

**VASIREDDY VENKATADRI INSTITUTE OF TECHNOLOGY**

**NAMBUR**



**VASIREDDY VENKATADRI  
INSTITUTE OF TECHNOLOGY**

**(AUTONOMOUS)**

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**PO-PSO-PEO ASSESSMENT MANUAL**

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# **1. INSTITUTE VISION AND MISSION**

## **VISION**

To impart quality education through exploration and experimentation and generate socially conscious engineers, embedding ethics and values, for the advancement in science and technology.

## **MISSION**

- To educate students with a practical approach to dovetail them to industry-needs.
- To govern the institution with a proactive and professional management with passionate teaching faculty.
- To provide holistic and integrated education and achieve over all development of students by imparting scientific and technical, social and cognitive, managerial and organizational skills.
- To compete with the best and be the most preferred institution of the studios and the scholarly.
- To forge strong relationships and linkage with the industry.

## **2. DEPARTMENT VISION AND MISSION**

### **VISION**

To produce IT professionals who can develop globally competitive and socially useful information technology-enabled solutions and products that offer cost-effective solutions, for organizations, in particular, and society in general, through their innovative ideas, and to create a knowledge pool through research in this field.

### **MISSION**

**M1:** To produce information technology professionals for the Global IT industry.

**M2:** To develop student centric and qualitative teaching-learning practices.

**M3:** To establish infrastructure that endows cutting edge technology requirements of the industry.

**M4:** To extend service to the public, the state and the nation at large by building quality engineers.

**M5:** To carve disciplined and socially, technologically better responsible citizens.

**M6:** To make the students pursuing information technology the technological ambassadors of VVIT in whatever part of the world they find themselves in their future careers.

### **3. OUTCOME BASED EDUCATION (OBE)**

Institutions adopting OBE try to bring changes to the curriculum by dynamically adapting to the requirements of the different stakeholders like Students, Parents, Industry Personnel and Recruiters. OBE is all about feedback and outcomes.

Four levels of outcomes from OBE are:

1. Program Educational Objectives (PEOs)
2. Program Outcomes (POs)
3. Program Specific Outcomes (PSOs)
4. Course Outcomes (COs)

#### **Why OBE?**

1. International recognition and global employment opportunities.
2. More employable and innovative graduates with professional and soft skills, social responsibility and ethics.
3. Better visibility and reputation of the technical institution among stakeholders.
4. Improving the commitment and involvement of all the stakeholders.
5. Enabling graduates to excel in their profession and accomplish greater heights in their careers.
6. Preparing graduates for the leadership positions and challenging them and making them aware of the opportunities in the technology development.

Benefits of OBE for Faculty Members Faculty members are referred to as Change of Agents in OBE.

1. Teaching will become a far more creative and innovative career.
2. Faculty members will no longer feel the pressure of having to be the “source of all knowledge”.
3. Faculty members shape the thinking and vision of students towards a course

#### **4. PROGRAM EDUCATIONAL OBJECTIVES (PEO)**

Program Educational Objectives (PEOs) should be defined by the Head of the Department in consultation with the faculty members. PEOs are a promise by the department to the aspiring students about what they will achieve once they join the programme. PEO assessment is not made compulsory by NBA as it is quite difficult to measure in Indian context. NBA assessors usually do not ask for PEO assessment. PEOs are about professional and career accomplishment after 4 to 5 years of graduation. PEOs can be written from different perspectives like Career, Technical Competency and behaviour. While writing the PEOs do not use the technical terms as it will be read by prospective students who wants to join the programme.

##### **PEO-1: Solid Foundation and Core Competence**

To provide the graduates with concrete base in Information Technology, to pursue higher studies and to succeed in industry / technical profession with global competence by imparting acute technical skills like designing, modeling, analyzing and problem-solving on top of solid foundation in mathematical, scientific, computing and engineering fundamentals.

##### **PEO-2: Employability and Research Spur**

To train the graduates for a higher degree of employability in both public and private sector industries at national and international level by imparting ability to Re-learn and innovate in ever-changing global economic and technological environments and to contribute effectively in research and development.

##### **PEO-3: Professional Skills and Societal Contribution**

To inculcate the graduates to have basic interpersonal skills, effective communication skills to teamwork/ lead in multidisciplinary approach, under diverse professional environments by handling critical situations through lifelong learning with an ethical attitude (administrative acumen) and an ability to relate engineering issues to broader social context.

##### **PEO-4: Real World Competency and Innovation**

To enable students with good scientific and engineering breadth and technology skills so as to comprehend, analyze, design, and create novel products and solutions for the real-life problems to emerge as researchers, experts, educators & entrepreneurs.

## 5. PROGRAM OUTCOMES (PO)

A Program Learning Outcome is broad in scope and be able to do at the end of the programme. POs are to be in line with the graduate attributes as specified in the Washington Accord. POs are to be specific, measurable and achievable. NBA has defined 12 POs and you need not define those POs by yourself and it is common for all the institutions in India. In the syllabus book given to students, there should be clear mention of course objectives and course outcomes along with CO-PO course articulation matrix for all the courses

**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 teamwork:** 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



## 6. PROGRAM SPECIFIC OUTCOMES (PSO)

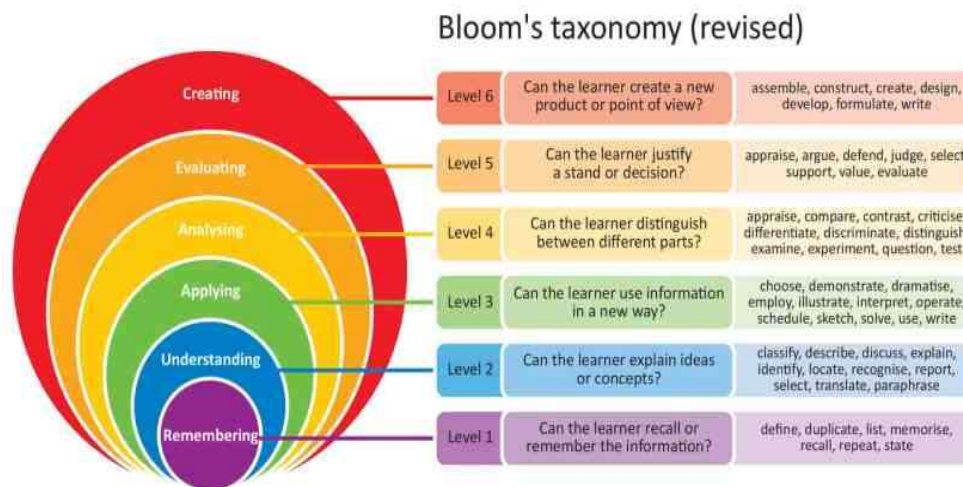
Program Specific Outcomes (PSOs) are statements that describe what the graduates of a specific engineering program should be able to do. A list of PSOs written for the department of Information Technology is given below.

**PSO1 Professional skills:** The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer based systems of varying complexity.

**PSO2 Successful career and entrepreneurship:** The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur and a zest for higher studies/employability in the field of computer science & engineering.

## 7. BLOOM'S TAXONOMY

Bloom's Taxonomy was created in 1956 under the leadership of educational psychologist Dr Benjamin Bloom in order to promote higher forms of thinking in education, such as analyzing and evaluating concepts, processes, procedures, and principles, rather than just remembering facts. It is most often used when designing educational, training, and learning processes. By utilizing Bloom's Taxonomy, students are not going to forget the information as soon as the class ends — rather, they retain and apply the information as they continue to grow as a student and in their careers, staying one step ahead of the competition



| BLOOM'S TAXONOMY DIGITAL PLANNING VERBS  |  |  |  |   |   |
|--|--|--|--|---|---|
| REMEMBERING  | UNDERSTANDING  | APPLYING   | ANALYZING  | EVALUATING  | CREATING  |
|  |  |  |  |   |   |
| Copying<br>Defining<br>Finding<br>Locating<br>Quoting<br>Listening<br>Googling<br>Repeating<br>Retrieving<br>Outlining<br>Highlighting<br>Memorizing<br>Networking<br>Searching<br>Identifying<br>Selecting<br>Tabulating<br>Duplicating<br>Matching<br>Bookmarking<br>Bullet-pointing | Annotating<br>Tweeting<br>Associating<br>Tagging<br>Summarizing<br>Relating<br>Categorizing<br>Paraphrasing<br>Predicting<br>Comparing<br>Contrasting<br>Commenting<br>Journaling<br>Interpreting<br>Grouping<br>Inferring<br>Estimating<br>Duplicating<br>Gathering<br>Exemplifying<br>Expressing | Acting out<br>Articulate<br>Reenact<br>Loading<br>Choosing<br>Determining<br>Displaying<br>Judging<br>Executing<br>Examining<br>Implementing<br>Sketching<br>Experimenting<br>Hacking<br>Interviewing<br>Painting<br>Preparing<br>Playing<br>Integrating<br>Presenting<br>Charting | Calculating<br>Categorizing<br>Breaking Down<br>Correlating<br>Deconstructing<br>Linking<br>Mashing<br>Mind-Mapping<br>Organizing<br>Appraising<br>Advertising<br>Dividing<br>Deducing<br>Distinguishing<br>Illustrating<br>Questioning<br>Structuring<br>Integrating<br>Attributing<br>Estimating<br>Explaining | Arguing<br>Validating<br>Testing<br>Scoring<br>Assessing<br>Criticizing<br>Commenting<br>Debating<br>Defending<br>Detecting<br>Experimenting<br>Grading<br>Hypothesizing<br>Measuring<br>Moderating<br>Posting<br>Predicting<br>Rating<br>Reflecting<br>Reviewing<br>Editorializing | Blogging<br>Building<br>Animating<br>Adapting<br>Collaborating<br>Composing<br>Directing<br>Devising<br>Podcasting<br>Wiki Building<br>Writing<br>Filming<br>Programming<br>Simulating<br>Role Playing<br>Solving<br>Mixing<br>Facilitating<br>Managing<br>Negotiating<br>Leading |

## 8. COURSE CODES

|      |                                    |
|------|------------------------------------|
| C111 | ENGLISH-I                          |
| C112 | MATHEMATICS-I                      |
| C114 | APPLIED PHYSICS                    |
| C115 | COMPUTER PROGRAMMING               |
| C113 | MATHEMATICS-II                     |
| C116 | ENGINEERING DRAWING                |
| C117 | ENGLISH-COMMUNICATION SKILLS LAB-I |
| C118 | APPLIED/ENGINEERING PHYSICS LAB    |
| C119 | PHYSICS VIRTUAL LAB                |
| C11A | C PROGRAMMING LAB                  |
| C121 | ENGLISH-II                         |
| C122 | MATHEMATICS - III                  |
| C123 | APPLIED CHEMISTRY                  |
| C125 | ENVIRONMENTAL STUDIES              |
| C124 | OOPS THROUGH C++                   |
| C126 | ENGINEERING MECHANICS              |
| C128 | ENGLISH - COMM. SKILLS LAB - II    |
| C127 | APPLIED CHEMISTRY LAB              |
| C129 | OBJECT ORIENTED PROGRAMMING LAB    |
| C211 | STATISTICS WITH R PROGRAMMING      |
| C212 | MFCS                               |
| C213 | DIGITAL LOGIC DESIGN               |
| C214 | PYTHON PROGRAMMING                 |
| C215 | DATA STRUCTURES THROUGH C++        |
| C217 | DATA STRUCTURES THROUGH C++ LAB    |
| C218 | PYTHON PROGRAMMING LAB             |
| C216 | SOFTWARE ENGINEERING               |
| C222 | JAVA PROGRAMMING                   |
| C224 | COMPUTER ORGANIZATION              |
| C226 | PPL                                |
| C228 | JAVA PROGRAMMING LAB               |
| C221 | COMPUTER GRAPHICS                  |
| C223 | E-COMMERCE                         |

|      |                                 |
|------|---------------------------------|
| C225 | OOAD USING UML                  |
| C227 | UNIFIED MODELING LANGUAGES LAB  |
| C312 | UNIX AND SHELL PROGRAMMING      |
| C314 | DATABASE MANAGEMENT SYSTEMS     |
| C315 | OPERATING SYSTEMS               |
| C311 | HUMAN COMPUTER INTERACTION      |
| C313 | ADVANCED JAVA PROGRAMMING       |
| C316 | ADVANCED JAVA PROGRAMMING LAB   |
| C317 | UNIX AND OPERATING SYSTEMS LAB  |
| C318 | DATABASE MANAGEMENT SYSTEM LAB  |
| C319 | PE&HV                           |
| C321 | COMPUTER NETWORKS               |
| C324 | SOFTWARE TESTING METHODOLOGIES  |
| C325 | ARTIFICIAL INTELLIGENCE         |
| C322 | DATA MINING                     |
| C323 | WEB TECHNOLOGIES                |
| C326 | WEB TECHNOLOGIES LAB            |
| C327 | SOFTWARE TESTING LAB            |
| C328 | DATA MINING LAB                 |
| C329 | IPR                             |
| C411 | CRYPT. AND NETWORK SECURITY     |
| C414 | MEFA                            |
| C415 | BIG DATA ANALYSIS               |
| C412 | MOBILE COMPUTING                |
| C413 | DWH AND BUSINESS INTE.          |
| C417 | MOBILE COMPUTING LAB            |
| C418 | CRYPT. AND NETWORK SECURITY LAB |
| C416 | MACHINE LEARNING                |
| C421 | DISTRIBUTED SYSTEMS             |
| C422 | MANAGEMENT SCIENCE              |
| C423 | MANAGEMENT INFORMATION SYSTEM   |
| C425 | SEMINAR                         |
| C424 | CYBER SECURITY                  |
| C426 | PROJECT                         |

## 9. COURSE OUTCOME STATEMENTS

- Course outcomes are what the student should be able to do at the end of the course.
- It is an effective ability, including attributes, skills and knowledge to successfully carry out some activity which is identified.
- The most important aspect of a course outcome (CO) is it should be measurable.
- These should be student-focused, not (not course coverage oriented)
- Focus on Objectives and Outcomes
- Focus on abilities central to discipline
- Focus on aspects of learning
- Are limited to a manageable number, like each unit should contain one course outcome

### CO-PO-PSOMAPPINGPROCEDURE

All the courses together must cover all the POs (and PSOs). For a course we map the COs to POs through the CO-PO -PSOmatrix as shown below. The various correlation levels are:

- “3”–Substantial(High)Correlation
- “2”–Moderate(Medium)Correlation
- “1”–Slight(Low)Correlation
- “-”indicatethereisnocorrelation.

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**CO-PO-PSO GRAND MATRIX**

By the end of the each course student will be able to

**1-1**

|             |                       |     |   |     |     |     |     |     |     |     |      |      |      |      |      |
|-------------|-----------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| <b>C111</b> | <b>English</b>        | CO1 | Identify the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English (I3)                      |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | CO2 | Formulatesentencesusingpropergrammaticalstructuresandcorrectwordformsandtakenoteswhile listening to a talk/lecture to answer questions (I3)                           |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | CO3 | Articulate clearly on a specific topic using suitable discourse markers in informal discussions (L3)  |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | CO4 | Write summaries based on global comprehension of reading/listening texts (L5)   |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | CO5 | Produce a coherent paragraph interpreting a figure/graph/chart/table (L4)   |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | PO1 | PO2   | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             | CO1                   | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |
|             | CO2                   | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |
|             | CO3                   | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |
|             | CO4                   | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |
| CO5         | -                     | -   | -   | -   | -   | -   | -   | -   | 2   | 3   | -    | 1    | -    | -    |      |
| <b>C112</b> | <b>Mathematics-I</b>  | CO1 | Summarize the first order ordinary Differential equations and analyze their applications. Or analyze applications of first order ordinary Differential equations (L2) |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | CO2 | Classify and solve the higher order ordinary differential equations and its applications.(I2)   |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | CO3 | Apply Laplace transformations and Evaluate the improper integral(L3)  |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | CO4 | Define partial differentiation and Compute extreme values.(L3)  |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | CO5 | Construct the Partial differential equations and Solve first order partial differential equations(L4)   |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | CO6 | Classify the nature of higher order partial differential equations(L2)  |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | PO1 | PO2   | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             | CO1                   | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | -    |
|             | CO2                   | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | -    |
|             | CO3                   | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | -    |
| CO4         | 3                     | 2   | -   | -   | -   | -   | -   | -   | -   | -   | -    | 1    | -    | -    |      |
| CO5         | 3                     | 2   | -   | -   | -   | -   | -   | -   | -   | -   | -    | 1    | -    | -    |      |
| CO6         | 3                     | 2   | -   | -   | -   | -   | -   | -   | -   | -   | -    | 1    | -    | -    |      |
| <b>C113</b> | <b>Mathematics-II</b> | CO1 | Apply Numerical methods to find roots of algebraic & transcendental equations (L3)  |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | CO2 | Summarize the interpolation and extrapolation techniques (L2)   |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | CO3 | Apply different numerical methods to Solve differential equations(L3)   |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | CO4 | Interpret Fourier series analysis which is central to many applications in engineering apart (L2)   |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | CO5 | Solve Higher order Partial differential equations and their application (L4)  |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | CO6 | Apply Fourier transforms to Evaluate improper integrals( L3)  |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                       | PO1 | PO2   | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             | CO1                   | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | -    |
|             | CO2                   | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | -    |
|             | CO3                   | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | -    |
| CO4         | 3                     | 2   | -   | -   | -   | -   | -   | -   | -   | -   | -    | 1    | -    | -    |      |

|             |                             |     |   |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|-------------|-----------------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|             |                             | CO5 | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -   | -   | 1    | -    | -    |      |      |
|             |                             | CO6 | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -   | -   | 1    | -    | -    |      |      |
| <b>C114</b> | <b>APPLIED PHYSICS</b>      | CO1 | Apply knowledge of Interference concepts of light(L3)   |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             | CO2 | Apply knowledge of Diffraction concepts of light(L3)  |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             | CO3 | Summarize the applications of Lasers(L2)  |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             | CO4 | Interpret EMW wave propagation and its applications(L2)   |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             | CO5 | Analyze technicalities in solving problems related to Quantum mechanics(L4)   |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             | CO6 | Experiment Laws and principles of Semiconductor Physics(L4) design by analyzing Laws and principles of Semiconductor Physics(L4)        |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             |     |   |     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                             |     |   | CO1 | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | -    |
|             |                             |     |   | CO2 | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | -    |
|             |                             |     |   | CO3 | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | -    |
|             |                             |     |   | CO4 | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | -    |
|             |                             |     |   | CO5 | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | -    |
|             |                             | CO6 | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -   | -   | 1    | -    | -    |      |      |
| <b>C115</b> | <b>Computer Programming</b> | CO1 | Formulate algorithmic solutions to problems by inferring basic jargon of Computer(L3)   |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             | CO2 | Summarize programming style in C(L2)  |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             | CO3 | Implement branching & iteration in Problem solving(L4)  |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             | CO4 | Develop program blocks using Modular programming approach(L4)   |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             | CO5 | Develop solutions to problems using Arrays & Strings(L4)  |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             | CO6 | Choose apt structures for representing group data and implement File Management(L4)   |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             |     |   |     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                             |     |   | CO1 | 2   | 2   | 2   | -   | 2   | -   | -   | -   | -   | -    | -    | -    | 2    | -    |
|             |                             |     |   | CO2 | 1   | 1   | 1   | -   | 2   | -   | -   | -   | -   | -    | -    | -    | 2    | -    |
|             |                             |     |   | CO3 | 2   | 2   | 2   | 2   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | 2    |
|             |                             |     |   | CO4 | 1   | 2   | 3   | 3   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | 2    |
|             |                             |     |   | CO5 | 2   | 3   | 2   | 2   | 1   | -   | -   | -   | -   | -    | -    | -    | 2    | 2    |
|             |                             | CO6 | 2   | 3   | 3   | 3   | -   | -   | -   | -   | -   | -   | -   | -    | 2    | 2    |      |      |
| <b>C116</b> | <b>Engineering Drawing</b>  | CO1 | Draw various Engineering curves & polygons(L3)  |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             | CO2 | Summarize different scales used in the industry, to recognize principles of projection & to draw Orthographic projections of points(L3) |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             | CO3 | Interpret the projection principles to draw projections of straight lines(L2)   |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             | CO4 | Illustrate various ways to draw projections of planes(L3)   |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             | CO5 | Draw the projections of solids by applying principles of Orthographic projections(L3)   |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             | CO6 | Convert isometric views into orthographic views and vice versa(L4)  |     |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                             |     |   |     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                             |     |   | CO1 | 1   | 1   | 1   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | -    |
|             |                             |     |   | CO2 | 2   | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | -    |
|             |                             |     |   | CO3 | 2   | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | -    |
|             |                             |     |   | CO4 | 2   | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | -    |
|             |                             |     |   | CO5 | 2   | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | -    |
|             |                             | CO6 | 3   | 3   | 3   | -   | -   | -   | -   | -   | -   | -   | -   | 1    | -    | -    |      |      |

|             |                                 |     |  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|-------------|---------------------------------|-----|--|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| <b>C117</b> | <b>English Lab</b>              | CO1 | Identify the context, topic, and pieces of specific information from social or transactional dialogues spoken by native speakers of English and speak clearly on a specific topic using suitable discourse markers in informal discussions(L3) |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO2 | Take notes while listening to a talk/lecture; to answer questions in English; formulate Sentences using proper grammatical structures and correct word forms; and use language effectively in competitive examinations (L3)                    |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO3 | Write summaries based on global comprehension of reading/listening texts; produce a Coherent write-up interpreting a figure/graph/chart/table; and use English as a successful medium of communication. (L3)                                   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 |     | PO1  | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                                 | CO1 | -  | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |
|             |                                 | CO2 | -  | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |
|             |                                 | CO3 | -  | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |
| <b>C118</b> | <b>Applied Physics Lab</b>      | CO1 | Apply knowledge of Interference concepts of light(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO2 | Apply knowledge of Interference concepts of light(L3)* repeated  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO3 | Infer the applications of Lasers(L2)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO4 | Define Acoustics of buildings and NDT applications (L1)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO5 | Define material properties and nuclear power generation(L1)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO6 | Correlate the applications of magnetic and dielectric materials in industry and engineering (L2)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 |     | PO1  | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                                 | CO1 | 3  | 3   | 3   | 2   | 2   | -   | -   | -   | -   | -    | -    | -    | -    | -    |
| CO2         | 2                               | 2   | 2  | 3   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    |      |      |
| CO3         | 3                               | 2   | 2  | 2   | 3   | -   | -   | -   | -   | -   | -   | -    | -    | -    |      |      |
| CO4         | 2                               | 2   | 3  | 3   | 3   | -   | -   | -   | -   | -   | -   | -    | -    | -    |      |      |
| CO5         | 3                               | 2   | 3  | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    |      |      |
| CO6         | 3                               | 3   | 2  | 2   | 1   | -   | -   | -   | -   | -   | -   | -    | -    | -    |      |      |
| <b>C119</b> | <b>Computer Programming Lab</b> | CO1 | Implement the basic terminology used in computer programming(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO2 | Write, compile and debug programs in C language(L4)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO3 | Analyze different data types in a computer program(L4)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO4 | Develop C programs involving decision structures, loops and functions(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO5 | Analyze the difference between call by value and call by reference( L4)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO6 | Develop C programs that utilize dynamics of memory by the use of pointers(L4)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 |     | PO1  | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1         | 3                               | 1   | 1  | 1   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    |      |      |
| CO2         | 3                               | 3   | 1  | 1   | 2   | -   | -   | -   | -   | -   | -   | -    | 1    | -    |      |      |
| CO3         | 3                               | 2   | 3  | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | 2    | -    |      |      |
| CO4         | 3                               | 3   | 2  | 3   | 2   | -   | -   | -   | -   | -   | -   | -    | 2    | -    |      |      |
| CO5         | 3                               | 3   | 2  | 2   | 3   | -   | -   | -   | -   | -   | -   | -    | 2    | -    |      |      |
| CO6         | 3                               | 2   | 2  | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | 3    | -    |      |      |
| <b>1-2</b>  |                                 |     |  |     |     |     |     |     |     |     |     |      |      |      |      |      |
| <b>C121</b> | <b>English II</b>               | CO1 | Read and comprehend English stories and texts(L2)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO2 | Write effectively using appropriate format and transfer verbal information into nonverbal Information(13)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO3 | Articulate listening skills particularly related to Technical English and speak in English without Inhibition(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO4 | Expand vocabulary range and use it effectively and grammatically for English communication(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO5 | Improve life skills and core skills necessary for effective communication and critically respond in English to a real life situations(13)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                 | CO6 | Read and comprehend English stories and texts(L2)  |     |     |     |     |     |     |     |     |      |      |      |      |      |



|      |                   |     |   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|------|-------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
|      |                   |     |   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | PO1 | PO2   | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |      |
|      | CO1               | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |      |
|      | CO2               | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |      |
|      | CO3               | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |      |
|      | CO4               | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |      |
|      | CO5               | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |      |
|      | CO6               | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |      |
| C122 | Mathematics III   | CO1 | Solve the system of linear equations and Analyze their applications(L4)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO2 | Compute an Eigen values and eigen vectors(L4)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO3 | Evaluate double and Triple integrals and Apply to find surface area and volumes of solids.(L4)  |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO4 | Compare definite integral with special functions(L2)  |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO5 | Differentiate the scalar and vector functions(L2)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO6 | Infer line, surface and volume integrals and Establish vector integral theorems(L2)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   |     |   | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8  | PO9  | PO10 | PO11 | PO12 | PSO1 |
|      |                   | CO1 | 3   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 1    | -    | -    |
|      |                   | CO2 | 3   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 1    | -    | -    |
|      |                   | CO3 | 3   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 1    | -    | -    |
|      |                   | CO4 | 3   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 1    | -    | -    |
|      |                   | CO5 | 3   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 1    | -    | -    |
|      |                   | CO6 | 3   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 1    | -    | -    |
| C123 | Applied Chemistry | CO1 | Summarize synthesis, physical and mechanical properties, compounding and reframing & fabrication of polymers, plastics and elastomers and Applications of fibre reinforced polymers along with conducting polymers(L2)  |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO2 | Recognize specific characteristic properties of fuels including calorific value determination , Ranking and Analysis of coal by proximate and ultimate methods (L1)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO3 | Summarize the principles, Construction and working of galvanic cells, electrode potentials, concentration cells , rechargeable batteries, apply the knowledge of electro chemistry to corrosion, distinguish various types of corrosions and able to solve corrosion problems(L3) |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO4 | Determine the advanced materials i.e. Nanomaterials, liquid crystals, super conductors and illustrate the applications of cleaner and greener synthetic methods adapted in industries for healthy living (L3)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO5 | Summarize the structures of solid crystalline structures, synthesis of ultra pure semiconductors, Working of rectifiers and transistors, insulating materials and distinguish various ferro and ferromagnetic materials(L3)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO6 | Recognize non-conventional energy sources, construction & working of photovoltaic cell, design of hydropower plant, tidal power, geothermal energy, bio gas for green environment(L3)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   |     |   | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8  | PO9  | PO10 | PO11 | PO12 | PSO1 |
|      |                   | CO1 | 2   | 3   | -   | -   | -   | -   | -   | -   | -    | -    | 2    | -    | -    | -    |
|      |                   | CO2 | 3   | 3   | -   | -   | -   | -   | -   | -   | -    | -    | 2    | 2    | -    | -    |
|      |                   | CO3 | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | 3    | -    | -    |
|      |                   | CO4 | 3   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | 3    | -    | -    |
|      |                   | CO5 | 2   | 1   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | 1    | -    | -    |
|      |                   | CO6 | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | 2    | -    | -    |

|             |                              |     |   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|-------------|------------------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| <b>C124</b> | <b>OOPS through C++</b>      | CO1 | Summarize the basic terminology used in oops Concepts (L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              | CO2 | Implement Scope rules, various members functions of Classes & Objects by summarizing the basic concepts (L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              | CO3 | Implement OOPS features like Polymorphism & Inheritance by determining their behavior(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              | CO4 | Implement virtual functions & pointers by determining their basics (L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              | CO5 | Implement Templates & Exceptions by determining their behavior(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              | CO6 | Summarize STL library and its usage(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             | CO1                          | 1   | 3   | 2   | --  | --  | --  | --  | --  | --  | --  | --   | 1    | 2    | 2    |      |
|             | CO2                          | 1   | 2   | 3   | 1   | --  | --  | --  | --  | --  | --  | --   | -    | 2    | 2    |      |
|             | CO3                          | 1   | 2   | 2   | --  | --  | --  | --  | --  | --  | --  | --   | 2    | 2    | 2    |      |
|             | CO4                          | 1   | 3   | 3   | --  | --  | --  | --  | --  | --  | --  | --   | 2    | 2    | 2    |      |
|             | CO5                          | --  | 3   | 3   | 1   | --  | --  | --  | --  | --  | --  | --   | 1    | 2    | 2    |      |
| CO6         | --                           | 3   | 3   | 3   | --  | --  | --  | --  | --  | --  | --  | --   | 2    | 2    |      |      |
| <b>C125</b> | <b>Environmental Studies</b> | CO1 | Illustrate the concepts of the ecosystem(L2)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              | CO2 | Summarize the natural resources and their importance(L2)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              | CO3 | Illustrate the biodiversity of India and categorize the threats to it and apply conservation practices(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              | CO4 | Summarize various attributes of the pollution and predict their impacts(L2)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              | CO5 | Analyze the social issues both rural and urban environment( L4)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              | CO6 | Illustrate environmental impact assessment and evaluate the stages involved in EIA(L4)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             | CO1                          | -   | -   | -   | -   | -   | -   | 3   | -   | -   | -   | -    | 3    | -    | -    |      |
|             | CO2                          | -   | -   | 3   | -   | -   | -   | 3   | -   | -   | -   | -    | 3    | -    | -    |      |
|             | CO3                          | -   | -   | -   | -   | -   | -   | 3   | -   | -   | -   | -    | 3    | -    | -    |      |
|             | CO4                          | -   | -   | 3   | -   | -   | -   | 3   | -   | -   | -   | -    | 3    | -    | -    |      |
|             | CO5                          | -   | -   | 3   | -   | -   | -   | 3   | -   | -   | -   | -    | 3    | -    | -    |      |
| CO6         | -                            | -   | 3   | -   | -   | -   | 3   | -   | -   | -   | -   | 3    | -    | -    |      |      |
| <b>C126</b> | <b>Engineering Mechanics</b> | CO1 | Summarize concepts of force and friction, direction and its application(L2)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              | CO2 | Determine application of free body diagrams, solution to problems using graphical methods and law of triangle forces ( L2)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              | CO3 | Define centroid and Centre of gravity(L1)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              | CO4 | Summarize moment of inertia and polar moment of inertia including transfer(L2)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              | CO5 | Distinguish the motion of a particle in straight line and in curvilinear path, its velocity and acceleration computation and methods of representing plane motion(L2) |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              | CO6 | Interpret the concepts of work, energy and particle motion(L2)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                              |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             | CO1                          | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -   | -    | 2    | -    | -    |      |
|             | CO2                          | 3   | 2   | 1   | -   | -   | -   | -   | -   | -   | -   | -    | 2    | -    | -    |      |
|             | CO3                          | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -   | -    | 2    | -    | -    |      |
|             | CO4                          | 3   | 2   | 1   | -   | -   | -   | -   | -   | -   | -   | -    | 2    | -    | -    |      |
|             | CO5                          | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -   | -    | 2    | -    | -    |      |
| CO6         | 3                            | 2   | 1   | -   | -   | -   | -   | -   | -   | -   | -   | 2    | -    | -    |      |      |

|             |                                      |     |   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|-------------|--------------------------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| <b>C127</b> | <b>Applied Chemistry Lab</b>         | CO1 | Estimate the amount of metal ions present in different solutions (L5)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO2 | Analyze the quality parameters of water (L4)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO3 | Determine the strength of different solutions by using different instrumentation techniques (L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                                      | CO1 | -   | 3   | 2   | -   | -   | -   | -   | 1   | 2   | -    | -    | 2    | -    | -    |
|             | CO2                                  | -   | 2   | 3   | -   | -   | -   | -   | 1   | 3   | -   | -    | 1    | -    | -    |      |
|             | CO3                                  | -   | 1   | 2   | -   | -   | -   | -   | 1   | 2   | -   | -    | 1    | -    | -    |      |
| <b>C128</b> | <b>English Lab II</b>                | CO1 | Prioritize information from reading texts after selecting relevant and useful points and paraphrase Short academic texts using suitable strategies and conventions (I3) |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO2 | Make formal structured presentations on academic topics using PPT slides with relevant graphical Elements (L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO3 | Participate in group discussions using appropriate conventions and language strategies (L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO4 | Prepare a CV with a cover letter to seek internship/ job (L2)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO5 | Collaborate with a partner to make presentations and Project Reports (L2)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                                      | CO1 | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |
|             |                                      | CO2 | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |
|             |                                      | CO3 | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |
|             |                                      | CO4 | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | -    | 1    | -    | -    |
| CO5         | -                                    | -   | -   | -   | -   | -   | -   | -   | 2   | 3   | -   | 1    | -    | -    |      |      |
| <b>C129</b> | <b>OOPS LAB</b>                      | CO1 | Demonstrate the basic Problem solving techniques through C++ by developing programs(L5)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO2 | Implement polymorphism, inheritance & virtual functions(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO3 | Apply exceptions and standard template libraries(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                                      | CO1 | 1   | 2   | 2   | 2   | -   | -   | -   | -   | -   | -    | -    | 2    | 2    | -    |
|             | CO2                                  | 1   | 2   | 2   | 2   | -   | -   | -   | -   | -   | -   | 2    | 2    | -    |      |      |
|             | CO3                                  | -   | 2   | 2   | 2   | -   | -   | -   | -   | -   | -   | 2    | 2    | -    |      |      |
| <b>2-1</b>  |                                      |     |   |     |     |     |     |     |     |     |     |      |      |      |      |      |
| <b>C211</b> | <b>Statistics with R Programming</b> | CO1 | Infer the concepts of Vectors and Lists for programming(L2)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO2 | Implement functions & pointers(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO3 | Apply statistics over data sets(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO4 | Discriminate the statistic results graphically(L4)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO5 | Differentiate probability distribution functions(L4)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO6 | Summarize linear models(L2)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                                      | CO1 | 2   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | 2    |
| CO2         | 2                                    | 3   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -    | 2    | -    |      |      |
| CO3         | 2                                    | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 2    |      |      |
| CO4         | 2                                    | 3   | 2   | 3   | -   | -   | -   | -   | -   | -   | -   | -    | 2    | 2    |      |      |
| CO5         | 2                                    | 3   | 2   | 2   | -   | -   | -   | -   | -   | -   | -   | -    | 2    | 2    |      |      |
| CO6         | 2                                    | 3   | 2   | 2   | -   | -   | -   | -   | -   | -   | -   | 2    | 2    | 2    |      |      |
| <b>C212</b> | <b>Mathematical Foundations of</b>   | CO1 | Define the propositional logic and Mathematical Principles(L2)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO2 | Apply logical reasoning to solve a variety of problems in sets and relations(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO3 | Solve problems on Number Theory and Analyze algebraic structures.(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO4 | Build solutions to problems using counting techniques and combinatory logic (L5)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO5 | Solve problems on recurrence relations.   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                      | CO6 | Infer Graphs, their representations, and solve problems using Graph Theory(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |

|      |                             |     |   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|------|-----------------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
|      |                             |     |   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             | PO1 | PO2   | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |      |
|      | CO1                         | 3   | 3   | 3   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | 1    |      |
|      | CO2                         | 3   | 3   | 3   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 1    | 2    |      |
|      | CO3                         | 3   | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | -    |      |
|      | CO4                         | 3   | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | -    |      |
|      | CO5                         | 2   | 3   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 3    | -    |      |
|      | CO6                         | 3   | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | 1    |      |
| C213 | Digital Logic Design        | CO1 | Determine the basics of Digital electronics, number systems and digital codes(L2)                                   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             | CO2 | Analyze the logic functions using k maps, in Boolean algebra(L4)  |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             | CO3 | Analyze the design procedure for different combinational circuits(L4)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             | CO4 | Summarize different synchronous sequential circuits and state machines(L2)  |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             | CO5 | Design different types of registers and counters(L5)  |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             | CO6 | Design different programmable logic devices(L5)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9  | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|      |                             | CO1 | 3   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | 3    | 1    |
|      |                             | CO2 | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | 2    | 1    |
|      |                             | CO3 | 2   | 2   | 3   | -   | -   | -   | -   | -   | -    | -    | -    | -    | 3    | 2    |
|      |                             | CO4 | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | 2    | 1    |
|      |                             | CO5 | 2   | -   | 3   | -   | -   | -   | -   | -   | -    | -    | -    | -    | 2    | 1    |
|      |                             | CO6 | 2   | -   | 2   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | 2    | 1    |
| C214 | Python Programming          | CO1 | Summarize how software can be build right out of the box, with ease(L3)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             | CO2 | Apply the interpreted language for problem solving through control statements Including loops and conditionals(13)  |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             | CO3 | Implement data structures for quick programming solutions(L3)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             | CO4 | Build software for real needs by breaking out code into reusable functions and modules(L5)                          |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             | CO5 | Implement software reliability through exception handling(L3)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             | CO6 | Integrate Python standard library for problem solving and summarize the necessity of testing software(L3)           |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9  | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|      |                             | CO1 | 1   | -   | -   | -   | 2   | -   | -   | -   | -    | -    | -    | -    | -    | 1    |
|      |                             | CO2 | 2   | 1   | -   | -   | 2   | -   | -   | -   | -    | -    | -    | -    | 1    | -    |
|      |                             | CO3 | 1   | 2   | 1   |     | 3   | -   | -   | -   | -    | -    | -    | -    | -    | 2    |
|      |                             | CO4 | 2   | 2   | 2   | 1   | 2   | -   | -   | -   | -    | -    | -    | -    | 2    | 2    |
|      |                             | CO5 | 2   | 2   | 2   | 2   | 3   | -   | -   | -   | -    | -    | -    | -    | 2    | 2    |
|      |                             | CO6 | 2   | 2   | 2   | 2   | 3   | -   | -   | -   | -    | -    | -    | 2    | 2    | 2    |
| C215 | Data Structures through C++ | CO1 | Analyze the differences between procedures and object oriented programming and implement array data structures (L3) |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             | CO2 | Implement Stack and Queue data structure (L3)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             | CO3 | Implement linked list data structure(L3)  |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             | CO4 | Integrate apt data structures into the applications such as binary search trees, AVL, and B Trees (L3)              |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             | CO5 | Apply Graph data structures(L3)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             | CO6 | Illustrate various sorting techniques(L4)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                             |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9  | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|      |                             | CO1 | 2   | 1   | 1   | 1   | 2   | -   | -   | -   | -    | -    | -    | 3    | 2    | 2    |
|      |                             | CO2 | 2   | 2   | 1   | 1   | 2   | -   | -   | -   | -    | -    | -    | 2    | 2    | 2    |
|      |                             | CO3 | 2   | 2   | -   | -   | 1   | -   | -   | -   | -    | -    | 3    | -    | 2    | 2    |
|      |                             | CO4 | 2   | 3   | 2   | 3   | 2   | -   | -   | -   | -    | -    | -    | 2    | 2    | 2    |
|      |                             | CO5 | 2   | 3   | 2   | 3   | 2   | -   | -   | -   | -    | -    | 3    | 3    | 3    | 2    |

|             |                               |     |  |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|-------------|-------------------------------|-----|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|             |                               | CO6 | 2  | 3   | 2   | 3   | 2   | -   | -   | -   | -   | -   | -    | 3    | 2    | 3    |      |
| <b>C216</b> | <b>Software Engineering</b>   | CO1 | Infer the basic software engineering methods , processes, process models and their applications(L2)                |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               | CO2 | Apply the knowledge of requirements gathering methods to create an SRS document for a defined problem(L3)          |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               | CO3 | Summarize various Software Design, UI design Techniques and apply that knowledge for a defined Problem((L3)        |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               | CO4 | Analysis and implement concepts such as modularity, coding principles, Testing strategies and coding standards(L3) |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               | CO5 | Summarize the Software Reliability, Quality and CASE tools by practicing Ethics & Team Work(L3)                    |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               | CO6 | Distinguish the maintenance process models and importance of software reuse(L2)                                    |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               |     |  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                               | CO1 | -  | -   | 3   | 2   | 2   | -   | -   | -   | 2   | -   | -    | -    | -    | 2    | -    |
|             |                               | CO2 | 2  | 2   | 2   | 2   | 2   | -   | -   | -   | 2   | -   | -    | -    | -    | 2    | -    |
|             |                               | CO3 | 2  | 2   | 2   | 2   | 3   | -   | -   | -   | 2   | -   | -    | -    | -    | 2    | -    |
|             |                               | CO4 | 2  | 1   | 2   | 2   | 2   | -   | -   | -   | 3   | 2   | -    | -    | -    | 1    | 1    |
|             |                               | CO5 | -  | 3   | 3   | 2   | 3   | -   | -   | -   | 3   | 2   | -    | -    | -    | 2    | 1    |
| CO6         | -                             | 2   | 2  | 3   | 3   | -   | -   | -   | 2   | -   | -   | -   | -    | 2    | 1    |      |      |
| <b>C217</b> | <b>DS through C++ Lab</b>     | CO1 | Implement Array data structures and its applications(L3)   |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               | CO2 | Implement stacks and Queue data structures and its applications(L3)  |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               | CO3 | Implement Linked List and its applications(L3)   |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               | CO4 | Implement Tree data structures (L3)  |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               | CO5 | Implement variants of Graph data structures and applications(L3)   |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               | CO6 | Implement various sorting techniques(L3)   |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               |     |  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                               | CO1 | 2  | 1   | 1   | 1   | 2   | -   | -   | -   | -   | -   | -    | -    | 3    | 2    | 2    |
|             |                               | CO2 | 2  | 2   | 1   | 1   | 2   | -   | -   | -   | -   | -   | -    | -    | 2    | 2    | 2    |
|             |                               | CO3 | 2  | 2   | -   | -   | 1   | -   | -   | -   | -   | -   | -    | 3    | -    | 2    | 2    |
|             |                               | CO4 | 2  | 3   | 2   | 3   | 2   | -   | -   | -   | -   | -   | -    | -    | 2    | 2    | 2    |
|             |                               | CO5 | 2  | 3   | 2   | 3   | 2   | -   | -   | -   | -   | -   | -    | 3    | 3    | 3    | 2    |
| CO6         | 2                             | 3   | 2  | 3   | 2   | -   | -   | -   | -   | -   | -   | -   | 3    | 2    | 3    |      |      |
| <b>C218</b> | <b>Python Programming Lab</b> | CO1 | Build software with a perception of out of the box/unconventional procedures, with ease(L5)                        |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               | CO2 | Implement control statements including loops and conditionals for problem solving(L3)                              |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               | CO3 | Apply data structures for quick programming solutions(L3)  |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               | CO4 | Implement reusable functions and modules (L3)  |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               | CO5 | Develop reliable programs by incorporating exception handling(L5)  |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               | CO6 | Develop solutions that use of apt modules of python standard library for problem solving and to test(L5)           |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                               |     |  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                               | CO1 | 1  | -   | -   | -   | 2   | -   | -   | -   | -   | -   | -    | -    | -    | -    | 1    |
|             |                               | CO2 | 2  | 1   | -   | -   | 2   | -   | -   | -   | -   | -   | -    | -    | -    | 1    | -    |
|             |                               | CO3 | 1  | 2   | 1   | -   | 3   | -   | -   | -   | -   | -   | -    | -    | -    | -    | 2    |
|             |                               | CO4 | 2  | 2   | 2   | 1   | 2   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | 2    |
|             |                               | CO5 | 2  | 2   | 2   | 2   | 3   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | 2    |
| CO6         | 2                             | 2   | 2  | 2   | 3   | -   | -   | -   | -   | -   | -   | -   | 2    | 2    | 2    |      |      |
| 2-2         |                               |     |  |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
| <b>C</b>    | <b>C</b>                      | CO1 | Transform and analyze 2D Objects by learning output primitives (L3)  |     |     |     |     |     |     |     |     |     |      |      |      |      |      |

|      |  |      |   |     |   |     |     |     |     |     |     |      |      |      |      |      |  |
|------|--|------|---|-----|---|-----|-----|-----|-----|-----|-----|------|------|------|------|------|--|
|      |  | CO2  | Summarize 3D Object representation models by learning various visualization techniques (L2)   |     |   |     |     |     |     |     |     |      |      |      |      |      |  |
|      |  | CO3  | Develop programs in OPENGL by using apt functions for efficacy in Computer Graphics 2D/3D and Animation(L5)   |     |   |     |     |     |     |     |     |      |      |      |      |      |  |
|      |  | CO4  | Perform Rendering of 2D/3D Objects by learning about shading, texture mapping techniques and drawing shadows(L3)                                    |     |   |     |     |     |     |     |     |      |      |      |      |      |  |
|      |  | CO5  | Design complicated Real World Scenes by learning Iterated Function Systems for implementing Fractals(L5)  |     |   |     |     |     |     |     |     |      |      |      |      |      |  |
|      |  | CO6  | Apply 3D Solid Geometric Techniques for representing 3D objects(L3)   |     |   |     |     |     |     |     |     |      |      |      |      |      |  |
|      |  |      | PO1   | PO2 | PO3   | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |  |
|      |  | CO1  | 2   | -   | 2   | 2   | -   | -   | -   | -   | -   | -    | -    | 1    | 1    | 1    |  |
|      |  | CO2  | 2   | -   | -   | 3   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | -    |  |
|      |  | CO3  | 2   | -   | 3   | 3   | -   | -   | -   | -   | -   | -    | -    | -    | 3    | -    |  |
|      |  | CO4  | 2   | 1   | 3   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | -    |  |
|      |  | CO5  | 2   | -   | 3   | 2   | -   | -   | -   | -   | -   | -    | -    | -    | 3    | -    |  |
|      |  | CO6  | 2   | 3   | 3   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    |  |
|      |  | C222 | Java Programming  | CO1 | Summarize the concepts & principles of OOP(L1)  |     |     |     |     |     |     |      |      |      |      |      |  |
|      |  |      |   | CO2 | Illustrate simple java primitives and problem solving using OOP concept(L3)                                       |     |     |     |     |     |     |      |      |      |      |      |  |
|      |  |      |   | CO3 | Implement packages, interfaces & exceptions(L3)   |     |     |     |     |     |     |      |      |      |      |      |  |
| CO4  | Analyze the behavior of Threads and I/O Streams in java(L4)        |      |   |     |   |     |     |     |     |     |     |      |      |      |      |      |  |
| CO5  | Create applications and Applets in java that can handle events(L5) |      |   |     |   |     |     |     |     |     |     |      |      |      |      |      |  |
| CO6  | Construct simple GUI applications using Frames & jframes (L5)      |      |   |     |   |     |     |     |     |     |     |      |      |      |      |      |  |
|      | PO1  |      |   | PO2 | PO3   | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |  |
| CO1  | 1  |      |   | 1   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | 2    | 2    |  |
| CO2  | 1  |      |   | 3   | 3   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | 2    | 2    |  |
| CO3  | 1  |      |   | 3   | 3   | 2   | -   | -   | -   | -   | -   | -    | -    | 1    | 2    | 2    |  |
| CO4  | 1  |      |   | 3   | 3   | 3   | -   | -   | -   | -   | -   | -    | -    | 1    | 3    | 2    |  |
| CO5  | 1  |      |   | 3   | 3   | 3   | -   | -   | -   | -   | -   | -    | -    | 1    | 3    | 2    |  |
| CO6  | 1  |      |   | 3   | 3   | 3   | -   | -   | -   | -   | -   | -    | -    | 1    | 3    | 2    |  |
| C223 | E-Commerce   |      |   | CO1 | Summarize major categories and trends of e-commerce applications(L1)  |     |     |     |     |     |     |      |      |      |      |      |  |
|      |  |      |   | CO2 | Classify various electronic payment types and associated security risks and the ways to protect against them(L2)  |     |     |     |     |     |     |      |      |      |      |      |  |
|      |  | CO3  | Summarize the essential processes of an e-commerce system(L1)   |     |   |     |     |     |     |     |     |      |      |      |      |      |  |
|      |  | CO4  | Classify several factors and web store requirements needed to succeed in e-commerce and the various marketing strategies for an online business(L2) |     |   |     |     |     |     |     |     |      |      |      |      |      |  |
|      |  | CO5  | Analyse benefits and trade-offs of various e-commerce clicks and bricks alternatives( L4)   |     |   |     |     |     |     |     |     |      |      |      |      |      |  |
|      |  | CO6  | Categorize the primary technologies behind e-commerce systems and how these technologies interact(L4)   |     |   |     |     |     |     |     |     |      |      |      |      |      |  |
|      |  |      | PO1   | PO2 | PO3   | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |  |
|      |  | CO1  | -   | 1   | 1   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 1    | 1    |  |
|      |  | CO2  | -   | -   | 1   | 1   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | -    |  |
|      |  | CO3  | -   | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | -    |  |
|      |  | CO4  | -   | -   | 3   | 1   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | 1    |  |
|      |  | CO5  | -   | 2   | 2   | -   | -   | 2   | -   | -   | -   | -    | -    | -    | 2    | -    |  |
|      |  | CO6  | -   | -   | 3   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | -    |  |
|      |  | C224 | Com   | CO1 | Compare modern computers with their processing units and also performance measurements of The computer system(12) |     |     |     |     |     |     |      |      |      |      |      |  |
|      |  |      |   | CO2 | Summarize the fundamentals of different addressing modes and instruction sets(L1)                                 |     |     |     |     |     |     |      |      |      |      |      |  |









|      |                   |     |  |     |     |     |     |     |     |     |      |      |      |      |      |      |
|------|-------------------|-----|--|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
|      |                   |     |  |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | PO1 | PO2  | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |      |
|      | CO1               | 1   | 2  | 2   | 2   | 1   | -   | -   | -   | -   | -    | -    | 2    | 2    | 2    |      |
|      | CO2               | 1   | 2  | 2   | 3   | 1   | -   | -   | -   | -   | -    | -    | 2    | 2    | 2    |      |
|      | CO3               | 1   | 3  | 3   | 2   | 1   | -   | -   | -   | -   | -    | -    | 2    | 3    | 3    |      |
|      | CO4               | 1   | 2  | 3   | 2   | 1   | -   | -   | -   | -   | -    | -    | 2    | 2    | 2    |      |
|      | CO5               | 1   | 2  | 2   | 3   | 1   | -   | -   | -   | -   | -    | -    | 2    | 2    | 2    |      |
|      | CO6               | 1   | 2  | 2   | 2   | 1   | -   | -   | -   | -   | -    | -    | 2    | 3    | 3    |      |
|      |                   |     |  |     |     |     |     |     |     |     |      |      |      |      |      |      |
| C317 | Unix and OS Lab   | CO1 | Simulate CPU Scheduling algorithms(FCFS, Round Robin, SJF, Priority) and analyse the performance (L4)              |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO2 | Implement different file and memory management techniques using system calls (L3)                                  |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO3 | Simulate Banker's and other page replacement algorithms and analyse performance (L4)                               |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO4 | Implement basic utilities for navigation in system environment of LINUX operating system(L4)                       |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO5 | Construct chained commands using grep, sed, awk and other data processing utilities that perform desired tasks(L5) |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO6 | Develop basic and advanced shell scripts that support the OS Administration tasks( L5)                             |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   |     | PO1  | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9  | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|      |                   | CO1 | 1  | 1   | 1   | -   | 1   | -   | -   | -   | -    | -    | -    | -    | 1    | 1    |
|      |                   | CO2 | -  | 2   | -   | -   | 1   | -   | -   | -   | -    | -    | -    | -    | 2    | 2    |
|      |                   | CO3 | -  | 3   | 3   | 3   | 2   | -   | -   | -   | 1    | -    | -    | -    | 3    | 2    |
|      |                   | CO4 | 1  | 3   | 3   | 3   | 2   | -   | -   | -   | -    | -    | -    | -    | 3    | 2    |
|      |                   | CO5 | 1  | 3   | 3   | 3   | 2   | -   | -   | -   | -    | -    | -    | -    | 3    | 2    |
|      |                   | CO6 | 2  | 2   | 2   | -   | -   | -   | -   | -   | -    | -    | -    | -    | 2    | 1    |
|      |                   |     |  |     |     |     |     |     |     |     |      |      |      |      |      |      |
| C318 | DBMS Lab          | CO1 | Create database for user (Creation of Database) (L5)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO2 | Develop SQL queries for user defined schemas(L5)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO3 | Build procedures and triggers using PL/ SQL blocks(L5)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO4 | Interpret the usage of predefined objects( L3)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   |     | PO1  | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9  | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|      |                   | CO1 | 2  | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    | -    |
|      |                   | CO2 | 2  | 2   | 3   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    | 2    |
|      |                   | CO3 | 1  | 1   | 3   | -   | 3   | -   | -   | -   | -    | -    | -    | -    | 3    | 3    |
|      | CO4               | 1   | 2  | 3   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 3    | 3    |      |
| 3-2  |                   |     |  |     |     |     |     |     |     |     |      |      |      |      |      |      |
| C321 | Computer Networks | CO1 | Analyze the OSI and TCP/IP reference models and sample networks(L4)  |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO2 | Summarize characteristics of transmission media and classify multiplexing techniques(L2)                           |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO3 | Interpret various error detection and control flow mechanism of data(L2)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO4 | Analyze channel allocation protocols and IEEE standards(L4)  |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO5 | Compute and implement routing algorithms and congestion control algorithms(L3)                                     |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   | CO6 | Interpret the use of TCP, UDP, DNS and E-mail services role in WWW(L2)   |     |     |     |     |     |     |     |      |      |      |      |      |      |
|      |                   |     | PO1  | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9  | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|      |                   | CO1 | 2  | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    | 2    |
|      |                   | CO2 | 2  | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | 2    |      |
|      |                   | CO3 | 3  | 2   | 2   | -   | -   | -   | -   | -   | -    | -    | 2    | -    | -    | 2    |
|      | CO4               | 2   | 2  | 2   | -   | -   | -   | -   | -   | -   | -    | 2    | -    | 2    | 2    |      |
|      | CO5               | -   | -  | 2   | -   | -   | -   | -   | -   | -   | -    | 2    | -    | 2    | 2    |      |
|      | CO6               | -   | -  | 2   | -   | -   | -   | -   | -   | -   | -    | 2    | 2    | 2    | 2    |      |

|      |                                |     |   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|------|--------------------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| C322 | Data Mining                    | CO1 | Summarize the stages in building a Data Warehouse(L2)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO2 | Implement various preprocessing techniques(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO3 | Interpret Similarity and dissimilarity techniques(L2)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO4 | Analyze and evaluate performance of algorithms for Association Rules(L6)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO5 | Analyze Classification and Clustering algorithms(L4)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO6 | Analyze various clustering algorithms ( L4)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|      |                                | CO1 | 2   | --  | --  | -   | 2   | -   | --  | --  | --  | --   | --   | --   | 2    | --   |
|      |                                | CO2 | 3   | 1   | --  | --  | --  | -   | --  | --  | --  | --   | --   | --   | --   | 3    |
|      |                                | CO3 | 2   | --  | 2   | --  | 2   | -   | --  | --  | --  | --   | --   | --   | 2    | --   |
| CO4  | --                             | 3   | 2   | 2   | 3   | -   | --  | --  | --  | --  | --  | --   | 2    | 3    |      |      |
| CO5  | --                             | 3   | 3   | 2   | 3   | -   | --  | --  | --  | --  | --  | --   | 2    | 3    |      |      |
| CO6  | --                             | 3   | 3   | 2   | 3   | -   | --  | --  | --  | --  | --  | --   | 2    | 3    |      |      |
| C323 | Web Technologies               | CO1 | Analyze a web page and identify its elements and attributes(L4)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO2 | Create web pages using JS(L5)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO3 | Build dynamic web pages(L5)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO4 | Build web applications using PHP(L5)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO5 | Create programming through PERL and Ruby(L5)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO6 | Develop simple client(L5)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|      |                                | CO1 | 1   | 2   | 2   | 2   | 2   | -   | -   | -   | -   | -    | -    | 2    | 2    | 2    |
|      |                                | CO2 | 1   | 2   | 2   | 3   | 2   | -   | -   | -   | -   | -    | -    | 2    | 2    | 2    |
|      |                                | CO3 | 1   | 3   | 3   | 2   | 1   | -   | -   | -   | -   | -    | -    | 2    | 3    | 3    |
| CO4  | 1                              | 2   | 3   | 2   | 2   | -   | -   | -   | -   | -   | -   | 2    | 2    | 2    |      |      |
| CO5  | 1                              | 2   | 2   | 3   | 2   | -   | -   | -   | -   | -   | -   | 2    | 2    | 2    |      |      |
| CO6  | 1                              | 2   | 2   | 2   | 3   | -   | -   | -   | -   | -   | -   | 2    | 3    | 3    |      |      |
| C324 | Software Testing Methodologies | CO1 | Relate the methodologies used in Software Test Process (L1)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO2 | Apply the existing test tools to support test automation(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO3 | Identify various software testing problems, and solve them by designing and selecting software test models, criteria, strategies, and methods(L3)       |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO4 | Implement various Communication methods and skills to communicate with their teammates to conduct their Practice-oriented software testing projects(L3) |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO5 | Summarize contemporary software testing trends, such as Component based testing(L1)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO6 | Apply Software testing knowledge and engineering methods to modern tools for testing project.(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|      |                                | CO1 | 2   | 1   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | -    |
|      |                                | CO2 | -   | 2   | 2   | -   | 3   | -   | -   | -   | -   | -    | -    | -    | 2    | -    |
|      |                                | CO3 | 1   | 2   | 2   | -   | 2   | -   | -   | -   | -   | -    | -    | -    | 2    | -    |
| CO4  | 1                              | 2   | 2   | -   | 2   | -   | -   | -   | -   | -   | -   | -    | 2    | -    |      |      |
| CO5  | 1                              | 2   | 2   | -   | 3   | -   | -   | -   | -   | -   | -   | -    | 2    | -    |      |      |
| CO6  | -                              | -   | 2   | -   | 3   | -   | -   | -   | -   | -   | -   | -    | 2    | 2    |      |      |
| C325 | OE-                            | CO1 | Summarize syntactic abilities of traditional AI language and implement routines(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO2 | Apply various heuristic search techniques and to improve designing and playing a game(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |                                | CO3 | Apply propositional calculus, proportional and predicate logic to understand few systems such as natural  |     |     |     |     |     |     |     |     |      |      |      |      |      |



|             |  |     |  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|-------------|--|-----|--|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|             |  | CO4 | -  | 3   | 1   | 1   | -   | 3   | -   | -   | -   | -    | -    | -    | 3    |      |
| <b>4-1</b>  |  |     |  |     |     |     |     |     |     |     |     |      |      |      |      |      |
| <b>C411</b> | <b>Cryptography &amp; N/w Security</b> | CO1 | Summarize various security threats, services and solve modular and linear congruence equations(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  | CO2 | Distinguish stream ciphers, block ciphers and Algebraic Structures(L2)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  | CO3 | Apply number theory in public key cryptographic algorithms(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  | CO4 | Implement Hash Algorithms and Digital Signatures for Online Authentication(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  | CO5 | Analyze various mail security protocols and e-commerce transaction protocols(14)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  | CO6 | Implement various password protection mechanisms and tuning firewall to protect the system(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  |     | PO1  | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |  | CO1 | 2  | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | 2    |
|             |  | CO2 | 2  | -   | -   | 2   | 2   | -   | -   | -   | -   | -    | 2    | -    | 2    | -    |
|             |  | CO3 | 3  | -   | 2   | 2   | -   | -   | -   | -   | -   | -    | 2    | -    | 2    | -    |
| CO4         | -                                      | -   | 2  | 2   | -   | -   | -   | -   | -   | -   | -   | -    | 2    | -    |      |      |
| CO5         | -                                      | -   | 2  | 2   | -   | -   | -   | -   | -   | -   | 2   | -    | 2    | -    |      |      |
| CO6         | -                                      | -   | -  | -   | -   | -   | -   | -   | -   | -   | 2   | 2    | 2    | 2    |      |      |
| <b>4-2</b>  |  |     |  |     |     |     |     |     |     |     |     |      |      |      |      |      |
| <b>C412</b> | <b>Mobile Computing</b>                | CO1 | Interpret various mobile communication and computing terminologies, paradigms and architectures(L2)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  | CO2 | Analyze problems in wireless MAC and infer different multiplexing techniques(L4)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  | CO3 | Interpret the working of mobile network layer, based on Mobile IP(L2)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  | CO4 | Analyze the working of conventional TCP/IP and infer different protocols for mobile transport layer(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  | CO5 | Analyze data synchronization, data hoarding issues and resolving techniques as part of mobile communication with various client server computing architectures(L4) |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  | CO6 | Interpret the working of manets and technologies in mobile computing environment.(L2)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  |     | PO1  | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |  | CO1 | 2  | -   | 1   | -   | -   | -   | -   | -   | -   | -    | -    | 1    | -    | 2    |
|             |  | CO2 | 3  | 2   | 1   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | 1    |
|             |  | CO3 | 3  | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | 1    |
| CO4         | 3                                      | 2   | 1  | -   | -   | -   | -   | -   | -   | -   | -   | -    | 2    | 1    |      |      |
| CO5         | 3                                      | 2   | -  | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    |      |      |
| CO6         | 2                                      | 1   | 1  | -   | -   | -   | -   | -   | -   | -   | -   | 2    | 2    | 3    |      |      |
| <b>4-3</b>  |  |     |  |     |     |     |     |     |     |     |     |      |      |      |      |      |
| <b>C413</b> | <b>DWBI</b>                            | CO1 | Distinguish traditional databases over the Data Warehouse(L4)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  | CO2 | Apply Preprocessing Techniques before Data Mining(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  | CO3 | Summarize the techniques in Data Warehouse : Architecture & Implementation(L2)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  | CO4 | Implement different approaches of Classification(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  | CO5 | Implement various approaches for Association Analysis (L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  | CO6 | Implement various approaches for Cluster Analysis(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  |     | PO1  | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |  | CO1 | 2  | -   | -   | 1   | -   | 2   | -   | 3   | -   | -    | -    | -    | 1    | -    |
|             |  | CO2 | 3  | 1   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | 3    |
|             |  | CO3 | 2  | -   | 1   | -   | -   | 2   | -   | -   | -   | -    | -    | -    | 1    | -    |
| CO4         | -                                      | 3   | 1  | 1   | -   | 3   | -   | -   | -   | -   | -   | -    | -    | 3    |      |      |
| CO5         | -                                      | 3   | 1  | 1   | -   | 3   | -   | -   | -   | -   | -   | -    | -    | 3    |      |      |
| CO6         | -                                      | 3   | 1  | 1   | -   | 3   | -   | -   | -   | -   | -   | -    | -    | 3    |      |      |
| <b>4-4</b>  |  |     |  |     |     |     |     |     |     |     |     |      |      |      |      |      |
| <b>C414</b> | <b>MEF</b>                             | CO1 | Summarize basics of Managerial Economics and concepts of demand(L2)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |  | CO2 | Perform breakeven analysis to determine breakeven point by applying the concepts of production & cost(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |

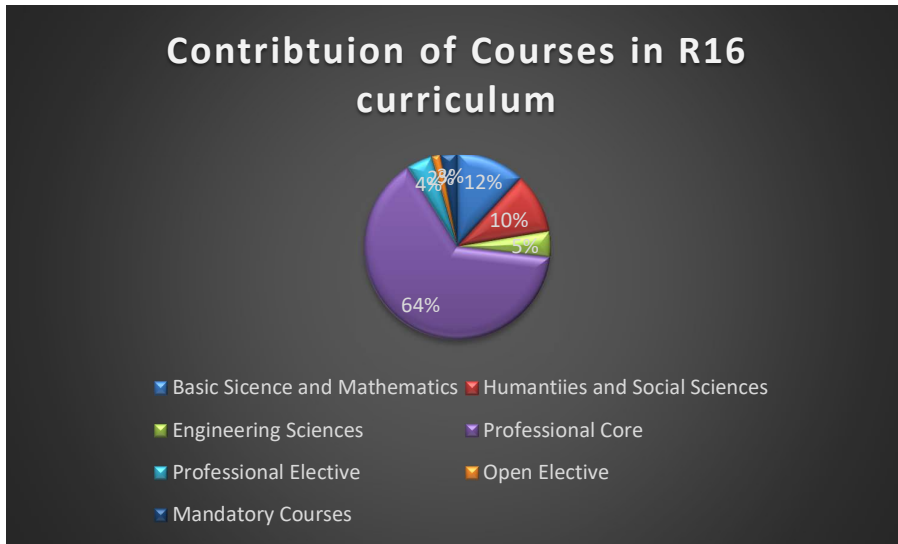
|             |                                |     |  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|-------------|--------------------------------|-----|--|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|             |                                | CO3 | Analyze different market structures to determine pricing (L5)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                | CO4 | Evaluate different forms of business organization(L5)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                | CO5 | Apply accounting principles to know the financial position of the business organization(L3)                                    |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                | CO6 | Anlyze project worth by applying Capital budgeting method(L4)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                |     | PO1  | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                                | CO1 | -  | -   | -   | -   | -   | -   | -   | -   | -   | -    | 2    | 2    | 3    | 2    |
|             |                                | CO2 | -  | 2   | -   | -   | -   | -   | -   | -   | -   | -    | 2    | 2    | 3    | 3    |
|             |                                | CO3 | -  | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 2    | 3    | 2    |
|             |                                | CO4 | -  | -   | -   | -   | -   | 3   | -   | -   | -   | -    | 2    | 2    | 3    | 3    |
|             |                                | CO5 | -  | -   | 2   | 2   | -   | -   | -   | -   | -   | -    | 2    | 2    | 3    | 2    |
| CO6         | -                              | -   | -  | 2   | 2   | -   | -   | -   | -   | -   | 3   | 2    | 3    | 3    |      |      |
| <b>C415</b> | <b>Big Data Analysis (BDA)</b> | CO1 | Apply Java concepts required for developing map reduce programs(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                | CO2 | Derive business benefits from structured and unstructured data(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                | CO3 | Implement data summarization, query, and analysis(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                | CO4 | Apply data modeling techniques to large data sets(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                | CO5 | Create applications for Big Data analytics(L5)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                | CO6 | Build a complete business data analytic solution(L5)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                |     | PO1  | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                                | CO1 | 1  | 1   | -   | -   | 1   | -   | -   | -   | -   | -    | -    | -    | 1    | -    |
|             |                                | CO2 | 1  | 2   | 1   | -   | 2   | -   | -   | -   | -   | -    | -    | -    | -    | -    |
|             |                                | CO3 | 1  | 2   | 2   | -   | 2   | -   | -   | -   | -   | -    | -    | -    | 1    | 1    |
| CO4         | 1                              | 1   | 1  | -   | 2   | -   | -   | -   | -   | -   | -   | -    | 1    | -    |      |      |
| CO5         | 1                              | 1   | -  | -   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | 1    |      |      |
| CO6         | 1                              | 2   | 1  | -   | -   | -   | -   | -   | -   | -   | 1   | -    | 1    | 1    |      |      |
| <b>C416</b> | <b>Mobile Computing Lab</b>    | CO1 | Implement software setup for creating mobile applications using Java2 Mobile Edition Software on the host Operating System(L3) |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                | CO2 | Develop new mobile applications in wireless application development environment(L5)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                | CO3 | Analyze the software setup for creating mobile application using Android Software Development Kit using Android Studio IDE(L3) |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                | CO4 | Construct a story board design for the mobile applications (L5)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                | CO5 | Implement MVC architecture in Mobile Applications(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                | CO6 | Creating Mobile Applications that are deployable on real time internet(L5)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                |     | PO1  | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                                | CO1 | 2  | 2   | 1   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 1    | 2    |
|             |                                | CO2 | -  | 1   | -   | 3   | -   | -   | -   | -   | -   | -    | -    | -    | 1    | 3    |
|             |                                | CO3 | 2  | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | -    |
| CO4         | 1                              | -   | 2  | 2   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 2    |      |      |
| CO5         | -                              | 3   | 1  | -   | -   | -   | -   | -   | -   | -   | -   | -    | 2    | -    |      |      |
| CO6         | 2                              | 1   | 2  | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 3    |      |      |
| <b>C417</b> | <b>C&amp;NS Lab</b>            | CO1 | Implement security threats, hijacking methods and cryptic algorithms(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                | CO2 | Design stream ciphers and block ciphers and custom-specific algorithm(L5)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                | CO3 | Implement number theory and public key cryptographic algorithms.(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                | CO4 | Implement Hash Algorithms and digital signatures for online authentication(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                |     | PO1  | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                                | CO1 | 3  | 2   | 2   |     |     |     |     |     |     |      |      |      |      | 2    |
| CO2         | 3                              |     |  | 2   | 2   |     |     |     |     |     | 2   |      | 2    |      |      |      |

|             |                                       |     |   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|-------------|---------------------------------------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|             |                                       | CO3 | 3   |     |     | 2   |     |     |     |     |     | 2    |      |      | 2    |      |
|             |                                       | CO4 |   |     | 2   | 2   |     |     |     |     |     |      |      | 2    | 2    |      |
| <b>4-2</b>  |                                       |     |   |     |     |     |     |     |     |     |     |      |      |      |      |      |
| <b>C421</b> | <b>Distributed Systems</b>            | CO1 | Recognize the properties of distributed systems(L2)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO2 | Summarize salient architectural features of such systems(L2)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO3 | Analyze inter-process communication in a distributed environment(L5)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO4 | Design and implement standard protocols which are used in distributed systems(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO5 | Investigate various architectures designed for multithreaded servers(L4)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO6 | Implement the typical algorithms used in distributed systems(L5)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                                       | CO1 | 1   | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | 2    |
|             |                                       | CO2 | 1   | -   |     | -   | -   | -   | -   | -   | -   | -    | -    | -    | 2    | -    |
|             |                                       | CO3 | 1   | 2   | 2   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | 2    |
| CO4         | 1                                     | 2   | 2   | -   | 2   | -   | -   | -   | -   | -   | -   | -    | 2    | 1    |      |      |
| CO5         | -                                     | -   | 2   | -   | -   | -   | -   | -   | -   | -   | -   | -    | 2    | 2    |      |      |
| CO6         | -                                     | -   | 2   | -   | -   | -   | -   | -   | -   | -   | -   | -    | 2    | 2    |      |      |
| <b>C422</b> | <b>Management Systems</b>             | CO1 | Summarize basics of management and organization(L2)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO2 | Exemplify principles of management and apply the concepts of work study and SQC to improve Productivity(L3)                             |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO3 | Analyze the functions of HRM and marketing(L4)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO4 | Applying PERT & CPM techniques to solve project management problems(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO5 | Evaluate SWOT Analysis for formulating and implementing strategies(L5)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO6 | Analyze modern or contemporary management practices(L4)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                                       | CO1 | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 2    | 2    | 2    | -    | 2    |
|             |                                       | CO2 | -   | -   | -   | -   | -   | -   | -   | -   | -   | 2    | 2    | 2    | -    | 2    |
|             |                                       | CO3 | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 3    | 2    | 2    | -    | 2    |
| CO4         | -                                     | -   | 2   | -   | -   | -   | -   | -   | -   | 2   | 3   | 2    | -    | 2    |      |      |
| CO5         | -                                     | -   | -   | -   | -   | -   | -   | -   | -   | 2   | 2   | 2    | -    | 2    |      |      |
| CO6         | -                                     | -   | -   | -   | 2   | -   | -   | -   | -   | 2   | 2   | 2    | -    | 2    |      |      |
| <b>C423</b> | <b>Management Information Systems</b> | CO1 | Summarize effective planning and control functions of the management(L2)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO2 | Understand various knowledge representation methods, expert systems to make business more competitive(L3)                               |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO3 | Summarize the inferences and uncertainty in managing the Information System(L2)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO4 | Implement MIS for controlling costs by giving information about idle time, labor turnover, wastages and losses and surplus capacity(L3) |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO5 | Apply MIS tools for effective management(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO6 | Evaluating performance of Managements by computing factual utilization of budget(L5)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|             |                                       | CO1 | -   | -   | -   | 1   | -   | -   | -   | -   | -   | -    | 2    | -    | 2    | 2    |
|             |                                       | CO2 | 2   | -   | -   | 2   | -   | 3   | 3   | -   | -   | -    | 2    | -    | -    | 1    |
|             |                                       | CO3 | -   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | 1    | 2    |
| CO4         | -                                     | -   | -   | 2   | -   | -   | -   | 3   | -   | -   | -   | -    | 2    | 1    |      |      |
| CO5         | -                                     | -   | -   | -   | 3   | -   | -   | -   | -   | -   | 3   | -    | -    | 3    |      |      |
| CO6         | -                                     | -   | 2   | -   |     | -   | -   | -   | -   | -   |     | -    | 1    | 1    |      |      |
| <b>C424</b> | <b>Electi</b>                         | CO1 | Summarize principles and laws of Cyber Security (L2)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO2 | Categorize various cyber offenses and predict their ill-effects(L2)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|             |                                       | CO3 | Predict Cyber Crimes w.r.t mobile devices and wireless networks (L2)  |     |     |     |     |     |     |     |     |      |      |      |      |      |

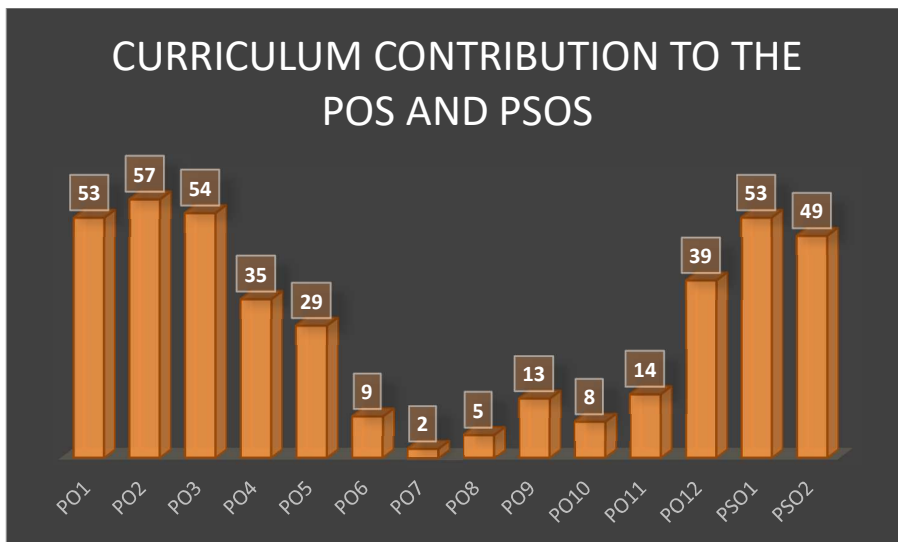
|      |         |     |   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|------|---------|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|      |         | CO4 | Apply various tools to detect the attacks (L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |         | CO5 | Identify Indian acts of cyber security(L1)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |         | CO6 | Interpret cyber forensics(L3)   |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |         |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|      |         | CO1 | -   | -   | -   | -   | -   | -   | -   | 2   | -   | -    | 2    | -    | -    | 2    |
|      |         | CO2 | -   | -   | -   | -   | -   | -   | -   | 2   | -   | -    | 2    | -    | 2    | -    |
|      |         | CO3 | -   | -   | -   | -   | -   | -   | -   | 2   | -   | -    | 2    | -    | -    | 2    |
|      |         | CO4 | -   | -   | -   | -   | 3   | -   | -   | 2   | -   | -    | 2    | 2    | -    | 2    |
| CO5  | -       | -   | -   | -   | -   | -   | -   | 2   | -   | -   | 2   | -    | 2    | 2    |      |      |
| CO6  | -       | -   | -   | -   | -   | -   | -   | 2   | -   | -   | 2   | 2    | 2    | 2    |      |      |
|      |         |     |   |     |     |     |     |     |     |     |     |      |      |      |      |      |
| C425 | Seminar | CO1 | Research for desired information from online/off-line resources (L1)                                      |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |         | CO2 | Compose the information collected, by employing various techniques of academic writing(L5)                |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |         | CO3 | Express the issue in public/professional contexts to gain experience in formal/ informal presentation(L2) |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |         | CO4 | Collaborate with others by role playing in reading, writing, speaking, researching skills(L5)             |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |         |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|      |         | CO1 | 1   | 2   | -   | 3   | -   | -   | -   | -   | -   | -    | -    | 3    | 2    | 2    |
|      |         | CO2 | -   | -   | -   | -   | -   | -   | -   | 2   | 3   | 3    | -    | 2    | -    | -    |
|      |         | CO3 | 3   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | 2    | 3    | -    |
| CO4  | 2       | -   | -   | 2   | 2   | -   | -   | -   | -   | 2   | -   | 3    | 2    | -    |      |      |
|      |         |     |   |     |     |     |     |     |     |     |     |      |      |      |      |      |
| C426 | Project | CO1 | Collaborate with team members in analyzing the requirements of the project to be developed(L5)            |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |         | CO2 | Build necessary design specifications and documents for the chosen project(L5)                            |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |         | CO3 | Develop apt domain and technical knowledge to implement/code the application(L3)                          |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |         | CO4 | Test and deploy the project after implementation(L4)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |         | CO5 | Demonstrate the project comprehensively with necessary tools(L3)  |     |     |     |     |     |     |     |     |      |      |      |      |      |
|      |         |     | PO1   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|      |         | CO1 | 3   | 3   | 2   | 3   | 3   | 1   | 1   | 1   | 3   | 2    | 2    | 2    | 3    | -    |
|      |         | CO2 | 1   | 3   | 3   | 2   | 2   | -   | 1   | -   | -   | 3    | 3    | 3    | 3    | 2    |
| CO3  | 1       | 3   | 2   | 2   | -   | -   | -   | -   | 2   | 3   | 1   | 1    | 2    | 3    |      |      |
| CO4  | -       | 3   | 3   | 2   | 1   | 1   | 1   | -   | 1   | 1   | 2   | -    | 2    | 2    |      |      |
| CO5  | -       | 2   | 1   | 2   | 1   | 1   | 1   | -   | -   | 2   | 2   | -    | 3    | 1    |      |      |



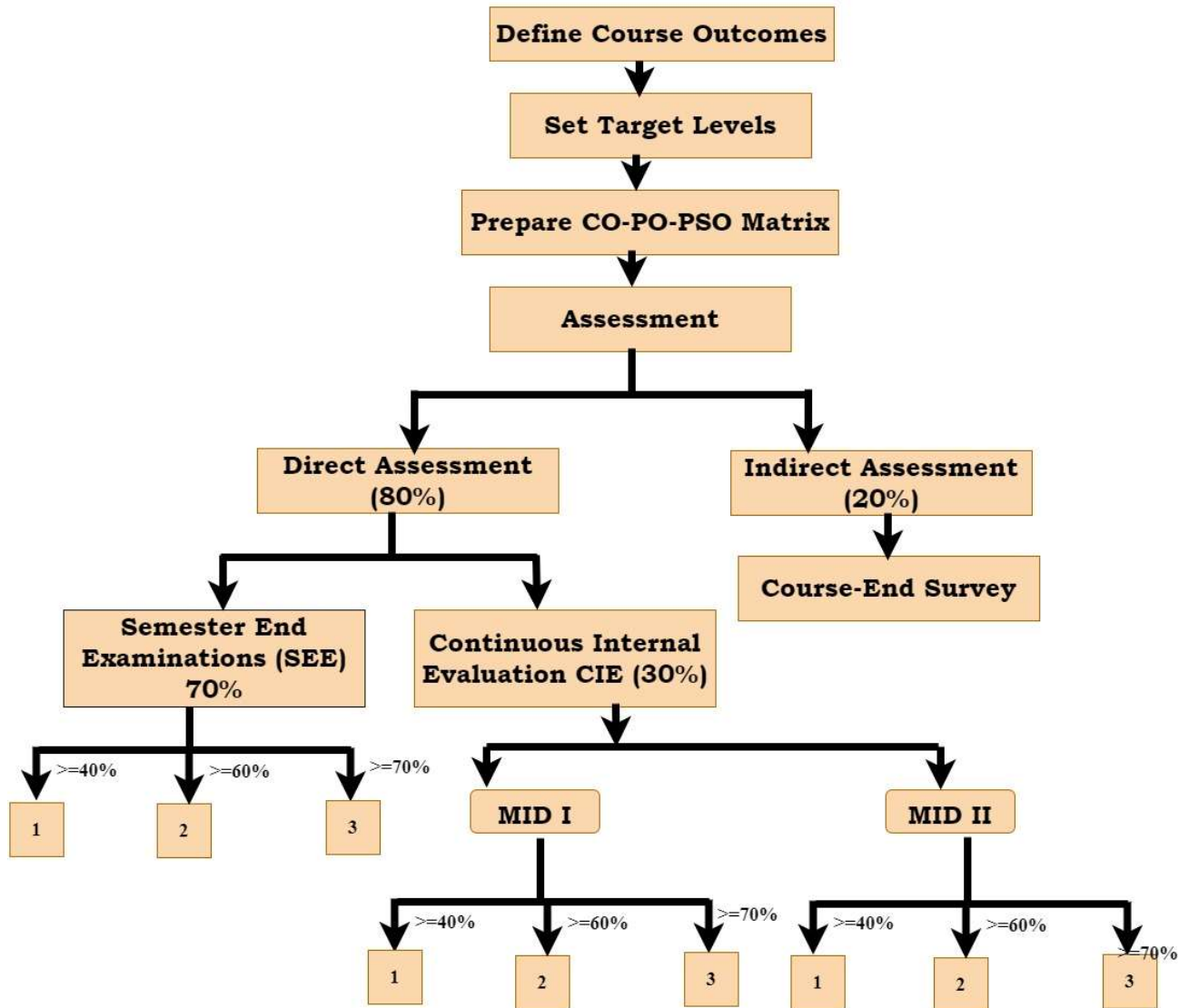
## 10. COURSE OUTCOME STATEMENTS



### Curriculum Contribution to the POs and PSOs



## 11. PROCEDURE FOR ASSESSMENT OF COUSE OUTCOMES



Attainment Level 3: 70% students scoring more than Class average marks in the internal and external examinations.

Attainment Level 2: 60% students scoring more than Class average marks in the internal and external examinations.

Attainment Level 1: 40% students scoring more than Class average marks in both internal or external examinations.

## 12. CO RUBRICS

| <b>DIRECT and INDIRECT ASSESSMENT TOOLS</b> |  |                                 |                         |   |
|---|--|---------------------------------|-------------------------|---|
| <b>CourseType</b>                           | <b>Assessment Type</b>                               | <b>AssessmentTools</b>          | <b>MinimumFrequency</b> | <b>Marks</b>  |
| <b>Theory</b>                               | Continuous Internal Evaluation (CIE)<br>30M          | Mid Examinations (Descriptive)  | Two per Course          | 15 (80% from the best mid and 20% from the other mid) |
|   |  | Assignments                     | Two per Course          | 5(80% from the best mid and 20% from the other mid)   |
|   |  | Online Quizzes                  | Two per Course          | 10(80% from the best mid and 20% from the other mid)  |
|   | Semester End Exams(SEE) 70M                          | Semester End Exams (University) | Once perCourse          | 70  |
| <b>Practical</b>                            | Continuous Internal Evaluation (25)                  | Day to Day Evaluation           | Everylabsession         | 10  |
|   |  | Internal Lab                    | OnceperCourse           | 15  |
|   | Semester End Exams (SEE) 50M                         | Semester End Exams (SEE)        | Once perCourse          | 50  |
| <b>Seminar</b>                              | Internal Evaluation                                  | Presentation                    | OnceperCourse           | 50  |
| <b>Project</b>                              | Continuous Internal Evaluation (50)                  | ZerothReview                    | Once per Project        | 5   |
|   |  | First Review                    |                         | 10  |
|   |  | Second Review                   |                         | 10  |
|   |  | Third Review                    |                         | 10  |
|   |  | Fourth Review                   |                         | 10  |
|   |  | Mock Viva Voce                  |                         | 5   |
|   | Semester End Exam (External appointed by University) | Viva -Voce                      | Once per Project        | 200   |



| <b>MID-I</b>                                  |                |               |               |               |               |               |
|---|----------------|---------------|---------------|---------------|---------------|---------------|
| <b>Details</b>                                | <b>Q1a (5)</b> | <b>Q1b(5)</b> | <b>Q2a(5)</b> | <b>Q2b(5)</b> | <b>Q3a(5)</b> | <b>Q3b(5)</b> |
| No of Students Registered                     | 57             | 57            | 57            | 57            | 57            | 57            |
| No of Students Attained >=class average mark  | 51             | 49            | 54            | 49            | 51            | 43            |
| %of students who got marks >= Class Avg marks | 89.47368       | 85.9649       | 94.7368       | 85.9649       | 89.4737       | 75.439        |
| Attainment Level                              | 3              | 3             | 3             | 3             | 3             | 3             |

| <b>MID II</b>                                 |               |               |               |               |               |               |
|---|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>Details</b>                                | <b>Q4a(7)</b> | <b>Q4b(3)</b> | <b>Q5a(8)</b> | <b>Q5b(2)</b> | <b>Q6a(8)</b> | <b>Q6b(2)</b> |
| No of Students Registered                     | 57            | 57            | 57            |               | 57            | 57            |
| No of Students Attained >=class average mark  | 23            | 0             | 41            |               | 39            | 57            |
| %of students who got marks >= Class Avg marks | 40.35088      | 0             | 71.9298       |               | 68.4211       | 100           |
| Attainment Level                              | 0             | 0             | 3             | 0             | 2             | 3             |

| <b>ASSIGNMENTS</b>                            |           |           |
|---|-----------|-----------|
| <b>Details</b>                                | <b>A1</b> | <b>A2</b> |
| No of Students Registered                     | 57        | 57        |
| No of Students Attained >=class average mark  | 57        | 0         |
| %of students who got marks >= Class Avg marks | 100       | 0         |
| Attainment Level                              | 3         | 0         |

| <b>ONLINE QUIZZES</b>                         |           |           |
|---|-----------|-----------|
| <b>Details</b>                                | <b>Q1</b> | <b>Q2</b> |
| No of Students Registered                     | 57        | 57        |
| No of Students Attained >=class average mark  | 46        | 41        |
| %of students who got marks >= Class Avg marks | 80.7018   | 71.93     |
| Attainment Level                              | 3         | 3         |



|                            |       |       |       |       |       |       |
|----------------------------|-------|-------|-------|-------|-------|-------|
| C113                       | 2.12  | 2.12  | 2.12  | 2.12  | 2.12  | 2.12  |
| C114                       | 1.85  | 1.85  | 1.85  | 1.85  | 1.85  | 1.85  |
| C115                       | 2.57  | 2.57  | 2.57  | 2.57  | 2.57  | 2.57  |
| C116                       | 1.15  | 1.15  | 1.15  | 1.15  | 1.15  | 1.15  |
| C117                       | 3     | 3     | 3     | -     | -     | -     |
| C118                       | 2.25  | 2.25  | 2.25  | 2.25  | 2.25  | 2.25  |
| C119                       | 2.58  | 2.58  | 2.58  | 2.58  | 2.58  | 2.58  |
| C11A                       | 2.438 | 2.438 | 2.438 | 2.438 | 2.438 | 2.438 |
| <b>I B.TECH - II SEM</b>   |       |       |       |       |       |       |
| C121                       | 2.7   | 2.7   | 2.7   | 2.7   | 2.7   | 2.7   |
| C122                       | 2.21  | 2.21  | 2.21  | 2.21  | 2.21  | 2.21  |
| C123                       | 1.375 | 1.375 | 1.375 | 1.375 | 1.375 | 1.375 |
| C124                       | 1.9   | 1.9   | 1.9   | 1.9   | 1.9   | 1.9   |
| C125                       | 2.325 | 2.325 | 2.325 | 2.325 | 2.325 | 2.325 |
| C126                       | 1.75  | 1.75  | 1.75  | 1.75  | 1.75  | 1.75  |
| C127                       | 3     | 3     | 3     | -     | -     | -     |
| C128                       | 2.85  | 2.85  | 2.85  | 2.85  | 2.85  | -     |
| C129                       | 3     | 3     | 3     | -     | -     | -     |
| <b>II B.TECH - I SEM</b>   |       |       |       |       |       |       |
| C211                       | 2.42  | 2.42  | 2.42  | 2.42  | 2.42  | 2.42  |
| C212                       | 1.82  | 1.82  | 1.82  | 1.82  | 1.82  | 1.82  |
| C213                       | 2.42  | 2.42  | 2.42  | 2.42  | 2.42  | 2.42  |
| C214                       | 2.31  | 2.31  | 2.31  | 2.31  | 2.31  | 2.31  |
| C215                       | 1.95  | 1.95  | 1.95  | 1.95  | 1.95  | 1.95  |
| C216                       | 2.11  | 2.11  | 2.11  | 2.11  | 2.11  | 2.11  |
| C217                       | 3     | 3     | 3     | 3     | 3     | 3     |
| C218                       | 3     | 3     | 3     | 3     | 3     | 3     |
| <b>II B.TECH - II SEM</b>  |       |       |       |       |       |       |
| C221                       | 2.09  | 2.09  | 2.09  | 2.09  | 2.09  | 2.09  |
| C222                       | 2.07  | 2.07  | 2.07  | 2.07  | 2.07  | 2.07  |
| C223                       | 2.28  | 2.28  | 2.28  | 2.28  | 2.28  | 2.28  |
| C224                       | 1.82  | 1.82  | 1.82  | 1.82  | 1.82  | 1.82  |
| C225                       | 2.16  | 2.16  | 2.16  | 2.16  | 2.16  | 2.16  |
| C226                       | 2.18  | 2.18  | 2.18  | 2.18  | 2.18  | 2.18  |
| C227                       | 3     | 3     | 3     | 3     | 3     | -     |
| C228                       | 2.846 | 2.846 | 2.846 | 2.846 | 2.846 | 2.846 |
| <b>III B.TECH - I SEM</b>  |       |       |       |       |       |       |
| C311                       | 2.44  | 2.44  | 2.44  | 2.44  | 2.44  | 2.44  |
| C312                       | 2.4   | 2.4   | 2.4   | 2.4   | 2.4   | 2.4   |
| C313                       | 2.11  | 2.11  | 2.11  | 2.11  | 2.11  | 2.11  |
| C314                       | 2.39  | 2.39  | 2.39  | 2.39  | 2.39  | 2.39  |
| C315                       | 2.4   | 2.4   | 2.4   | 2.4   | 2.4   | 2.4   |
| C316                       | 3     | 3     | 3     | 3     | 3     | 3     |
| C317                       | 3     | 3     | 3     | 3     | 3     | 3     |
| C318                       | 2.934 | 2.934 | 2.934 | 2.934 | -     | -     |
| C319                       | 2.9   | 2.9   | 2.9   | 2.9   | 2.9   | 2.9   |
| <b>III B.TECH - II SEM</b> |       |       |       |       |       |       |



|                           |       |       |       |       |       |       |
|---------------------------|-------|-------|-------|-------|-------|-------|
| C321                      | 2.42  | 2.42  | 2.42  | 2.42  | 2.42  | 2.42  |
| C322                      | 2.25  | 2.25  | 2.25  | 2.25  | 2.25  | 2.25  |
| C323                      | 2.42  | 2.42  | 2.42  | 2.42  | 2.42  | 2.42  |
| C324                      | 2.3   | 2.3   | 2.3   | 2.3   | 2.3   | 2.3   |
| C325                      | 2.67  | 2.67  | 2.67  | 2.67  | 2.67  | 2.67  |
| C326                      | 2.802 | 2.802 | 2.802 | 2.802 | 2.802 | 2.802 |
| C327                      | 2.934 | 2.934 | 2.934 | 2.934 | 2.934 | 2.934 |
| C328                      | 2.702 | 2.702 | 2.873 | 2.72  | -     | -     |
| C329                      | 2.9   | 2.9   | 2.9   | 2.9   | 2.9   | 2.9   |
| <b>IV B.TECH - I SEM</b>  |       |       |       |       |       |       |
| C411                      | 2.25  | 2.25  | 2.25  | 2.25  | 2.25  | 2.25  |
| C412                      | 2.14  | 2.14  | 2.14  | 2.14  | 2.14  | 2.14  |
| C413                      | 2.42  | 2.42  | 2.42  | 2.42  | 2.42  | 2.42  |
| C414                      | 2.46  | 2.46  | 2.46  | 2.46  | 2.46  | 2.46  |
| C415                      | 2.19  | 2.19  | 2.19  | 2.19  | 2.19  | 2.19  |
| C416                      | 2.96  | 2.96  | 2.96  | 2.96  | 2.96  | 2.96  |
| C417                      | 3     | 3     | 3     | 3     | -     | -     |
| C418                      | 3     | 3     | 3     | 3     | 3     | 3     |
| <b>IV B.TECH - II SEM</b> |       |       |       |       |       |       |
| C421                      | 2.42  | 2.42  | 2.42  | 2.42  | 2.42  | 2.42  |
| C422                      | 2.3   | 2.3   | 2.3   | 2.3   | 2.3   | 2.3   |
| C423                      | 2.76  | 2.76  | 2.76  | 2.76  | 2.76  | 2.76  |
| C424                      | 2.18  | 2.18  | 2.18  | 2.18  | 2.18  | 2.18  |
| C425                      | 3     | 3     | 3     | 3     | -     | -     |
| C426                      | 3     | 3     | 3     | 3     | 3     | -     |

### 15. CO ATTAINMENT-INDIRECT (FOR ALL COURSES)

#### ii. CO InDirect Attainment for all the courses - 2016 Admitted Batch

| COURSE                  | CO1  | CO2  | CO3  | CO4  | CO5  | CO6  |
|-------------------------|------|------|------|------|------|------|
| <b>I B.TECH - I SEM</b> |      |      |      |      |      |      |
| C111                    | 2.78 | 2.72 | 2.78 | 2.74 | 2.76 | -    |
| C112                    | 2.60 | 2.64 | 2.78 | 2.71 | 2.76 | 2.56 |
| C113                    | 2.79 | 2.74 | 2.81 | 2.74 | 2.78 | 2.76 |
| C114                    | 2.78 | 2.45 | 2.68 | 2.77 | 2.76 | 2.81 |
| C115                    | 2.81 | 2.54 | 2.82 | 2.84 | 2.4  | 2.23 |
| C116                    | 2.57 | 2.66 | 2.74 | 2.64 | 2.62 | 2.57 |
| C117                    | 3    | 3    | 2.76 | -    | -    | -    |



|                            |      |      |      |      |      |      |
|----------------------------|------|------|------|------|------|------|
| <b>C118</b>                | 2.58 | 2.59 | 2.61 | 2.61 | 2.84 | 2.68 |
| <b>C119</b>                | 2.58 | 2.59 | 2.61 | 2.57 | 2.66 | 2.76 |
| <b>C11A</b>                | 2.19 | 2.1  | 1.88 | 2.15 | 2.15 | 2.23 |
| <b>I B.TECH - II SEM</b>   |      |      |      |      |      |      |
| <b>C121</b>                | 2.78 | 2.72 | 2.78 | 2.74 | 2.76 | 2.78 |
| <b>C122</b>                | 2.79 | 2.74 | 2.79 | 2.76 | 2.76 | 2.79 |
| <b>C123</b>                | 2.78 | 2.72 | 2.78 | 2.74 | 2.76 | 2.78 |
| <b>C124</b>                | 2.81 | 2.54 | 2.82 | 2.84 | 1.96 | 1.81 |
| <b>C125</b>                | 2.78 | 2.72 | 2.78 | 2.74 | 2.76 | 2.78 |
| <b>C126</b>                | 2.88 | 2.84 | 2.89 | 2.90 | 2.90 | 2.86 |
| <b>C127</b>                | 3    | 3    | 3    | -    | -    | -    |
| <b>C128</b>                | 3    | 3    | 3    | 3    | 3    | -    |
| <b>C129</b>                | 2.11 | 1.93 | 1.91 | -    | -    | -    |
| <b>II B.TECH - I SEM</b>   |      |      |      |      |      |      |
| <b>C211</b>                | 2.06 | 1.99 | 2    | 1.97 | 1.93 | 1.79 |
| <b>C212</b>                | 2.15 | 2.35 | 2.75 | 2.86 | 2.4  | 2.79 |
| <b>C213</b>                | 2.81 | 2.54 | 2.82 | 2.84 | 1.96 | 1.81 |
| <b>C214</b>                | 2.71 | 2.74 | 2.72 | 2.84 | 1.86 | 2.81 |
| <b>C215</b>                | 2.06 | 1.93 | 1.91 | 1.86 | 1.84 | 1.8  |
| <b>C216</b>                | 2.25 | 2.13 | 2.18 | 2.39 | 2.27 | 2.36 |
| <b>C217</b>                | 2.56 | 2.5  | 2.74 | 2.37 | 2.54 | 2.58 |
| <b>C218</b>                | 2.11 | 1.93 | 1.91 | 1.86 | 1.84 | 1.8  |
| <b>II B.TECH - II SEM</b>  |      |      |      |      |      |      |
| <b>C221</b>                | 2.07 | 2.09 | 2.01 | 3.09 | 2.03 | 2.8  |
| <b>C222</b>                | 2.34 | 2.22 | 2.2  | 2.43 | 2.27 | 2.41 |
| <b>C223</b>                | 2.81 | 2.54 | 2.82 | 2.84 | 1.96 | 1.81 |
| <b>C224</b>                | 2.81 | 2.54 | 2.82 | 2.84 | 1.96 | 1.81 |
| <b>C225</b>                | 2.23 | 2.13 | 2.16 | 2.39 | 2.27 | 2.36 |
| <b>C226</b>                | 2.27 | 2.09 | 2.2  | 2.41 | 2.27 | 2.35 |
| <b>C227</b>                | 2.23 | 2.3  | 2.2  | 2.25 | 2.36 | -    |
| <b>C228</b>                | 2.56 | 2.5  | 2.74 | 2.37 | 2.54 | 2.58 |
| <b>III B.TECH - I SEM</b>  |      |      |      |      |      |      |
| <b>C311</b>                | 2.06 | 2.04 | 2    | 1.97 | 2.09 | 2.2  |
| <b>C312</b>                | 2.12 | 2.03 | 2.2  | 2.04 | 2.32 | 2.02 |
| <b>C313</b>                | 2.32 | 2.08 | 2.05 | 2.2  | 2.34 | 2.3  |
| <b>C314</b>                | 2.81 | 2.54 | 2.82 | 2.84 | 1.96 | 1.81 |
| <b>C315</b>                | 2.83 | 2.52 | 2.8  | 2.86 | 2.4  | 2.04 |
| <b>C316</b>                | 2.25 | 2.13 | 2.18 | 2.39 | 2.27 | 2.36 |
| <b>C317</b>                | 2.3  | 2.3  | 2.25 | 2.18 | 2.2  | 2.27 |
| <b>C318</b>                | 2.19 | 2.1  | 1.88 | 2.15 | -    | -    |
| <b>C319</b>                | 2.9  | 2.93 | 2.91 | 2.94 | 2.9  | 2.93 |
| <b>III B.TECH - II SEM</b> |      |      |      |      |      |      |
| <b>C321</b>                | 2.5  | 2.6  | 2.48 | 2.36 | 2.44 | 2.56 |
| <b>C322</b>                | 2.23 | 2.35 | 2.42 | 2.21 | 2.24 | 2.33 |
| <b>C323</b>                | 2.81 | 2.54 | 2.82 | 2.84 | 1.96 | 1.81 |
| <b>C324</b>                | 2.23 | 2.35 | 2.19 | 2.21 | 2.16 | 2.33 |
| <b>C325</b>                | 2.81 | 2.54 | 2.82 | 2.84 | 1.96 | 1.81 |

|                           |      |      |      |      |      |      |
|---------------------------|------|------|------|------|------|------|
| <b>C326</b>               | 2.5  | 2.6  | 2.48 | 2.36 | 2.44 | 2.56 |
| <b>C327</b>               | 1.94 | 2.06 | 2.06 | 1.8  | 1.67 | 1.85 |
| <b>C328</b>               | 2.19 | 2.1  | 1.88 | 2.15 | -    | -    |
| <b>C329</b>               | 2.9  | 2.83 | 2.85 | 2.94 | 2.86 | 2.93 |
| <b>IV B.TECH - I SEM</b>  |      |      |      |      |      |      |
| <b>C411</b>               | 2.03 | 2.56 | 2.45 | 2.4  | 2.4  | 2.3  |
| <b>C412</b>               | 2.12 | 2.4  | 2.03 | 2.5  | 2.1  | 2.04 |
| <b>C413</b>               | 2.01 | 2.4  | 2.34 | 2.03 | 2.4  | 2.03 |
| <b>C414</b>               | 2.08 | 2.4  | 2.3  | 2.2  | 2.02 | 2.03 |
| <b>C415</b>               | 2.08 | 2.4  | 2.34 | 2.03 | 2.4  | 2.03 |
| <b>C416</b>               | 2.23 | 2.13 | 2.16 | 2.39 | 2.27 | 2.36 |
| <b>C417</b>               | 2.19 | 2.1  | 1.88 | 2.15 | -    | -    |
| <b>C418</b>               | 2.56 | 2.5  | 2.74 | 2.37 | 2.54 | 2.58 |
| <b>IV B.TECH - II SEM</b> |      |      |      |      |      |      |
| <b>C421</b>               | 2.81 | 2.54 | 2.82 | 2.84 | 1.96 | 1.81 |
| <b>C422</b>               | 2.72 | 2.63 | 2.88 | 2.84 | 2.93 | 2.62 |
| <b>C423</b>               | 2.3  | 2.03 | 2.2  | 1.91 | 1.95 | 2.12 |
| <b>C424</b>               | 2.3  | 2.05 | 2.2  | 2.3  | 2.04 | 2.32 |
| <b>C425</b>               | 2.46 | 2.3  | 2.23 | 2.22 | -    | -    |
| <b>C426</b>               | 2.06 | 1.97 | 1.78 | 2.04 | 2.02 | -    |

## 16. CO ATTAINMENT-DIRECT+INDIRECT (FOR ALL COURSES)

### iii. CO Attainment for all the courses - 2016 Admitted Batch

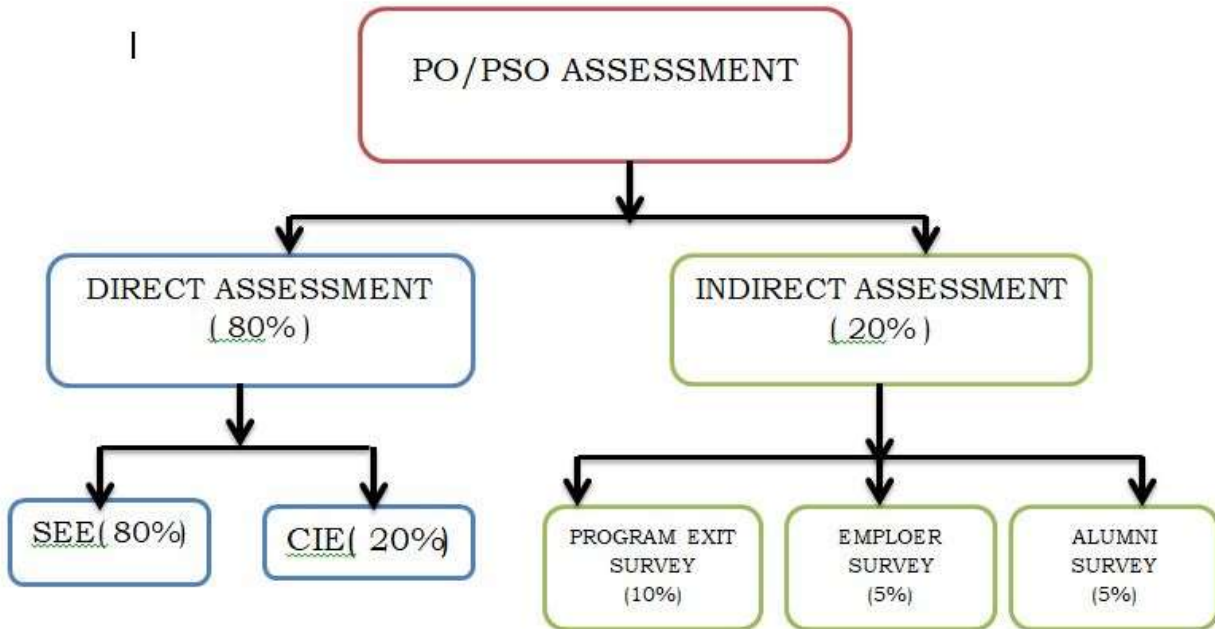
| COURSE                    | CO1    | CO2    | CO3    | CO4    | CO5    | CO6    |
|---------------------------|--------|--------|--------|--------|--------|--------|
| <b>I B.TECH - I SEM</b>   |        |        |        |        |        |        |
| C111                      | 2.78   | 2.76   | 2.78   | 2.77   | 2.77   | -      |
| C112                      | 2.18   | 2.19   | 2.22   | 2.20   | 2.21   | 2.17   |
| C113                      | 2.25   | 2.24   | 2.26   | 2.24   | 2.25   | 2.25   |
| C114                      | 2.04   | 1.97   | 2.02   | 2.03   | 2.03   | 2.04   |
| C115                      | 2.62   | 2.56   | 2.62   | 2.62   | 2.54   | 2.50   |
| C116                      | 1.43   | 1.45   | 1.47   | 1.45   | 1.44   | 1.43   |
| C117                      | 3.00   | 3.00   | 2.95   | -      | -      | -      |
| C118                      | 2.32   | 2.32   | 2.32   | 2.32   | 2.37   | 2.34   |
| C119                      | 2.58   | 2.58   | 2.59   | 2.58   | 2.60   | 2.62   |
| C11A                      | 2.39   | 2.37   | 2.33   | 2.38   | 2.38   | 2.40   |
| <b>I B.TECH - II SEM</b>  |        |        |        |        |        |        |
| C121                      | 2.72   | 2.70   | 2.72   | 2.71   | 2.71   | 2.72   |
| C122                      | 2.33   | 2.32   | 2.33   | 2.32   | 2.32   | 2.33   |
| C123                      | 1.66   | 1.64   | 1.66   | 1.65   | 1.65   | 1.66   |
| C124                      | 2.08   | 2.03   | 2.08   | 2.09   | 1.91   | 1.88   |
| C125                      | 2.42   | 2.40   | 2.42   | 2.41   | 2.41   | 2.42   |
| C126                      | 1.98   | 1.97   | 1.98   | 1.98   | 1.98   | 1.97   |
| C127                      | 3.00   | 3.00   | 3.00   | -      | -      | -      |
| C128                      | 2.88   | 2.88   | 2.88   | 2.88   | 2.88   | -      |
| C129                      | 2.82   | 2.79   | 2.78   | -      | -      | -      |
| <b>II B.TECH - I SEM</b>  |        |        |        |        |        |        |
| C211                      | 2.348  | 2.334  | 2.336  | 2.33   | 2.322  | 2.294  |
| C212                      | 1.886  | 1.926  | 2.006  | 2.028  | 1.936  | 2.014  |
| C213                      | 2.498  | 2.444  | 2.5    | 2.504  | 2.328  | 2.298  |
| C214                      | 2.39   | 2.396  | 2.392  | 2.416  | 2.22   | 2.41   |
| C215                      | 1.972  | 1.946  | 1.942  | 1.932  | 1.928  | 1.92   |
| C216                      | 2.138  | 2.114  | 2.124  | 2.166  | 2.142  | 2.16   |
| C217                      | 2.912  | 2.9    | 2.948  | 2.874  | 2.908  | 2.916  |
| C218                      | 2.822  | 2.786  | 2.782  | 2.772  | 2.768  | 2.76   |
| <b>II B.TECH - II SEM</b> |        |        |        |        |        |        |
| C221                      | 2.086  | 2.09   | 2.074  | 2.29   | 2.078  | 2.232  |
| C222                      | 2.124  | 2.1    | 2.096  | 2.142  | 2.11   | 2.138  |
| C223                      | 2.386  | 2.332  | 2.388  | 2.392  | 2.216  | 2.186  |
| C224                      | 2.018  | 1.964  | 2.02   | 2.024  | 1.848  | 1.818  |
| C225                      | 2.174  | 2.154  | 2.16   | 2.206  | 2.182  | 2.2    |
| C226                      | 2.198  | 2.162  | 2.184  | 2.226  | 2.198  | 2.214  |
| C227                      | 2.846  | 2.86   | 2.84   | 2.85   | 2.872  | -      |
| C228                      | 2.7888 | 2.7768 | 2.8248 | 2.7508 | 2.7848 | 2.7928 |
| <b>III B.TECH - I SEM</b> |        |        |        |        |        |        |
| C311                      | 2.364  | 2.36   | 2.352  | 2.346  | 2.37   | 2.392  |
| C312                      | 2.344  | 2.326  | 2.36   | 2.328  | 2.384  | 2.324  |

|                            |        |        |        |        |        |        |
|----------------------------|--------|--------|--------|--------|--------|--------|
| <b>C313</b>                | 2.152  | 2.104  | 2.098  | 2.128  | 2.156  | 2.148  |
| <b>C314</b>                | 2.474  | 2.42   | 2.476  | 2.48   | 2.304  | 2.274  |
| <b>C315</b>                | 2.486  | 2.424  | 2.48   | 2.492  | 2.4    | 2.328  |
| <b>C316</b>                | 2.85   | 2.826  | 2.836  | 2.878  | 2.854  | 2.872  |
| <b>C317</b>                | 2.86   | 2.86   | 2.85   | 2.836  | 2.84   | 2.854  |
| <b>C318</b>                | 2.7852 | 2.7672 | 2.7232 | 2.7772 | -      | -      |
| <b>C319</b>                | 2.9    | 2.906  | 2.902  | 2.908  | 2.9    | 2.906  |
| <b>III B.TECH - II SEM</b> |        |        |        |        |        |        |
| <b>C321</b>                | 2.436  | 2.456  | 2.432  | 2.408  | 2.424  | 2.448  |
| <b>C322</b>                | 2.246  | 2.27   | 2.284  | 2.242  | 2.248  | 2.266  |
| <b>C323</b>                | 2.498  | 2.444  | 2.5    | 2.504  | 2.328  | 2.298  |
| <b>C324</b>                | 2.286  | 2.31   | 2.278  | 2.282  | 2.272  | 2.306  |
| <b>C325</b>                | 2.698  | 2.644  | 2.7    | 2.704  | 2.528  | 2.498  |
| <b>C326</b>                | 2.7416 | 2.7616 | 2.7376 | 2.7136 | 2.7296 | 2.7536 |
| <b>C327</b>                | 2.7352 | 2.7592 | 2.7592 | 2.7072 | 2.6812 | 2.7172 |
| <b>C328</b>                | 2.5996 | 2.5816 | 2.6744 | 2.606  | -      | -      |
| <b>C329</b>                | 2.9    | 2.886  | 2.89   | 2.908  | 2.892  | 2.906  |
| <b>IV B.TECH - I SEM</b>   |        |        |        |        |        |        |
| <b>C411</b>                | 2.206  | 2.312  | 2.29   | 2.28   | 2.28   | 2.26   |
| <b>C412</b>                | 2.136  | 2.192  | 2.118  | 2.212  | 2.132  | 2.12   |
| <b>C413</b>                | 2.338  | 2.416  | 2.404  | 2.342  | 2.416  | 2.342  |
| <b>C414</b>                | 2.384  | 2.448  | 2.428  | 2.408  | 2.372  | 2.374  |
| <b>C415</b>                | 2.168  | 2.232  | 2.22   | 2.158  | 2.232  | 2.158  |
| <b>C416</b>                | 2.814  | 2.794  | 2.8    | 2.846  | 2.822  | 2.84   |
| <b>C417</b>                | 2.838  | 2.82   | 2.776  | 2.83   | -      | -      |
| <b>C418</b>                | 2.912  | 2.9    | 2.948  | 2.874  | 2.908  | 2.916  |
| <b>IV B.TECH - II SEM</b>  |        |        |        |        |        |        |
| <b>C421</b>                | 2.498  | 2.444  | 2.5    | 2.504  | 2.328  | 2.298  |
| <b>C422</b>                | 2.384  | 2.366  | 2.416  | 2.408  | 2.426  | 2.364  |
| <b>C423</b>                | 2.668  | 2.614  | 2.648  | 2.59   | 2.598  | 2.632  |
| <b>C424</b>                | 2.204  | 2.154  | 2.184  | 2.204  | 2.152  | 2.208  |
| <b>C425</b>                | 2.892  | 2.86   | 2.846  | 2.844  | -      | -      |
| <b>C426</b>                | 2.812  | 2.794  | 2.756  | 2.808  | 2.804  | -      |

## 17. PO/PSOS ASSESSMENT TOOLS

### (i) POandPSOAssessmentTools:

The process used to assess POs& PSOs is depicted in the following diagram



## 18. PROCEDURE FOR CALCULATING THE ATTAINMENT OF PO/PSOS (FOR ONE COURSE)

| MECHANISM FOR THE ATTAINMENTS OF Pos/PSOs OF THE COURSE:                                     |                     |                      |             |                           |     |     |     |     |     |     |     |     |      |      |      |      |      |
|--|---------------------|----------------------|-------------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| In view of the threshold assumed for each course, Individual course assessment is calculated |                     |                      |             |                           |     |     |     |     |     |     |     |     |      |      |      |      |      |
| CO   | CO Attainment Level |                      |             | Level of Mapping of CO-PO |     |     |     |     |     |     |     |     |      |      |      |      |      |
|  | SEE+CIE(A)          | COURSE END SURVEY(B) | A*0.8+B*0.2 | PO1                       | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| C01  | 2.25                | 2.68                 | 2.34        | 2                         | 2   | 2   |     |     |     |     |     |     |      |      |      | 2    | 2    |
| C02  | 2.25                | 2.98                 | 2.4         | 2                         |     |     | 2   | 2   |     |     |     |     |      | 2    |      | 2    |      |
| C03  | 2.25                | 2.64                 | 2.33        | 3                         |     | 2   | 2   |     |     |     |     |     |      | 2    |      | 2    |      |
| C04  | 2.25                | 2.78                 | 2.36        |                           |     | 2   | 2   |     |     |     |     |     |      |      |      | 2    |      |
| C05  | 2.25                | 2.63                 | 2.33        |                           |     | 2   | 2   |     |     |     |     |     |      | 2    |      | 2    |      |
| C06  | 2.25                | 2.69                 | 2.34        |                           |     |     |     |     |     |     |     |     |      | 2    | 2    | 2    | 2    |

For example, Attainment of PO1 for the table given above:

$$\text{PO Attainment} = \frac{\sum(\text{level of mapping of PO-CO} \times \text{CO attainment})}{\sum(\text{level of mapping of PO-CO})}$$

$$\text{PO1 Attainment} = \frac{2.34 \times 2 + 2.4 \times 2 + 2.33 \times 3}{2 + 2 + 3} = 2.35$$

Similarly calculate all PO's

Set the target level of attainment for PO1 say 70% then it is concluded that PO1 has attained accordingly, PSO attainment are also calculated based on direct and indirect attainment values.

$$\text{PSO Attainment} = \frac{\sum(\text{level of mapping of PSO-CO} \times \text{CO attainment})}{\sum(\text{level of mapping of PSO-CO})}$$

$$\text{PSO1 Attainment} = \frac{2.34 \times 2 + 2.4 \times 2 + 2.33 \times 2 + 2.36 \times 2 + 2.33 \times 2 + 2.34 \times 2}{2 + 2 + 2 + 2 + 2 + 2} = 2.35$$

Similarly calculate all PSO's

The PO and PSO attainments calculated using the above equations are given in the below table

| PO1  | PO2  | PO3  | PO4  | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|------|------|------|------|-----|-----|-----|-----|-----|------|------|------|------|------|
| 2.35 | 2.34 | 2.34 | 2.35 | 2.4 | 0   | 0   | 0   | 0   | 0    | 2.35 | 2.34 | 2.35 | 2.34 |

## 19. PO/PSOS ATTAINMENTS (FOR ALL COURSES)

| S.No  | Program Level Attainment | Program Outcomes |       |      |      |      |     |     |     |      |      |      |       | Program Specific Outcomes |      |
|---|--------------------------|------------------|-------|------|------|------|-----|-----|-----|------|------|------|-------|---------------------------|------|
|   |                          | PO1              | PO2   | PO3  | PO4  | PO5  | PO6 | PO7 | PO8 | PO9  | PO10 | PO11 | PO12  | PSO1                      | PSO2 |
| 1   | Course1                  | 0                | 0     | 0    | 0    | 0    | 0   | 0   | 0   | 2.35 | 2.35 | 0    | 2.35  | 0                         | 0    |
| 2   | Course2                  | 2.19             | 2.19  | 0    | 0    | 0    | 0   | 0   | 0   | 0    | 0    | 0    | 2.19  | 0                         | 0    |
| 3   | Course3                  | 2.25             | 2.25  | 0    | 0    | 0    | 0   | 0   | 0   | 0    | 0    | 0    | 2.25  | 0                         | 0    |
| 4   | Course4                  | 2.021            | 2.021 | 0    | 0    | 0    | 0   | 0   | 0   | 0    | 0    | 0    | 2.021 | 0                         | 0    |
| 5   | Course5                  | 2.57             | 2.56  | 2.57 | 2.56 | 2.58 | 0   | 0   | 0   | 0    | 0    | 0    | 0     | 2.57                      | 2.57 |
| Average=(course1+course2+course3+...+courseN)/Total number of courses |                          | 1.80             | 1.80  | 2.57 | 2.56 | 2.58 | 0   | 0   | 0   | 0    | 0    | 0    | 2.204 | 2.57                      | 2.57 |

$$\text{Attainment of PO}_i = \frac{\sum_{i=1}^k \text{PO}_{ij}}{\text{Number of Courses Mapped}} \text{ where } j=1,2,\dots,12$$

PO<sub>ij</sub> is the part contribution of i-th Course to the j-th PO, and K is the total number of the courses in the program.

$$\text{Attainment of PSO}_i = \frac{\sum_{i=1}^k \text{PSO}_{ij}}{\text{Number of Courses Achieved}} \text{ where } j=1,2,\dots,12$$

PSO<sub>ij</sub> is the part contribution of i-th Course to the j-th PO, and K is the total number of the courses in the program.

## 20. PO/PSOS ATTAINMENTS FOR THE ENTIRE PROGRAMME

| S. No | Assessment Components (Direct + Indirect)  | Program Outcomes |         |         |      |         |         |         |         |         |         |         | Program Specific Outcomes |         |      |
|-------|--|------------------|---------|---------|------|---------|---------|---------|---------|---------|---------|---------|---------------------------|---------|------|
|       |  | PO1              | PO2     | PO3     | PO4  | PO5     | PO6     | PO7     | PO8     | PO9     | PO10    | PO11    | PO12                      | PSO1    | PSO2 |
| 1     | Direct Assessment (CEE+SEE+ Course End Survey)   | 2.41             | 2.42    | 2.44    | 2.49 | 2.50    | 2.52    | 2.53    | 2.69    | 2.70    | 2.69    | 2.45    | 2.41                      | 2.44    | 2.46 |
| 2     | Program Exit Survey  | 2.45             | 2.5     | 2.65    | 2.82 | 2.55    | 2.65    | 2.35    | 2.5     | 2.58    | 2.7     | 2.4     | 2.62                      | 2.44    | 2.64 |
| 3     | Alumni Survey  | 2.82             | 2.62    | 2.85    | 2.85 | 2.62    | 2.95    | 2.28    | 2.4     | 2.65    | 2.68    | 2.68    | 2.82                      | 2.83    | 2.82 |
| 4     | Employer Survey  | 3                | 3       | 3       | 3    | 3       | 3       | 3       | 3       | 3       | 3       | 3       | 3                         | 3       | 3    |
|       | Average  | 2.75667          | 2.70667 | 2.83333 | 2.89 | 2.72333 | 2.86667 | 2.54333 | 2.63333 | 2.74333 | 2.79333 | 2.69333 | 2.81333                   | 2.75667 | 2.82 |
|       | Final Attainment=80% of direct assessment + 10% of Program Exit Survey + 5% of Alumni Survey + 5% of Employer Survey | 2.48             | 2.48    | 2.52    | 2.57 | 2.54    | 2.59    | 2.53    | 2.68    | 2.71    | 2.71    | 2.5     | 2.49                      | 2.51    | 2.53 |



## 21. PO/PSOs Attainment Levels and Actions for Improvement

| POs  | Target Level | Attainment Level | Observations |
|--|--------------|------------------|--------------|
| <b>PO1: Engineering Knowledge</b>  |              |                  |              |
| PO1  | 2.5          | 2.48             | Not Attained |
| To improve the attainment, bridge courses and Induction Programs are conducted for first year students and bridge courses on Engineering subjects to the lateral entry students  |              |                  |              |
| <b>PO2: Problem Analysis</b>   |              |                  |              |
| PO2  | 2.5          | 2.48             | Not Attained |
| To enhance the problem analytical skills, students are given hands on training on Wipro TNP modules, InfyTQ modules, HackerRank and HackerEarth platforms are used. Weekly technical events are conducted by the Professional societies to enhance the student skill set |              |                  |              |
| <b>PO3: Design/development of Solutions</b>  |              |                  |              |
| PO3  | 2.5          | 2.52             | Attained     |
| To train the students in System design and development, Mini Projects, Socially Relevant Projects are introduced to encourage the students and to improve their skill set  |              |                  |              |
| <b>PO4: Conduct Investigations of Complex Problems</b>   |              |                  |              |
| PO4  | 2.5          | 2.57             | Attained     |
| A Guest Lecture is conducted on Data Integration in IT Industry, The Real-Time Scenario on 19/07/2018 by APSSDC Team.  |              |                  |              |
| Students are encouraged to participate in Smart India Hackathon, Google's Skillenza, Design Thinking Workshops, IUCEE Project based Learning   |              |                  |              |
| <b>PO5: Modern Tool Usage</b>  |              |                  |              |
| PO5  | 2.5          | 2.54             | Attained     |
| A Guest Lecture on CISCO Networking on 26/02/2020 by Mr. Piyush Kamal, Tech Consulting Engineer.   |              |                  |              |
| <b>PO6: The Engineer and Society</b>   |              |                  |              |
| PO6  | 2.5          | 2.59             | Attained     |
| Students are encouraged to develop projects based on the needs of the society. A few examples of the projects done by the students are Crop Doctor, E-Marketing, Road Traffic Accident Prediction, Driver Drowsiness   |              |                  |              |

|  |     |      |             |
|--|-----|------|-------------|
| Detection  |     |      |             |
| <b>PO7:EnvironmentandSustainability</b>  |     |      |             |
| PO7  | 2.5 | 2.53 | Attained    |
| Workshops are conducted on Swatchh Bharath, As part of NSS, students participate in Blood Donation Camps, Tree Planting, Clean and Green Programs,   |     |      |             |
| <b>PO8:Ethics</b>  |     |      |             |
| PO8  | 2.5 | 2.68 | Attained    |
| AGuestLectureisconductedonEthicsinlifeon10/12/2018byShriChagantiKoteswaraRao   |     |      |             |
| <b>PO9:IndividualandTeamWork</b>   |     |      |             |
| PO9  | 2.5 | 2.71 | Attained    |
| Toimprovethe teamworkandCodingSkillsInternships,SociallyRelevantProjects,MiniandMajorprojectsaremandatedintheR19andR20Curriculum.  |     |      |             |
| <b>PO10:Communication</b>  |     |      |             |
| PO10   | 2.5 | 2.71 | Attained    |
| ToimproveCommunicationskillsspecialclassesandcompetitionsareconductedregularly by the English department. Soft skills are imparted in the regular time table itself.   |     |      |             |
| <b>PO11:ProjectManagementandFinance</b>  |     |      |             |
| PO11   | 2.5 | 2.5  | Attained    |
| Students are encouraged to do multi disciplinary projects  |     |      |             |
| <b>PO12:Life-longLearning</b>  |     |      |             |
| PO12   | 2.5 | 2.49 | NotAttained |
| Toimproveself-learninginstudents,studentsareencouragedtodoonlineself-pacedcoursesinCoursera,Udemy,NasscomFutureSkills and also encouraged to do Masters in prestigious institutions and also encouraged to do research on recent developments of IT. |     |      |             |

### PSOs Attainment Levels and Actions for Improvement

| PSOs | Target Level | Attainment Level | Observations |
|------|--------------|------------------|--------------|
|------|--------------|------------------|--------------|

**PSO1: The ability to model and develop efficient algorithms and software applications as safe and secure Information Technology Solutions**

|   |     |      |          |
|---|-----|------|----------|
| PSO1  | 2.5 | 2.51 | Attained |
| <p>To enhance coding skills, conducted training classes by Edyst, E-box, InfyTQ, Wipro TNP.<br/>                     A Guest Lecture is conducted on Technology trends and Job Opportunities on 01/03/2019 by Mr. Krishna Mohan Jampala, Enterprise Architect, TCS. An<br/>                     Online Webinar on Cyber Safety on 28/05/2020 by Manjunath Mattam, Head MSIT</p> |     |      |          |

**PSO2: The ability to embark on research and development after mastering modern computer languages, environments and platforms by pursuing higher education, to manage an IT infrastructure in a qualitative manner**

|  |     |      |          |
|--|-----|------|----------|
| PSO2   | 2.5 | 2.53 | Attained |
| <p>Students are encouraged to select research based problems as their Major project and publish the same in an UGC Care International Journals and IEEE and Springer Conferences</p> <p>A Guest Lecture is conducted on Technology trends and Job Opportunities on 01/03/2019 by Mr. Krishna Mohan Jampala, Enterprise Architect,</p> <p>To make students Industry ready, many certification programs are conducted on emerging technologies like Robotic Process Automation, Salesforce Automation, AWS Cloud Fundamentals, Solution Architect, Fullstack Development</p> |     |      |          |

## 22. PEO Assessment

### Procedure for Assessment of PEOs

1. POs and PSOs are mapped with relevant PEOs
2. Direct attainment of PEO=sum of the attainment level of POs and PSOs mapped to a PEO with Total number of POs and PSOs

### PO/PSO – PEO Mapping:

|      | PEO1 | PEO2 | PEO3 | PEO4 |
|------|------|------|------|------|
| PO1  |      |      |      | X    |
| PO2  | X    | X    |      |      |
| PO3  | X    | X    | X    | X    |
| PO4  |      | X    |      | X    |
| PO5  |      |      | X    |      |
| PO6  |      |      | X    |      |
| PO7  |      |      | X    |      |
| PO8  |      | X    | X    |      |
| PO9  | X    | X    |      |      |
| PO10 | X    |      |      | X    |
| PO11 |      | X    | X    | X    |
| PO12 |      | X    | X    |      |
| PSO1 | X    | X    | X    |      |
| PSO2 | X    | X    |      | X    |

### PO & PSO Attainment for the Batch 2016-2020

|  | PO1  | PO2  | PO3  | PO4  | PO5  | PO6  | PO7  | PO8  | PO9  | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| CO-PO-PSO Attainment                                     | 2.41 | 2.42 | 2.44 | 2.49 | 2.50 | 2.52 | 2.53 | 2.69 | 2.70 | 2.69 | 2.45 | 2.41 | 2.44 | 2.46 |
| Placements and Higher Education                          | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Direct Attainment (Avg of the above two)                 | 2.70 | 2.71 | 2.72 | 2.74 | 2.75 | 2.76 | 2.76 | 2.84 | 2.85 | 2.85 | 2.73 | 2.70 | 2.72 | 2.73 |
| Indirect Attainment                                      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Program Exit survey                                      | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Alumni Survey  | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Employer Survey  | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Parent Survey  | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Avg of Indirect Attainment                               | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Overall PO/PSO Attainment (80%of Direct +20%of indirect) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Overall PO/PSO Attainment                                | 2.76 | 2.77 | 2.77 | 2.79 | 2.8  | 2.81 | 2.81 | 2.87 | 2.88 | 2.88 | 2.78 | 2.76 | 2.78 | 2.78 |

### PO/PSO Attainments w.r.t relevant PEOs for 2016-2020

|                               | PEO1 | PEO2 | PEO3 | PEO4 |
|-------------------------------|------|------|------|------|
| PO1                           |      |      |      | 2.76 |
| PO2                           | 2.77 | 2.77 |      |      |
| PO3                           | 2.77 | 2.77 | 2.77 | 2.77 |
| PO4                           |      | 2.79 |      | 2.79 |
| PO5                           |      |      | 2.8  |      |
| PO6                           |      |      | 2.81 |      |
| PO7                           |      |      | 2.81 |      |
| PO8                           |      | 2.87 | 2.87 |      |
| PO9                           | 2.88 | 2.88 |      |      |
| PO10                          | 2.88 |      |      | 2.88 |
| PO11                          |      | 2.78 | 2.78 | 2.78 |
| PO12                          |      | 2.76 | 2.76 |      |
| PSO1                          | 2.78 | 2.78 | 2.78 |      |
| PSO2                          | 2.78 | 2.78 |      | 2.78 |
| AVG                           | 2.81 | 2.8  | 2.8  | 2.79 |
| Average attainment of PEO=2.8 |      |      |      |      |

### PO & PSO Attainment for the Batch 2017-2021

|  | PO1  | PO2  | PO3  | PO4  | PO5  | PO6  | PO7  | PO8  | PO9  | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Direct Attainment  | 2.30 | 2.30 | 2.32 | 2.39 | 2.37 | 2.44 | 2.51 | 2.61 | 2.58 | 2.62 | 2.35 | 2.30 | 2.30 | 2.30 |
| Placements and Higher Education                          | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Direct Attainment(Avg of the above two)                  | 2.65 | 2.65 | 2.66 | 2.70 | 2.68 | 2.72 | 2.75 | 2.81 | 2.79 | 2.81 | 2.67 | 2.65 | 2.65 | 2.65 |
| Indirect Attainment                                      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Program Exit survey                                      | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Alumni Survey  | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Employer Survey  | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Parent Survey  | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Avg Indirect Attainment                                  | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Overall PO/PSO Attainment (80%of Direct +20%of indirect) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Overall PO/PSO Attainment                                | 2.72 | 2.72 | 2.73 | 2.76 | 2.75 | 2.78 | 2.8  | 2.84 | 2.83 | 2.85 | 2.74 | 2.72 | 2.72 | 2.72 |

### PO/PSO Attainments w.r.t relevant PEOs for 2017-2021

|                                  | PEO1 | PEO2 | PEO3 | PEO4 |
|----------------------------------|------|------|------|------|
| PO1                              |      |      |      | 2.72 |
| PO2                              | 2.72 | 2.72 |      |      |
| PO3                              | 2.73 | 2.73 | 2.73 | 2.73 |
| PO4                              |      | 2.76 |      | 2.76 |
| PO5                              |      |      | 2.75 |      |
| PO6                              |      |      | 2.78 |      |
| PO7                              |      |      | 2.8  |      |
| PO8                              |      | 2.84 | 2.84 |      |
| PO9                              | 2.83 | 2.83 |      |      |
| PO10                             | 2.85 |      |      | 2.85 |
| PO11                             |      | 2.74 | 2.74 | 2.74 |
| PO12                             |      | 2.72 | 2.72 |      |
| PSO1                             | 2.72 | 2.72 | 2.72 |      |
| PSO2                             | 2.72 | 2.72 |      | 2.72 |
| AVG                              | 2.76 | 2.75 | 2.76 | 2.75 |
| Average attainment of PEO = 2.76 |      |      |      |      |

### PO & PSO Attainment for the Batch 2018-2022

|   | PO1  | PO2  | PO3  | PO4  | PO5  | PO6  | PO7  | PO8  | PO9  | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Direct Attainment   | 2.34 | 2.36 | 2.39 | 2.46 | 2.44 | 2.45 | 2.50 | 2.69 | 2.69 | 2.69 | 2.40 | 2.38 | 2.35 | 2.36 |
| Placements and Higher Education   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Direct Attainment(Avg of the above two)   | 2.67 | 2.68 | 2.70 | 2.73 | 2.72 | 2.73 | 2.75 | 2.85 | 2.85 | 2.85 | 2.70 | 2.69 | 2.67 | 2.68 |
| Indirect Attainment   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Program Exit survey   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Alumni Survey   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Employer Survey   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Parent Survey   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Avg Indirect Attainment   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Overall PO/PSO Attainment (80%of Direct +10%of Exit+5%of Alumni+5%of Employer Survey) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Overall PO/PSO Attainment   | 2.74 | 2.74 | 2.76 | 2.78 | 2.77 | 2.78 | 2.8  | 2.88 | 2.88 | 2.88 | 2.76 | 2.75 | 2.74 | 2.74 |

### PO/PSO Attainments w.r.t relevant PEOS for 2018-2022 Batch

|                                  | PEO1 | PEO2 | PEO3 | PEO4 |
|----------------------------------|------|------|------|------|
| PO1                              |      |      |      | 2.74 |
| PO2                              | 2.74 | 2.74 |      |      |
| PO3                              | 2.76 | 2.76 | 2.76 | 2.76 |
| PO4                              |      | 2.78 |      | 2.78 |
| PO5                              |      |      | 2.77 |      |
| PO6                              |      |      | 2.78 |      |
| PO7                              |      |      | 2.8  |      |
| PO8                              |      | 2.88 | 2.88 |      |
| PO9                              | 2.88 | 2.88 |      |      |
| PO10                             | 2.88 |      |      | 2.88 |
| PO11                             |      | 2.76 | 2.76 | 2.76 |
| PO12                             |      | 2.75 | 2.75 |      |
| PSO1                             | 2.74 | 2.74 | 2.74 |      |
| PSO2                             | 2.74 | 2.74 |      | 2.74 |
| AVG                              | 2.79 | 2.78 | 2.78 | 2.78 |
| Average attainment of PEO = 2.78 |      |      |      |      |

**Methodology for feedback from stakeholders:**

Google forms with questionnaire framed as per the program Outcomes were sent to the students. A questionnaire is distributed to students and Parents. Each of the questions were to be rated on a scale of 5. Data collected was analyzed. The target level aimed is 60% target. Only those stakeholders who have given score of more than 3 (60%) out of 5 in each question were considered for analysis.

**Details of 2016-2020 Batch:**

| <b>Placement &amp; Higher Education Details of 2016-2020</b> |          |
|--|----------|
| No of students Appeared for Final Year Exams                 | 57       |
| No of Students placed and got admission to Higher studies    | 40(33+7) |
| %of the Placements and Higher Education                      | 70.17%   |
| Attainment Level   | 3        |

| <b>EXIT Survey 2016-2020 Batch</b>          |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| No of students Surveyed=50                  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| No of students given scores responses >60%  | 30  | 48  | 38  | 36  | 28  | 39  | 37  | 29  | 28  | 28   | 27   | 38   | 38   | 27   |
| No of students given scores responses <60%  | 20  | 2   | 12  | 14  | 22  | 11  | 13  | 21  | 22  | 22   | 23   | 12   | 12   | 23   |
| Attainment Level                            | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 3    | 3    | 3    | 3    |
| <b>Alumni Survey 2016-2020 batch</b>        |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
| No of students Surveyed=35                  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| No of students given scores responses >60%  | 35  | 35  | 35  | 33  | 35  | 32  | 31  | 31  | 32  | 32   | 33   | 33   | 32   | 33   |
| No of students given scores responses < 60% |     |     |     | 2   |     | 3   | 4   | 4   | 3   | 3    | 2    | 2    | 3    | 2    |
| Attainment Level                            | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 3    | 3    | 3    | 3    |
| <b>Parents Survey 2016-2020 Batch</b>       |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
| No of Parents Surveyed=50                   | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |



|  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| No of students given scores responses >60% | 36 | 35 | 38 | 40 | 45 | 33 | 38 | 33 | 32 | 39 | 32 | 45 | 40 | 36 |
| No of students given scores responses <60% | 14 | 25 | 12 | 10 | 5  | 17 | 12 | 17 | 18 | 11 | 18 | 5  | 10 | 14 |
| Attainment Level                           | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  | 3  |

**Details of 2017-2021 Batch:**

| <b>Placement &amp; Higher Education Details of 2017-2021</b> |            |
|--|------------|
| No of students Appeared for Final Year Exams                 | 163        |
| No of Students placed and got admission to Higher studies    | 125(95+30) |
| %of the Placements and Higher Education                      | 76.68%     |
| Attainment Level   | 3          |

| <b>EXIT Survey 2017-2021 Batch</b>         |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| No of students Surveyed=50                 | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| No of students given scores responses >60% | 30  | 48  | 38  | 36  | 28  | 39  | 37  | 29  | 28  | 28   | 27   | 38   | 38   | 27   |
| No of students given scores responses <60% | 20  | 2   | 12  | 14  | 22  | 11  | 13  | 21  | 22  | 22   | 23   | 12   | 12   | 23   |
| Attainment Level                           | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 3    | 3    | 3    | 3    |
| <b>Alumni Survey 2017-2021 batch</b>       |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
| No of students Surveyed=75                 | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| No of students given scores responses >60% | 64  | 64  | 64  | 62  | 64  | 63  | 65  | 65  | 63  | 63   | 62   | 62   | 63   | 62   |
| No of students given scores responses <60% | 11  | 11  | 11  | 13  | 9   | 12  | 10  | 10  | 12  | 12   | 13   | 13   | 12   | 13   |

|   |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| Attainment Level                            | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 3    | 3    | 3    | 3    |
| <b>Parents Survey 2017-2021 Batch</b>       |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
| No of Parents Surveyed=                     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| No of students given scores responses > 60% | 60  | 55  | 58  | 67  | 57  | 51  | 50  | 57  | 56  | 52   | 59   | 62   | 63   | 60   |
| No of students given scores responses <60%  | 10  | 15  | 12  | 3   | 13  | 19  | 20  | 13  | 14  | 18   | 11   | 8    | 7    | 10   |
| Attainment Level                            | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 3    | 3    | 3    | 3    |

**Details of 2018-2022 Batch:**

| <b>Placement &amp; Higher Education Details of 2018-2022</b> |               |
|--|---------------|
| No of students Appeared for Final Year Exams                 | 165           |
| No of Students placed and got admission to Higher studies    | 150(129+20+1) |
| %of the Placements and Higher Education                      | 90.9%         |
| Attainment Level   | 3             |

| <b>EXIT Survey 2018-2022 Batch</b>          |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| No of students Surveyed=60                  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| No of students given scores responses > 60% | 40  | 58  | 48  | 46  | 48  | 49  | 47  | 39  | 38  | 38   | 37   | 48   | 48   | 37   |
| No of students given scores responses <60%  | 20  | 2   | 12  | 14  | 22  | 11  | 13  | 21  | 22  | 22   | 23   | 12   | 12   | 23   |
| Attainment Level                            | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 3    | 3    | 3    | 3    |
| <b>Alumni Survey 2018-2022 batch</b>        |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
| No of students Surveyed=85                  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| No of students given scores responses >60%  | 75  | 75  | 75  | 70  | 75  | 74  | 78  | 78  | 74  | 74   | 70   | 70   | 74   | 70   |

|  |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| No of students given scores responses <60% | 10  | 10  | 10  | 15  | 10  | 11  | 7   | 7   | 11  | 11   | 15   | 15   | 11   | 15   |
| Attainment Level                           | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 3    | 3    | 3    | 3    |
| <b>Parents Survey 2018-2022 Batch</b>      |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
| No of Parents Surveyed=60                  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| No of students given scores responses >60% | 50  | 45  | 48  | 57  | 47  | 41  | 40  | 47  | 46  | 42   | 49   | 52   | 53   | 50   |
| No of students given scores responses <60% | 10  | 15  | 12  | 3   | 13  | 19  | 20  | 13  | 14  | 18   | 11   | 8    | 7    | 10   |
| Attainment Level                           | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 3    | 3    | 3    | 3    |

### ANNEXURE-I PROGRAM EXIT SURVEY

An exit survey is conducted for students who have graduated out of the department for that year. Relevant questionnaire in exit survey format to evaluate attainment of POs and PSOs is given in section (a) and the relation of POs & PSOs with each question is given in section (b).

#### (a) Questionnaire Format

##### Assessment of Abilities, Skills and Attributes acquired at VVIT.

Please rate each of the following items in terms how well your education at VVIT prepared you for them. After graduating the four years degree, your expertise in the following areas is

| PO/PS O | Attribute  | Excellent | Good | Satisfactory | Unsatisfactory |
|---------|--|-----------|------|--------------|----------------|
| 1       | The level of your Engineering knowledge                          |           |      |              |                |
| 2       | Problem Analysis skills  |           |      |              |                |
| 3       | Skills in designing and developing solutions are                 |           |      |              |                |
| 4       | Strength in investigating complex problems                       |           |      |              |                |
| 5       | Skills in using modern tools is                                  |           |      |              |                |
| 6       | Applicability of Engineering Knowledge towards the society needs |           |      |              |                |
| 7       | Impact on environmental sustainability is                        |           |      |              |                |
| 8       | Your professional ethics are                                     |           |      |              |                |
| 9       | Your individual and team work is                                 |           |      |              |                |
| 10      | Your Communication Skills are                                    |           |      |              |                |
| 11      | Managing projects in multidisciplinary areas                     |           |      |              |                |
| 12      | Ability to engage in lifelong learning                           |           |      |              |                |
| 13      | Ability to develop safe and secure IT solutions                  |           |      |              |                |
| 14      | Ability to pursue higher education and get placed                |           |      |              |                |

|         |  |  |  |  |
|---------|--|--|--|--|
| in MNCs |  |  |  |  |
|---------|--|--|--|--|

**(b) Relation of Pos and PSOs with Questionnaire:**

|           |     |     |     |     |     |     |     |     |     |      |      |      |      |      |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| Pos       | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| Questions | Q1  | Q2  | Q3  | Q4  | Q5  | Q6  | Q7  | Q8  | Q9  | Q10  | Q11  | Q12  | Q13  | Q14  |

**(c) Evaluation Process:**

The questionnaire consists of 14 questions which are relevant for assessing each PO and PSO. The first 12 questions correspond to the 12 POs and the remaining 2 questions are for PSOs (Questions 13 is used to evaluate PSO1, Question 14 is used to evaluate PSO2). Each question is having 4 options namely: Excellent, Good, Satisfactory and Unsatisfactory, which is given marks 4, 3, 2 and 1 respectively. The survey results are tabulated and the average values corresponding to each PO and PSO are calculated.

**ANNEXURE- II ALUMNI SURVEY**

Feedback is taken from alumni. The questionnaire format in the alumni survey form to evaluate attainment of POs and PSOs is given in section (a) and the relation of POs & PSOs with each question is given in section (b).

**(a) Questionnaire Format:**

**Assessment of Knowledge, Skills, Abilities, Attitude, and attributes acquired at VVIT**

Please rate each of the following Knowledge, skills, abilities, attitudes (K, S, A) or attribute in terms how well VVIT inculcated them in your education

| SNo  | Attribute   | Assessment (Please tick one) |   |   |   |   |
|--|---|------------------------------|---|---|---|---|
|  |   | 1                            | 2 | 3 | 4 | 5 |
| <b>SECTION –A</b>  |   |                              |   |   |   |   |
| 1  | I am proud of being alumni of the institution   |                              |   |   |   |   |
| 2  | The institution has groomed me as a full-fledged engineer   |                              |   |   |   |   |
| 3  | I have benefitted by the new teaching – learning methodology – student centric learning process adopted by the institution. |                              |   |   |   |   |
| 4  | I am able to solve real-life problems with the knowledge acquired in the institution  |                              |   |   |   |   |
| 5  | The student mentoring and career guidance provided by the institution helped me to excel in my career                       |                              |   |   |   |   |
| 6  | The practical exposure in the labs is sufficient to understand/implement the basic concepts                                 |                              |   |   |   |   |
| 7  | The institution provides guidance in curricular, co-curricular and extra-curricular activities.                             |                              |   |   |   |   |
| 8  | The faculty are friendly and are available all the time for clarifications  |                              |   |   |   |   |
| 9  | The clubs organized by the institution gave me the opportunity for all-round development of my personality                  |                              |   |   |   |   |
| 10   | The institution emphasises more on ethics and professionalism   |                              |   |   |   |   |
| <b>SECTION – B</b>   |   |                              |   |   |   |   |
| <b>B1. HIGHER EDUCATION / RESEARCH</b>                     |   |                              |   |   |   |   |
| 11   | Institution provides enough background to pursue higher education at reputed institutions in India and abroad.              |                              |   |   |   |   |
| 12   | Institution stresses more on fundamental concepts and gives enough mathematical background to pursue research.              |                              |   |   |   |   |
| 13   | The practical training given over and above the JNTUK curriculum enables to pursue experimental research.                   |                              |   |   |   |   |
| 14   | Institution tunes the Students towards comprehension, analysis, and design.   |                              |   |   |   |   |
| 15   | Institution encourages and supports participation in conferences/ workshops/research publications.                          |                              |   |   |   |   |
| <b>B2. SERVING THE SOCIETY THROUGH WORKING IN INDUSTRY</b> |   |                              |   |   |   |   |
| 16   | I found myself employable in the organization without any additional training.  |                              |   |   |   |   |
| 17   | I am able to easily adopt myself to different functions of the organization.  |                              |   |   |   |   |
| 18   | I am able to adopt organizational goals as my goals   |                              |   |   |   |   |
| 19   | I am proud to be part of developing society with service as maxim   |                              |   |   |   |   |
| 20   | I am comfortable leading a team or working in a group   |                              |   |   |   |   |

| <b>B3. ENTERPRENUERSHIP</b> |   |  |  |  |  |  |
|-----------------------------|---|--|--|--|--|--|
| 21                          | I am able to conceptualize and start an enterprise myself.  |  |  |  |  |  |
| 22                          | I am able to produce goods to suit the market.  |  |  |  |  |  |
| 23                          | The products coming from my organization continuously strive to meet the international standards. |  |  |  |  |  |
| 24                          | I am able to serve the society by providing jobs to the needy people.                             |  |  |  |  |  |
| 25                          | The products developed by my organization conform to green policy                                 |  |  |  |  |  |

**(b) Relation of Pos and PSOs with Questionnaire:**

| POs/PSOs  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| Questions | A   | A   | A   | B1  | A   | B3  | B2  | B2  | B3  | B3   | B1   | B1   | B3   | B1   |

**(c) Evaluation Process:**

The questionnaire consists of 25 questions which are relevant for assessing each PO and PSO. The section-A questions are used to evaluate the PO1, PO2, PO3, and PO5, section-B questions are used to evaluate the PO4, PO6, PO7, PO8, PO9, PO10,, PO11, PO12, PSO1 and PSO2. Each question is having 5 options namely: Excellent (5), Very Good (4), Good (3), Average (2) and Poor (1) respectively. These marks are tabulated and the average values corresponding to each PO and PSO are determined

| S No | Attribute   | Assessment (Please tick one) |   |   |   |   |
|------|---|------------------------------|---|---|---|---|
|      |   | 1                            | 2 | 3 | 4 | 5 |
| 1    | The candidate is good enough to be able to put in project developmental / R&D activities.   |                              |   |   |   |   |
| 2    | The candidate possesses sound fundamental concepts in the domain area.  |                              |   |   |   |   |
| 3    | The candidate possesses basic analytical skills to solve the problems.  |                              |   |   |   |   |
| 4    | He/she is able to apply the knowledge in comprehension, analysis and design.  |                              |   |   |   |   |
| 5    | The candidate is socially aware of his responsibilities and working towards achieving better goals through team work, keeping in view the ethics. |                              |   |   |   |   |
| 6    | The candidate can work on multidisciplinary projects and can work in a team with social consciousness.  |                              |   |   |   |   |
| 7    | The candidate exhibits professionalism and upholds ethical standards in his dealings.   |                              |   |   |   |   |
| 8    | /she is ready to continuously upgrade his/her knowledge through training programs.  |                              |   |   |   |   |
| 9    | e candidate is clear in his/her goals and following the path to achieve it.   |                              |   |   |   |   |

### ANNEXURE-III EMPLOYER SURVEY

Feedback is taken at a frequency of once in two years from the employers who had given jobs to our graduates. The questionnaire format in the employer survey form to evaluate attainment of POs and PSOs is given in section (a) and the relation of POs & PSOs with each question is given in section(b)

**(a) Questionnaire Format:**

Rate the VVIT graduates working in your organization using the following criterion. Put a tick mark (√) Knowledge, Skills, Abilities, Attitude and other Attributes expected out of VVIT graduates

**(b) Relation of POs and PSOs with questionnaire:**

| POs/PSO   | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| Questions | 2   | 3   | 4   | 1   | 11  | 6   | 7   | 8   | 5   | 9    | 6    | 8    | 1    | 1    |

**(c) Evaluation Process:**

The questionnaire consists of 9 questions. These questions are relevant for assessing each PO and PSO. If multiple questions satisfy a PO, then their average is taken. A similar procedure is followed for PSOs also. Each question is having 5 options namely: Excellent (5), Very Good (4), Good (3), Average (2) and Poor (1) respectively. These marks

are tabulated and the average values corresponding to each PO and PSO are determined

**ANNEXURE-IV PARENT FEEDBACK**

Name of the Parent : -----: Age:----- Sex(M/F)-----

Qualification :----- Occupation : ----- : Age :-----

Name of the Student:-----Regd No:-----

Make a tick mark in the appropriate cell:

| S.No | Particulars   | Strongly agree | Agree | Neutral | Disagree | Strongly Disagree |
|------|---|----------------|-------|---------|----------|-------------------|
| 1    | Getting admission in the college for my ward is a matter of pride for me                    |                |       |         |          |                   |
| 2    | The college admission process (management quota) is fair and accurate                       |                |       |         |          |                   |
| 3    | My ward is improving his/her knowledge base through interaction with faculty of the college |                |       |         |          |                   |
| 4    | The discipline in the college is good   |                |       |         |          |                   |
| 5    | The atmosphere in the college is conducive for learning                                     |                |       |         |          |                   |



|    |   |  |  |  |  |  |
|----|---|--|--|--|--|--|
| 6  | There is a positive change in the behaviour of my ward after joining in the college     |  |  |  |  |  |
| 7  | Student attendance details are informed regularly through SMS                           |  |  |  |  |  |
| 8  | VVIT web site is very informative and regularly updated                                 |  |  |  |  |  |
| 9  | The college staff are very cooperative  |  |  |  |  |  |
| 10 | The college bus services are timely and good  |  |  |  |  |  |
| 11 | Hostel facilities are good  |  |  |  |  |  |
| 12 | Placements are good   |  |  |  |  |  |
| 13 | Special training for placements is effective  |  |  |  |  |  |
| 14 | Remedial classes/makeup classes for slow learners are effective                         |  |  |  |  |  |
| 15 | Students are encouraged to participate in Co-Curricular and Extra-Curricular activities |  |  |  |  |  |

**SIGNATURE OF THE PARENT**