interpret the fundamentals of graphs and trees and to apply these as computer science applications such as to find a minimal spanning tree for a given weighted graph etc. | PO1, PO2, PO3, PO4, PO6, PO7, PO10, PO12, PSO1 |
| 3. | CO3: Discover the advanced properties and concepts of graphs such as cut-sets and circuits in graph, planarity of graphs etc in addition to their application in real-world. | PO2, PO4, PO5,PO6, PO10, PO12, PSO2 |
| 4. | CO4: Examine a graph using matrices to communicate their application in real world. | PO2, PO4, PO10,PSO1, PSO2, |
| 5. | CO5: Develop efficient graph-theoretic algorithms (mathematically) to explore the applications of coloring problem of graph theory. | PO1, PO2, PO4, PO5, PO6, PO10, PO12, PSO2 |
| 6 | **CO6: Relating the concepts to prepare grounds for project work and research interests.** | PO4, PO6,PO12,PO10, PSO2, PSO3. |

**PO and PSO mapping with level of strength for Course Name: Introduction to Graph Theory and its Application (CSE 012 )**

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | - | - | 2 | 1 | 2 | 3 | 1 | - |
| CO2 | 3 | 3 | 3 | 2 | - | 1 | 1 | - | - | 1 | - | 2 | 3 | 1 | - |
| CO3 | 1 | 3 | 1 | 3 | 2 | 2 | - | - | - | 1 | - | 2 | 2 | 2 | - |
| CO4 | 1 | 3 | 1 | 3 | 1 | 1 | - | - | - | 2 | - | 1 | 3 | 2 | - |
| CO5 | 2 | 2 | 2 | 3 | 2 | 1 | - | - | - | 1 | - | 2 | 1 | 2 | - |
| Co6 | 1 | 1 | 2 | 3 | 1 | 2 | - | - | - | 2 | - | 2 | 1 | 2 | 2 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE012 | Introduction to Graph Theory and its Application | 1.83 | 2.83 | 1.83 | 2.67 | 1.17 | 1.5 | 0.5 | - | - | 1.5 | 0.17 | 1.83 | 2.17 | 1.67 | 0.33 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

## Syllabus: CSP 249, Database management System Lab

| | | |
|---|---|---|
| **School: SET** | | **Batch: 2019-2023** |
| **Program: B.Tech** | | **Current Academic Year: 2019-2020** |
| **Branch:CSE** | | **Semester: IV** |
| 1 | Course Code | CSP249 |
| 2 | Course Title | Database Management System Lab |
| 3 | Credits | 1 |
| 4 | Contact Hours (L-T-P) | 0-0-2 |
| | Course Status | Compulsory |
| 5 | Course Objective | • To Develop efficient SQL programs to access Oracle databases<br>• Build database using Data Definition Language Statements<br>• Perform operations using Data Manipulation Language statements like Insert, Update and Delete |
| 6 | Course Outcomes | By the end of this course you will be able to:<br>CO1: Understand the concept of SQL commands in DBMS<br>CO2: Create SQL SELECT statements that retrieve any required data<br>CO3: Perform operations using Data Manipulation Language statements like Insert, Update and Delete<br>CO4: Manipulate your data to modify and summaries your results for reporting<br>CO5: Apply Grouping Clauses on various tuples & relations of database<br>CO6: Develop project based on various SQL commands. |
| 7 | Course Description | An introduction to the design and creation of relational databases. Create database-level applications and tuning robust business applications. Lab sessions reinforce the learning objectives and provide participants the opportunity to gain practical hands-on experience. |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Practical based Data types** | |
| | | Classification SQL, Data types of SQL/Oracle | CO1,CO2 |
| | **Unit 2** | **Practical based on DDL commands** | |
| | | Create table, Alter table and drop table | CO2,CO3 |
| | **Unit 3** | **DML commands and Aggregate functions** | |
| | | Introduction about the INSERT, SELECT, UPDATE & DELETE commands. | CO3,CO4 |
| | **Unit 4** | **Practical based on Grouping Clauses GROUP BY ORDER BY & GROUP BY HAVING** | |
| | | Briefly explain Group by, order by ,having clauses with examples. Aggregate function: sum, avg, count, max, min | CO5 |
| | **Unit 5** | **Practical based on Sub- queries, JOINS** | |
| | | Related example of Sub- queries, Joins and related examples,Views,Trigger | CO5,CO6 |

| | | | | | |
|---|---|---|---|---|---|
| | Mode of examination | Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | 0% | 40% | |
| | Text book/s* | 1. Korth ,Silberschatz& Sudarshan, Data base Concepts, Tata McGraw-Hill | | | |
| | Other References | 1. Elmasri, Navathe, Fundamentals of Database Systems, Pearson Education Inc.<br>2. *Thomas Connolly, Carolyn Begg, Database Systems: A Practical Approach to design, Implementation and Management, Pearson Education, Latest Edition.*<br>3. *Jeffrey D. Ullman, Jennifer Windon, A first course in Database Systems, Pearson Education.* | | | |

## CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: Understand the concept of SQL commands in DBMS. | PO1,PO5, PSO1 ,PSO2 |
| 2. | CO2: Create SQL SELECT statements that retrieve any required data. | PO2, PO3, PO4, PO5, PO9,PSO1, ,PSO3 |
| 3. | CO3: Perform operations using Data Manipulation Language statements like Insert, Update and Delete. | PO2, PO3, PO4, PO5, PO9,PSO1, ,PSO3 |
| 4. | CO4: Manipulate your data to modify and summaries your results for reporting. | PO2, PO3, PO4, PO5, PO9,PSO1, ,PSO3 |
| 5 | CO5: Apply Grouping Clauses on various tuples & relations of database | PO2, PO3, PO4, PO5, PO9,PSO1, ,PSO3 |
| 6 | CO6: Develop project based on various SQL commands. | PO2, PO3, PO4, PO5, PO9, PO12,PSO1, PSO2,PSO3 |

**PO and PSO mapping with level of strength for Course Name Principles of Database Management System lab (Course Code CSP 249)**

| **COs** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Engineering knowledge** | **Problem analysis** | **Design/development of solutions** | **Conduct investigations of complex problems** | **Modern tool usage** | **The engineer and society** | **Environment and sustainability** | **Ethics** | **Individual and team work** | **Communication:** | **Project management and finance** | **Life-long learning** | **Familiarity and practical proficiency** | **Understand, analyse and develop** | **Apply standard Software** |
| CO1 | 3 | - | - | - | 2 | - | - | - | - | - | - | - | 2 | 3 | 2 |
| CO2 | - | 3 | 3 | 3 | 2 | - | - | - | 3 | - | - | - | 2 | 3 | 3 |
| CO3 | - | 2 | 2 | 2 | 2 | - | - | - | 3 | - | - | - | 2 | 2 | 3 |
| CO4 | - | 2 | 2 | 2 | 2 | - | - | - | 3 | - | - | - | 2 | 2 | 3 |
| CO5 | - | 2 | 2 | 2 | 2 | - | - | - | 3 | - | - | - | 2 | 2 | 3 |
| CO6 | - | 2 | 3 | 2 | 3 | - | - | - | 3 | - | - | 2 | 3 | 3 | 3 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code/ Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP249 / DBMS lab | 3 | 2.2 | 2.4 | 2.2 | 2.2 | - | - | - | 3 | - | - | 2 | 2.2 | 2.5 | 2.8 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

## INP248:Human Computer Interaction Lab

| | | | |
|---|---|---|---|
| **School:** | | **School of Engineering and technology** | |
| **Department** | | **Department of Computer Science and Engineering** | |
| **Program:** | | **B.Tech** | |
| **Branch:** | | | |
| 1 | Course Code | INP248 | |
| 2 | Course Title | Human computer interaction lab | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Compulsory/Elective | |
| 5 | Course Objective | This course teaches students to design user interfaces based on the capabilities of computer technology and the needs of human factors. | |
| 6 | Course Outcomes | CO1: Define the concept of software for user interface<br>CO2: Build the user interface keeping design considerations in mind.<br>CO3: Construct user interface for student registration and displaying picture.<br>CO4: Design user interface for calculator and menu based applications<br>CO5: Build the user interface for any reservation system<br>CO6: Develop, implement and evaluate effective and usable graphical computer interfaces. | |
| 7 | Course Description | Course readings will span practice in interface specification, design and evaluation. This course gives experience as working in interdisciplinary design teams. Students will learn principles and guidelines for usability, quantitative and qualitative analysis methods, and apply them through critiques of existing interfaces and development of new ones. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | | |
| | | 1) Introduction to tool and design an interface for welcome screen | CO1,CO6 |
| | | 2) Design an interface for multiplication and addition of any two numbers | CO1,CO6 |
| | **Unit 2** | | |
| | | 3)Design an user interface for assigning a grade to students based on the subjects marks | CO2,CO6 |
| | | 4)Design an user interface for printing the numbers in<br>a) Ascending order<br>b) descending order | CO2,CO6 |
| | **Unit 3** | | |
| | | 5)Design an user interface for registration of students for admission | CO3,CO6 |
| | | 6)Design an user interface for displaying and changing of picture on the form | CO3,CO6 |
| | **Unit 4** | | |
| | | 7)Design an user interface for menu based program | CO4,CO6 |
| | | 8)Design an user interface for mathematical and | CO4,CO6 |

| | | | | | |
|---|---|---|---|---|---|
| | | scientific calculator | | | |
| | **Unit 5** | | | | |
| | | 9)Design an user interface for reservation system e.g. bus/Flight/railways etc. | | | CO5,CO6 |
| | | 10)Design and implement modules of a given application or system. | | | CO5,CO6 |
| | Mode of examination | Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | 0% | 40% | |
| | Text book/s* | - | | | |
| | Other References | Internet as a resource | | | |

**PO and PSO mapping with level of strength for Course Name INP248 (Course Code Human Computer Interaction Lab)**

| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INP248_Human computer Interaction Lab | CO1 | 2 | 1 | 1 | 1 | 3 | 1 | - | - | 1 | 3 | 3 | 3 | 2 | 2 | 1 |
| | CO2 | 2 | 1 | 2 | 2 | 3 | 1 | - | - | 1 | 3 | 3 | 3 | 2 | 2 | 1 |
| | CO3 | 2 | 1 | 2 | 2 | 3 | 1 | - | - | 1 | 3 | 3 | 3 | 2 | 2 | 1 |
| | CO4 | 2 | 1 | 2 | 2 | 3 | 1 | - | - | 1 | 3 | 3 | 3 | 2 | 2 | 1 |
| | CO5 | 2 | 2 | 2 | 2 | 3 | 1 | - | - | 2 | 3 | 3 | 3 | 2 | 2 | 1 |
| | CO6 | 3 | 2 | 3 | 3 | 3 | 2 | - | - | 3 | 3 | 3 | 3 | 2 | 2 | 1 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INP 248 | Human computer interaction Lab | 2 | 1.3 | 2 | 2 | 3 | 1.6 | - | - | 1.5 | 3 | 3 | 3 | 2 | 2 | 1 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

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| | | | |
|---|---|---|---|
| School: | | School of Engineering and technology | |
| Department | | Department of Computer Science and Engineering | |
| Program: | | B.Tech | |
| Branch: | | | |
| 1 | Course Code | CSP-252 | |
| 2 | Course Title | Computer Networks Lab | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Compulsory/Elective | |
| 5 | Course Objective | The students will be introduced to the basic concepts and fundamentals of computer networks along with the study of individual layers of reference model. | |
| 6 | Course Outcomes | Students will be able to:<br>CO1: Explain the basic concepts of computer network.<br>CO2: Illustrate and differentiate working of all layers of the OSI Reference Model and TCP/IP model<br>CO3: Analyze fundamental issues driving network design including error control, IP addressing, access control, flow and congestion control<br>CO4: Compare working of various routing algorithms<br>CO5: Test various network security algorithms<br>CO6: Examine various cryptographic Algorithms | |
| 7 | Course Description | To familiarize with the basic taxonomy and terminology of computer networking area. | |
| 8 | Outline syllabus | | CO Mapping |
| | Unit 1 | Introduction | |
| | A | Study of Data Communication and Networking. Identify five components of Data communication system. | CO1, CO2 |
| | B | Study of computer network topology and OSI model layered architecture. | CO1, CO2 |
| | C | Study of basic networking commands: IPCONFIG, PING / Tracer and Net stat utilities to debug the network issues. | CO1, CO2 |
| | Unit 2 | Data Link Layer | |
| | A | To connect the computers in Local Area Network | CO1, CO2 |
| | B | Write a C program to implement Character Stuffing and Destuffing | CO1, CO2 |
| | C | Write a C program to Error Detection using Cyclic Redundancy Check Algorithms. | CO1, CO2 |
| | Unit 3 | Network Layer | |
| | A | Write a program to generate Hamming code. | CO1,CO3 |
| | B | Write a C program to determine if the IP address is | CO1,CO3 |

| | | | | | |
|---|---|---|---|---|---|
| | | in Class A, B, C, D, or E. | | | |
| | C | Write a C program to translate dotted decimal IP address into 32 bit address. | | | CO1,CO3,CO4 |
| | Unit 4 | Transport Layer | | | |
| | A | Write a program for congestion control using Leaky bucket algorithm. | | | CO1,CO4 |
| | B | Write a Program to simulate Distance vector routing. | | | CO1,CO4,CO5 |
| | C | Creating a Network topology using CISCO packet tracer software | | | CO1,CO4,CO5 |
| | Unit 5 | Application Layer | | | |
| | A | Write a program to implement DES for encryption. | | | CO1,CO5 |
| | B | Using RSA algorithm encrypts a text data and decrypts the same. | | | CO1,CO5,CO6 |
| | C | Open Ended Project | | | CO1,CO5,CO6 |
| | Mode of examination | Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | 0% | 40% | |
| | Text book/s* | Tanenbaum, A.S." Computer Networks", 4th Edition, PHI | | | |
| | Other References | 1. Forouzan, B.., "Communication Networks", TMH, Latest Edition<br>2. W. Stallings, "Data and Computer Communication" Macmillan Press | | | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: Explain the basic concepts of computer network. | PO2,PO11,PO12,PSO2 |
| 2. | CO2: Illustrate and differentiate working of all layers of the OSI Reference Model and TCP/IP model | PO1,PO3,PO4,PO5,PO 11PO12,PSO2 |
| 3. | CO3: Analyze fundamental issues driving network design including error control, IP addressing, access control, flow and congestion control | PO1,PO2,PO4,PO6,PS O1,PSO3 |
| 4. | CO4: Compare working of various routing algorithms | PO2,PO3,PSO2,PSO3 |
| 5. | CO5: Test various network security algorithms | PO1, PO2,PO3, PO4, PSO2 |
| 6. | CO6: Examine various cryptographic Algorithms | PO1, PO2, PO4,PO8 PO11, PSO2 |

PO and PSO mapping with level of strength for Course Name Computer Networks Lab (Course Code CSP252)

| | | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Computer Networks Lab (Course Code CSP252) | CO1 | | 2 | - | - | - | - | - | - | - | - | 2 | 3 | - | 3 | - |
| | CO2 | 2 | - | 2 | 2 | 3 | - | - | - | - | - | 2 | 3 | | 3 | - |
| | CO3 | 3 | 2 | - | 2 | - | 2 | - | - | - | - | - | - | 2 | - | 2 |
| | CO4 | - | 2 | 2 | - | - | - | - | - | - | - | - | - | - | 2 | 2 |
| | CO5 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 | - |
| | CO6 | 2 | - | - | 2 | - | - | - | 2 | - | - | 2 | - | - | 2 | - |

*Average of non-zeros entry in following table (should be auto calculated).*

| Course Code/ Name | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Computer Networks (CSP 252) | 1.5 | 1.33 | 1 | 1.33 | 0.5 | 0.33 | - | 0.33 | - | - | 1 | 1 | 0.33 | 2 | 0.67 |

*Strength of Correlation*

*1.* Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
*3.* Addressed to *Substantial (High=3) extent*

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2018 - 2022** | |
| **Program: B.tech** | | **Current Academic Year: 2019-2020** | |
| **Branch: CSE / IT** | | **Semester: 4th** | |
| 1 | Course Code | **CSP298** | Course Name: Project Based Learning -2 |
| 2 | Course Title | Project Based Learning -2 | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | 7.To align student's skill and interests with a realistic problem or project<br>8.To understand the significance of problem and its scope<br>9.Students will make decisions within a framework | |
| 6 | Course Outcomes | Students will be able to:<br>CO1: Identify and formulate problem statement with systematic approach.<br>CO2: Develop teamwork and problem-solving skills, along with the ability to communicate effectively with others.<br>CO3: Design the problem solution as per the problem statement framed.<br>CO4: Explain the characteristics, architecture of database approach, describe the components of the project.<br>CO5: Fabricate and implement the solution by using different object oriented concepts like encapsulation, polymorphism etc.<br>CO6: Develop a glory of the need to engage in life-long learning. | |
| 7 | Course Description | In PBL-1, the students will learn how to define the problem for developing projects, identifying the skills required for developing the project based on given a set of specifications and all subjects of that Semester. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | Problem Definition, Team/Group formation and Project Assignment. Finalizing the problem statement, resource requirement, if any. | CO1, CO2 |
| | **Unit 2** | Develop a work flow or block diagram for the proposed system / software. | CO2,CO3 |
| | **Unit 3** | Design algorithms for the proposed problem. | CO3 |
| | **Unit 4** | Implementation of work under the guidance of a faculty member and obtain the appropriate results. | CO3, CO4 |
| | **Unit 5** | Demonstrate and execute Project with the team. Validate and verify the project modules. | CO4, CO5, CO6 |
| | | Report should include Abstract, Hardware / Software Requirement, Problem Statement, Design/Algorithm, Implementation Detail. Validation Reports.<br>References if any. | |

| | | | | | |
|---|---|---|---|---|---|
| | | The presentation, report, work done during the term supported by the documentation, forms the basis of assessment. | | | |
| | | | | | |
| | Mode of examination | Practical /Viva | | | |
| | Weight age Distribution | CA | MTE | ETE | |
| | | 60% | NA | 40% | |

## CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) |
|---|---|---|
| 1. | CO1: Identify and formulate problem statement with systematic approach. | PO1, PO2, PO4, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3 |
| 2. | CO2: Develop teamwork and problem-solving skills, along with the ability to communicate effectively with others. | PO1, PO2, PO4, PO7, PO9, PO10, PO11, PO12 ,PSO3 |
| 3. | CO3: Design the problem solution as per the problem statement framed. | PO1, PO2, PO5, PO9, PO10, PO11, PO12, PSO1,PSO2 |
| 4. | CO4: Explain the characteristics, architecture of database approach, describe the components of the project. | PO1, PO2, PO6, PO9, PO10, PO11, PO12,PSO2 |
| 5. | CO5: Fabricate and implement the solution by using different object oriented concepts like encapsulation, polymorphism etc. | PO1, PO2, PO3, PO4,PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12 PSO1,PSO2, PSO3 |
| 6. | CO6: Develop a glory of the need to engage in life-long learning. | PO1, PO2, PO4, PO9, PO10, PO11, PO12,PSO3 |

**PO and PSO mapping with level of strength for Course Name Project Based Learning -1 (Course Code CSP251)**

**CO/PO Mapping**

(1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Low

| Cos | Programme Outcomes(POs) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CO1 | 3 | 3 | - | 3 | - | - | - | - | 3 | 3 | 2 | 3 | 2 | 2 | 1 |
| CO2 | 3 | 2 | - | 3 | - | - | 2 | - | 3 | 3 | 2 | 3 | | | 1 |
| CO3 | 3 | 2 | - | - | 2 | - | - | - | 3 | 3 | 2 | 3 | 2 | 2 | |
| CO4 | 3 | 3 | - | - | - | 2 | - | - | 3 | 3 | 2 | 3 | | 2 | |
| CO5 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | |
| CO6 | 3 | 3 | - | 3 | - | - | - | - | 3 | 3 | 2 | 3 | | | 1 |
| Avg PO attainted | 3 | 2.7 | 0.3 | 1.8 | 0.7 | 0.7 | 0.8 | 0.5 | 3 | 3 | 2 | 3 | 1 | 1.3 | 0.5 |

| | | | |
|---|---|---|---|
| **School:** SET | | **Batch :** 2018-19 | |
| **Program:** | | **Current Academic Year:** 2018-19 | |
| **Branch:** CSE | | **Semester:** IV | |
| 1 | Course Code | **ARP204** | Course Name : **Aptitude Reasoning and Business Communication Skills-Intermediate** |
| 2 | Course Title | **Aptitude Reasoning and Business Communication Skills-Intermediate** | |
| 3 | Credits | 2 | |
| 4 | Contact Hours (L-T-P) | 0-0-4 | |
| | Course Status | | |
| 5 | Course Objective | To enhance holistic development of students and improve their employability skills. Provide a 360 degree exposure to learning elements of Business English readiness program, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a will have entered the threshold of his/her 2nd phase of employability enhancement and skill building activity exercise. | |
| 6 | Course Outcomes | CO1: *At the end of the session a student would have learned what is VMOSA (Vision, Mission, Values and Ethics) and Communication Process. This would help students understand and interpret the deeper meaning of life.*<br>CO2: *At the end of the session a student would have learned Communication Styles and flexing and 4 social styles of communication which will lead to effective and meaningful communication process along with Listening Styles & Listening Skills*<br>CO3: *At the end of the session a student would have learned the Art of giving feedback and probing skills that will help in improving peer to peer and business communication by giving meaningful feedbacks and probing skills to understand, assess and evaluate real life situations better*<br>CO4: *At the end of the session a student would have learned business writing skills and non-verbal communication process to make an impression in written communication process in office or otherwise coupled with positive body language and non-verbal communication*<br>CO5: *At the end of the session a student would have learned MTI (Mother Tongue Influence) Reduction attributes that will help to eliminate the influence of mother tongue in one's speech leading to meaningful communication levels and proficiencies.*<br>CO6: *At the end of the 2nd Level proficiency program in Quant & Aptitude Reasoning abilities a student will be able to coherently reason real life situations, will have more pronounced aptitudinal abilities that will help a student deal with real life situations more effectively* | |
| 7 | Course Description | This course bundle allows students to build vision, mission and strategy statements while exposing them to various models of communication along with MTI reduction and the 2nd level of quant, aptitude and reasoning abilities | |
| 8 | Outline syllabus – ARP204 | | CO MAPPING |
| | **Unit 1** | **Communicate to Conquer** | |
| | A | VMOSA (Vision, Mission, Values and Ethics)\| Business Communication - Verbal Communication Skills \| Barriers in communication \| Basics of effective communication – PRIDE Model | CO1 |
| | B | Different styles of communication & style flexing (Based on the 4 social styles-Analytical, Driving, Expressive, Amiable) \| Importance of Listening & practice of Active Listening \| The Art of Giving Feedbacks\| Feedback Skills \| | CO3,CO2 |

| | | | |
|---|---|---|---|
| | | Asking fact finding questions- Probing Skills | |
| | C | Email Etiquette \| Business Writing Skills\| Telephone Etiquette Skills ( Telephone Handling Skills ) \| Non Verbal Communication-Kinesics, Proxemics, Paralanguage \| MTI Reduction Program \| Verbal Abilities - 2 | CO4, CO5 |
| | **Unit 2** | **Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical** | |
| | A | Coding Decoding , Ranking & Their Comparison Level-2 | CO6 |
| | B | Series, Blood Relations & Number Puzzle | CO6 |
| | **Unit 3** | **Quantitative Aptitude** | |
| | A | Number System Level 2 | CO6 |
| | B | Vedic Maths Level-2 \| Probability \| Permutation & Combination | CO6 |
| | C | Percentage, Profit & Loss ,Partnership, Simple Interest & Compound Interest | CO6 |
| | Weightage Distribution | *( CA )Class Assignment/Free Speech Exercises / JAM – 60% \| (ETE) Group Presentations/Mock Interviews/GD/ Reasoning, Quant & Aptitude – 40%* | |
| | Text book/s* | *Wiley's Quantitative Aptitude-P Anand* \| ***Quantum CAT – Arihant Publications*** \| ***Quicker Maths-M. Tyra*** \| *Power of Positive Action (English, Paperback, Napoleon Hill)* \| *Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness – Nathaniel Brandon* \| *Goal Setting (English, Paperback, Wilson Dobson* | |

# TERM-V

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch :2018** | |
| **Program:B.Tech** | | **Current Academic Year:** | |
| **Branch:CSE** | | **Semester:V** | |
| 1 | Course Code | CSE350 \| Course Name: Design and Analysis of Algorithms | |
| 2 | Course Title | Design and Analysis of Algorithms | |
| 3 | Credits | 4 | |
| 4 | Contact Hours (L-T-P) | 3-1-0 | |
| | Course Status | UG | |
| 5 | Course Objective | Objective of this course is to<br>1. Reinforce basic design concepts (e.g., pseudocode, specifications, top-down design)<br>2. Knowledge of algorithm design strategies<br>3. Familiarity with an assortment of important algorithms.<br>4. Enable students to analyze time and space complexity | |
| 6 | Course Outcomes | Students will be able to:<br>**CO1: Analyze** the asymptotic performance of algorithms<br>**CO2**: **Describe** the dynamic-programming and Greedy paradigm and explain when an algorithmic design situation calls for it.<br>**CO3: Demonstrate** a familiarity with major algorithms and data structures<br>**CO4: Apply** important algorithmic design paradigms and methods of analysis<br>**CO5: Discuss** NP-complete problems and develop algorithms to solve the problems.<br>**CO6: Choose** appropriate algorithm design techniques for solving problems. | |
| 7 | Course Description | This course introduces concepts related to the design and analysis of algorithms. Specifically, it discusses recurrence relations, and illustrates their role in asymptotic and probabilistic analysis of algorithms. It covers in detail greedy strategies divide and conquer techniques, dynamic programming and max flow - min cut theory for designing algorithms, and illustrates them using a number of well-known problems and applications. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Introduction** | |
| | A | Introduction : Algorithms, Analyzing algorithms, Complexity of algorithms, Growth of functions, Performance measurements | CO1, CO3 |
| | B | Asymptotic Notations and their properties – Mathematical analysis for Recursive and Non-recursive algorithms, Recurrences relations, Master Method | CO1, CO2, CO3 |
| | C | Divide-and-conquer: Analysis and Structure of divide-and-conquer algorithms, Divide- | CO1, CO2, CO4 |

| | | | |
|---|---|---|---|
| | | and-conquer examples-Quick sort, Merge sort,<br>Sorting in Linear Time, Heap Sort | |
| | **Unit 2** | **Dynamic Programming** | |
| | A | Overview, Difference between dynamic programming and divide and conquer, All pair shortest path problems: Floyd-Warshall Algorithm | CO1,CO2,CO3, CO4 |
| | B | Applications and analysis: Matrix Chain Multiplication, 0/1 Knapsack Problem | CO1, CO2, CO3, CO4 |
| | C | Applications and analysis: Longest Common sub-sequence, Optimal Binary Search tree | |
| | **Unit 3** | **Greedy Method** | CO1,CO2,CO3 |
| | A | Overview of the Greedy paradigm, Analysis and example: task scheduling, | CO1,CO2,CO3 |
| | B | Fractional Knapsack problem, Single source shortest paths problem: Dijkastra's Algorithm, Bellman-ford Algorithm, | CO1,CO2,CO3 |
| | C | Overview and analysis of Backtracking & Branch and Bound: N-Queens problem and Sum of subsets | |
| | **Unit 4** | **Selected Topics** | CO1,CO2,CO3, |
| | A | Introduction to NP Complete and NP Hard Problems, Examples, Amortized Analysis | CO1,CO2,CO3, |
| | B | Approximation Algorithms – Travelling Sales Person Problem and Vertex Cover Problem, Randomized Algorithms, Randomized Quick Sort Algorithm | CO1,CO2,CO3 |
| | C | String Matching Algorithms – Naive String Matching Algorithm, Rabin Karp Algorithm. | CO1,CO2,CO3, CO4 |
| | **Unit 5** | **Advanced Data Structures** | |
| | A | Red-Black Trees - Definition, Applications, Insertion and deletion of elements in RB-Tree | CO1, CO2, CO3, CO4 |
| | B | B-Trees - Definitions, Applications, Insertion and Deletion in B-Trees | CO1, CO2, CO4 |
| | C | Data Structure for Disjoint Sets – Definition, Binomial Heaps, Fibonacci Heaps. | CO1, CO2, CO3, CO4 |
| | Mode of examination | Theory | |
| | Weightage Distribution | CA: 30% / MTE: 20% / ETE: 50% | |
| | Text book/s* | 2. Cormen et al., "Introduction of Computer Algorithms", Prentice Hall India | |
| | Other References | 4. Sahni et al., "Fundamentals of Computer Algorithms", Galgotia Publications.<br>5. Hopcroft A, The Design And Analysis Computer Algorithms, Addison Wesley | |

## CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | **CO1: Analyze** the asymptotic performance of algorithms | PO1, PO2, PO3, PO4, PO9, PSO1, PSO2, PSO3 |
| 2. | **CO2**: **Describe** the dynamic-programming and Greedy paradigm and explain when an algorithmic design situation calls for it. | PO1, PO2, PO3, PO4, PO9, PSO1, PSO2, PSO3 |
| 3. | **CO3: Demonstrate** a familiarity with major algorithms and data structures | PO1, PO2, PO3, PO9, PSO1, PSO2 |
| 4. | **CO4: Apply** important algorithmic design paradigms and methods of analysis | PO1, PO2, PO3, PO4, PO9, PSO1, PSO2, PSO3 |
| 5. | **CO5: Discuss** NP-complete problems and develop algorithms to solve the problems. | PO1, PO2, PO3, PO4, PO9, PSO1, PSO2, PSO3 |
| 6. | **CO6: Choose** appropriate algorithm design techniques for solving problems. | PO1, PO2, PO3, PO4, PO5, PO9, PSO1, PSO2 |

**PO and PSO mapping with level of strength for Course Name Design and Analysis of Algorithms Course Code CSE 350)**

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 3 | 1 | 2 | - | -- | -- | - | 2 | - | - | - | 3 | 2 | 2 |
| CO2 | 2 | 2 | 2 | 2 | - | -- | -- | - | 3 | - | - | - | 2 | 3 | 2 |
| CO3 | 2 | 1 | 2 | - | - | -- | -- | - | 1 | - | - | - | 3 | 2 | - |
| CO4 | 1 | 2 | 2 | 3 | - | -- | -- | - | 2 | - | - | - | 2 | 2 | 2 |
| CO5 | 3 | 3 | 1 | 3 | - | - | - | - | 3 | - | - | - | 2 | 1 | 3 |
| CO6 | 2 | 2 | 3 | 2 | 2 | - | - | -- | 2 | - | - | - | 3 | 2 | - |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP 350 | Design and Analysis of Algorithms Lab | 2 | 2.17 | 1.83 | 2.4 | 2 | - | - | - | 2.2 | - | - | - | 2.5 | 2 | 2.3 |

| | | | |
|---|---|---|---|
| **School:** | | **School of Engineering and technology** | |
| **Department** | | **Department of Computer Science and Engineering** | |
| **Program:** | | **B.Tech** | |
| **Branch:** | | Computer Science and Engineering | |
| 1 | Course Code | CSE351 | Course Name: Software Engineering and Testing Methodologies |
| 2 | Course Title | Software Engineering and Testing Methodologies | |
| 3 | Credits | 3 | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | |
| | Course Status | Core /Elective/Open Elective | |
| 5 | Course Objective | The objective of this course is to provide<br>1. Fundamental knowledge of software engineering<br>2. To make student aware of best software engineering practices<br>3. Inculcate ability in students to work as an effective member or leader of software engineering teams<br>4. To help students to develop skills that will enable them to construct software of high quality | |
| 6 | Course Outcomes | CO1: Illustrate and compare an effective software engineering process, based on knowledge of widely used development lifecycle model<br>CO2: Apply effective requirement elicitation techniques to develop SRS for a project.<br>CO3: Construct design documents with the help of designing tools<br>CO4: Analyze testing strategies for a software system<br>CO5: Develop and deliver quality software as an individual or as part of a multidisciplinary team.<br>CO6: Adapt techniques and tools necessary for software engineering practices. | |
| 7 | Course Description | This course provides knowledge of software engineering. It introduces concepts such as software processes and agile methods and essential software development activities, from initial specification to system maintenance. Formalisms and tools to assist in software development are also presented, including common design patterns and UML notation. Course focuses on all levels of testing. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Introduction to Software Engineering and Process Models** | |
| | A | Significance challenges and Software Myths in software engineering, Software Components, Software Characteristics, Software Crisis, software applications | CO1 |
| | B | Software Development Methodologies: Waterfall model, prototyping model, Incremental model, Spiral model, V model, component based, RAD model | CO1 |
| | C | Agility, Agile Process models: Extreme Programming (XP), Adaptive Software Development (ASD), Scrum | CO1 |
| | **Unit 2** | **Software Requirement Engineering** | |
| | A | Requirement Engineering process, Elicitation techniques, Review and Management of User Needs, Types of Requirements | CO2 |

| | | | | | |
|---|---|---|---|---|---|
| | B | Feasibility study, DFD, data dictionary ,decision tables | | | CO2 |
| | C | Requirement Documentation: Characteristics of SRS, Document SRS according to IEEE standards, SRS case study | | | CO2 |
| | **Unit 3** | **Software Design** | | | |
| | A | Design Concepts, Design Strategies: Function Oriented Design, Object Oriented Design, Top-Down and Bottom-Up Design | | | CO3, CO6 |
| | B | Effective modular design: Functional independence, Cohesion, Coupling, Design documentation | | | CO3, CO6 |
| | C | UML Diagrams and Tools: Introduction to UML Diagrams, Use Case , Object and Class, Interaction diagram: Sequence & Collaboration , Introduction to Rational Rose tool | | | CO3, CO6 |
| | **Unit 4** | **Software Implementation and Testing** | | | |
| | A | Fundamental of testing: Objectives, principles, myths and facts, Error, Mistake, Bug, Fault and Failure, limitations of testing | | | CO4 |
| | B | Levels of testing: Unit Testing, Integration Testing, System Testing, Acceptance Testing: Alpha & Beta Testing, Integration techniques | | | CO4, CO6 |
| | C | White Box Testing, Black Box Testing, Verification and Validation, Test case designing, Guidelines for Coding, Debugging | | | CO4, CO6 |
| | **Unit 5** | **Maintenance & Quality Management** | | | |
| | A | Introduction to Maintenance , Need for Maintenance, Categories of Maintenance: Preventive, Corrective and Perfective Maintenance, Cost of Maintenance | | | CO5, CO6 |
| | B | Quality Concepts: Quality, Quality Control, Cost of Quality, Software Quality Assurance , SQA Plan , Software Reliability: Measures of Reliability and Availability, Software Safety | | | CO5, CO6 |
| | C | Statistical Software Quality Assurance: Six Sigma, The ISO 9000 Quality Standards, Capability Maturity Model | | | CO5, CO6 |
| | Mode of examination | Theory/Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 1. Pressman R S, Software Engineering: A Practitioners Approach, McGraw Hill. | | | |
| | Other References | 1.Datta S, Software Engineering: Concepts and Applications, Oxford University Press, 2010.<br>2. K.K. Aggrawal and Yogesh Singh, “Software Engineering”, New Age International Publication<br>3 .Sommerville, Ian. “Software Engineering”, Pearson(Latest Ed). | | | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: Illustrate and compare an effective software engineering process, based on knowledge of widely used development lifecycle model | PO1,PO3,PO8,PO9,PO10,PO12,PSO1, PSO3 |
| 2. | CO2: Apply effective requirement elicitation techniques to develop SRS for a project | PO1,PO2,PO3,PO4,PO5,PO8,PO9,PO 10, PO11,PO12,PSO1,PSO3 |
| 3. | CO3: Construct design documents with the help of designing tools | PO1,PO2,PO3,PO4,PO5, PO8,PO9,PO10, PO11,PO12,PSO1,PSO3 |
| 4. | CO4:Analyze testing strategies for a software system | PO1,PO2,PO4,PO5,PO6,PO7,PO8,PO 9,PO10, PO11,PO12,PSO1,PSO3 |
| 5. | CO5: Develop and deliver quality software as an individual or as part of a multidisciplinary team. | PO1,PO2,PO3,PO4,PO5, PO6,PO7, PO8,PO9,PO10,PO11,PO12,PSO1,PS O3 |
| 6. | CO6: Adapt techniques and tools necessary for software engineering practices . | PO1,PO4,PO5,PO8,PO9,PO10,PO11,P SO3 |

**PO and PSO mapping with level of strength for Course Name Software Engineering and Testing Methodologies (Course Code CSE351)**

| Course Code_ Course Name | CO's | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE351_ Software Engineering and Testing Methodologies | CO1 | 3 | - | 2 | - | - | - | - | 1 | 2 | 3 | - | 3 | 1 | - | 2 |
| | CO2 | 3 | 3 | 2 | 3 | 3 | - | - | 1 | 2 | 3 | 2 | 3 | 2 | - | 3 |
| | CO3 | 3 | 2 | 3 | 3 | 3 | - | - | 1 | 2 | 3 | 1 | 2 | 2 | - | 3 |
| | CO4 | 3 | 1 | - | 1 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 1 | - | 3 |
| | CO5 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | 1 | - | 3 |
| | CO6 | 2 | - | - | 1 | 3 | - | - | 1 | 2 | 2 | 2 | - | - | - | 3 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO11 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE351 | Software Engineering and Testing Methodologies | 2.8 | 1.75 | 2.5 | 2.2 | 3 | 2.5 | 2.5 | 1.3 | 2.3 | 2.8 | 1.6 | 2.8 | 1.4 | 0 | 2.8 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***

***3.*** Addressed to ***Substantial (High=3) extent***

| | | | | | |
|---|---|---|---|---|---|
| **School:** | | **School of Engineering and technology** | | | |
| **Department** | | **Department of Computer Science and Engineering** | | | |
| **Program:** | | **B. Tech.** | | | |
| **Branch:** | | **Computer Science and Enginering** | | | |
| 1 | Course Code | CSE021 | | | |
| 2 | Course Title | Introduction to Cloud Computing | | | |
| 3 | Credits | 3 | | | |
| 4 | Contact Hours (L-T-P) | 3 | 0 | 0 | |
| | Course Status | Core | | | |
| 5 | Course Objective | This introductory course on Cloud computing will teach both the fundamental concepts of how and why Cloud systems works, as well as Cloud technologies that manifest these concepts. | | | |
| 6 | Course Outcomes | At the end of the course, students will have achieved the following learning objectives.<br>CO1. Define the basics of cloud and recall the computer Science concepts which are helpful in understanding on demand service architecture.<br>CO2. Classify and describe the architecture and taxonomy of parallel and distributed computing, including shared and distributed memory, and data and task parallel computing.<br>CO3. Apply the PAAS and SAAS to manage the workflow and use of cloud in scientific application.<br>CO4. Categorize and Characterize between Infrastructure services, deployment models, and governance in cloud computing. Examine the design of task and data parallel distributed algorithms for Clouds and use them to construct Cloud applications.<br>CO5. Evaluate the importance of cloud using monitoring and management of services for performance improvement of HPC and to follow the Governance and Compliances.<br>CO6. Elaborate the design concept and formulate to build the solution | | | |

| | | | |
|---|---|---|---|
| | | using cloud service providers as AWS, MS Azure, Google Cloud. Demonstrate the use of Map-Reduce, Vertex-Centric and Continuous Dataflow programming models. | |
| 7 | Course Description | This course is an introductory course for cloud computing concepts and helps in understanding the core functionalities, algorithms, models and workflows in cloud environment. In this course Students will get demonstrations of real-time cloud services for better exposure and research understanding. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **FOUNDATIONS** | |
| | A | **Introduction to compute**<br>Types of Computing, Grid computing, distributed computing, Client-server computing, Three Tier Architecture, use of Sockets and Remote Procedure Call, working of RMI and CORBA, Web services, Web Sockets, Message Queues and Message Brokers. | CO1 |
| | B | **Introduction to Cloud Computing**<br>Cloud Computing definition, Roots of Cloud Computing, Layers and Types of Clouds, Desired Features of a Cloud, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenges and Risks | CO1 |
| | C | **Migrating and Integrating into Cloud**<br>Broad Approaches to Migrating into the Cloud, The Seven-Step Model of Migration into a Cloud, Enriching the 'Integration as a Service' Paradigm for the Cloud Era, Evolution and Challenges of SaaS Paradigm, Integration Scenarios, The Integration Methodologies | CO1 |
| | **Unit 2** | **ENTERPRISE CLOUD COMPUTING AND IAAS** | |
| | A | **The Enterprise Cloud Computing Paradigm**<br>Issues for Enterprise Applications on the Cloud, Transition Challenges, Enterprise Cloud Technology and Market Evolution, Business Drivers Toward a Marketplace for Enterprise Cloud Computing, The Cloud Supply Chain | CO1,CO2 |
| | B | **Virtual Machines Provisioning and Migration Services**<br>Introduction to Virtual Machines,The Anatomy of Cloud | CO1,CO2 |

| | | | |
|---|---|---|---|
| | | Infrastructures, VM Provisioning and Manageability, Virtual Machine Migration Services, Management of Virtual Machines for Cloud Infrastructures,, Distributed Management of Virtual Infrastructures, Scheduling Techniques | |
| | C | **Enhancing Cloud Computing Environments Using a Cluster as a Service**<br>Introduction and Related Work, RVWS Design, Cluster as a Service: The Logical Design, Secure Distributed Data Storage in Cloud Computing, Cloud Storage, Technologies for Data Security in Cloud Computing | CO1,CO2 |
| | **Unit 3** | **PLATFORM AND SOFTWARE AS A SERVICE** | |
| | A | **Aneka and CometCloud**<br>Aneka—Integration of Private and Public Clouds, Technologies and Tools for Cloud Computing, Aneka Cloud Platform, CometCloud: An Autonomic Cloud Engine, Introduction of CometCloud (Architecture, Autonomic Behavior, Applications overview) | CO1,CO3 |
| | B | **Business Solutions and WorkFlow**<br>Cloud-Based Solutions for Business Applications (Introduction of Enterprises Demand and Cloud Computing, Dynamic ICT Services), Workflow Engine for Clouds, Workflow Management Systems, Architecture of Workflow Management Systems | CO1,CO3, CO6 |
| | C | **Scientific Applications and MapReduce Model**<br>Scientific Application for Cloud Environments, Classification of Scientific Applications and Services in the Cloud, SAGA-based Scientific Applications, MapReduce Programming Model, MapReduce Impacts and Research Directions | CO1,CO3, CO6 |
| | **Unit 4** | **MONITORING, MANAGEMENT & GOVERNANCE** | |
| | A | **SLA Management in Cloud Computing**<br>Introduction of typical Use Cases, Model for Federated Cloud Computing, Security Considerations, SLA Management in Cloud Computing: A Service Provider's Perspective, Types of SLA, Life Cycle of SLA, Automated Policy-based Management | CO1,CO4 |

| | | | |
|---|---|---|---|
| | B | **Performance Predictions for HPC on Clouds**<br>Introduction and Background of Grid and Cloud, HPC in the Cloud: Performance-related Issues, Game Hosting on Cloud Resources, Building Content Delivery Networks Using Clouds, Resource Cloud Mashups | CO1,CO4 |
| | C | **Security and Governance**<br>Basic Concept of Organizational Readiness, Drivers for Changes: Common Change Management Models, Security and Risk in the Cloud, Cloud Computing and Identity, Content Level Security—Pros and Cons, Legal Issues in Cloud Computing(PCI DSS), Data Privacy and Security Issues | CO1,CO4 |
| | **Unit 5** | **AWS, MS AZURE AND GOOGLE CLOUD** | |
| | A | AWS Services:EC2, IAM, S3, Lambda, EBS, CDN, CloudWatch, | CO1,CO5, CO6 |
| | B | MS Azure Services:Azure VM , SQL Server on Virtual Machines, Azure SQL Database,Azure Active Directory, Azure Backup | CO1,CO5, Co6 |
| | C | Google Cloud: Compute Engine,Migrate for Compute Engine, Cloud Functions, Gsuite Admin,Cloud Lab Balancing ,Cloud Storage | CO1,CO5, CO6 |
| | Mode of examination | Theory/Jury/Practical/Viva | |
| | Weightage Distribution | CA / MTE / ETE | |
| | | 30% / 20% / 50% | |
| | Text book/s* | CLOUD COMPUTING Principles and Paradigms, Edited by Rajkumar Buyya, Jam<br>Cloud Computing: A Practical Approach, Anthony T. Velte, Toby J. Velte, Robert Elsenpeter | |
| | Other References | | |
| | | | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | Define the basics of cloud and recall the computer Science concepts which are helpful in understanding on demand service architecture. Classify and describe the architecture and taxonomy of parallel and distributed computing, including shared and distributed memory, and data and task parallel computing. | PO1,PO2,PO3,PO4 |
| 2. | Define the basics of cloud and recall the computer | PO1,PO2,PO3,PO4 |
| 3. | Apply the PAAS and SAAS to manage the workflow and use of cloud in scientific application. | PO1,PO2,PO3,PO4,PSO2,PSO3 |
| 4. | Categorize and Characterize between Infrastructure services, deployment models, and governance in cloud computing. Examine the design of task and data parallel distributed algorithms for Clouds and use them to construct Cloud applications. | PO1,PO2,PO3,PO4,PSO2,PSO3 |
| 5. | Evaluate the importance of cloud using monitoring and management of services for performance improvement of HPC and to follow the Governance and Compliances | PO1,PO2,PO3,PO4,PSO2,PSO3 |
| 6. | Elaborate the design concept and formulate to build the solution using cloud service providers as AWS, MS Azure, Google Cloud. Demonstrate the use of Map-Reduce, Vertex-Centric and Continuous Dataflow programming models. | PO1,PO2,PO3,PO4,PSO1,PSO2,PSO3 |

**PO and PSO mapping with level of strength for Course Name xxxx (Course Code yyyy)**

| **Course Code_ Course Name** | **CO's** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **CO1** | 2 | 3 | 1 | 2 | | | | | | | | | | | |
| | **CO2** | 2 | 2 | 2 | 3 | | | | | | | | | | | |
| **Yyyy_xxxx** | **CO3** | 1 | 3 | 1 | 2 | | | | | | | | | | 2 | 3 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **CO4** | 3 | 1 | 2 | 2 | | | | | | | | | | 3 | 2 |
| | **CO5** | 2 | 2 | 3 | 1 | | | | | | | | | | 2 | 2 |
| | **CO6** | 1 | 3 | 1 | 2 | | | | | | | | | 2 | 3 | 3 |

***Average of non-zeros entry in following table (should be auto calculated).***

| **Course Code** | **Course Name** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.83 | 2.33 | 1.66 | 2 | | | | | | | | | .33 | 1.66 | 1.67 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

## 2.1 Template A1: Syllabus for Theory Courses (SAMPLE)

| | | | | |
|---|---|---|---|---|
| **School:** | | **School of Engineering and technology** | | |
| **Department** | | **Department of Computer Science and Engineering** | | |
| **Program:** | | **B.Tech** | | |
| **Branch:** | | **Cyber Security and Forensics** | | |
| 1 | Course Code | INT021 | | |
| 2 | Course Title | Ethical Hacking | | |
| 3 | Credits | 3 | | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | | |
| | Course Status | core | | |
| 5 | Course Objective | To provide students about the Ethical hacking Concepts, importance of ethical hacking in IT and Working structure of hacking | | |
| 6 | Course Outcomes | On successful completion of this module students will be able to:<br>CO1: Define the description of ethical Hacking<br>CO2: Illustrate Types of Ethical Hacking.<br>CO3: Explain about web and network hacking<br>CO4: Demonstrate report writing and Mitigation<br>CO5: Formulate the use of safe techniques on the World Wide Web<br>CO6: Analyze various digital forensic problems | | |
| 7 | Course Description | This course introduces ethical hacking concept and application of ethical hacking in network security. | | |
| 8 | Outline syllabus | | | Outline syllabus |
| | **Unit 1** | Introduction to Ethical Hacking | | |
| | A | Security Fundamental, Security testing, Hacker and Cracker, Descriptions | | CO1 |
| | B | Test Plans-keeping It legal, Ethical and Legality | | CO1, CO2 |
| | C | The Attacker's Process, The Ethical Hacker's Process, Security and the Stack | | CO1, CO2,CO4 |
| | **Unit 2** | Footprinting and Scanning | | |
| | A | Information Gathering, Determining the Network Range, Identifying Active Machines | | CO1, CO2 |
| | B | Finding Open Ports and Access Points, OS Fingerprinting Services, Mapping the Network Attack Surface | | CO1, CO2 |
| | C | Enumeration, System Hacking | | CO1, CO2,CO5,CO6 |
| | **Unit 3** | Malware Threats | | |
| | A | Viruses and Worms, Trojans, Covert Communication | | CO1,CO2,CO3 |

| | | | | | |
|---|---|---|---|---|---|
| | B | Keystroke Logging and Spyware, Malware Counter measures | | | CO1,CO2,CO3 |
| | C | Sniffers, Session Hijacking, Denial of Service and Distributed, Denial of Service | | | CO1,CO2,CO3 |
| | **Unit 4** | Web Server Hacking | | | |
| | A | Web Server Hacking, Web Application Hacking | | | CO2,CO3,CO4 |
| | B | Database Hacking | | | CO3,CO4 |
| | C | Wireless Technologies, Mobile Device Operation and Security, Wireless LANs | | | CO2, CO4,CO5 |
| | **Unit 5** | IDS, Firewalls and Honeypots | | | |
| | A | Intrusion Detection Systems, Firewalls, Honeypots | | | CO2,CO5, |
| | B | Physical Security, Social Engineering | | | CO3,CO5,CO6 |
| | C | Case Studies | | | CO4,CO5,CO6 |
| | Mode of examination | Theory | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 1.Ec-Council, "Ethical Hacking and Countermeasures: Attack Phases", Delmar Cengage Learning, 2009.<br>2. Michael T. Simpson, Kent Backman, James E. Corley, "Hands-On Ethical Hacking and Network Defense", Cengage Learning, 2012 | | | |
| | Other References | 3. Patrick Engebretson, "The Basics of Hacking and Penetration Testing – Ethical Hacking and Penetration Testing Made Easy", Syngress Media, Second Revised Edition, 2013.<br>4. Jon Erickson, "Hacking: The Art of Exploitation", No Starch Press, Second Edition, 2008. | | | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: Define the description of ethical Hacking | PO1,PO2, PO5, PO8,PO12,PSO3 |
| 2. | CO2: Illustrate Types of Ethical Hacking. | PO1, PO2, PO3, PSO3 |
| 3. | CO3: Explain about web and network hacking | PO1, PO2, PO3, PO5, PO9, PO12, PSO1 |
| 4. | CO4: Demonstrate report writing and Mitigation | PO1, PO2, PO4, PO5, PO6, PO8, PSO2 |

| | | |
|---|---|---|
| 5. | CO5: Formulate the use of safe techniques on the World Wide Web | PO1, PO2, PO3,PO8,PO9,PSO2, |
| 6. | CO6: Analyze various digital forensic problems | PO1, PO2, PO4, PO5, PO6,PO7,PO10,PO11,PSO1 |

**PO and PSO mapping with level of strength for Course Name Ethical Hacking (Course Code INT 021)**

| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PS O2 | PS O3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ethical Hacking (Course Code INT 021)** | CO1 | 3 | 3 | - | - | 2 | - | - | 3 | - | - | - | 3 | - | - | 3 |
| | CO2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | 3 |
| | CO3 | 3 | 3 | 2 | - | 2 | - | - | - | 2 | - | - | 2 | 3 | - | - |
| | CO4 | 3 | 3 | - | 3 | 2 | 3 | - | 2 | - | - | - | - | - | 3 | - |
| | CO5 | 3 | 2 | 3 | - | - | - | - | 3 | 3 | - | - | - | - | 3 | - |
| | CO6 | 3 | 3 | - | 3 | 3 | 3 | 3 | - | - | 3 | 3 | - | 3 | - | - |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PS O1 | PS O2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INT 021 | Ethical Hacking | 3 | 2.7 | 2.3 | 3 | 2. 25 | 3 | 3 | 2.6 | 2.5 | 3 | 3 | 2.5 | 3 | 3 | 3 |

***Strength of Correlation***

***1.*** Addressed to***Slight (Low=1)extent2.*** Addressed to***Moderate (Medium=2) extent***
***3.*** Addressed to***Substantial (High=3) extent***

2.1 Template A1: Syllabus for Theory Courses (SAMPLE)

| | | | | | |
|---|---|---|---|---|---|
| School: | | School of Engineering and technology | | | |
| Department | | Department of Computer Science and Engineering | | | |
| Program: | | B.Tech | | | |
| Branch: | | | | | |
| 1 | Course Code | CSE023 | | | |
| 2 | Course Title | Quantum Computing | | | |
| 3 | Credits | 3 | | | |
| 4 | Contact Hours (L-T-P) | 3 | 0 | 2 | |
| | Course Status | Core /Elective/Open Elective | | | |
| 5 | Course Objective | Fundamentals of quantum information processing, including quantum computation, quantum cryptography, and quantum information theory. Topics include: the quantum circuit model, qubits, unitary operators, measurement, entanglement, quantum algorithms for factoring and search, quantum cryptographic key distribution, error-correction and fault-tolerance, information capacity of quantum channels, complexity of quantum computation. | | | |
| 6 | Course Outcomes (must be 6 COs, following verbs given in Bloom's Taxonomy) | CO1: Analyze the behavior of basic quantum algorithms<br>CO2: Demonstrate simple quantum algorithms<br>CO3: Simulate a simple quantum error-correcting code<br>CO4: Prove basic facts about quantum information channels<br>CO5: Explain quantum computing and quantum protocols<br>CO6: Illustrate information channels in the quantum circuit model | | | |
| 7 | Course Description | This course teaches the fundamentals of quantum information processing, including quantum computation, quantum cryptography, and quantum information theory. | | | |
| 8 | Outline syllabus | | | | CO Mapping |
| | Unit 1 | Introduction | | | |
| | A | Computers and the Strong Church–Turing Thesis, Circuit Model of Computation | | | |
| | B | A Linear Algebra Formulation of the Circuit Model, Reversible Computation | | | CO1 |
| | C | Quantum Physics and Computation | | | CO1, CO2 |
| | Unit 2 | LINEAR ALGEBRA AND THE DIRAC NOTATION | | | CO1, CO2,CO4 |
| | A | The Dirac Notation and Hilbert Spaces, Dual Vectors, Operators | | | |
| | B | The Spectral Theorem, Functions of Operators | | | |
| | C | Tensor Products, The Schmidt Decomposition Theorem | | | CO1, CO2 |
| | Unit 3 | A QUANTUM MODEL OF COMPUTATION | | | CO1, CO2 |
| | A | The Quantum Circuit Model, Quantum Gates | | | CO1, CO2,CO5,CO6 |
| | B | Universal Sets of Quantum Gates, Efficiency of Approximating Unitary Transformations | | | |
| | C | Implementing Measurements with Quantum Circuits | | | |
| | Unit 4 | INTRODUCTORY QUANTUM ALGORITHMS | | | CO1,CO2,CO3 |
| | A | Probabilistic Versus Quantum Algorithms, Phase Kick-Back | | | CO1,CO2,CO3 |
| | B | The Deutsch Algorithm, The Deutsch–Jozsa Algorithm | | | CO1,CO2,CO3 |
| | C | Simon's Algorithm | | | |
| | Unit 5 | | | | |
| | A | Tools for Analysing Probabilistic Algorithms | | | CO2,CO3,CO4 |
| | B | Solving the Discrete Logarithm Problem When the Order of a Is Composite | | | CO3,CO4 |
| | C | Computing Schmidt Decompositions | | | CO2, CO4,CO5 |
| | Mode of examination | Theory/Jury/Practical/Viva | | | |

| | | | | | |
|---|---|---|---|---|---|
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | "An Introduction to Quantum Computing", Phillip Kaye Raymond Laflamme, Michele Mosca | | | |
| | Other References | | | | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: Analyze the behavior of basic quantum algorithms | |
| 2. | CO2: Demonstrate simple quantum algorithms | PO1, PO2, PO5, PO8, PO12, PSO3 |
| 3. | CO3: Simulate a simple quantum error-correcting code | PO1, PO2, PO3, PSO3 |
| 4. | CO4: Prove basic facts about quantum information channels | PO1, PO2, PO3, PO5, PO9, PO12, PSO1 |
| 5. | CO5: Explain quantum computing and quantum protocols | PO1, PO2, PO4, PO5, PO6, PO8, PSO2 |
| 6. | CO6: Illustrate information channels in the quantum circuit model | PO1, PO2, PO3, PO8, PO9, PSO2, |

PO and PSO mapping with level of strength for Course Name Quantum Computing (Course Code yyyy)

| Course Code_ Course Name | CO's | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quantum Computing | CO1 | 3 | 3 | - | - | 2 | - | - | 3 | - | - | - | 3 | - | - | 3 |
| | CO2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | 3 |
| | CO3 | 3 | 3 | 2 | - | 2 | - | - | - | 2 | - | - | 2 | 3 | - | - |
| | CO4 | 3 | 3 | - | 3 | 2 | 3 | - | 2 | - | - | - | - | - | 3 | - |
| | CO5 | 3 | 2 | 3 | - | - | - | - | 3 | 3 | - | - | - | - | 3 | - |
| | CO6 | 3 | 3 | - | 3 | 3 | 3 | 3 | - | - | 3 | 3 | - | 3 | - | - |

*Average of non-zeros entry in following table (should be auto calculated).*

| Course Code | Course Name | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quantum Computing | 3 | 2.7 | 1.1 | 1 | 1.5 | 1 | .5 | 1.3 | .8 | .5 | .5 | .8 | 1 | 1 | 1 |

*Strength of Correlation*

*1.* Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
*3.* Addressed to *Substantial (High=3) extent*

| | | | | |
|---|---|---|---|---|
| School: | | School of Engineering and technology | | |
| Department | | Department of Computer Science and Engineering | | |
| Program: | | B.Tech | | |
| Branch: | | | | |
| 1 | Course Code | CSE024 | | |
| 2 | Course Title | Parallel Computing Algorithms | | |
| 3 | Credits | 3 | | |
| 4 | Contact Hours (L-T-P) | 3 | 0 | 2 |
| | Course Status | Core /Elective/Open Elective | | |
| 5 | Course Objective | Design and analysis of parallel algorithms on various parallel network model, with emphasis on time complexities after implementation, a comparative study of various architecture with respect to time complexity. Understanding the fundamental of parallel algorithms. | | |
| 6 | Course Outcomes (must be 6 COs, following verbs given in Bloom's Taxonomy) | CO1: Acquire the skill to design and develop parallel algorithms with efficient time complexity.<br>CO2: Explain various terminology of parallel processing which is required to design and understand the future processor architectures.<br>CO3: Demonstrate the skill to choose the technology to use, based on the requirements and functionality of multi-processor architecture based on the design parameters of the parallel architectures.<br>CO4: Explain how large-scale parallel systems are architecture and how massive parallelism are implemented in accelerator architectures<br>CO5: Design efficient parallel algorithms and applications<br>CO6: Analyse performance and modeling of parallel programs | | |
| 7 | Course Description | This course introduces critical methods and techniques related to parallel computing. Particularly, the course focuses on hardware, algorithm, and programming of parallel systems, providing students a complete picture to understand pervasive parallel computing. | | |
| 8 | Outline syllabus | | | CO Mapping |
| | Unit 1 | Introduction | | |
| | A | Introduction to Parallel Processing Approach | | |
| | B | Difference between Parallel Processing and Serial Processing, Background, Flynn's Taxonomy for serial and parallel computer architecture | | CO1 |
| | C | Parallel Algorithms, Performance of Parallel Algorithm. | | CO1, CO2 |
| | Unit 2 | Basic Techniques and Different Network Architecture | | CO1, CO2,CO4 |
| | A | Criteria to evaluate processor organization | | |
| | B | Mesh Networks, Binary Tree Networks, Hypertree Networks, Pyramid Networks, Butterfly Networks, Hypercube (Cube-Connected) Networks, | | |
| | C | Cube-Connected Cycle Networks, Shuffle-Exchange Networks, Case Studies Based on the Parallel Network Architecture. | | CO1, CO2 |
| | Unit 3 | Parallel Architectures | | CO1, CO2 |
| | A | Multiprocessors, Uniform Memory Access (UMA) Multiprocessors and Non-Uniform Memory Access, Mesh of Trees Architecture, | | CO1, CO2,CO5,CO6 |
| | B | Applications based on MoT, Advantages/Disadvantages of MoT based on parallel parameters, Multi-Mesh Architecture, | | |
| | C | Applications based on MM, Advantages/Disadvantages of MM based on parallel parameters Multi-Mesh of Trees Architecture, Advantages of MMT over MM and MoT | | |
| | Unit 4 | Parallel Algorithms on Different Architectures | | CO1,CO2,CO3 |
| | A | One to One Communication Algorithm on Multi-Mesh Architecture and Multi-Mesh of Trees Architecture, | | CO1,CO2,CO3 |

| | | | | | |
|---|---|---|---|---|---|
| | B | All-to-All Algorithm Communication Algorithm on Multi-Mesh Architecture and Multi-Mesh of Trees Architecture, | | | CO1,CO2,CO3 |
| | C | Sorting Algorithms on MMT, Case Studies based on MMT Architecture | | | |
| | Unit 5 | Parallel computing Application | | | |
| | A | Performance measurement and analysis of parallel programs | | | CO2,CO3,CO4 |
| | B | Problem solving on clusters using MapReduce | | | CO3,CO4 |
| | C | Warehouse-scale computing | | | CO2, CO4,CO5 |
| | Mode of examination | Theory/Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | "Introduction to Parallel Computing", 2nd Ed, Ananth Grama, Anshul Gupta, George Karypis, Vipin Kumar | | | |
| | Other References | • "Using MPI: Portable Parallel Programming with the Message-Passing Interface", 3rd Ed - William Gropp, Ewing Lusk, Anthony Skjellum<br>• "Programming Massively Parallel Processors: A Hands-on Approach", 3rd Ed. - David B. Kirk, Wen-mei W. Hwu | | | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: Acquire the skill to design and develop parallel algorithms with efficient time complexity. | |
| 2. | CO2: Explain various terminology of parallel processing which is required to design and understand the future processor architectures. | PO1, PO2, PO5, PO8, PO12, PSO3 |
| 3. | CO3: Demonstrate the skill to choose the technology to use, based on the requirements and functionality of multi-processor architecture based on the design parameters of the parallel architectures. | PO1, PO2, PO3, PSO3 |
| 4. | CO4: Explain how large-scale parallel systems are architecture and how massive parallelism are implemented in accelerator architectures | PO1, PO2, PO3, PO5, PO9, PO12, PSO1 |
| 5. | CO5: Design efficient parallel algorithms and applications | PO1, PO2, PO4, PO5, PO6, PO8, PSO2 |
| 6. | CO6: Analyse performance and modeling of parallel programs | PO1, PO2, PO3, PO8, PO9, PSO2, |

PO and PSO mapping with level of strength for Course Name Parallel Computing (Course Code yyyy)

| Course Code_ Course Name | CO's | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parallel Computing | CO1 | 3 | 3 | - | - | 2 | - | - | 3 | - | - | - | 3 | - | - | 3 |
| | CO2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | 3 |
| | CO3 | 3 | 3 | 2 | - | 2 | - | - | - | 2 | - | - | 2 | 3 | - | - |
| | CO4 | 3 | 3 | - | 3 | 2 | 3 | - | 2 | - | - | - | - | - | 3 | - |
| | CO5 | 3 | 2 | 3 | - | - | - | - | 3 | 3 | - | - | - | - | 3 | - |
| | CO6 | 3 | 3 | - | 3 | 3 | 3 | 3 | - | - | 3 | 3 | - | 3 | - | - |

*Average of non-zeros entry in following table (should be auto calculated).*

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Parallel Computing | 3 | 2.7 | 1.1 | 1 | 1.5 | 1 | .5 | 1.3 | .8 | .5 | .5 | .8 | 1 | 1 | 1 |

*Strength of Correlation*

*1.* Addressed to *Slight (Low=1) extent* *2.* Addressed to *Moderate (Medium=2) extent*
*3.* Addressed to *Substantial (High=3) extent*

| | | | | |
|---|---|---|---|---|
| School: | | School of engineering and technology | | |
| Department | | Department of computer science and engineering | | |
| Program: | | B.tech | | |
| Branch: | | | | |
| 1 | Course code | CSE025 | | |
| 2 | Course title | 3d printing and software tools | | |
| 3 | Credits | 3 | | |
| 4 | Contact hours (l-t-p) | 2 | 0 | 2 |
| | Course status | Core /elective/open elective | | |
| 5 | Course objective | This course will help understand the technical principles and workflows of polymers, metals, and composites. | | |
| 6 | Course outcomes (must be 6 cos, following verbs given in bloom's taxonomy) | Co1: apply the unique advantages of 3d printing to their designs.<br>Co2: compare additive manufacturing to traditional technologies and choose the best technology for a given application.<br>Co3: distinguish between various 3d printing technologies and materials and select appropriately for a given application.<br>Co4: discuss the economic implications of 3d printing including its impact on startup businesses and supply chains<br>Co5: evaluate real-life scenarios and recommend the appropriate use of 3d printing technology<br>Co6: explain current and emerging 3d printing applications in a variety of industries | | |
| 7 | Course description | In this course students will gain broad understanding of the advances that led to today's manufacturing environment. They will understand how humans, machines and code work together to make things. | | |
| 8 | Outline syllabus | | | Co mapping |
| | Unit 1 | Introduction to 3d printing | | |
| | A | Cutting, subtractive manufacturing | | |
| | B | Forming | | Co1 |
| | C | Additive manufacturing | | Co1, co2 |
| | Unit 2 | Mesh | | Co1, co2,co4 |
| | A | Review of geometry terms | | |
| | B | Things to consider when preparing a mesh file | | |
| | C | Making process (a reminder), making by sharing | | Co1, co2 |
| | Unit 3 | Introduction to computer numerical control (cnc) | | Co1, co2 |
| | A | Numerical control, functions of a machine tool, concept of numerical control, historical development, definition | | Co1, co2,co5,co6 |

| | | | | | |
|---|---|---|---|---|---|
| | B | Advantages of cnc machine tools, evolution of cnc, advantages of cnc, limitations of cnc, features of cnc | | | |
| | C | The machine control unit (mcu) for cnc, classification of cnc machine tools, cnc machining centers | | | |
| | Unit 4 | Blue print reading | | | Co1,co2,co3 |
| | A | Reading the machining sketches, different geometrical tolerance symbols, | | | Co1,co2,co3 |
| | B | Reading dimensional tolerances, understanding the views, | | | Co1,co2,co3 |
| | C | Concept of first angle & third angle projection | | | |
| | Unit 5 | Cnc milling | | | |
| | A | Fundamentals of cnc milling, familiarization of control panel | | | Co2,co3,co4 |
| | B | Fundamentals of cnc programming, part programming techniques | | | Co3,co4 |
| | C | Machining practice on cnc milling, practice session at industry | | | Co2, co4,co5 |
| | Mode of examination | Theory/jury/practical/viva | | | |
| | Weightage distribution | Ca | Mte | Ete | |
| | | 30% | 20% | 50% | |
| | Text book/s* | Liza Wallach Kloski, Nick Kloski – “Getting Started with 3D Printing_ A Hands-on Guide to the Hardware, Software, and Services Behind the New Manufacturing Revolution”-Maker Media, Inc (2016) | | | |
| | Other references | | | | |

Co and po mapping

| S. No. | Course outcome | Program outcomes (po) & program specific outcomes (pso) |
|---|---|---|
| 1. | Co1: apply the unique advantages of 3d printing to their designs. | |
| 2. | Co2: compare additive manufacturing to traditional technologies and choose the best technology for a given application. | Po1, po2, po5, po8, po12, pso3 |
| 3. | Co3: distinguish between various 3d printing technologies and materials and select appropriately for a given application. | Po1, po2, po3, pso3 |
| 4. | Co4: discuss the economic implications of 3d printing including its impact on startup businesses and supply chains | Po1, po2, po3, po5, po9, po12, pso1 |
| 5. | Co5: evaluate real-life scenarios and recommend the appropriate use of 3d printing technology | Po1, po2, po4, po5, po6, po8, pso2 |
| 6. | Co6: explain current and emerging 3d printing applications in a variety of industries | Po1, po2, po3, po8, po9, pso2, |

Po and pso mapping with level of strength for course name 3d printing and software tools (course code yyyy)

| Course code_ course name | Co's | Po 1 | Po 2 | Po 3 | Po 4 | Po 5 | Po 6 | Po 7 | Po 8 | Po 9 | Po 10 | Po 11 | Po 12 | Pso 1 | Pso 2 | Pso 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3d printing and software tools | Co1 | 3 | 3 | - | - | 2 | - | - | 3 | - | - | - | 3 | - | - | 3 |
| | Co2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - | 3 |
| | Co3 | 3 | 3 | 2 | - | 2 | - | - | - | 2 | - | - | 2 | 3 | - | - |
| | Co4 | 3 | 3 | - | 3 | 2 | 3 | - | 2 | - | - | - | - | - | 3 | - |
| | Co5 | 3 | 2 | 3 | - | - | - | - | 3 | 3 | - | - | - | - | 3 | - |
| | Co6 | 3 | 3 | - | 3 | 3 | 3 | 3 | - | - | 3 | 3 | - | 3 | - | - |

*Average of non-zeros entry in following table (should be auto calculated).*

| Course code | Course name | Po 1 | Po 2 | Po 3 | Po 4 | Po 5 | Po 6 | Po 7 | Po 8 | Po 9 | Po 10 | Po 11 | Po 12 | Pso 1 | Pso 2 | Pso 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3d printing and software tools | 3 | 2.7 | 1.1 | 1 | 1.5 | 1 | .5 | 1.3 | .8 | .5 | .5 | .8 | 1 | 1 | 1 |

*Strength of correlation*

*1.* Addressed to *slight (low=1) extent 2.* Addressed to *moderate (medium=2) extent*
*3.* Addressed to *substantial (high=3) extent*

| | | | |
|---|---|---|---|
| **School:** SET | | **Batch :** 2018-19 | |
| **Program:** | | **Current Academic Year:** 2018-19 | |
| **Branch:** CSE | | **Semester: Vth \| QAB** | |
| 1 | Course Code | **ARP 301** | Course Name : **Quantitative Aptitude Behavioural and Interpersonal Skills** |
| 2 | Course Title | **Quantitative Aptitude Behavioural and Interpersonal Skills** | |
| 3 | Credits | 2 | |
| 4 | Contact Hours (L-T-P) | 0-0-4 | |
| | Course Status | | |
| 5 | Course Objective | To enhance holistic development of students and improve their employability skills. Provide a 360 degree exposure to learning elements of Business English readiness program, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a will have entered the threshold of his/her 3rd phase of employability enhancement and skill building activity exercise. | |
| 6 | Course Outcomes | CO1: *A student will understand & apply Personality and its traits \| The art of impression management. A Student will learn Personality development which will help a student groom to meet the needed social strata for establishing himself/herself in the society, make a meaningful personality and find employment*<br>CO2: *At the end of the program Behavioural and Interpersonal Skills curriculum will help a student assert a positive behavioural attitude and attributes developing interpersonal skills for building positive and meaningful social and professional relationships*<br>CO3: *At the end of the program a student will learn the art of avoiding Arguments and learn to build meaningful conversations that will help them become effective speakers and conversation makers helping them succeed in social and professional life\| The Art of Assertiveness will help them to become assertive communicators and not aggressive ones for the same end result*<br>CO4: *At the end of the program the Constructive Criticism syllabus will let a student criticize for positive emphasis for improvement, growth and eliminating wasteful synergies that deter holistic development*<br>CO5: *At the end of the program The 4M Model \| Verbal Abilities-3 syllabi will teach the students basics of leadership in coaching and mentoring models that will help them become effective leaders and coaches*<br>CO6: *At the end of the program the Level 3 of Quant , Aptitude and Reasoning abilities will help students build enhanced reasoning and aptitudinal abilities* | |
| 7 | Course Description | This bundles Training approach attempts to explore the personality, character, and the natural style of the student. This helps to develop character, personality, confidence and interpersonal abilities within the student along with level 3 readiness in quant, aptitude and reasoning skills | |
| 8 | Outline syllabus – ARP301 | | |
| | **Unit 1** | **Impress to Impact** | **CO MAPPING** |
| | A | What is Personality?\| Creating a positive impression – The 3 V's of Impression \| Individual Differences and Personalities | CO1 |
| | B | Personality Development and Transformation \| Building Self Confidence \| Behavioural and Interpersonal Skills | CO2 |
| | C | Avoiding Arguments \| The Art of Assertiveness \| Constructive Criticism \| The Personal Effectiveness Grid \| Assessing our Strengths & Limitations and Creating an Action Plan for Learning with the 4M Model \| Verbal Abilities-3 | CO5, CO4, CO3 |
| | **Unit 2** | **Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical** | |

| | | | |
|---|---|---|---|
| | A | Numbers & Digits , Mathematical Operations \| Analytical Reasoning | CO6 |
| | B | Cubes & Cuboids \| Statement & Assumptions | CO6 |
| | C | Strong & Weak Argument | CO6 |
| | **Unit 3** | **Quantitative Aptitude** | |
| | A | Work & Time ,Pipes & Cistern | CO6 |
| | B | Time ,Speed & Distance, Quadratic & Linear Equations, Logs & Inequalities | CO6 |
| | C | Sequence & Series, Logarithms, Data Interpretation \| Data sufficiency - Level 1 | CO6 |
| | Weightage Distribution | *( CA )Class Assignment/Free Speech Exercises / JAM – 60% \| (ETE) Group Presentations/Mock Interviews/GD/ Reasoning, Quant & Aptitude – 40%* | |
| | Text book/s* | *Wiley's Quantitative Aptitude-P Anand \|* ***Quantum CAT – Arihant Publications \| Quicker Maths- M. Tyra \|*** *Power of Positive Action (English, Paperback, Napoleon Hill) \| Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness – Nathaniel Brandon \| Goal Setting (English, Paperback, Wilson Dobson* | |

**Syllabus: Design and Analysis of Algorithm lab**

| | | | |
|---|---|---|---|
| **School:** | | **Batch:** | |
| **Program:** | | **Current Academic Year:** | |
| **Branch:** | | **Semester:** | |
| 1 | Course Code | CSP 350 | |
| 2 | Course Title | **Design and Analysis of Algorithm lab** | |
| 3 | Credits | | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Compulsory/Elective | |
| 5 | Course Objective | Objective of this course is to<br>1. Reinforce basic design concepts (e.g., pseudocode, specifications, top-down design)<br>2. Knowledge of algorithm design strategies<br>3. Familiarity with an assortment of important algorithms.<br>• Enable students to analyze time and space complexity | |
| 6 | Course Outcomes<br><br>(same as theory course) | Students will be able to:<br>**CO1: calculate** time complexity of searching algorithm<br>**CO2**: **Write** program based on dynamic programming.<br>**CO3: apply** greedy algorithm to any problem<br>**CO4: develop** program based on advanced data structure<br>CO5: **design** a program based on different string matching algorithm<br>CO6**: implement** real world problem based on greedy and dynamic algorithm | |
| 7 | Course Description | This course introduces concepts related to the design and analysis of algorithms. Specifically, it discusses recurrence relations, and illustrates their role in asymptotic and probabilistic analysis of algorithms. It covers in detail greedy strategies divide and conquer techniques, dynamic programming and max flow - min cut theory for designing algorithms, and illustrates them using a number of well-known problems and applications. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Practical based on Searching and sorting** | |
| | | 1. WAP to demonstrate the concept of Linear and Binary Search<br>2. WAP to implement Merge sort<br>3. WAP to implement Quick Sort | CO1 |
| | **Unit 2** | **Practical based on Dynamic Programming** | |
| | | 1. WAP to implement Matrix Chain Multiplication problem<br>2. WAP to demonstrate the concept of Longest Common Subsequence(LCS)<br>3. WAP to demonstrate concept of 0 – 1 Knapsack Problem | CO2, CO6 |
| | **Unit 3** | **Practical based on Greedy Programming** | |
| | | 1. WAP to demonstrate concept of Minimum Spanning Tree(Prim's Algorithm)<br>2. WAP to demonstrate concept of Fractional | CO3, CO6 |

| | | | | | |
|---|---|---|---|---|---|
| | | Knapsack Problem<br>3. WAP to implement single source shortest problem using Dijkstra's Algorithm | | | |
| | **Unit 4** | **Practical based on Advance concepts** | | | |
| | | WAP to demonstrate concept of Red Black Tree insertion and Deletion | | | CO4 |
| | **Unit 5** | **Practical based on String Matching** | | | |
| | | 1. WAP to demonstrate the concept of Naïve String matching algorithm.<br>2. WAP to demonstrate the concept of Robin Karp Algorithm. | | | CO5 |
| | Mode of examination | Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | 0% | 40% | |
| | Text book/s* | - | | | |
| | Other References | | | | |

**PO and PSO mapping with level of strength for Course Name Design and Analysis of Algorithms Lab. Course Code CSP 350)**

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO1** | 3 | 3 | 2 | 3 | 1 | -- | -- | - | 2 | - | - | - | 2 | 3 | 3 |
| **CO2** | 2 | 3 | 3 | 2 | 2 | -- | -- | - | 2 | - | - | - | 3 | 2 | 2 |
| **CO3** | 3 | 2 | 2 | - | 3 | -- | -- | - | 1 | - | - | - | 2 | 1 | - |
| **CO4** | 2 | 3 | 3 | 3 | 1 | -- | -- | - | 3 | - | - | - | 3 | 3 | 1 |
| **CO5** | 3 | 2 | 2 | 3 | 2 | - | - | - | 2 | - | - | - | 2 | 3 | 2 |
| **CO6** | 2 | 3 | 3 | 1 | 3 | - | - | -- | 1 | - | - | - | 3 | 2 | 3 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 | PS O1 | PS O2 | PS O3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CSP 350** | **Design and Analysis of Algorithms Lab** | 2.5 | 2.7 | 2.5 | 2.4 | 2 | - | - | - | 1.8 | - | - | - | 2.5 | 2.3 | 2.2 |

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2018 - 2022** | |
| **Program: B.tech** | | **Current Academic Year: 2019-2020** | |
| **Branch: CSE / IT** | | **Semester: 5th** | |
| 1 | Course Code | **CSP351** Course Name: Project Based Learning -3 | |
| 2 | Course Title | Project Based Learning -3 | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | 10. To align student's skill and interests with a realistic problem or project.<br>11. To understand the significance of problem and its scope.<br>12. Students will make decisions within a framework. | |
| 6 | Course Outcomes | Students will be able to:<br>CO1: Identify and formulate problem statement.<br>CO2: Design relational database schema.<br>CO3: Develop the solution by using different aspects of programming language.<br>CO4: Classify and understand various test techniques for verification and validation of project.<br>CO5: Analyze and make use of modern for solving real word problems.<br>CO6: Develop teamwork and need to engage in life-long learning, along with the ability to communicate effectively with others. | |
| 7 | Course Description | In PBL-3, the students will learn how to define the problem for developing projects, and Design applicable solutions in one or more application domains using software engineering approaches that integrate ethical, social, legal and economic concerns. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | Problem Definition and identification, Team/Group formation and Project Assignment. Finalizing the problem statement, resource requirement, if any. | CO1,CO4 |
| | **Unit 2** | Use of the relational algebra operations from mathematical set theory (union, intersection, difference, and Cartesian product) and the relational algebra operations developed specifically for relational databases (select (restrict), project, join, and division).. | CO2,CO6 |
| | **Unit 3** | Design; implement project work in any programming language. | CO3 |
| | **Unit 4** | Use of various test tools and techniques for software verification and validation of project | CO4,CO5 |
| | **Unit 5** | Demonstrate and execute Project with the team. | CO6 |
| | | Report should include Abstract, Hardware / Software Requirement, Problem Statement, Design/Algorithm, ER diagrams, Use Case Diagrams, State Diagrams, Sequence | |

| | | | | | |
|---|---|---|---|---|---|
| | | Diagrams, Communication Diagrams, and Activity Diagrams, Implementation Detail. Validation Reports. References, Test cases if any.<br>The presentation, report, work done during the term supported by the documentation, forms the basis of assessment. | | | |
| | Mode of examination | Practical /Viva | | | |
| | Weight age Distribution | CA | | | MTE |
| | | 60% | NA | ETE | |
| | | | | | |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) |
|---|---|---|
| 1. | CO1: Identify and formulate problem statement. | PO1, PO2, PO4,PO6, PO8,PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3 |
| 2. | CO2: Design relational database schema. | PO1, PO2, PO3,PO4,PO5, PO7, PO8, PO9, PO11, PO12 , PSO1,PSO2,PSO3 |
| 3. | CO3: Develop the solution by using different aspects of programming language. | PO1, PO2, PO3,PO4,PO5, PO6, PO8, PO9, PO11, PO12, PSO1,PSO2 |
| 4. | CO4: Classify and understand various test techniques for verification and validation of project. | PO1, PO2, PO3,PO4,PO5, PO8,PO9, PO10, PO11, PO12 ,PSO1,PSO2,PSO3 |
| 5. | CO5: Analyze and make use of modern for solving real word problems. | PO1, PO2, PO5, PO6, PO7, PO8, PO9, PO12 PSO1,PSO2 |
| 6. | CO6: Develop teamwork and need to engage in life-long learning, along with the ability to communicate effectively with others. | PO2, PO4, PO8,PO9, PO10, PO11, PO12,PSO1,PSO3 |

**PO and PSO mapping with level of strength for Course Name Project Based Learning -3 (Course Code CSP351)**

**CO/PO Mapping**

(1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Low

| Cos | Programme Outcomes(POs) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CO1 | 3 | 3 | - | 2 | - | 1 | - | 1 | 2 | - | 2 | 1 | 2 | 2 | 3 |
| CO2 | 3 | 2 | 2 | 2 | 2 | - | - | 1 | 2 | - | 2 | 1 | 2 | 1 | 1 |
| CO3 | 3 | 2 | 2 | 2 | 2 | 3 | - | 1 | 2 | - | 2 | 1 | 2 | 2 | - |
| CO4 | 3 | 3 | 2 | 2 | 3 | - | - | 1 | 2 | - | - | 1 | 2 | 2 | 2 |
| CO5 | 3 | 2 | - | - | 3 | - | - | 1 | 2 | - | - | 1 | 2 | 2 | - |
| CO6 | | 1 | - | 1 | - | - | - | 2 | 2 | 3 | 3 | 3 | 1 | - | 1 |
| Avg PO attained | 3 | 2.2 | 1 | 1.5 | 1.7 | 0.7 | 0 | 1.2 | 2 | 1 | 2 | 1 | 2 | 1.5 | 1.2 |

## Technical Skill Enhancement Course-1 (Simulation Lab)

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch: 2019-2023** | |
| **Program: B.TECH** | | **Current Academic Year: 2019-2020** | |
| **Branch:CSE** | | **Semester: V** | |
| 1 | Course Code | CSP 395 | Technical Skill Enhancement Course-1 ( Simulation Lab) |
| 2 | Course Title | Simulation Lab | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Lab | |
| 5 | Course Objective | The objective of this course is to provide the basic programming concepts of MATLAB such as – functions, arrays, loops, conditional statements, procedures. It also expose students with visual representations of a model and its results. | |
| 6 | Course Outcomes | Students will be able to:<br>**CO1:**Use basic fundamentals to write simple Matlab programs.<br>**CO2:** Plot graphs in Matlab and use procedural functions.<br>**CO3**: Writing Matlab programs with logic and flow control.<br>**CO4:**Manipulate and work with text files.<br>**CO5**:Make use of graphical user interfaces in MATLAB.<br>**CO6**: Apply MATLAB Programming to solve real life problem | |
| 7 | Course Description | This course introduces the concepts of MATLAB programming, Modelling and simulation to identify the problems, and choose the relevant models and algorithms to apply. Matlab is used for scientific applications involving images, sound, and other signals. | |
| 8 | Outline syllabus | | CO Mapping |
| | **UNIT-1** | **Introduction to MATLAB** | CO1,CO6 |
| | A | Programming Environment: MATLAB Windows, A First Program | |
| | B | Expressions, Constants, Variables and assignment statement | |
| | C | Arrays | |
| | **UNIT-2** | **Graph Plots & Procedures and Functions** | CO2,CO6 |
| | A | Basic plotting, Built in functions, Generating waveforms, Sound replay, load and save | |
| | B | Procedures and Functions: Arguments and return values, M-files | |
| | C | Formatted console input-output, String handling | |
| | **UNIT-3** | **Control Statements** | CO3,CO6 |
| | A | Conditional statements: If, Else, Else-if | |
| | B | Repetition statements: While | |
| | C | Repetition statements: for loop | |

| | | | | | |
|---|---|---|---|---|---|
| | **UNIT-4** | **Manipulating Text** | | | CO4,CO6 |
| | A | Writing to a text file, Reading from a text file | | | |
| | B | Randomising and sorting a list | | | |
| | C | Searching a list | | | |
| | **UNIT-5** | **GUI Interface** | | | CO5,CO6 |
| | A | Attaching buttons to actions | | | |
| | B | Getting Input, Setting Output | | | |
| | C | Develop MATALB Application | | | |
| | Mode of examination | | | | |
| | Weightage Distribution | Project on Simulation based | ETE | | |
| | | 60 % | 40% | | |
| | Text book/s* | | | | |
| | Other References | 1. | | | |

## CO and PO Mapping

| Mapping between Cos and Pos, PSO's | | |
|---|---|---|
| **Sl. No.** | **Course Outcomes (COs)** | **Mapped Program Outcomes and PSO's** |
| **1** | **CO1:**Use basic fundamentals to write simple Matlab programs. | **PO1,PO3,PO5,PO12,PSO1,PSO2,PSO3** |
| **2** | **CO2:** Plot graphs in Matlab and use procedural functions. | **PO1,PO3,PO5,PO10,PO12,PSO1,PSO2,PSO3** |
| **3** | **CO3**: Writing Matlab programs with logic and flow control. | **PO1,PO2,PO3,PO5,PO12,PSO1,PSO2,PSO3** |
| **4** | **CO4:**Manipulate and work with text files. | **PO1,PO3,PO5,PO12,PSO1,PSO2,PSO3** |
| **5** | **CO5**:Make use of graphical user interfaces in MATLAB. | **PO1,PO3,PO5,PO12,PSO1,PSO2,PSO3** |
| **6** | **CO6**: Apply MATLAB Programming to solve real life problem | **PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO8,PO9,PO10,PO11,PO12,PSO1,PSO2,PSO3** |

**PO and PSO mapping with level of strength for Course Name: Technical Skill Enhancement Course-1 CSP 395)**

**1-Slight (Low) 2-Moderate (Medium) 3-Substantial (High)**

| COs | PO1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO9 | PO 10 | PO1 1 | PO 12 | PSO 1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | 1 | - | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| CO2 | 1 | - | 1 | - | 2 | - | - | - | - | 2 | - | 1 | 1 | 2 | 1 |
| CO3 | 1 | 2 | 1 | - | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| CO4 | 1 | - | 1 | - | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| CO5 | 1 | - | 1 | - | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| CO6 | 2 | 2 | 3 | 3 | 2 | 2 | 1 | - | 2 | 3 | 2 | 2 | 2 | 3 | 1 |
| Avg PO attained | 1 | 0.7 | 1.3 | 0.5 | 2 | 0.3 | 0.2 | 0 | 0 | 1 | 0 | 1 | 1 | 2.2 | 1 |

## Syllabus: CSP 398, Summer Internship-II

| | | | | | |
|---|---|---|---|---|---|
| **School: SET** | | **Batch: 2018-2022** | | | |
| **Program:B.Tech** | | **Current Academic Year: 2019-20** | | | |
| **Branch: CSE** | | **Semester** | | | |
| 1 | Course Code | CSP398 | Course Name: **Summer Internship-II** | | |
| 2 | Course Title | **Summer Internship-II** | | | |
| 3 | Credits | 1 | | | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | | | |
| | Course Status | UG | | | |
| 5 | Course Objective | 1. Experience the activities and functions of business professionals.<br>2. Develop and refine oral and written communication skills.<br>3. Identify areas for future knowledge and skill development. | | | |
| 6 | Course Outcomes | Students will be able to:<br>CO1. Integrate the concepts and strategies of academic study in a real time environment.<br>CO2. Identify, formulate and model problems and find engineering solution based on a systems approach.<br>CO3. Develop teamwork and apply prior acquired knowledge in problem solving.<br>CO4. Develop communication, interpersonal and other critical skills required for career growth.<br>CO5. Practice engineer's responsibilities, self-understanding, self-discipline and ethical standards.<br>CO6. Explore career alternatives prior to graduation. | | | |
| 7 | Course Description | An internship experience provides the student with an opportunity to explore career interests while applying knowledge and skills learned in the classroom in a work setting. The experience also helps students gain a clearer sense of what they still need to learn and provides an opportunity to build professional networks. | | | |
| 8 | Outline syllabus | | | | CO Mapping |
| | **Unit 1** | Define objectives and conditions for the internship, ensuring students that it is related to the study path carried out at the University | | | **CO1,CO2** |
| | **Unit 2** | Problem Definition and identification, Team/Group formation and Project Assignment. Finalizing the problem statement, resource requirement, if any. | | | **CO2** |
| | **Unit 3** | The internship work plan is drawn up by developing team work and applies prior acquired knowledge in problem solving. | | | **CO3** |
| | **Unit 4** | Demonstrate and execute Project with the team. Submission of evaluation form and final report completed by the intern. | | | **CO4** |
| | **Unit 5** | Final evaluation form completed by the supervisor at the Host Organization and final presentation before departmental committee. | | | **CO5,CO6** |
| | Mode of examination | Practical | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | NIL | 40% | |
| | Text book/s* | NA | | | |

| | | |
|---|---|---|
| | Other References | NA |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) |
|---|---|---|
| 1. | CO1. Integrate the concepts and strategies of academic study in a real time environment. | PO1,PO2,PO4,PO5, PO7,PO8,PO9,PSO1 ,PSO2,PSO3 |
| 2. | CO2. Identify, formulate and model problems and find engineering solution based on a systems approach. | PO1,PO2,PO3,PO4, PO5,PO7,PO8,PO9, PSO1,PSO2 |
| 3. | CO3. Develop teamwork and apply prior acquired knowledge in problem solving. | PO1,PO3,PO4,PO5, PO8,PO9,PO11,PO12, PSO1,PSO2,PSO3 |
| 4. | CO4. Develop communication, interpersonal and other critical skills required for career growth. | PO8,PO10 |
| 5. | CO5. Practice engineer's responsibilities, self-understanding, self-discipline and ethical standards. | PO6,PO8 |
| 6. | CO6. Explore career alternatives prior to graduation. | PO12,PSO1,PSO2 |

**PO and PSO mapping with level of strength for Course Name Summer Internship-II (CSP398)**

**CO/PO Mapping**

(1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Low

| Cos | Programme Outcomes(POs) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CO1 | 2 | 2 | - | 3 | 2 | - | 1 | 1 | 1 | - | - | - | 1 | 2 | 2 |
| CO2 | 1 | 2 | 1 | 2 | 2 | - | 1 | 1 | 1 | - | - | - | 1 | 2 | - |
| CO3 | 2 | - | 2 | 2 | 2 | - | - | 1 | 3 | - | 1 | 1 | 1 | 2 | 2 |
| CO4 | - | - | - | - | - | - | - | 1 | - | 3 | - | - | - | - | - |
| CO5 | - | - | - | - | - | 2 | - | 3 | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | 2 | 2 | 2 | - |
| Avg PO attained | 1 | 0.7 | 0.5 | 1.2 | 1 | 0.3 | 0.3 | 1.2 | 1 | 1 | 0 | 1 | 1 | 1.3 | 0.7 |

# TERM-VI

## 2.1 Template A1: Syllabus for Theory Subjects

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2016-2020** | |
| **Program: B.Tech** | | **Current Academic Year: 2019** | |
| **Branch: Mechanical Engineering** | | **Semester: VI** | |
| 1 | Course Code | HMM305 | |
| 2 | Course Title | Management for Engineers | |
| 3 | Credits | 3 | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | The objective of this course is to expose the students to understand the basics of Management Foundations. The students will be given a detailed grounding for the theories and cases related to the general management. The aim of the course is to orient the students in theories and practices of Management so as to apply the acquired knowledge in actual business practices. This is a gateway to the real world of management and decision-making. | |
| 6 | Course Outcomes | CO1: Define basic principles and concepts related to management in an organization including the functions, different theories of management and roles they play in an organization.<br>CO2: Explain the primary function Planning with its process. Also, how forecasting is done in organizations with various techniques are used.<br>CO3: Use of organizing by studying different types of organization and also using decentralization and span of control in organizations.<br>CO4: Analyse jobs, recruitment process, manpower planning, job rotation, trainings and rewards in various organizations.<br>CO5: Measure motivation and management control concepts to obtain effective controlling in management system in organizations.<br>CO6: Develop proper system in an organization by using all the functions of management. | |
| 7 | Course Description | This course gives an overview of engineering management and help to understand the various functions of management used in an organization. The focus of the course is the development of individual skills and team work. | |
| 8 | Outline syllabus | | CO Mapping |
| | Unit 1 | Introduction of Management & Organisation | CO1,CO6 |
| | A | Management-Definition of Management & Organisation | CO1,CO6 |
| | B | Concept, Nature, Scope and Functions of Management, Levels of Management, Management Theories - Taylors principle, Fayol's Principles, Hawthorne Studies, Systems Approach and Contingency Approach to Management. | CO1,CO6 |
| | C | Mintzberg's Managerial Roles, Skills of Manager, Functions of management | CO1,CO6 |
| | Unit 2 | Management Planning Process | CO2,CO6 |
| | A | Planning objectives and characteristics. | CO2,CO6 |
| | B | Hierarchies of planning. | CO2, CO6 |

| | | | | | |
|---|---|---|---|---|---|
| | C | The concept and techniques of forecasting. | | | CO2,CO6 |
| | Unit 3 | Organizing | | | C03,C06 |
| | A | Meaning, Importance and Principles | | | C03,C06 |
| | B | Departmentalization, Span of Control | | | CO3,CO6 |
| | C | Types of Organization, Authority, Delegation of Authority | | | CO3,CO6 |
| | Unit 4 | Staffing | | | CO4,C06 |
| | A | Meaning, Job analysis | | | CO4,C06 |
| | B | Manpower planning, Recruitment, Transfers and Promotions | | | CO4, CO6 |
| | C | Appraisals, Management Development, Job Rotation, Training, Rewards and Recognition, | | | CO4, CO6 |
| | Unit 5 | Directing & Controlling | | | CO5,CO6 |
| | A | Motivation, Co-ordination, Communication, | | | CO5,CO6 |
| | B | Directing and Management Control, Decision Making, | | | CO5,CO6 |
| | C | Management by objectives (MBO) the concept and relevance. Objectives and Process of Management Control | | | CO5,CO6 |
| | Mode of examination | Theory | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 1. Principles & practice of Mgmt., L.M. Prasad | | | |
| | Other References | 1. Management Today, Burton & Thakur<br>2. Principles & Practices of Mgmt., C.B. Gupta<br>3. Understanding Management, Richard L.Daft<br>4. Management, Stoner, Freemand & Gilbert<br>5. Essential of Management, Koontz O' Donnel | | | |

**Program Outcome Vs Courses Mapping Table:**

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO305.1 | 2 | 1 | 2 | 2 | 2 | 2 | - | 2 | 1 | 3 | - | - | 1 | 1 | 2 |
| CO305.2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | - | - | 2 | 2 | 1 | 1 | 1 | 2 |
| CO305.3 | 3 | 1 | 1 | 2 | 3 | 2 | - | 2 | - | - | 1 | 2 | 1 | 2 | 2 |
| CO305.4 | - | 2 | 2 | 1 | - | 1 | - | 1 | - | 2 | 1 | - | 1 | 1 | 2 |
| CO305.5 | - | 1 | 2 | 2 | - | 2 | 3 | 1 | 2 | - | - | 1 | 2 | 2 | 1 |
| CO305.6 | **1** | 2 | 1 | 1 | 2 | 2 | 2 | - | 1 | - | - | 1 | 2 | 2 | 2 |
| CO305 | | | | | | | | | | | | | | | |

## 2.1 Template A1: Syllabus for Theory Courses

| | | | |
|---|---|---|---|
| **School:** | | **School of Engineering and technology** | |
| **Department** | | **Department of Computer Science and Engineering** | |
| **Program:** | | **B-Tech** | |
| **Branch:** | | **Computer Science and Engineering** | |
| 1 | Course Code | | |
| 2 | Course Title | Web Technologies | |
| 3 | Credits | 2 | |
| 4 | Contact Hours (L-T-P) | 2-0-0 | |
| | Course Status | Core /Elective/Open Elective | |
| 5 | Course Objective | The objective of this course is to provide a foundation of technologies and technical skills in web development. Based upon the development of a web, this course provides an insight of computer and networking technologies, and hands on experience in web programming. | |
| 6 | Course Outcomes | CO1: Define the basic concept of HTML<br>CO2: Illustrate the basics of PHP<br>CO3:Develop interactive web pages using HTML5 and CSS3<br>CO4:Design web pages/site having validation on user data access.<br>CO5:Compare relationship of HTML,Javascript and PHP<br>CO6:Develop web site for business and organization or for individual | |
| 7 | Course Description | The purpose of this course is to give students the basic understanding of Web pages and technologies to be used for designing web sites. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **HTML & HTML 5** | |
| | A | HTML basic tags, various links implementation, image ,image map, table formatting, Lists, form design. | CO1 |
| | B | Page layout design using frame, div and span tag, iframe | CO1 |
| | C | HTML5: New elements, canvas, offline webpage, HTML Media: video, audio | CO1,CO3 |
| | **Unit 2** | **CSS &CSS3** | |
| | A | Introduction, syntax, selector: class and id, text formatting, margin, align, pseudo-class, pseudo-element | CO3 |
| | B | Positioning, background formatting, Navigation bar, and image gallery. | CO3 |
| | C | CSS3: Introduction, colors, text formatting, fonts formatting, Background formatting, 2D transform, animation | CO3 |
| | **Unit 3** | **Java script** | |
| | A | Introduction, syntax, comment, statement, variable, operators | CO4,CO5 |

| | | | | | |
|---|---|---|---|---|---|
| | B | Conditional statements, looping statements, Functions | | | CO4,CO5 |
| | C | Object, events, Accessing form elements, validating form elements,popup windows. | | | CO4,CO5 |
| | **Unit 4** | **PHP Basics** | | | |
| | A | Introduction to PHP, syntax, variables, operators | | | CO2,CO5 |
| | B | Conditional statement, iterative statements,Functions | | | CO2,CO5 |
| | C | Array: single, multi dimensional, numeric array, associative array | | | CO2,CO5 |
| | **Unit 5** | **File Handling in PHP** | | | |
| | A | File Operation: Reading & writing data on web page from file, deleting file, renaming file | | | CO5,CO6 |
| | B | Session Management: introduction, creation, destroying and login session management | | | CO5,CO6 |
| | C | PHP Database Connectivity, Retrieving records, retrieving fields from record | | | CO5,CO6 |
| | Mode of examination | Theory/Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 1. Ivan Bayross,"HTML,DHTML, JavaScript, Perl & CGI", BPB Publication<br>2. Schildt H, "The Complete Reference JAVA2", TMH<br>3. Schildt H, "The Complete Reference J2EE", TMH | | | |
| | Other References | 1. Rick Delorme," Programming in HTML5 with JavaScript and CSS3", Microsoft | | | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | Define the basic concept of HTML | PO5,PSO2 |
| 2. | Illustrate the basics of Extensible markup language. | PO5,PSO2,PO12 |
| 3. | Develop interactive web pages using HTML5 and CSS3 | PO2,PO3,PO5,PO6,PO9, PSO1,PSO2,PSO3 |
| 4. | Design web pages/site having validation on user data access. | PO2,PO3,PO5,PO6,PO9, PSO1,PSO2,PSO3 |
| 5. | Compare relationship of HTML,Javascript and PHP | PO5,PSO2 |
| 6. | Develop web site for business and organization or for individual | PO1, PO2,PO3,PO4,PO5,PO6, PO7,PO9,PO11,PO12,PS O1,PSO2,PSO3 |

**PO and PSO mapping with level of strength for Course Name** Web Technologies **(Course Code CSE352)**

| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CSE 352_** Web Technologies | CO1 | | | | | 1 | | | | | | | | | 1 | |
| | CO2 | | | | | 3 | | | | | | | 1 | | 1 | |
| | CO3 | | 1 | 3 | | 2 | 1 | | | 2 | | | | 1 | 2 | 2 |
| | CO4 | | 1 | 3 | | 1 | 1 | | | 2 | | | | 1 | 2 | 2 |
| | CO5 | | | | | 2 | | | | | | | | | 1 | |
| | CO6 | 2 | 3 | 3 | 1 | 3 | 3 | 1 | | 3 | | 2 | 2 | 1 | 2 | 3 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cse 352 | Web Technologies | 2 | 1.6 | 2.3 | 1 | 2 | 1.6 | 1 | 0 | 2.2 | 0 | 2.3 | 1.5 | 1 | 1.5 | 2.2 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

## 2.1 Template A1: Syllabus for Theory Courses (SAMPLE)

| | | | | |
|---|---|---|---|---|
| **School:** | | **School of Engineering and technology** | | |
| **Department** | | **Department of Computer Science and Engineering** | | |
| **Program:** | | | | |
| **Branch:** | | | | |
| 1 | Course Code | CSE022 | | |
| 2 | Course Title | Android Application Development | | |
| 3 | Credits | 3 | | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | | |
| | Course Status | Core /Elective/Open Elective | | |
| 5 | Course Objective | 1. Basics of Android OS<br>2. Develop Basic and advance Android Apps<br>3. Publishing and Monetizing the app | | |
| 6 | Course Outcomes | CO1: Demonstrate and understanding anatomy of an android application.<br>CO2: Develop various android applications related to layouts and rich uses interactive interfaces.<br>CO3:Apply essential android programming concept<br>CO4: Distinguish and compare different components of Android<br>CO5: Access and work with databases under an android operating system.<br>CO6: Develop Basic and advance android app development for android devices. | | |
| 7 | Course Description | This android development course will help students to Understand the basis of Android Platform and its lifecycle. This will help them to implement simple GUI applications, use built-in components and work with database to store the data. | | |
| 8 | Outline syllabus | | | CO Mapping |
| | **Unit 1** | **Introduction and Architecture of Android** | | |
| | A | History of Android, Features of Android, Android Devices, Open Handset Alliance (OHA) , Advantages of Android, Comparing Android with other platform | | CO1 |
| | B | Android Directory Structure, Android Development Tools, Architecture of Android. | | CO1 |
| | C | Structure of Manifest files, Activities, Activity life cycle | | CO1 |
| | **Unit 2** | **User Interfaces** | | |
| | A | Layouts-Linear layout, Relative layout, Constraint layout | | CO1,CO2 |
| | B | Input Controls – Text input, Checkboxes, Radio buttons, Spinner, Toggle buttons and switches | | CO1,CO2 |
| | C | Menus- Popup, Dialog, Context, date picker, style | | CO1,CO2 |

| | | | | | |
|---|---|---|---|---|---|
| | **Unit 3** | **Components of Android** | | | |
| | A | Intents, types of intents, Intent Filter | | | CO3 |
| | B | Starting a new activity, Sending and Receiving of data, Notifications | | | CO3 |
| | C | Services, service life cycle, Broadcast receivers | | | CO3 |
| | **Unit 4** | **Working with SQL Lite** | | | |
| | A | Introduction to SQLite database, Steps for connecting application with database. | | | CO4,CO5 |
| | B | Fetch and update data in database from application, | | | CO4,CO5 |
| | C | Cursor and content value, opening and closing database | | | CO4,CO5 |
| | **Unit 5** | **Sensors and Animation** | | | |
| | A | Sensor Manager, Sensor Framework, Types of Sensors Accelerometer, Gyroscope, Proximity Sensor, Orientation, Light Sensor | | | CO6 |
| | B | Detect availability of sensor, Fetch data from sensors on frequent basis, Development of compass application with help of gyroscope sensor | | | CO6 |
| | C | SMS , Graphics and Animation | | | CO6 |
| | Mode of examination | Theory/Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 1. Anubhav Pradhan and Anil V. Deshpande , Composing Mobile Apps: Learn, Explore, Apply Using Android , 1st Edition,Wiley India. | | | |
| | Other References | 1. Wei-Meng Lee , Beginning Android 4 Application Development.<br>2. Neil Smyth ,Android Studio Development essentials-Android 6 | | | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: Demonstrate and understanding anatomy of an android application. | PO5,PO9,PO12,PSO3 |
| 2. | CO2: Develop various android applications related to layouts and rich uses interactive interfaces. | PO5,PO9,PO12,PSO3 |
| 3. | CO3:Apply essential android programming concept | PO3,PO5,PO9,PO12,PSO1,PSO3 |
| 4. | CO4: Distinguish and compare different components of Android | PO5,PO9,PO11,PO12,PSO3 |
| 5. | CO5: Access and work with databases under an android operating system. | PO3,PO4,PO5,PO7,PO9,PO11, PO12,PSO3 |
| 6. | CO6: Develop Basic and advance android app development for android devices | PO1,PO2,PO3,PO4,PO5,PO7,PO9,PO11,PO12,PSO1,PSO2,PSO3 |

**PO and PSO mapping with level of strength for Course Name** Android Application Development **(Course Code** CSE022**)**

| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE 022_ Android Application Development | CO1 | | | | | 3 | | | | 2 | | | 1 | | | 2 |
| | CO2 | | | | | 3 | | | | 2 | | | 1 | | | 2 |
| | CO3 | | | 2 | | 3 | | | | 2 | | | 1 | 2 | | 2 |
| | CO4 | | | | | 3 | | | | 2 | | 2 | 1 | | | 2 |
| | CO5 | | | 2 | 3 | 3 | | 2 | | 2 | | 2 | 1 | | | 2 |
| | CO6 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | | 3 | | 3 | 1 | 3 | 3 | 3 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE022 | Android Application Development | 1 | 2 | 2.3 | 3 | 3 | 3 | 2.5 | 0 | 2.2 | 0 | 2.3 | 1 | 2.5 | 3 | 2.2 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

| | | | | | |
|---|---|---|---|---|---|
| **School: SET** | | **Batch:** | | | |
| **Program: BTECH** | | **Current Academic Year:** | | | |
| **Branch:CSE** | | **Semester:** | | | |
| 1 | Course Code | CSP 352 | | | |
| 2 | Course Title | Web Technologies Lab | | | |
| 3 | Credits | 1 | | | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | | | |
| | Course Status | | | | |
| 5 | Course Objective | Provide the knowledge to design and develop web application .Students will gain the skills and project-based experience needed for entry into web application and development careers | | | |
| 6 | Course Outcomes | CO1:Select essential skills to create simple, original web pages<br>CO2:Demonstrate interactive web pages using CSS and Javascript<br>CO3:Develop web pages/site having validation on user data access.<br>CO4: Examine well-formed XML Document and XML technology<br>CO5: Evaluate Dynamic web site using HTML,Javascript and PHP<br>CO6:Develop web site for small business and organization or for individual | | | |
| 7 | Course Description | This course is an overview of the modern technologies used for the Web development. | | | |
| 8 | | | | | CO Mapping |
| | **Unit 1** | **HTML & HTML 5** | | | |
| | | Program related to HTML and HTML5 new elements | | | CO1 |
| | **Unit 2** | **CSS &CSS3** | | | |
| | | Program related to CSS and CSS3 | | | CO2 |
| | **Unit 3** | **Java script & Jquery** | | | |
| | | Program related to form validation using javascript and Jquery effect | | | CO2,CO3 |
| | **Unit 4** | **PHP** | | | |
| | | Program related to File handling, session management, PHP-ODBC connectivity. | | | CO3,CO5 |
| | **Unit 5** | **XML** | | | |
| | | Program related to XML schema ,XSLT,DTD | | | CO4,CO6 |
| | Mode of examination | Theory/Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 4. Ivan Bayross,"HTML,DHTML, JavaScript, Perl & CGI", BPB Publication<br>5. Schildt H, "The Complete Reference JAVA2", TMH<br>6. Schildt H, "The Complete Reference J2EE", TMH | | | |
| | Other References | 2. Rick Delorme," Programming in HTML5 with JavaScript and CSS3", Microsoft | | | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | Select essential skills to create simple, original web pages | PO5,PO9,PSO2 |
| 2. | Demonstrate interactive web pages using CSS and Javascript | PO2,PO3,PO5,PO9,PO12,PSO2, PSO3 |
| 3. | Develop web pages/site having validation on user data access. | PO3,PO5,PO6,PO9,PSO2,PSO3 |
| 4. | Examine well-formed XML Document and XML technology | PO5,PO6 |
| 5. | Evaluate Dynamic web site using HTML,Javascript and PHP | PO1,PO5,PO9,PO12,PSO1,PSO2 |
| 6. | Develop web site for small business and organization or for individual | PO1,PO2,PO3,PO4,PO5,PO6,PO 9,PO11,PO12,PSO1,PSO2,PSO3 |

**PO and PSO mapping with level of strength for Course Name** Web Technologies Lab **(Course Code CSP352)**

| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PS O3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CSP 352_** Web Technologies Lab | CO1 | | | | | 1 | | | | 2 | | | | | 1 | |
| | CO2 | | 1 | 1 | | 3 | | | | 2 | | | 1 | | 1 | 2 |
| | CO3 | | | 1 | | 2 | 1 | | | 2 | | | | | 1 | 2 |
| | CO4 | | | | | 1 | 1 | | | | | | | | | |
| | CO5 | | 1 | | | 2 | | | | 2 | | | 1 | | 1 | 2 |
| | CO6 | 2 | 3 | 3 | 1 | 3 | 3 | | | 3 | | 2 | 2 | 1 | 2 | 3 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP 352 | Web Technologies Lab | 2 | 1.67 | 1.67 | 1 | 2 | 1.67 | 0 | 0 | 2.2 | 0 | 2 | 1.3 | 1 | 1.2 | 2.25 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

## 2.1 Template A1: Syllabus for Theory Courses (SAMPLE)

| | | | | | |
|---|---|---|---|---|---|
| **School:** | | **School of Engineering and technology** | | | |
| **Department** | | **Department of Computer Science and Engineering** | | | |
| **Program:** | | | | | |
| **Branch:** | | | | | |
| 1 | Course Code | CSP022 | | | |
| 2 | Course Title | Android Application Development | | | |
| 3 | Credits | 3 | | | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | | | |
| | Course Status | Core /Elective/Open Elective | | | |
| 5 | Course Objective | 4. Basics of Android OS<br>5. Develop Basic and advance Android Apps<br>6. Publishing and Monetizing the app | | | |
| 6 | Course Outcomes | CO1: Demonstrate and understanding anatomy of an android application.<br>CO2: Develop various android applications related to layouts and rich uses interactive interfaces.<br>CO3:Apply essential android programming concept<br>CO4: Distinguish and compare different components of Android<br>CO5: Access and work with databases under an android operating system.<br>CO6: Develop Basic and advance android app development for android devices. | | | |
| 7 | Course Description | This android development course will help students to Understand the basis of Android Platform and its lifecycle. This will help them to implement simple GUI applications, use built-in components and work with database to store the data. | | | |
| 8 | Outline syllabus | | | | CO Mapping |
| | **Unit 1** | **Introduction and Architecture of Android** | | | |
| | A | Basic program to study the directory structure of android | | | CO1 |
| | **Unit 2** | **User Interfaces** | | | |
| | A | Programs to develop UI for android app | | | CO1,CO2 |
| | **Unit 3** | **Components of Android** | | | |
| | A | Program using different component of android | | | CO3 |
| | **Unit 4** | **Working with SQL Lite** | | | |
| | A | Program used to store and retrieve data from database | | | CO4,CO5 |
| | **Unit 5** | **Sensors and Animation** | | | |
| | A | Program based on sensor and animation | | | CO6 |
| | Mode of examination | Theory/Jury/Practical/Viva | | | |
| | Weightage | CA | MTE | ETE | |

| | | | | | |
|---|---|---|---|---|---|
| | Distribution | 60% | 0% | 40% | |
| | Text book/s* | 1. Anubhav Pradhan and Anil V. Deshpande , Composing Mobile Apps: Learn, Explore, Apply Using Android , 1st Edition,Wiley India. | | | |
| | Other References | 1. Wei-Meng Lee , Beginning Android 4 Application Development.<br>2. Neil Smyth ,Android Studio Development essentials-Android 6 | | | |

**PO and PSO mapping with level of strength for Course Name** Android Application Development **(Course Code** CSP022**)**

| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP 022_ Android Application Development | CO1 | | | | | 3 | | | | 2 | | | 1 | | | 2 |
| | CO2 | | | | | 3 | | | | 2 | | | 1 | | | 2 |
| | CO3 | | | 2 | | 3 | | | | 2 | | | 1 | 2 | | 2 |
| | CO4 | | | | | 3 | | | | 2 | | 2 | 1 | | | 2 |
| | CO5 | | | 2 | 3 | 3 | | 2 | | 2 | | 2 | 1 | | | 2 |
| | CO6 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | | 3 | | 3 | 1 | 3 | 3 | 3 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP022 | Android Application Development | 1 | 2 | 2.3 | 3 | 3 | 3 | 2.5 | 0 | 2.2 | 0 | 2.3 | 1 | 2.5 | 3 | 2.2 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2019-2023** | |
| **Program: B-TECH** | | **Current Academic Year: 2019-20** | |
| **Branch: CSE** | | **Semester: VI** | |
| **1** | **Course Code** | **CSA031** | **Course Name: Digital Image Processing** |
| **2** | **Course Title** | **Digital Image Processing** | |
| **3** | **Credits** | **3** | |
| **4** | **Contact Hours (L-T-P)** | **3-0-0** | |
| | **Course Status** | **Program Elective 3** | |
| **5** | **Course Objective** | The objective of this course is to introduce the students to the fundamental techniques and algorithms used for acquiring, processing and extracting useful information from digital images. Particular emphasis will be placed on covering methods used for image sampling and quantization, image transforms, image enhancement and restoration, image encoding, image analysis and pattern recognition. In addition, the students will learn how to apply the methods to solve real-world problems in several areas including medical, remote sensing and surveillance and develop the insight necessary to use the tools of digital image processing (DIP) to solve any new problem | |
| **6** | **Course Outcomes (CO's)** | The Successful Completion of the Course Enables the Students to achieve the following learning Objectives:<br>CO-7. Define the fundamental concepts of a digital image processing system.<br>CO-8. Classify images in the frequency domain using various transformations.<br>CO-9. Apply various operations for image enhancement and image restoration.<br>CO-10. Analyse image segmentation and various representation techniques.<br>CO-11. Choose various morphological operations for Digital Image processing.<br>CO-12. Discuss and Build various image processing techniques for real life applications. | |
| **7** | **Course Description** | Images and Visual information are integral parts of our daily lives. Digital image processing plays an important role in various practical applications including television, medical imaging modalities such as X-ray or ultrasound, photography, security, astronomy and remote sensing.<br>This subject will introduce the fundamentals of image processing and manipulation, while image applications will be used for illustrations etc. The subject emphasizes general principles of image processing rather than specific applications and also to know and understand how computers can process digital images and some of the fundamental operations in image processing. | |
| 8 | **Syllabus Outline** | | **CO Mapping** |
| | **Unit 1** | **Introduction** | |
| | A | Fundamental of digital image processing, Elements of Visual Perception system, Applications of Digital Image Progressing | CO1 |
| | B | Image Sampling and Quantization, Relationships between pixels , Image Sensing and Acquisition | CO1 |
| | C | Color image fundamentals – RGB, HSI models, Two-dimensional mathematical preliminaries, 2D transforms – DFT, DCT, DWT. | CO1 |
| | **Unit 2** | **Image Enhancement in Spatial and Frequency Domain** | |
| | A | Spatial Domain: Gray level Transformations, Histogram Processing , Basics of Spatial Filtering, Smoothing and Sharpening Spatial Filtering | CO2 |
| | B | Frequency Domain: Introduction to Fourier | CO2 |

| | | | |
|---|---|---|---|
| | | Transform– Low-pass filter in frequency domain | |
| | C | High-pass filters in frequency domain | CO2 |
| | **Unit 3** | **Image Restoration and Compression** | |
| | A | Restoration Process model, Noise models , Mean Filters, Order Statistics, Adaptive filters | CO3 |
| | B | Frequency Domain Filtering: Band reject Filters, Band pass Filters , Notch Filters, Optimum Notch Filtering, Inverse Filtering, Wiener filtering | CO3 |
| | C | Encoder-Decoder model, Types of redundancies, Brief Overview of Lossy and Lossless Compression Techniques | CO3 |
| | **Unit 4** | **Image Segmentation** | |
| | A | Boundary detection based techniques, Point, line detection, Edge detection, Edge linking, local processing, regional processing, Hough transform | CO4,CO6 |
| | B | Thresholding, Global Threshloding, adaptive thresholding, Iterative thresholding, Otsu's method, Moving averages, Multivariable thresholding | CO4,CO6 |
| | C | Region based segmentation, Watershed algorithm, Use of motion in segmentation | CO4,CO6 |
| | **Unit 5** | **Morphological Image Processing** | |
| | A | Basics, Erosion, Dilation, Opening, Closing, Hit-or-Miss Transform | CO5 ,CO6 |
| | B | Morphological Algorithms: Boundary Detection, Hole filling, Connected components, convex hull, thinning, thickening, skeletons, pruning | CO5,CO6 |
| | C | Geodesic Dilation, Erosion, Reconstruction by dilation and erosion. Applications of Morphological Image Processing | CO5,CO6 |
| | **Mode of examination** | Theory | |
| | **Weightage Distribution** | ***CA*** / ***MTE*** / ***ETE*** | |
| | | 30% / 20% / 50% | |
| | **Text Books** | 1. Digital Image Processing 2nd Edition, Rafael C. Gonzalvez and Richard E. Woods. Published by: Pearson Education. | |
| | **Reference Books** | 1. Digital Image Processing and Computer Vision, R.J. Schalkoff. Published by: John Wiley and Sons, NY.<br>2. Fundamentals of Digital Image Processing, A.K. Jain. Published by Prentice Hall, Upper Saddle River, NJ.<br>3. Image Processing, Analysis and Machine Vision , by Milan Sonka ,Vaclav Hlavac , Roger Boyle Cengage Learning 3rd Edition<br>4. Digital Image Processing, by S Jayaraman, S Esakkirajan, T Veerakumar TMH Publication | |
| | **Online Materials** | 1. https://nptel.ac.in/courses/106105032/<br>2. http://users.rowan.edu/~polikar/WTtutorial.html | |

**CO and PO Mapping**

| S. No. | Course Outcome (CO) | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1 | Define the fundamental concepts of a digital image processing system. | PO1,PO2,PO3,PO5,PO8,PSO1,PSO2 |
| 2 | Classify images in the frequency domain using various transformations. | PO1,PO2,PO3,PO4,PO5,PO6,PO8, PO9,PO10,PSO1,PSO2 |
| 3 | Apply various operations for image enhancement and image restoration. | PO1,PO2,PO3,PO4,PO5,PO6,PO8, PO9,PO10,PO12,PSO1,PSO2 |
| 4 | Analyse image segmentation and various representation techniques. | PO1,PO2,PO3,PO4,PO5,PO6,PO8, PO9,PO10,PO12,PSO1,PSO2 |
| 5 | Choose various morphological operations for Digital Image processing. | PO1,PO2,PO3,PO4,PO5,PO6,PO8, PO9,PO10,PO12,PSO1,PSO2 |
| 6 | Discuss and Build various image processing techniques for real life applications. | PO1,PO2,PO3,PO4,PO5,PO6,PO8, PO9,PO10,PO12,PSO1,PSO2 |

**CO-PO and PSO Mappings of Digital Image Processing CSE031**

| Subject | PO's / PSO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Digital Image Processing CSE031** | CO1 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 2 | 3 | 1 |
| | CO2 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 2 | 3 | 2 |
| | CO3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 3 | 3 | 2 |
| | CO4 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 3 | 3 | 3 | 2 |
| | CO5 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 3 | 3 | 3 | 2 |
| | CO6 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | 2 | 1 | 3 | 3 | 3 | 3 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSA031 | Digital Image Processing | 3.00 | 3.00 | 3.00 | 3.00 | 1.83 | 1.67 | 1.33 | 1.00 | 1.33 | 2.00 | 1.00 | 3.00 | 2.67 | 3.00 | 2.00 |

**Total- 32.83**

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

| | | | |
|---|---|---|---|
| **School:** | | **School of Engineering and technology** | |
| **Department** | | **Department of Computer Science and Engineering** | |
| **Program:** | | **B. Tech** | |
| **Branch:** | | | |
| 1 | Course Code | CSE032 | |
| 2 | Course Title | Cryptography and Network Security | |
| 3 | Credits | 3 | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | |
| | Course Status | Core | |
| 5 | Course Objective | The objective of this course is to provide an intention to explain basic concepts and algorithms of symmetric &asymmetric key cryptography, including encryption/decryption and key exchange with the application of cryptography and technique. | |
| 6 | Course Outcomes | On successful completion of this module students will be able to:<br>CO1: Identify the basic concepts of computer security, algorithms of symmetric Key cryptography, including encryption/decryption.<br>CO2: Apply the tools and methodologies used to perform mathematic concepts behind the cryptographic algorithms..<br>CO3: Explain the tools and methodologies used to perform Security analysis.<br>CO4: Interpret use of cryptographic data integrity algorithms and user authentication protocols<br>CO5: Examine security at application layer, transport layer and network layer.<br>CO6: Compare various algorithm of cryptography used for Network Security. | |
| 7 | Course Description | This course will provide a deterministic approach of both the principles and practice of cryptography & network security. It covers the basic issues to be addressed by a network security capability, and explored by providing a tutorial and survey of cryptography and network security technology. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Introduction& symmetric Key Cryptography** | |
| | A | Computer Security Concepts- OSI security Architecture, Security attacks, Services, mechanism, model of network security | CO1 |
| | B | Classical encryption techniques- Substitution Cipher(Mono-alphabetic, Poly-alphabetic), Transposition cipher, Stegnography | CO1 |
| | C | Block Cipher- Encryption Principles, DES and its variants, strength of DES | CO1 |
| | **Unit 2** | **Mathematics of Cryptography** | |

| | | | |
|---|---|---|---|
| | A | Eucledian, Extended Eucledian Algorithm, EuilersTotient Function , Ferment little Theorem, Eulers theorem | CO2 |
| | B | Primality Testing-Miller Rabin test, Chinese Remainder Theorem | CO2, CO6 |
| | C | Exponential- square and multiply method, Discrete Logarithm | CO2, CO6 |
| | **Unit 3** | **Asymmetric Cryptography & Key Exchange** | |
| | A | Public Key cryptography-RSA, Cryptanalysis of RSA | CO3 |
| | B | Elgamal cryptography, Elliptic Curve cryptography | CO3, CO6 |
| | C | Key Management and distribution : KDC, Diffie Hellman Key Exchange | CO3, CO6 |
| | **Unit 4** | **Digital signatures** | |
| | A | User Authentication protocol- Kerberos | CO4 |
| | B | Digital Signature –RSA, Elgamal, DSS | CO4 |
| | C | Data integrity algorithms-Hash Functions, MD5, SHA-512 | CO4 |
| | **Unit 5** | **Security** | |
| | A | Security at Application layer-Email Architecture, S/MIME, PGP-Scenarios, key rings | CO5 |
| | B | Security at Transport layer-SSL( Services, Protocols) | CO5 |
| | C | Security at Network layer-IPSec(Modes, Security Protocols-AH, ESP, Services provided by IPSEC) | CO6 |
| | Mode of examination | Theory/Jury/Practical/Viva | |
| | Weightage Distribution | CA: 30% / MTE: 20% / ETE: 50% | |
| | Text book/s* | 1. Atul Kahate , "Network Security ", Wiley India Pvt Ltd, 2010.<br>2. Michael T. Simpson, "Hands-on Cryptography & Network Security & Network Defense", Course Technology, 2010.<br>3. Rajat Khare, "Network Seuciryt and Cryptography & Network Security ", Luniver Press, 2006. | |
| | Other References | 1. Bruce Schneier, “Applied Cryptography”, John Wiley & Sons Inc, 2001.<br>2. Behrouz A. Forouzan, “Cryptography And Network Security”- McGraw Hill<br>1. Internet as a resource for reference. | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: Identifybasic concepts of computer security, algorithms of symmetric Key cryptography, including encryption/decryption. | PO1, PO2, PSO1. PSO2 |
| 2. | CO2: Apply the tools and methodologies used to perform mathematic concepts behind the cryptographic algorithms.. | PO1,PO2,PO3, PO4, PSO1,PSO2 |
| 3. | CO3: Explain the tools and methodologies used to perform Security analysis. | PO1, PO3, PO5, PSO1, PSO2 |
| 4. | CO4: Analyze and use cryptographic data integrity | PO1, PO4, PO6, PO7, PSO1,PSO2 |

| | | |
|---|---|---|
| | algorithms and user authentication protocols | |
| 5. | CO5. Examine security at application layer, transport layer and network layer. | PO5,PO7, PO8, PO9, PSO1,PSO2 |
| 6. | CO6: Compare various algorithm of cryptography used for Network Security. | PO10,PO11,PO12,PSO1,PSO3 |

**PO and PSO mapping with level of strength for Course Name** Cryptography and Network Security **(Course Code CSE032)**

| Code_ Course Name | CO's | PO 1 | PO2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | |
| CSE032_Cryptography and Network Security | **CO1** | 3 | 2 | | - | - | - | - | - | - | - | - | - | 3 | 1 | - |
| | **CO2** | 2 | 3 | 2 | 1 | - | - | - | - | - | - | - | - | 2 | 3 | - |
| | **CO3** | 2 | - | 2 | - | 3 | - | - | - | - | - | - | - | 2 | 2 | 1 |
| | **CO4** | 2 | - | - | 2 | - | 2 | 2 | - | - | - | - | - | 2 | 2 | |
| | **CO5** | - | - | - | - | 2 | - | 2 | 2 | 2 | | - | - | 1 | - | - |
| | **CO6** | - | - | - | - | - | - | - | - | - | 2 | 2 | 2 | 2 | - | 2 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO1 | PO2 | PO 3 | PO 4 | PO 5 | PO6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE032 | Cryptography and Network Security y and Network Security | 2.5 | 2.5 | 2 | 1.5 | 2.5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1.5 |

***Strength of Correlation***

***1.*** Addressed to***Slight (Low=1) extent*** ***2.*** Addressed to***Moderate (Medium=2) extent***

***3.*** Addressed to***Substantial (High=3) extent***

# Syllabus: CSE041 SOFTWARE PROJECT MANAGEMENT

| | | | | | |
|---|---|---|---|---|---|
| **School:** | | **School of Engineering and technology** | | | |
| **Department** | | **Department of Computer Science and Engineering** | | | |
| **Program:** | | **B.Tech** | | | |
| **Branch:** | | **Computer Science and Engineering** | | | |
| 1 | Course Code | CSE041 | | | |
| 2 | Course Title | SOFTWARE PROJECT MANAGEMENT | | | |
| 3 | Credits | 3 | | | |
| 4 | Contact Hours (L-T-P) | 3 | 0 | 0 | |
| | Course Status | Core /Elective/Open Elective | | | |
| 5 | Course Objective | To provide fundamental skills of software Project management emphasizing on issues & hurdles associated with delivering successful projects. Apply project management concepts through working in a group as team leader or active team member on an IT project. | | | |
| 6 | Course Outcomes (6) | After successful completion of this course students should be able to:<br>CO1: Define the Project Management principles while developing software.<br>CO2: Explain different project scheduling techniques.<br>CO3: Apply various project monitoring,control and review techniques<br>CO4: Categorize various activities and estimate the risks involved in various project activities.<br>CO5: Assess project quality and issues related to contract management.<br>CO6: Discuss the impact of project planning on the performance of the organizations | | | |
| 7 | Course Description | This course is aimed at introducing the primary important concepts of project management related to managing software development projects. Students will also get familiar with the different activities involved in Software Project Management. Further, they will also come to know how to successfully plan and implement a software project management activity, and to complete a specific project in time with the available budget. | | | |
| 8 | Outline syllabus | | | | CO Mapping |
| | **Unit 1** | **Introduction to Software Project Planning** | | | |
| | A | Fundamentals of Software Project Management (SPM), Need Identification, Vision and Scope Document, Project Management Cycle, SPM Objectives | | | CO1 |
| | B | SPM Framework, Software Project Planning, Planning Objectives, Project Plan, Types of Project Plan, Structure of a Software Project Management Plan | | | CO1 |
| | C | Software Project Estimation, Estimation Methods, Estimation Models, Decision Process | | | CO1 |
| | **Unit 2** | **Project Organization and Scheduling Project Elements** | | | |
| | A | Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle | | | CO2 |
| | B | Ways to Organize Personnel, Project Schedule, Scheduling Objectives, Building the Project Schedule, Scheduling Terminology and Techniques | | | CO2 |
| | C | Network Diagrams: PERT, CPM, Bar Charts: Milestone Charts, Gantt Charts | | | CO2 |

| | | | | | |
|---|---|---|---|---|---|
| | **Unit 3** | **Project Monitoring and Control** | | | |
| | A | Dimensions of Project Monitoring & Control, Earned Value Analysis | | | CO3, CO6 |
| | B | Earned Value Indicators: Budgeted Cost for Work Scheduled (BCWS), Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI), Schedule Performance Index (SPI) | | | CO3 |
| | C | Software Reviews, Types of Review: Inspections, Deskchecks, Walkthroughs, Code Reviews | | | CO3 |
| | **Unit 4** | **Project Management Tools** | | | |
| | A | Software Configuration Items and Tasks, Baselines, Plan for Change, Change Control, Change Requests Management, Version Control | | | CO4 |
| | B | Risk Management: Risks and Risk Types, Risk Breakdown Structure (RBS), Risk Management Process: Risk Identification, Risk Analysis, Risk Planning, Risk Monitoring | | | CO4, CO6 |
| | C | Cost Benefit Analysis, Software Project Management Tools: CASE Tools, MS-Project | | | CO4, CO6 |
| | **Unit 5** | **Software Quality and Staffing in Project Management** | | | |
| | A | Concept of Software Quality, Software Quality Attributes, Software Quality Metrics and Indicators, The SEI Capability Maturity Model (CMM) | | | CO5, CO6 |
| | B | SQA Activities, Formal SQA Approaches: Proof of Correctness, Statistical Quality Assurance, Product versus process quality management, | | | CO5 |
| | C | Introduction, types of contract, stages in contract, placement, typical terms of a contract, contract management, acceptance | | | CO5, CO6 |
| | Mode of examination | Theory/Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 1. Cottrell M. and Hughes B., "Software Project Management", 5th Edition, The McGraw-Hill Companies.<br>2. Walker Royce: —Software Project Management- Addison-Wesley, 1998 | | | |
| | Other References | 1. Pankaj Jalote, "Software Project Management in practice", 1st Edition, Pearson Education, 2005.<br>2. Kathy Schwalbe, "Information Technology Project Management" International Student Ed. THOMSON Course Technology | | | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: Define the Project Management principles while developing software. | PO1,PO3,PO5,PO9,PO10, PO11,PO12,PSO3 |
| 2. | CO2: Explain different project scheduling techniques. | PO1,PO3,PO5,PO9,PO10, PO11,PO12,PSO3 |
| 3. | CO3: Apply various project monitoring, control and review techniques | PO1,PO3,PO5,PO8,PO9, PO10,PO11,PO12,PSO3 |
| 4. | CO4: Categorize various activities and estimate the risks involved in various project activities. | PO1,PO3,PO5,PO8,PO9, PO10,PO11,PO12,PSO3 |
| 5. | CO5: Assess project quality and issues related to contract management. | PO1,PO3,PO5,PO6,PO8,PO9, PO10,PO11,PO12,PSO3 |
| 6. | CO6: Discuss the impact of project planning on the performance of the organizations | PO1,PO3,PO4,PO5,PO6,PO8,PO9, PO10,PO11,PO12,PSO3 |

**PO and PSO mapping with level of strength for Software Project management (Course code CSE 041)**

| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE041_ Software Project Management | CO1 | 3 | - | 1 | - | 1 | - | - | - | 3 | 2 | 3 | 2 | - | - | 2 |
| | CO2 | 2 | - | 2 | - | 2 | - | - | - | 3 | 3 | 3 | 3 | - | - | 2 |
| | CO3 | 2 | - | 3 | - | 2 | - | - | 1 | 3 | 2 | 3 | 3 | - | - | 3 |
| | CO4 | 2 | - | 2 | - | 2 | - | - | 1 | 3 | 2 | 3 | 3 | - | - | 3 |
| | CO5 | 1 | - | 3 | - | 2 | 3 | - | 1 | 3 | 3 | 3 | 3 | - | - | 3 |
| | CO6 | 2 | - | 3 | 3 | 2 | 2 | - | 1 | 3 | 3 | 3 | 2 | - | - | 2 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE041 | Software Project Management | 2 | - | 2.3 | 3 | 1.8 | 2.5 | - | 1 | 3 | 2.5 | 3 | 2.6 | - | - | 2.5 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

## CSE042 SOFTWARE TESTING

| | | | | | |
|---|---|---|---|---|---|
| **School:** | | **SET** | | | |
| **Program:** | | **B.Tech** | | | |
| **Branch:** | | **CSE** | | | |
| 1 | Course Code | CSE042 | | | |
| 2 | Course Title | SOFTWARE TESTING | | | |
| 3 | Credits | 3 | | | |
| 4 | Contact Hours (L-T-P) | 3 | 0 | 0 | |
| | Course Status | Core /Elective/Open Elective (Drop Down) | | | |
| 5 | Course Objective | The primary objective of this course is to introduce and instruct software testing and Quality assurance concepts, strategies, and techniques in order to develop a total understanding of the testing process and how it impacts the software project. | | | |
| 6 | Course Outcomes (5-6) | On successful completion of this module students will be able to<br>CO1: Define Basic concepts of Testing and Debugging<br>CO2: Make use of Control flow graph to perform white box testing<br>CO3: Apply Data flow and integration testing to develop feasible software<br>CO4: Classify techniques of Functional testing and design test cases<br>CO5: Evaluate the software quality using Reviews, maturity models and ISO standards.<br>CO6: Adapt software testing methods and modern software testing tools for their testing projects. | | | |
| 7 | Course Description | This course will examine fundamental software testing and related program analysis techniques. In particular, the important phases of testing will be reviewed, emphasizing the significance of each phase when testing different types of software. The course will also include concepts such as test generation, test oracles, test coverage, regression testing, mutation testing, program analysis (e.g., program-flow and data-flow analysis), and test prioritization. | | | |
| 8 | Outline syllabus | | | | CO Mapping |
| | **Unit 1** | Introduction | | | |
| | A | Human and errors, Testing Objectives, Principles of Testing, Behaviour and Correctness, verification and validation, Debugging and its techniques | | | CO1 |
| | B | Software metrics, Software Testing Life Cycle, Testing activities , Test Levels, | | | CO1 |
| | C | Testing exit criteria, Bug defect life cycle, White Box and Black Box Testing, test planning and design | | | CO1 |
| | **Unit 2** | Unit and Control Flow Testing | | | |
| | A | Concept of Unit Testing, Static Unit Testing, Defect Prevention, Dynamic Unit Testing, Mutation Testing | | | CO2,CO6 |
| | B | Control Flow Testing: Overview of Control Flow Testing, Control Flow Graph, Paths in a Control Flow Graph | | | CO2,CO6 |
| | C | Cyclomatic complexity, Path Selection Criteria, Generating | | | CO2,CO6 |

| | | | | | |
|---|---|---|---|---|---|
| | | test input | | | |
| | **Unit 3** | Data Flow & Performance testing | | | |
| | A | Data Flow Anomaly, Overview of Dynamic Data Flow Testing, Data Flow Graph, Data Flow Terms | | | CO3,CO6 |
| | B | Data Flow Testing Criteria, Comparison of Data Flow Test Selection Criteria, Feasible Paths and Test Selection Criteria | | | CO3,CO6 |
| | C | Integration Testing: Introduction, Integration Techniques, Regression testing, Performance testing: Stress, Load, Volume, Soak and Spike, Overview of performance tools: Jmeter, Loadrunner, WebLoad | | | CO3,CO6 |
| | **Unit 4** | Functional Testing | | | |
| | A | Equivalence Class Partitioning, Boundary Value Analysis, Decision Tables, Random Testing: Monkeys & Gorillas, Error Guessing | | | CO4,CO6 |
| | B | Test case designing – Test cases, Test case format, Test case designing, Acceptance testing and criteria | | | CO4,CO6 |
| | C | Automation testing**:** Need for automation, categorization of Testing tools, Selection of testing tools, Guidelines for automated testing, Overview of commercial testing tools | | | CO4,CO6 |
| | **Unit 5** | **Reviews and Quality Control** | | | |
| | A | Testing maturity model, Test metrics and measurements – project, progress and productivity metrics – Status Meetings – Reports and Control Issues – Criteria for Test Completion | | | CO5,CO6 |
| | B | Types of reviews – Developing a review program – Components of Review Plans– Reporting Review Results | | | CO5,CO6 |
| | C | Five Views of Software Quality, McCall's Quality Factors and Criteria, ISO 9000:2000 Software Quality Standard, evaluating software quality | | | CO5,CO6 |
| | Mode of examination | Theory/Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 1. Sagar Naik & Piyu Tripathy, "Software Testing and Quality Assurance: Theory and Practice", Wiley. | | | |
| | Other References | 1. Naresh Chauhan, "Software Testing : Principles and practices", Oxford university press<br>2. Boris Beizer, "Software Testing Techniques", Dreamtech Press<br>3. K.K. Aggrawal and Yogesh Singh, " Software Engineering" New Age International Publication | | | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: Define Basic concepts of Testing and Debugging | PO1,PO2,PO10,PO12,PSO3 |
| 2. | CO2: Make use of Control flow graph to perform white box testing | PO1,PO2,PO3,PO4,PO5,PO6, PO8,PO9,PO10,PO12,PSO1,PSO3 |
| 3. | CO3: Apply Data flow and integration testing to develop feasible software | PO1,PO2,PO3,PO4,PO5,PO6, PO8,PO9,PO10,PO12,PSO1,PSO3 |
| 4. | CO4: Classify techniques of Functional testing and design test cases | PO1,PO2,PO3,PO4,PO5,PO6, PO8,PO9,PO10,PO12,PSO1,PSO3 |
| 5. | CO5: Evaluate the software quality using Reviews, maturity models and ISO standards. | PO1,PO2,PO3,PO4,PO5,PO6, PO8,PO9,PO10,PO12,PSO1,PSO3 |
| | CO6: Adapt software testing methods and modern software testing tools for their testing projects. | PO1,PO2,PO3,PO4,PO5,PO6,PO7, PO8,PO9,PO10,PO11,PO12,PSO1,PSO3 |

**PO and PSO mapping with level of strength for Software Testing (CSE 042)**

| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PS O3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE042_ Software Testing | CO1 | 2 | 1 | - | - | - | - | - | - | - | 3 | - | 2 | - | - | 3 |
| | CO2 | 3 | 3 | 3 | 2 | 3 | 1 | - | 1 | 2 | 3 | - | 2 | 2 | - | 3 |
| | CO3 | 3 | 3 | 3 | 2 | 2 | 2 | - | 1 | 2 | 3 | - | 2 | 2 | - | 3 |
| | CO4 | 3 | 3 | 3 | 2 | 3 | 1 | - | 1 | 2 | 3 | - | 2 | 2 | - | 3 |
| | CO5 | 3 | 3 | 2 | 2 | 2 | 2 | - | 1 | 2 | 3 | - | 2 | 2 | - | 3 |
| | CO6 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | - | 3 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE042 | Software Testing | 2.8 | 2.6 | 2.8 | 2 | 2.6 | 1.6 | 3 | 1.2 | 2.2 | 3 | 3 | 2.1 | 2 | - | 3 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

| | | | |
|---|---|---|---|
| **School:** SET | | **Batch :** 2018-19 | |
| **Program:** | | **Current Academic Year:** 2018-19 | |
| **Branch:** CSE | | **Semester: VIth \|HOM** | |
| 1 | Course Code | **ARP 302** | Course Name : **Higher Order Mathematics and Advanced People Skills** |
| 2 | Course Title | **Higher Order Mathematics and Advanced People Skills** | |
| 3 | Credits | 2 | |
| 4 | Contact Hours (L-T-P) | 0-0-4 | |
| | Course Status | | |
| 5 | Course Objective | To enhance holistic development of students and improve their employability skills. Provide a 360 degree exposure to learning elements of Business English readiness program, behavioural traits, achieve softer communication levels and a positive self-branding along with augmenting numerical and altitudinal abilities. To up skill and upgrade students' across varied industry needs to enhance employability skills. By the end of this semester, a will have entered the threshold of his/her 4th phase of employability enhancement and skill building activity exercise. | |
| 6 | Course Outcomes | CO1: *A student will be able to Understanding basics of Human Resources, which will help him understand how the employment domains work and the key skills needed to get employed. A Student will learn role Clarity \| KRA \| KPI \| Understanding JD to anticipate and prepare for an upcoming job interview OR interpret the job responsibilities by reading the KPI and KRA statements*<br>CO2: *At the end of the program, a student will be able to learn to avoid conflicts and learn Conflict Management at workplace and help to build a workplace and society more free from conflicts and work towards resolving conflicts*<br>CO3: *At the end of the program, a student will be able to Understanding The art of Negotiations and negotiate better to get maximum from any deal in practical life scenarios*<br>CO4: *At the end of the program, a student will be able to Understanding how Personal Branding is critical to create a brand image and the art of self-branding as a positive self-branding is extremely important for success in life*<br>CO5: *At the end of the program, a student will be able to Understanding the art of Relationship Management as managing people and relationships holds the key to success in social and professional life. \| Verbal Abilities-4 will equip the students on advanced communication skills and practices*<br>CO6: *At the end of the program, a student will be able to understand Level-4 Quant & aptitude, Reasoning abilities to deal with real life logical situations better and more effectively with sharpened reasoning skills* | |
| 7 | Course Description | This penultimate stage introduces the student to the basics of Human Resources. Allows the student to understand and interpret KRA \| KPI and understand Job descriptions. A student also understands how to manage conflicts, brand himself/herself, understand relations and empathise others with level-4 of quant, aptitude and logical reasoning | |
| 8 | Outline syllabus – ARP 302 | | |

| | | | |
|---|---|---|---|
| | **Unit 1** | **Ace the Interview** | **CO MAPPING** |
| | A | HR Sensitization ( Role Clarity \| KRA \| KPI \| Understanding JD ) \| Conflict Management | CO1, CO2, |
| | B | Negotiation Skills \| Personal Branding | CO3, CO4 |
| | C | Empathy VS Sympathy \| Relationship Management \| Verbal Abilities-4 | CO5 |
| | **Unit 2** | **Introduction to APTITUDE TRAINING- Reasoning- Logical/ Analytical** | |
| | A | Sitting Arrangement & Venn Diagrams \| Puzzles \| Distribution \| Selection | CO6 |

| | | | |
|---|---|---|---|
| | B | Direction Sense \| Statement & Conclusion \| Strong & Weak Arguments | CO6 |
| | C | Analogies, Odd One out \| Cause & Effect | CO6 |
| | **Unit 3** | **Quantitative Aptitude** | |
| | A | Average , Ratio & Proportions, Mixtures & Allegation | CO6 |
| | B | Geometry-Lines, Angles & Triangles | CO6 |
| | C | Problem of Ages \| Data Sufficiency - L2 | CO6 |
| | Weightage Distribution | *( CA )Class Assignment/Free Speech Exercises / JAM – 60% \| (ETE) Group Presentations/Mock Interviews/GD/ Reasoning, Quant & Aptitude – 40%* | |
| | Text book/s* | *Wiley's Quantitative Aptitude-P Anand* \| ***Quantum CAT – Arihant Publications*** \| ***Quicker Maths- M. Tyra*** \| *Power of Positive Action (English, Paperback, Napoleon Hill)* \| *Streets of Attitude (English, Paperback, Cary Fagan, Elizabeth Wilson) The 6 Pillars of self-esteem and awareness – Nathaniel Brandon* \| *Goal Setting (English, Paperback, Wilson Dobson* | |

| | | | | | |
|---|---|---|---|---|---|
| **School: SET** | | **Batch:** | | | |
| **Program: BTECH** | | **Current Academic Year:** | | | |
| **Branch:CSE** | | **Semester:** | | | |
| 1 | Course Code | CSP 352 | | | |
| 2 | Course Title | Web Technologies Lab | | | |
| 3 | Credits | 1 | | | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | | | |
| | Course Status | | | | |
| 5 | Course Objective | Provide the knowledge to design and develop web application .Students will gain the skills and project-based experience needed for entry into web application and development careers | | | |
| 6 | Course Outcomes | CO1:Select essential skills to create simple, original web pages<br>CO2:Demonstrate interactive web pages using CSS and Javascript<br>CO3:Develop web pages/site having validation on user data access.<br>CO4: Examine well-formed XML Document and XML technology<br>CO5: Evaluate Dynamic web site using HTML,Javascript and PHP<br>CO6:Develop web site for small business and organization or for individual | | | |
| 7 | Course Description | This course is an overview of the modern technologies used for the Web development. | | | |
| 8 | | | | | CO Mapping |
| | **Unit 1** | **HTML & HTML 5** | | | |
| | | Program related to HTML and HTML5 new elements | | | CO1 |
| | **Unit 2** | **CSS &CSS3** | | | |
| | | Program related to CSS and CSS3 | | | CO2 |
| | **Unit 3** | **Java script & Jquery** | | | |
| | | Program related to form validation using javascript and Jquery effect | | | CO2,CO3 |
| | **Unit 4** | **PHP** | | | |
| | | Program related to File handling, session management, PHP-ODBC connectivity. | | | CO3,CO5 |
| | **Unit 5** | **XML** | | | |
| | | Program related to XML schema ,XSLT,DTD | | | CO4,CO6 |
| | Mode of examination | Theory/Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 7. Ivan Bayross,"HTML,DHTML, JavaScript, Perl & CGI", BPB Publication<br>8. Schildt H, "The Complete Reference JAVA2", TMH<br>9. Schildt H, "The Complete Reference J2EE", TMH | | | |
| | Other References | 3. Rick Delorme," Programming in HTML5 with JavaScript and CSS3", Microsoft | | | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|

| | | |
|---|---|---|
| 1. | Select essential skills to create simple, original web pages | PO5,PO9,PSO2 |
| 2. | Demonstrate interactive web pages using CSS and Javascript | PO2,PO3,PO5,PO9,PO12,PSO2,PSO3 |
| 3. | Develop web pages/site having validation on user data access. | PO3,PO5,PO6,PO9,PSO2,PSO3 |
| 4. | Examine well-formed XML Document and XML technology | PO5,PO6 |
| 5. | Evaluate Dynamic web site using HTML,Javascript and PHP | PO1,PO5,PO9,PO12,PSO1,PSO2 |
| 6. | Develop web site for small business and organization or for individual | PO1,PO2,PO3,PO4,PO5,PO6,PO9,PO11,PO12,PSO1,PSO2,PSO3 |

**PO and PSO mapping with level of strength for Course Name** Web Technologies Lab **(Course Code CSP352)**

| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP 352_ Web Technologies Lab | CO1 | | | | | 1 | | | | 2 | | | | | 1 | |
| | CO2 | | 1 | 1 | | 3 | | | | 2 | | | 1 | | 1 | 2 |
| | CO3 | | | 1 | | 2 | 1 | | | 2 | | | | | 1 | 2 |
| | CO4 | | | | | 1 | 1 | | | | | | | | | |
| | CO5 | | 1 | | | 2 | | | | 2 | | | 1 | | 1 | 2 |
| | CO6 | 2 | 3 | 3 | 1 | 3 | 3 | | | 3 | | 2 | 2 | 1 | 2 | 3 |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSP 352 | Web Technologies Lab | 2 | 1.67 | 1.67 | 1 | 2 | 1.67 | 0 | 0 | 2.2 | 0 | 2 | 1.3 | 1 | 1.2 | 2.25 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

**Syllabus: Compiler Design lab**

| | | |
|---|---|---|
| **School:** | | **School of Engineering and technology** |
| **Department** | | **Department of Computer Science and Engineering** |
| **Program:** | | **B.Tech** |
| **Branch:CSE** | | **Semester:** |
| 1 | Course Code | CSP353 |
| 2 | Course Title | Compiler Design Lab |
| 3 | Credits | 1 |
| 4 | Contact Hours (L-T-P) | 0-0-2 |
| | Course Status | Compulsory |
| 5 | Course Objective | This laboratory course is intended to make the students experiment on the basic techniques of compiler construction and tools that can used to perform syntax-directed translation of a high-level programming language into an executable code. Students will design and implement language processors in C by using tools to automate parts of the implementation process. This will provide deeper insights into the more advanced semantics aspects of programming languages, code generation, machine independent optimizations, dynamic memory allocation, and object orientation. |
| 6 | Course Outcomes | CO1 **Apply** different compiler writing tools to implement the different Phases<br>CO2: **Understand** and define the role of lexical analyzer, use of regular expression and transition diagrams.<br>CO3: **Implement** a parser for different context free grammars.<br>CO4: **Construct** the intermediate representation<br>CO5: **Implement** Symbol table<br>CO6: **Compare** various code optimization techniques |
| 7 | Course Description | This self-paced course will discuss the major ideas used today in the implementation of programming language compilers, including lexical analysis, parsing, syntax-directed translation, abstract syntax trees, types and type checking, intermediate languages, dataflow analysis, program optimization, code generation, and runtime systems. As a result, you will learn how a program written in a high-level language designed for humans is systematically translated into a program written in low-level assembly more suited to machines |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Practical based on Designing of Finite Automata and Compiler construction tools** | |
| | | 1. Design a DFA which will accept all the strings containing even number of 0's and even number of 1's over an alphabet {0, 1} and write a program to implement the DFA.<br>2. Design a DFA which will accept all the strings containing mod 3 of 0's over an alphabet {0, 1} and write a program to implement the DFA.<br>3. Design a lexical analyzer for given language and the lexical analyzer should ignore redundant spaces, tabs and new lines | CO1 |

| | | | | | |
|---|---|---|---|---|---|
| | **Unit 2** | **Practical related to -- Parsing Techniques** | | | |
| | | 1. Write an algorithm and program on Recursive Descent parser.<br>2. Write an algorithm and program to compute FIRST and FOLLOW function.<br>3. Develop an operator precedence parser for a given language.<br>4. Implementation of shift reduce parsing algorithm and LR parser | | | CO2,CO3 |
| | **Unit 3** | **Practical related to--- Syntax Directed Translations And Intermediate Code Generation** | | | |
| | | 1. Write code to generate abstract syntax tree.<br>2. Intermediate Code Generation | | | CO4 |
| | **Unit 4** | **Practical related to---Symbol table** | | | |
| | | Implement Symbol table | | | CO5 |
| | **Unit 5** | **Practical related to---Code optimization techniques** | | | |
| | | 1. Implementation of Directed Acyclic Graph<br>2. Implementation of Code Generation | | | CO4,CO5 |
| | Mode of examination | Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | 0% | 40% | |
| | Text book/s* | Aho, Sethi, Ulman, compilers Principles, Techniques, and Tools, Pearson Education, 2003 | | | |
| | Other References | Lauden, Principles of Compiler Construction.<br>1. D. M. *Dhamdhere Compiler* Construction--Principles and Practice, Macmillan India, | | | |

## CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1 **Apply** different compiler writing tools to implement the different Phases | PO1,PO5,PO6,PO9,PO12,PSO1,PSO2 |
| 2. | CO2: **Understand** and define the role of lexical analyzer, use of regular expression and transition diagrams. | PO1,PO2,PO3, PO4,PO5, PO12, PSO1, PSO2 |
| 3. | CO3: **Understand** and use Context free grammar, and parse tree construction. | PO1,PO2,PO3,PSO1,PSO2 |
| 4. | CO4: **Construct** the intermediate representation | PO1,PO2,PO3, PO4,PO5,PO9, PSO2,PSO3 |
| 5. | CO5: **Implement** Symbol table | PO1,PO2,PO3, PO4,PO5,PO9,PO12,PSO1,PSO2,PSO3 |
| 6. | CO6: **Compare** various code optimization techniques | PO1, PO3,PO4, PO4,PO5,PO9,PO12 PSO1,PSO2,PSO3 |

**PO and PSO mapping with level of strength for Course Name Compiler Design Lab (Course Code CSP353)**

| Cos | PO1 | PO 2 | PO3 | PO4 | PO5 | PO 6 | PO7 | PO8 | PO9 | PO1 0 | PO 11 | PO1 2 | PS O1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | -- | -- | -- | 3 | -- | -- | -- | 2 | -- | -- | 3 | 2 | 1 | -- |
| CO2 | 2 | 2 | 3 | 3 | 2 | -- | -- | -- | -- | -- | -- | 2 | 3 | 2 | -- |
| CO3 | 3 | 3 | 3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3 | 2 | -- |
| CO4 | 1 | 2 | 3 | 3 | 3 | -- | -- | -- | 3 | -- | -- | -- | -- | 3 | 2 |
| CO5 | 1 | 1 | 2 | 3 | 2 | -- | -- | -- | 3 | -- | -- | 3 | 1 | 2 | 2 |
| CO6 | 2 | -- | 3 | 3 | 2 | -- | -- | -- | 3 | -- | -- | 3 | 3 | 2 | 3 |

**1-Slight (Low) 2-Moderate (Medium) 3-Substantial (High)**

***Average of non-zeros entry in following table (should be auto calculated).***

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | P O 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE353 | Compiler Design | 2 | 1.3 | 2.3 | 2 | 2 | 0 | 0- | 0 | 1.8 | 0 | 0 | 2 | 2 | 2 | 1.2 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2018 - 2022** | |
| **Program: B.tech** | | **Current Academic Year: 2019-2020** | |
| **Branch: CSE / IT** | | **Semester: 6th** | |
| 1 | Course Code | **CSP392** | Course Name: Project Based Learning -4 |
| 2 | Course Title | Project Based Learning -4 | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | 1. To align student's skill and interests with a realistic problem or project.<br>2.To understand the significance of problem and its scope.<br>3.Students will make decisions within a framework. | |
| 6 | Course Outcomes | Students will be able to:<br>CO1: Identify and formulate problem statement.<br>CO2: Design relational database schema.<br>CO3: Develop the solution by using different aspects of programming language.<br>CO4: Classify and understand various test techniques for verification and validation of project.<br>CO5: Analyze and make use of modern for solving real word problems.<br>CO6: Develop teamwork and need to engage in life-long learning, along with the ability to communicate effectively with others. | |
| 7 | Course Description | In PBL-4, the students will learn how to define the problem for developing projects, and Design applicable solutions in one or more application domains using software engineering approaches that integrate ethical, social, legal and economic concerns. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | Problem Definition and identification, Team/Group formation and Project Assignment. Finalizing the problem statement, resource requirement, if any. | CO1,CO4 |
| | **Unit 2** | Use of the relational algebra operations from mathematical set theory (union, intersection, difference, and Cartesian product) and the relational algebra operations developed specifically for relational databases (select (restrict), project, join, and division).. | CO2,CO6 |
| | **Unit 3** | Design; implement project work in any programming language. | CO3 |
| | **Unit 4** | Use of various test tools and techniques for software verification and validation of project | CO4,CO5 |
| | **Unit 5** | Demonstrate and execute Project with the team. | CO6 |
| | | Report should include Abstract, Hardware / Software Requirement, Problem Statement, Design/Algorithm, ER diagrams, Use Case Diagrams, State Diagrams, Sequence Diagrams, Communication Diagrams, and Activity Diagrams, Implementation Detail. Validation Reports. References, Test cases if any. | |

| | | | | | |
|---|---|---|---|---|---|
| | | The presentation, report, work done during the term supported by the documentation, forms the basis of assessment. | | | |
| | Mode of examination | Practical /Viva | | | |
| | Weight age Distribution | CA | | | MTE |
| | | 60% | NA | ETE | |
| | | | | | |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) |
|---|---|---|
| 1. | CO1: Identify and formulate problem statement. | PO1, PO2, PO4,PO6, PO8,PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3 |
| 2. | CO2: Design relational database schema. | PO1, PO2, PO3,PO4,PO5, PO7, PO8, PO9, PO11, PO12 , PSO1,PSO2,PSO3 |
| 3. | CO3: Develop the solution by using different aspects of programming language. | PO1, PO2, PO3,PO4,PO5, PO6, PO8, PO9, PO11, PO12, PSO1,PSO2 |
| 4. | CO4: Classify and understand various test techniques for verification and validation of project. | PO1, PO2, PO3,PO4,PO5, PO8,PO9, PO10, PO11, PO12 ,PSO1,PSO2,PSO3 |
| 5. | CO5: Analyze and make use of modern for solving real word problems. | PO1, PO2, PO5, PO6, PO7, PO8, PO9, PO12 PSO1,PSO2 |
| 6. | CO6: Develop teamwork and need to engage in life-long learning, along with the ability to communicate effectively with others. | PO2, PO4, PO8,PO9, PO10, PO11, PO12,PSO1,PSO3 |

**PO and PSO mapping with level of strength for Course Name Project Based Learning – 4 (Course Code CSP392)**

| **CO/PO Mapping** (1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Low | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cos | Programme Outcomes(POs) | | | | | | | | | | | | | | |
| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
| CO1 | 3 | 3 | - | 2 | - | 1 | - | 1 | 2 | - | 2 | 1 | 2 | 2 | 3 |
| CO2 | 3 | 2 | 2 | 2 | 2 | - | - | 1 | 2 | - | 2 | 1 | 2 | 1 | 1 |
| CO3 | 3 | 2 | 2 | 2 | 2 | 3 | - | 1 | 2 | - | 2 | 1 | 2 | 2 | - |
| CO4 | 3 | 3 | 2 | 2 | 3 | - | - | 1 | 2 | - | - | 1 | 2 | 2 | 2 |
| CO5 | 3 | 2 | - | - | 3 | - | - | 1 | 2 | - | - | 1 | 2 | 2 | - |
| CO6 | - | 1 | - | 1 | - | - | - | 2 | 2 | 3 | 3 | 3 | 1 | - | 1 |
| Avg PO attained | 3 | 2.2 | 1 | 1.5 | 1.7 | 0.7 | 0 | 1.2 | 2 | 1 | 2 | 1 | 2 | 1.5 | 1.2 |

## Syllabus: CSP 396, Technical Skill Enhancement Course-2(Application Development Lab)

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch: 2019-2023** | |
| **Program: BTech** | | **Current Academic Year: 2019-2020** | |
| **Branch:** | | **Semester:6** | |
| 1 | Course Code | CSP396 | |
| 2 | Course Title | Technical Skill Enhancement Course-2(Application Development Lab) | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Compulsory/Elective | |
| 5 | Course Objective | Describe the components and structure of a mobile development frameworks (Android SDK and Eclipse Android Development Tools (ADT)) and learn how and when to apply the different components to develop a working system. | |
| 6 | Course Outcomes | On successful completion of the course, the student will be able to:<br>**CO1:**Explainthe fundamentals of Android App Development.<br>**CO2:**Make use of UI components to create Android applications.<br>**CO3:**Examine the services and notifications in android to perform event driven programming.<br>**CO4:**Develop database SQLite based Android applications.<br>**CO5:**Analyze the usage of commonly available device sensors while building Android App.<br>**CO6:**Develop application using Android software development tools. | |
| 7 | Course Description | The course will introduce concepts of the Android platform, Android application components, Activities and their lifecycle, UI design. It will also help students to build applications according to their problem statements. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Introduction to Android** | |
| | | Configuration of android SDK and test run of application on device, Create “Hello World” application, develop an Android Application to implement Activity life cycle. | CO1,CO6 |
| | **Unit 2** | **Android UI Components** | |
| | | Create a layout of Calculator using Grid layout, develop an Android Application to implement event listener on above layout, develop an Android Application to implement implicit intent. | CO1,CO2, ,CO6 |
| | **Unit 3** | **Services and Notification** | |
| | | Develop an Android Application to implement Service life cycle, Develop an Android Application to implement status bar notification, Create a menu with 5 options and selected option should appear in text box | CO3, ,CO6 |
| | **Unit 4** | **Working with SQL Lite** | |
| | | Create and Login applicationfor above mentioned problems, Create an application to implement Create, Insert and update operation on the database, Create an application to perform Delete and retrieve operation on the database. | CO4, ,CO6 |

| | | | | | |
|---|---|---|---|---|---|
| | **Unit 5** | **Sensor Device** | | | |
| | | Develop an Android Application to detect availability of all sensors, Develop an Android Application to Fetch data from sensors, Develop an Android Application for development of compass application with help of Orientation sensor | | | CO5, ,CO6 |
| | Mode of examination | Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | 0% | 40% | |
| | Text book/s* | 1. AnubhavPradhan and Anil V. Deshpande , Composing Mobile Apps: Learn, Explore, Apply Using Android , 1st Edition, Wiley India. | | | |
| | Other References | 1. Wei-MengLee , Beginning Android 4 Application Development.<br>2. Neil Smyth ,Android Studio Development essentials-Android 6 | | | |

**CO and PO Mapping**

| **Mapping between Cos and Pos, PSO's** | | |
|---|---|---|
| **Sl. No.** | **Course Outcomes (COs)** | **Mapped Program Outcomes and PSO's** |
| **1** | **CO1:** Explain the fundamentals of Android App Development. | **PO1,PO3,PO5,PO12,PSO1,PSO2,PSO3** |
| **2** | **CO2:** Make use of UI components to create Android applications. | **PO1,PO3,PO5,PO10,PO12,PSO1,PSO2, PSO3** |
| **3** | **CO3:** Examine the services and notifications in android to perform event driven programming. | **PO1,PO2,PO3,PO5,PO12,PSO1,PSO2,PSO3** |
| **4** | **CO4:** Develop database SQLite based Android applications. | **PO1,PO3,PO5,PO12,PSO1,PSO2,PSO3** |
| **5** | **CO5:** Analyze the usage of commonly available device sensors while building Android App. | **PO1,PO3,PO5,PO12,PSO1,PSO2,PSO3** |
| **6** | **CO6:** Develop application using Android software development tools. | **PO1,PO2,PO3,PO4,PO5,PO6,PO7,PO9, PO10,PO11,PO12,PSO1,PSO2,PSO3** |

**PO and PSO mapping with level of strength for Course Name Technical Skill Enhancement Course-2 (Course Code CSP 396)**

| COs | PO1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO9 | PO 10 | PO1 1 | PO 12 | PSO 1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | 1 | - | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| CO2 | 1 | - | 1 | - | 2 | - | - | - | - | 2 | - | 1 | 1 | 2 | 1 |
| CO3 | 1 | 2 | 1 | - | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| CO4 | 1 | - | 2 | - | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| CO5 | 2 | - | 1 | - | 2 | - | - | - | - | - | - | 1 | 1 | 2 | 1 |
| CO6 | 2 | 2 | 3 | 2 | 2 | 2 | 1 | - | 2 | 3 | 2 | 2 | 2 | 3 | 1 |
| Avg PO attained | 1 | 0.7 | 1.5 | 0.3 | 2 | 0.3 | 0.2 | 0 | 0 | 1 | 0 | 1 | 1 | 2.2 | 1 |

# TERM-VII

CSE451**: Artificial Intelligence**

| | | | |
|---|---|---|---|
| **School: SET** | | **Batch : 2018-2022** | |
| **Program: B.Tech** | | | |
| **Branch: ALL** | | **Semester: VII** | |
| **1** | **Course Code** | **CSE451** | **Course Name: Artificial Intelligence** |
| **2** | **Course Title** | **Artificial Intelligence** | |
| **3** | **Credits** | **3** | |
| **4** | **Contact Hours (L-T-P)** | **3-0-0** | |
| | **Course Status** | **CORE** | |
| 5 | Course Objective | The objective of the course is to introduce basic fundamental concepts in Artificial Intelligence (AI), with a practical approach in understanding them. To visualize the scope of AI and its role in futuristic development. | |
| 6 | Course Outcomes | After the completion of this course, students will be able to:<br>CO-1. ***Relate*** the goals of Artificial Intelligence and AI and non-AI solution.<br>CO-2. ***Analyze and*** various AI uninformed and informed search algorithms.<br>CO-3. ***Extend*** knowledge representation, reasoning, and theorem proving techniques to real-world problems<br>CO-4. ***Make use of:*** Machine learning algorithms in various application domains of AI.<br>CO-5. ***Select*** Artificial Intelligent based applications.<br>CO-6. ***Develop*** independent (or in a small group) research and communicate it effectively. | |
| 7 | Course Description | In this course students will learn basic introduction of Artificial Intelligence, problem solving agents, reasoning, learning and applications of artificial intelligence. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **INTRODUCTION TO AI** | |
| | A | Foundation of AI, Goals of AI, History and AI course line | CO1 |
| | B | Introduction to Intelligent Agents; Environment; Structure of Agent | CO1 |
| | C | AI Solutions Vs Conventional Solutions; a philosophical approach; a practical approach | CO1, CO2 |
| | **Unit 2** | **PROBLEM SOLVING AGENTS** | |
| | A | Problem solving using Search Techniques; Problems; Solutions; Optimality | CO1, CO2 |
| | B | Informed Search Strategies; Greedy Best-First; A* Search; Heuristic Functions | CO1, CO2 |
| | C | Uninformed Search Strategies; BFS; DFS; DLS; UCS; IDFS; BDS | CO1, CO2 |
| | **Unit 3** | **KNOWLEDGE & REASONING** | |
| | A | Knowledge-Based Agents; Logic; First-Order Logic; Syntax-Semantics in FOL; Simple usage; | CO3 |
| | B | Inference Procedure; Inference in FOL; Reduction; Inference Rules; | CO3 |
| | C | Forward Chaining; Backward Chaining; Resolution | CO3 |
| | **Unit 4** | **LEARNING** | |
| | A | Common Sense Vs Learning; Components; Representations; Feedback | CO1, CO2, CO3,CO4 |
| | B | Learning Types: Supervised; Unsupervised; | CO1, CO2, |

| | | | | | |
|---|---|---|---|---|---|
| | | Reinforcement Learnings | | | CO3,CO4 |
| | C | Artificial Neural Networks: Introduction, types of networks; Single Layer and Multi-Layer n/w. | | | CO1, CO2, CO3,CO4 |
| | **Unit 5** | **APPLICATIONS** | | | |
| | A | AI Present & Future; application case studies on NLP, Image Processing; | | | CO3, CO4, CO5, CO6 |
| | B | Robotics – Hardware; Vision; Navigation based case studies; | | | CO3, CO4, CO5, CO6 |
| | C | Ambient Intelligence case studies; | | | CO3, CO4, CO5, CO6 |
| | Mode of examination | Theory | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | **Text book/s*** | **Rich E**& Knight K, **Artificial Intelligence,** Tata McGraw Hill, Edition 3. | | | |
| | **Reference Books** | 1. Russell S &Norvig P, *Artificial Intelligence: A Modern Approach*, Prentice Hall.<br>2. Dan W. Patterson, Artificial Intelligence & Expert Systems, Pearson Education with Prentice Hall India. Indian Edition. | | | |

**Course Outcomes:**

| Sl. No. | Course Outcome (CO) | |
|---|---|---|
| CO-1: | ***Relate*** the goals of Artificial Intelligence and AI and non-AI solution. | PO3, PO4, PO5, PO10, PSO1, PSO2, PSO3 |
| CO-2: | ***Analyze and*** various AI uninformed and informed search algorithms. | PO1, PO2, PO3, PO4, PO5, PO10, PSO1, PSO2, PSO3 |
| CO-3: | ***Extend*** knowledge representation, reasoning, and theorem proving techniques to real-world problems | PO1, PO2, PO3, PO4, PO5, PO12, PSO1, PSO2, PSO3 |
| CO-4: | ***Make use of:*** Machine learning algorithms in various application domains of AI. | PO1, PO2, PO3, PO4, PO5, PO12, PSO1, PSO2, PSO3 |
| CO-5: | ***Select*** Artificial Intelligent based applications. | PO1, PO2, PO3, PO4, PO5, PO9, PO10 PO12, PSO1, PSO2, PSO3 |
| CO-6: | ***Develop*** independent (or in a small group) research and communicate it effectively. | PO1, PO2, PO3, PO4, PO5, PO9, PO10 PO12, PSO1, PSO2, PSO3 |

**Mapping of POs & COs: CO-PO and CO-PSO Mapping with level of strength**

| Course Objectives | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | 2 | 3 | 2 | 2 | | | | | 2 | | 2 | 3 | 2 | 2 |
| CO2 | 2 | 3 | 3 | 2 | 3 | | | | | 2 | | 2 | 3 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | | | 1 | 2 | 3 | 3 | 2 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | | | 2 | 1 | 3 | 3 | 2 | 3 |
| CO5 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 |
| CO6 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 |

| | | | |
|---|---|---|---|
| 1 | Course Code | **CSE051** | |
| 2 | Course Title | **Wireless Networks** | |
| 3 | Credits | 3 | |
| 4 | Contact Hours | **3-0-0** | |
| 5 | Course Objective | The objective of this course is to provide fundamental knowledge about Wireless networks, protocol stack and standards, understand and analyze the network layer solutions for Wireless networks, and make student aware of 4G Services. | |
| 6 | Course Outcomes | After successful completion of this course students should be able to:<br>CO1. Enumerate, identify the foundation, and describe properties and capabilities of commonly used wireless technologies<br>CO2. Identify and describe the infrastructure and requirements of Mobile IP and Mobile IPv6<br>CO3.Illustrate the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer & Transport Layer<br>CO4. Demonstrate the typical mobile networking infrastructure through a popular GSM protocol<br>CO5. Identify and describe the structure of current 4G cellular networks.<br>CO6.Compare applications of 4G technologies. | |
| **7** | **Course Description** | The course will describe concepts, technology and applications of wireless networking as used in current and next-generation wireless networks. In addition, the course addresses the fundamentals of wireless communications and provides an overview of existing and emerging wireless communication networks. | |
| **8** | **Course Contents** | | |
| 8.01 | Unit A | **WIRELESS LAN** | **CO Mapping** |
| 8.02 | Unit A Topic 1 | Introduction-WLAN technologies: Infrared, UHF narrowband, spread spectrum -IEEE802.11: System architecture, protocol architecture, | CO1 |
| 8.03 | Unit A Topic 2 | Physical layer, MAC layer, 802.11b, 802.11a – Hiper LAN: WATM, BRAN, HiperLAN2 | CO1 |
| 8.04 | Unit A Topic 3 | Bluetooth: Architecture, Radio Layer, Baseband layer, Link manager Protocol, security - IEEE802.16-WIMAX: Physical layer, MAC, Spectrum allocation for WIMAX | CO1 |
| 8.05 | Unit B | **MOBILE NETWORK LAYER** | |
| 8.06 | Unit B Topic 1 | Introduction - Mobile IP: IP packet delivery, Agent discovery, tunneling and encapsulation, | CO1, CO2 |
| 8.07 | Unit B Topic 2 | IPV6-Network layer in the internet Mobile IP session initiation protocol | CO1, CO2 |
| 8.08 | Unit B Topic 3 | Mobile ad-hoc network: Routing Destination Sequence distance vector, Dynamic source routing. | CO1, CO2 |
| 8.09 | Unit C | **MOBILE TRANSPORT LAYER** | |
| 8.10 | Unit C Topic 1 | TCP enhancements for wireless protocols - Traditional TCP: Congestion control, fast retransmit/fast recovery, Implications of mobility | CO3 |
| 8.11 | Unit C Topic 2 | Classical TCP improvements: Indirect TCP, Snooping TCP, Mobile TCP, Time out freezing | CO3 |
| 8.12 | Unit C Topic 3 | Selective retransmission, Transaction oriented TCP - TCP over 3G wireless networks. | CO3 |
| 8.13 | Unit D | **WIRELESS WIDE AREA NETWORK** | |
| 8.14 | Unit D Topic 1 | Overview of UTMS Terrestrial Radio access network-UMTS Core network Architecture | CO3, CO4 |
| 8.15 | Unit D Topic 2 | 3G-MSC, 3G-SGSN, 3G-GGSN, SMS-GMSC/SMS-IWMSC, Firewall, | CO3, CO4 |

| | | | |
|---|---|---|---|
| 8.16 | Unit D Topic 3 | DNS/DHCP-High speed Downlink packet access (HSDPA)- LTE network architecture and protocol. | CO3, CO4 |
| 8.17 | Unit E | **4G NETWORKS** | |
| 8.18 | Unit E Topic 1 | Introduction – 4G vision – 4G features and challenges - Applications of 4G – 4G Technologies | CO5, CO6 |
| 8.19 | Unit E Topic 2 | Multicarrier Modulation, Smart antenna techniques, OFDM-MIMO systems, | CO5, CO6 |
| 8.20 | Unit E Topic 3 | Adaptive Modulation and coding with time slot scheduler, Cognitive Radio. | CO5, CO6 |
| 10 | **Reading Content** | | |
| 9.1 | Text book* | 1. Jochen Schiller, Mobile Communications, Second Edition, Pearson Education 2012.(Unit I,II,III) | |
| 9.2 | other references | 1. Erik Dahlman, Stefan Parkvall, Johan Skold and Per Beming, "3G Evolution HSPA and LTE for Mobile Broadband", Second Edition, Academic Press, 2008.<br>2.Anurag Kumar, D.Manjunath, Joy kuri, "Wireless Networking", First Edition, Elsevier 2011.<br>3.Simon Haykin , Michael Moher, David Koilpillai, "Modern Wireless Communications", First Edition, Pearson Education 2013 | |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: Enumerate, identify the foundation, and describe properties and capabilities of commonly used wireless technologies | PO1,PO3,PO8 PSO3 |
| 2. | CO2. Identify and describe the infrastructure and requirements of Mobile IP and Mobile IPv6 | PO1,PO2,PO3,PO8 PSO3 |
| 3. | CO3.Illustrate the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer & Transport Layer | PO1,PO2,PO3,PO8 PSO3 |
| 4. | CO4. Demonstrate the typical mobile networking infrastructure through a popular GSM protocol | PO1,PO2,PO3,PO8 PSO3 |
| 5 | CO5. Identify and describe the structure of current 4G cellular networks. | PO1,PO2,PO3,PO4,PO5,PO8 PSO3 |
| 6. | CO6.Compare applications of 4G technologies. | PO1,PO2,PO3,PO4,PO5,PO8 PSO3 |

**PO and PSO mapping with level of strength for Course Name Wireless Networks (CSE051)**

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

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CO 3 | 3 | 2 | 3 | - | - | - | - | 1 | - | - | - | - | - | - | 2 |
| | CO 4 | 3 | 2 | 3 | - | - | - | - | 1 | - | - | - | - | - | - | 2 |
| | CO 5 | 3 | 2 | 3 | 2 | 2 | - | - | 1 | - | - | - | - | - | - | 3 |
| | CO 6 | 3 | 2 | 3 | 2 | 2 | - | - | 1 | - | - | - | - | - | - | 3 |
| | Avg. | 3 | 1.6 | 3 | 0.6 | 0.6 | - | - | 1 | - | - | - | - | - | - | 2.3 |

| | | | | |
|---|---|---|---|---|
| **School:** | | **School of Engineering and technology** | | |
| **Department** | | **Department of Computer Science and Engineering** | | |
| **Program:** | | **B. tech** | | |
| **Branch: CSE** | | **Semester:** | | |
| 1 | Course Code | CSE052 | | |
| 2 | Course Title | **Risk Management** | | |
| 3 | Credits | 3 | | |
| 4 | Contact Hours (L-T-P) | 3-0-0 | | |
| | Course Status | Core /Elective/Open Elective | | |
| 5 | Course Objective | The objective of this course is to provide an insight to fundamentals of risk management in which business and society make an assessment of, control, regulation of risk management and transfer risk. | | |
| 6 | Course Outcomes | On successful completion of this module students will be able to:<br><br>CO1: define the basic concept of risk, types, uncertainty, managing, evaluation and prediction of risk.<br>CO2: illustrate the key stages, component, framework, standards, architecture, strategy policies, and protocols process of the risk management.<br>CO3: identify various risk, score them, control and opportunity risk<br>CO4: apply approach/technique of risk assessment for strategy, projects and operations, and make use of risk matrix<br>CO5: analyze uncertainty and risk in projects and apply measurement<br>CO6: Explain, compare and apply risk management concept and techniques in projects to the success of the organization. | | |
| 7 | Course Description | This course is to provide students with the concepts and fundamentals of risk management, a study of risk assessment and management techniques, methods, and models used in industry to minimize, control and communicate risks. | | |
| 8 | Outline syllabus | | | CO Mapping |
| | **Unit 1** | **Introduction** | | |
| | A | The Concept of Risk, Risk and Uncertainty: Distinction, Classification of Risks | | CO1, CO6 |
| | B | Managing Risk, Sources and Measurement of Risk | | CO1, CO6 |
| | C | Risk Evaluation and Prediction, Types of Risk | | CO1, CO6 |
| | **Unit 2** | **Principles and aims of risk management** | | |
| | A | Principles of risk management, Importance of risk | | CO2, CO6 |

| | | | | | |
|---|---|---|---|---|---|
| | | management, Risk management activities, Perspectives of risk management | | | |
| | B | Scope of risk management standards:- Risk management process, Risk management framework | | | CO2, CO6 |
| | C | Risk architecture, strategy Policies and protocols | | | CO2, CO6 |
| | **Unit 3** | **Risk classification Systems** | | | |
| | A | Shor, Medium and long term Risk | | | CO3, CO6 |
| | B | FIRM risk scorecard, PESTLE risk classification system | | | CO3, CO6 |
| | C | Hazard, control and opportunity risk | | | CO3, CO6 |
| | **Unit 4** | **Risk Assessment** | | | |
| | A | Importance of risk assessment, Approaches to risk assessment, risk assessment techniques | | | CO4, CO6 |
| | B | Risk Matrix, Risk Perception, Risk appetite | | | CO4, CO6 |
| | C | Application of risk matrix, inherent and current level of risk, 4T's of risk response | | | CO4, CO6 |
| | **Unit 5** | **Risk Management** | | | |
| | A | Importance of risk appetite – Risk tolerance, treatment, termination | | | CO5, CO6 |
| | B | Introduction to Project Risk Management, uncertainty in projects , project lifecycle, Project risk analysis and management | | | CO5, CO6 |
| | C | Operational risk management- definition, measurement, difficulties of measurement | | | CO5, CO6 |
| | Mode of examination | Theory | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 1. Paul Hopkin,"Fundamental of Risk Management- Understanding evaluating and implementing effective risk management", KoganPage London Philadelphia New Delhi. | | | |
| | Other References | 1. Internet | | | |

## CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: define the basic concept of risk, types, uncertainty, managing, evaluation and prediction of risk. | PO1, PO2, PO7, P12, PSO1 |
| 2. | CO2: illustrate the key stages, component, framework, standards, architecture, strategy policies, and protocols process of the risk management. | PO1, PO4, PO5, PO8, PO9, PO10, PO11, PO12 PSO3 |
| 3. | CO3: identify various risk, score them, control and opportunity risk | PO1, PO2, PO4, PO9, P12, PSO1 |
| 4. | CO4: apply approach/technique of risk assessment for strategy, projects and operations, and make use of risk matrix | PO1, PO3, PO5, PO6, PO9, P11, PSO3 |
| 5. | CO5: analyze uncertainty and risk in projects and apply measurement | PO1, PO2, PO4, PO5, PO7, PO9, PSO3 |
| 6. | CO6: explain, compare and apply risk management concept and techniques in projects to the success of the organization. | PO1, PO3, PO5, PO7, PO9, P11, P12, PSO2 |

**PO and PSO mapping with level of strength for Course Name Risk Management (Course Code CSE052 )**

| | Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CSE052 _ Risk Management** | CO1 | 3 | - | - | - | - | - | 1 | - | - | - | - | 1 | 2 | - | - |
| | CO2 | 2 | 2 | - | 3 | 2 | - | - | 1 | 2 | 1 | 1 | 1 | - | - | 2 |
| | CO3 | 2 | - | - | - | - | - | - | - | 2 | - | - | 1 | 1 | - | - |
| | CO4 | 1 | - | 2 | - | 3 | - | - | - | 2 | 2 | 2 | - | - | - | 1 |
| | CO5 | 2 | 2 | - | 2 | 1 | - | 1 | - | 2 | 1 | 1 | - | - | - | 1 |
| | CO6 | 2 | 2 | 2 | - | - | - | 1 | - | 2 | 1 | 1 | 1 | - | 1 | - |

***Average of non-zeros entry in following table (should be auto calculated).***

| Course Code | Course Name | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE052 | Risk Management | 2 | 2 | 2 | 2.5 | 2 | - | 1 | 1 | 2 | 1.25 | 1.25 | 1 | 1.5 | 1 | 1.33 |

## Syllabus: CSE062 MOBILE COMPUTING

| | | | | | |
|---|---|---|---|---|---|
| **School:** | | **SET** | | | |
| **Program:** | | **B.Tech** | | | |
| **Branch:** | | **CSE** | | | |
| 1 | Course Code | CSE062 | | | |
| 2 | Course Title | MOBILE COMPUTING | | | |
| 3 | Credits | 3 | | | |
| 4 | Contact Hours (L-T-P) | 3 | 0 | 0 | |
| | Course Status | Core /Elective | | | |
| 5 | Course Objective | The objective of the course is to impart knowledge of mobile and wireless computing systems and techniques | | | |
| 6 | Course Outcomes (5-6) | On successful completion of this module students will be able to<br>CO1: synthesize the basic concepts and principles in mobile computing.<br>CO2: analyze the concept of wireless& telecommunication networks.<br>CO3: synthesize the concepts of IEEE802.11, Bluetooth and HYPERLAN.<br>CO4: Understand the concept of mobile IP & various Routing Protocols<br>CO5: synthesize the concepts of Mobile Transport Layer & WAP<br>CO6: Comparison of all the protocols | | | |
| 7 | Course Description | This course will cover various topics of mobile computing, networking, and systems, including but not limited to: applications of smart phones, cellular networks, embedded sensor systems, localization systems, energy efficiency of mobile devices, wearable and vehicular mobile systems, mobile security etc. | | | |
| 8 | Outline syllabus | | | | CO Mapping |
| | **Unit 1** | **INTRODUCTION** | | | |
| | A | Wireless transmission , Frequencies for radio transmission | | | CO1 |
| | B | Signals , Antennas , Signal Propagation , Multiplexing, Modulations | | | CO1 |
| | C | Spread spectrum, MAC, SDMA , FDMA , TDMA , CDMA , Cellular Wireless Networks | | | CO1 |
| | **Unit 2** | **TELECOMMUNICATION NETWORKS** | | | |
| | A | GSM: Mobile services, System architecture, Radio interface, Protocols | | | CO2 |
| | B | Localization and calling, Handover, Security | | | CO2 |
| | C | General Packet Radio Service (GPRS): GPRS Architecture, GPRS network nodes, | | | CO2 |
| | **Unit 3** | **WIRELESS LANS** | | | |
| | A | Introduction to IEEE 802.11b/g/n | | | CO3 |
| | B | Bluetooth technologies and architecture. | | | CO3 |
| | C | HIPERLAN, WML programming | | | CO3 |
| | **Unit 4** | **MOBILE NETWORK LAYER** | | | |
| | A | Mobile IP Goals, Entities, IP packet Delivery Agent Advertisement and Discovery, Registration. | | | CO4 |
| | B | Hidden and exposed terminal problems ,Routing protocols classification, | | | CO4 |

| | | | | | |
|---|---|---|---|---|---|
| | C | DSDV, DSR, AODV ,Security | | | CO4 |
| | **Unit 5** | **Mobile Transport Layer & Wireless Application Protocol** | | | |
| | A | Traditional TCP, Indirect TCP, | | | CO5 |
| | B | Snooping TCP, Mobile TCP | | | CO5,CO6 |
| | C | WAP: Protocols, Architecture | | | CO5,CO6 |
| | Mode of examination | Theory/Jury/Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 30% | 20% | 50% | |
| | Text book/s* | 2. JochenSchiller : Mobile Communication, Pearson Education.<br>3. U. Hansman and L. Merck : Principles of Mobile Computing", 2nd Ed., Springer | | | |
| | Other References | 4. A. S. Tanenbaum. : Computer Networks, 4th Ed., Pearson Education.<br>5. D. Milojicic, F. Douglis. : Mobility Processes, Computers and Agents",Addison Wesley<br>6. D.B. Lange and M. Oshima : Programming and Deploying Java Mobile Agents with Aglets, Addison Wesley. | | | |

CO and PO Mapping

| S. No. | Course Outcome | Program Outcomes (PO) & Program Specific Outcomes (PSO) |
|---|---|---|
| 1. | CO1: synthesize the basic concepts and principles in mobile computing. | PO1, PO2, PO4, PO5, PO10, PSO1, PSO2 |
| 2. | CO2: analyze the concept of wireless& telecommunication networks. | PO1, PO2, PO4, PO5, PO10, PSO1, PSO2 |
| 3. | CO3: synthesize the concepts of IEEE802.11, Bluetooth and HYPERLAN. | PO1, PO2, PO4, PO5, PO10, PSO1, PSO2 |
| 4. | CO4: Understand the concept of mobile IP & various Routing Protocols | PO1, PO2, PO4, PO5, PO10, PSO1, PSO2 |
| 5. | CO5: synthesize the concepts of Mobile Transport Layer & WAP | PO1, PO2, PO4, PO5, PO10, PSO1, PSO2 |
| 6. | CO6: Comparison of all the protocols | PO1, PO2, PO4, PO5, PO10, PSO1, PSO2 |

**PO and PSO mapping with level of strength for Mobile Computing (CSE 062)**

| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PS O3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSE062_ MOBILE COMPUTING | CO1 | 3 | 3 | - | 2 | 3 | - | - | - | - | 2 | - | - | 3 | 2 | - |
| | CO2 | 3 | 3 | - | 2 | 3 | - | - | - | - | 2 | - | - | 3 | 2 | - |
| | CO3 | 3 | 3 | - | 2 | 3 | - | - | - | - | 2 | - | - | 2 | 3 | - |
| | CO4 | 3 | 3 | - | 2 | 3 | - | - | - | - | 2 | - | - | 3 | 2 | - |
| | CO5 | 3 | 3 | - | 2 | 3 | - | - | - | - | 2 | - | - | 2 | 2 | - |
| | CO6 | 3 | 3 | - | 2 | 3 | - | - | - | - | 2 | - | - | 2 | 2 | - |
| **Avg.** | | 3 | 3 | - | 2 | 3 | - | - | - | - | 2 | - | - | 2 | 2 | - |

# CSP451: Artificial Intelligence Lab

| | | | |
|---|---|---|---|
| **School:** | | **School of Engineering and technology** | |
| **Department** | | **Department of Computer Science and Engineering** | |
| **Program:** | | **B-TECH** | |
| **Branch:** | | **Computer Science and Engineering** | |
| 1 | Course Code | CSP451 | |
| 2 | Course Title | **Artificial Intelligence Lab** | |
| 3 | Credits | 1 | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | |
| | Course Status | Compulsory | |
| 5 | Course Objective | The objective of the course is to introduce basic fundamental concepts in Artificial Intelligence (AI), with a practical approach in understanding them. To visualize the scope of AI and its role in futuristic development.<br>• To develop a sense of appreciation for traditional AI Programming<br>• To use classical AI problems to understand cognitive process.<br>• To have an overview of the various processes involved in Machine Learning<br>• To develop a working model of real life problem base on Artificial Agent. | |
| 6 | Course Outcomes | After the completion of this course, students will be able to:<br>CO-1. ***Relate*** the goals of Artificial Intelligence and AI and non-AI solution.<br>CO-2. ***Analyze and*** various AI uninformed and informed search algorithms.<br>CO-3. ***Extend*** knowledge representation, reasoning, and theorem proving techniques to real-world problems<br>CO-4. ***Make use of:*** Machine learning algorithms in various application domains of AI.<br>CO-5. ***Select*** Artificial Intelligent based applications.<br>CO-6. ***Develop*** independent (or in a small group) research and communicate it effectively. | |
| 7 | Course Description | In this course students will learn basic introduction of Artificial Intelligence, problem solving agents, reasoning, learning and applications of artificial intelligence. | |
| 8 | Outline syllabus | | CO Mapping |
| | **Unit 1** | **Practical based on goal based problems** | |
| | | Sub unit - a, b and c detailed in Instructional Plan | |
| | **Unit 2** | **Practical related to uninformed search algorithm.** | |
| | | Sub unit - a, b and c detailed in Instructional Plan | |
| | **Unit 3** | **Practical related to informed search algorithm.** | |
| | | Sub unit - a, b and c detailed in Instructional Plan | |
| | **Unit 4** | **Practical related to knowledge representations and logical reasoning** | |
| | | Sub unit - a, b and c detailed in Instructional Plan | |
| | **Unit 5** | **Practical related to machine learning algorithms** | |

| | | | | | |
|---|---|---|---|---|---|
| | | Sub unit - a, b and c detailed in Instructional Plan | | | |
| | Mode of examination | Practical/Viva | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | 0% | 40% | |
| | Text book/s* | **1. Rich E**& Knight K, **Artificial Intelligence,** Tata McGraw Hill, Edition 3. | | | |
| | Other References | 3. Russell S &Norvig P, *Artificial Intelligence: A Modern Approach*, Prentice Hall.<br>4. Dan W. Patterson, Artificial Intelligence & Expert Systems, Pearson Education with Prentice Hall India. Indian Edition. | | | |

**Course Outcomes:**

| Sl. No. | Course Outcome (CO) | |
|---|---|---|
| CO-7: | ***Relate*** the goals of Artificial Intelligence and AI and non-AI solution. | PO3, PO4, PO5, PO10, PSO1, PSO2, PSO3 |
| CO-8: | ***Analyze and*** various AI uninformed and informed search algorithms. | PO1, PO2, PO3, PO4, PO5, PO10, PSO1, PSO2, PSO3 |
| CO-9: | ***Extend*** knowledge representation, reasoning, and theorem proving techniques to real-world problems | PO1, PO2, PO3, PO4, PO5, PO12, PSO1, PSO2, PSO3 |
| CO-10: | ***Make use of:*** Machine learning algorithms in various application domains of AI. | PO1, PO2, PO3, PO4, PO5, PO12, PSO1, PSO2, PSO3 |
| CO-11: | ***Select*** Artificial Intelligent based applications. | PO1, PO2, PO3, PO4, PO5, PO9, PO10 PO12, PSO1, PSO2, PSO3 |
| CO-12: | ***Develop*** independent (or in a small group) research and communicate it effectively. | PO1, PO2, PO3, PO4, PO5, PO9, PO10 PO12, PSO1, PSO2, PSO3 |

**PO and PSO mapping with level of strength for Course Name Artificial Intelligence Lab (Course Code CSP451)**

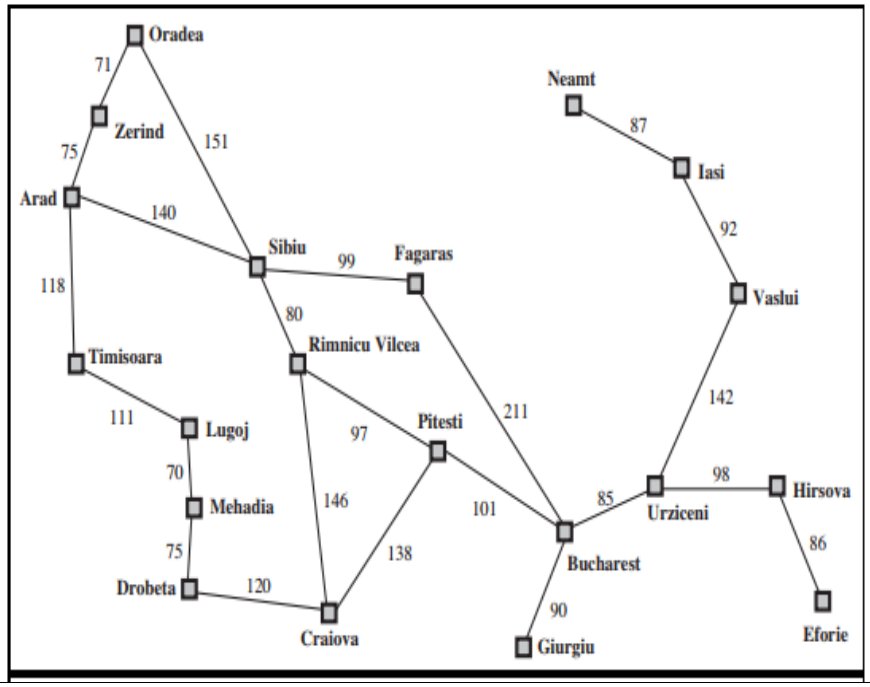
| Course Code_ Course Name | CO's | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CSP 312: Artificial Intelligence Lab** | CO1 | 1 | 2 | 3 | 2 | 2 | | | | | 2 | | 2 | 3 | 2 | 2 |
| | CO2 | 2 | 3 | 3 | 2 | 3 | | | | | 2 | | 2 | 3 | 3 | 2 |
| | CO3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | | | 1 | 2 | 3 | 3 | 2 | 3 |
| | CO4 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | | | 2 | 1 | 3 | 3 | 2 | 3 |
| | CO5 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 |
| | CO6 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 |

***Strength of Correlation***

***1.*** Addressed to ***Slight (Low=1) extent*** ***2.*** Addressed to ***Moderate (Medium=2) extent***
***3.*** Addressed to ***Substantial (High=3) extent***

**List of Practical's:**

| | | | |
|---|---|---|---|
| | **Unit 1** | **Practical based on goal based problems** | |
| **Week 1** | a | Lab expt.1 | Implementation of Water Jug Problem. |
| Week 2, 3 | b | Lab expt.2 | Introduction to Lisp, and basic programming in Lisp like following:<br>i. Write a LISP function to compute sum of squares.<br>ii. Write a LISP function to compute difference of squares. (if x > y return $x^2 - y^2$, Otherwise $y^2 - x^2$).<br>iii. Write a Recursive LISP function which takes one argument as a list and return last element of the list. (Do not use last predicate.)<br>iv. Write a Recursive LISP function which takes one argument as a list and return list except last element of the list. (Do not use butlast.)<br>v. Write a Recursive LISP function which takes one argument as a list and return reverse of the list. (Do not use reverse predicate).<br>vi. Write a Recursive LISP function which takes two arguments first an atom second a list returns a list after removing first occurrence of that atom within the list.<br>vii. Write a Recursive LISP function which appends two lists together.<br>viii. Write a recursive LISP function which takes 2 lists as arguments and returns a list containing alternate elements from each list. |
| Week 4 | c | Lab expt.3 | Advance programming in Lisp like following:<br>i. Write a function that compute the factorial of a number.(factorial of 0 is 1, and factorial of n is n*(n-1)*...1.Factorial is defined only for integers greater than or equal to 0.)<br>ii. Write a function that evaluate a fully parenthesized infix arithmetic expression. For examples, (infix (1+ (2*3))) should return 7.<br>iii. Write a function that performs a depth first traversal of binary tree. The function should return a list containing the tree nodes in the order they were visited.<br>iv. Write a LISP program for water jug problem.<br>v. Write a LISP program that determines whether an integer is prime. |
| | **Unit 2** | **Practical related to uninformed search algorithm.** | |
| Week 5 | a, b, | Lab expt.4 | Refer following figure as map with distance details, Write a program in your preferred language to generate path from ARAD to BUCHREST, analyze result obtained by<br>a) Depth First Search<br>b) Breadth First Search<br>c) Uniform Cost Search |

| | | | |
|---|---|---|---|
| | | |  |
| Week 6 | c | Lab expt.5 | Write a program in your preferred language to generate steps to solve Tower of Hanoi problem. |
| | **Unit 3** | **Practical related to informed search algorithm.** | |
| Week 7 | Mid term | | |
| Week 8 | a,b,c | Lab expt.6 | Write a program in your preferred language to solve the 8 puzzle Problem-using A* algorithm. |
| | **Unit 4** | **Practical related to knowledge representations and logical reasoning** | |
| Week 9 | A | Lab expt.7 | Write PROLOG program to Program to categorize animal characteristics. |
| Week 10 | B | Lab expt.8 | Write PROLOG program to solver for the linear equation A*X + B = 0. Let the predicate linear (A, B, X) return the root X of the equation. |
| Week 11 | c | Lab expt.9 | Write a PROLOG program that answers questions about family members and relationships includes predicates and rules which define sister, brother, father, mother, grandchild, grandfather and uncle. The program should be able to answer queries such as the following:<br>father(x, Amit)<br>grandson(x, y)<br>uncle (sumit, puneet)<br>mother (anita, x) |
| | **Unit 5** | **Practical related to machine learning algorithms** | |
| Week 12 | a, | Project | Project Work Evaluation-0: Problem Statement |
| Week 13 | b | Project | Project Work Evaluation-1: Design Specification |
| Week 14 | c | Project | Project Work Evaluation-2: Development |

## Syllabus: CSP 398, Summer Internship-II

| | | | | | |
|---|---|---|---|---|---|
| **School: SET** | | **Batch: 2018-2022** | | | |
| **Program:B.Tech** | | **Current Academic Year: 2019-20** | | | |
| **Branch: CSE** | | **Semester** | | | |
| 1 | Course Code | CSP398 | Course Name: **Summer Internship-II** | | |
| 2 | Course Title | **Summer Internship-II** | | | |
| 3 | Credits | 1 | | | |
| 4 | Contact Hours (L-T-P) | 0-0-2 | | | |
| | Course Status | UG | | | |
| 5 | Course Objective | 1. Experience the activities and functions of business professionals.<br>2. Develop and refine oral and written communication skills.<br>3. Identify areas for future knowledge and skill development. | | | |
| 6 | Course Outcomes | Students will be able to:<br>CO1. Integrate the concepts and strategies of academic study in a real time environment.<br>CO2. Identify, formulate and model problems and find engineering solution based on a systems approach.<br>CO3. Develop teamwork and apply prior acquired knowledge in problem solving.<br>CO4. Develop communication, interpersonal and other critical skills required for career growth.<br>CO5. Practice engineer's responsibilities, self-understanding, self-discipline and ethical standards.<br>CO6. Explore career alternatives prior to graduation. | | | |
| 7 | Course Description | An internship experience provides the student with an opportunity to explore career interests while applying knowledge and skills learned in the classroom in a work setting. The experience also helps students gain a clearer sense of what they still need to learn and provides an opportunity to build professional networks. | | | |
| 8 | Outline syllabus | | | | CO Mapping |
| | **Unit 1** | Define objectives and conditions for the internship, ensuring students that it is related to the study path carried out at the University | | | **CO1,CO2** |
| | **Unit 2** | Problem Definition and identification, Team/Group formation and Project Assignment. Finalizing the problem statement, resource requirement, if any. | | | **CO2** |
| | **Unit 3** | The internship work plan is drawn up by developing team work and applies prior acquired knowledge in problem solving. | | | **CO3** |
| | **Unit 4** | Demonstrate and execute Project with the team. Submission of evaluation form and final report completed by the intern. | | | **CO4** |
| | **Unit 5** | Final evaluation form completed by the supervisor at the Host Organization and final presentation before departmental committee. | | | **CO5,CO6** |
| | Mode of examination | Practical | | | |
| | Weightage Distribution | CA | MTE | ETE | |
| | | 60% | NIL | 40% | |

| | | |
|---|---|---|
| | Text book/s* | NA |
| | Other References | NA |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) |
|---|---|---|
| 1. | CO1. Integrate the concepts and strategies of academic study in a real time environment. | PO1,PO2,PO4,PO5,PO7,PO8,PO9,PSO1, PSO2,PSO3 |
| 2. | CO2. Identify, formulate and model problems and find engineering solution based on a systems approach. | PO1,PO2,PO3,PO4,PO5,PO7,PO8,PO9, PSO1,PSO2 |
| 3. | CO3. Develop teamwork and apply prior acquired knowledge in problem solving. | PO1,PO3,PO4,PO5, PO8,PO9,PO11,PO12, PSO1,PSO2,PSO3 |
| 4. | CO4. Develop communication, interpersonal and other critical skills required for career growth. | PO8,PO10 |
| 5. | CO5. Practice engineer's responsibilities, self-understanding, self-discipline and ethical standards. | PO6,PO8 |
| 6. | CO6. Explore career alternatives prior to graduation. | PO12,PSO1,PSO2 |

**PO and PSO mapping with level of strength for Course Name Summer Internship-II (CSP398)**

**CO/PO Mapping**

(1/2/3 indicates strength of correlation) 3-Strong, 2-Medium, 1-Low

| Cos | Programme Outcomes(POs) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CO1 | 2 | 2 | - | 3 | 2 | - | 1 | 1 | 1 | - | - | - | 1 | 2 | 2 |
| CO2 | 1 | 2 | 1 | 2 | 2 | - | 1 | 1 | 1 | - | - | - | 1 | 2 | - |
| CO3 | 2 | - | 2 | 2 | 2 | - | - | 1 | 3 | - | 1 | 1 | 1 | 2 | 2 |
| CO4 | - | - | - | - | - | - | - | 1 | - | 3 | - | - | - | - | - |
| CO5 | - | - | - | - | - | 2 | - | 3 | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | 2 | 2 | 2 | - |
| Avg PO attained | 1 | 0.7 | 0.5 | 1.2 | 1 | 0.3 | 0.3 | 1.2 | 1 | 1 | 0 | 1 | 1 | 1.3 | 0.7 |

# Syllabus: CSP 497, Major Project -1

| | | | | |
|---|---|---|---|---|
| **School: SET** | | **Batch: 2019-2023** | | |
| **Program: B.tech** | | **Current Academic Year: 2019-2020** | | |
| **Branch: CSE** | | **Semester: 7th** | | |
| 1 | Course Code | **CSP497** | Course Name: Major Project -1 | |
| 2 | Course Title | Major Project -1 | | |
| 3 | Credits | 3 | | |
| 4 | Contact Hours (L-T-P) | 0-0-0 | | |
| | Course Status | Compulsory | | |
| 5 | Course Objective | Project being the student's last activity at the institution, it fulfills a purpose of synthesis of all the knowledge they have acquired throughout the different years. In addition, this knowledge must be used in a particular way, in order to solve a specific problem, which lets student demonstrate their aptitude by applying this knowledge. | | |
| 6 | Course Outcomes | Students will be able to:<br>CO1: Identify problem statement in engineering and technology in selected field of interest.<br>CO2: Analyze the gathered information required to develop a project.<br>CO3: Apply prior knowledge of mathematics, computer science and engineering.<br>CO4: Participate in different teams and to focus on getting a working project done on time with each student being held accountable for their part of the project.<br>CO5: Prepare the designs requirements, functional and conceptual design.<br>CO6: Initiate the actual implementation of the project work to produce the deliverables and explain the work in written and oral forms. | | |
| 7 | Course Description | The object of Major Project-I is to enable the student to take up investigative study in the broad field of Computer Science & Engineering, either fully theoretical/practical or involving both theoretical and practical work to be assigned by the Department on an individual basis or two/three students in a group, under the guidance of a Supervisor. | | |
| 8 | Outline syllabus | | | CO Mapping |
| | **Unit 1** | Problem identification, Literature survey/Gather & analyze information from multiple sources | | CO1, CO2,CO4, |
| | **Unit 2** | Formulate solution/ Problem Description: Project Planning, Time and Cost Estimation and budgeting, Risk Management, Project scheduling and Planning Tools: Work Breakdown structure/ LRC/ Gantt charts/CPM/PERT Networks.<br>Creating System Requirement Specifications (Functional & Non Functional) | | CO1, CO2, CO3 |
| | **Unit 3** | Preparing Design: Data Flow Diagrams & Flow Charts, Use of appropriate tools and techniques for project design | | CO3, CO4 |
| | **Unit 4** | Identify and Implement Project Modules. | | CO4, CO5 |
| | **Unit 5** | Use of appropriate tools/technologies for coding the modules | | CO2, CO5, CO6 |
| | | Report on final problem statement, specifications, project schedule, final concept design and project schedule<br>Report and Presentation - Project Modules development | | |
| | Mode of examination | Practical | | |
| | Weightage Distribution | CA | MTE | ETE |
| | | 60% | NA | 40% |
| | Text book/s* | | | |
| | Other References | | | |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) |
|---|---|---|
| 1. | CO1: Identify problem statement in engineering and technology in selected field of interest. | PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3 |
| 2. | CO2: Analyze the gathered information required to develop a project. | PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3 |
| 3. | CO3: Apply prior knowledge of mathematics, computer science and engineering. | PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3 |
| 4. | CO4: Participate in different teams and to focus on getting a working project done on time with each student being held accountable for their part of the project. | PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3 |
| 5. | CO5: Prepare the designs requirements, functional and conceptual design. | PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3 |
| 6. | CO6: Initiate the actual implementation of the project work to produce the deliverables and explain the work in written and oral forms. | PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3 |

**PO and PSO mapping with level of strength for Course Name Major Project -1 (Course Code CSP497)**

| Cos | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 3 | 3 |
| CO2 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 3 | 3 | 3 |
| CO3 | 3 | 1 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 3 | 3 | 3 |
| CO4 | 1 | 1 | 2 | 1 | 2 | 3 | 3 | 1 | 2 | 3 | 1 | 2 | 1 | 2 | 3 |
| CO5 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 3 |
| CO6 | 2 | 1 | 2 | 1 | 3 | - | - | 1 | 2 | 3 | 1 | 2 | 3 | 3 | 3 |

**1-Slight (Low) 2-Moderate (Medium) 3-Substantial (High)**

# TERM-VII

## Syllabus: CSP 498, Major Project - 2

| | | | | | |
|---|---|---|---|---|---|
| **School: SET** | | **Batch: 2019-2023** | | | |
| **Program: B.tech** | | **Current Academic Year: 2019-2020** | | | |
| **Branch: CSE / IT** | | **Semester: VIII** | | | |
| 1 | Course Code | **CSP498** | Course Name: Major Project -2 | | |
| 2 | Course Title | Major Project -2 | | | |
| 3 | Credits | 8 | | | |
| 4 | Contact Hours (L-T-P) | 0-0-16 | | | |
| | Course Status | Compulsory | | | |
| 5 | Course Objective | 1. To understand the concept of project design after the completion of project planning<br>2. Students making decisions within a framework<br>3. Continuous evaluation of the project<br>4. A final product to be evaluated for quality | | | |
| 6 | Course Outcomes | Students will be able to:<br>CO1: Demonstrate the implementation of the project.<br>CO2: Identify the test procedure for each implemented module.<br>CO3: Deploy and evaluate the modules to verify the required need of the project.<br>CO4: Use different tools for communication, testing and report writing.<br>CO5: Develop the attitude and ethics of a professional engineer.<br>CO6: Demonstrate an ability to present and defend their project work to a panel of experts. | | | |
| 7 | Course Description | The objective of Major Project-II is to enable the student to extend further the development of project till testing and deployment under the guidance of a Supervisor. | | | |
| 8 | Outline syllabus | | | | CO Mapping |
| | **Unit 1** | Complete the implementation of the project. Testing of the modules, Use of appropriate tools/techniques for testing | | | CO1, CO2 |
| | **Unit 2** | Deploy & demonstrate developed modules of the project | | | CO2, CO3 |
| | **Unit 3** | Preparing a Project Report in the standard format for being evaluated by the Supervisor | | | CO4, CO5 |
| | **Unit 4** | Submission of Project and Report to Departmental Committee | | | CO4, CO5, CO6 |
| | **Unit 5** | Final Presentation before Departmental Committee | | | CO6 |
| | Mode of examination | Practical | | | |
| | Weight age Distribution | CA | | | MTE |
| | Text book/s* | 60% | NA | ETE | |
| | | | | 40% | |

**CO and PO Mapping**

| S. No. | Course Outcome | Program Outcomes (PO) |
|---|---|---|
| 1. | CO1: Demonstrate the implementation of the project. | PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3 |
| 2. | CO2: Identify the test procedure for each implemented module. | PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3 |
| 3. | CO3: Deploy and evaluate the modules to verify the required need of the project. | PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3 |
| 4. | CO4: Use different tools for communication, testing and report writing. | PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3 |
| 5. | CO5: Develop the attitude and ethics of a professional engineer. | PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3 |
| 6. | CO6: Demonstrate an ability to present and defend their project work to a panel of experts. | PO1, PO2, PO3, PO4, PO5,PO6,PO7, PO8, PO9, PO10, PO11, PO12,PSO1,PSO2,PSO3 |

**PO and PSO mapping with level of strength for Course Name Major Project -2 (Course Code CSP498)**

| COs | PO1 | PO 2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO1 0 | PO1 1 | PO1 2 | PSO 1 | PSO 2 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 |
| CO2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 11 | 3 | 3 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 3 |
| CO4 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 2 |
| CO5 | 1 | 2 | 2 | 1 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 2 | 2 |
| CO6 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

**1-Slight (Low)  2-Moderate (Medium)  3-Substantial (High)**