# 8.1 Actions Taken Based on the Results of Evaluation of the CO's, PO's and PSO's Attainment

## 8.1.1 Actions Taken Based on the Results of Evaluation of the CO's Attainment – Documentary Evidence

| Provide results of evaluation of each CO | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 Admitted Batch | | | | | | | | | | | | | | |
| CO -DIRECT & INDIRECT ATTAINMENTS | | | | | | | | | | | | | | |
| **S.No** | **COURSE CODE** | **Course Name** | **SEM & YEAR** | **CO's** | **Level** | **Target Value** | **Direct Attainment Value(DA)** | **Indirect Attainment Value(IDA)** | **DA(80%) - DA*0.8** | **IDA (20%)-IDA*0.2** | **Overall CO Attainment (DA+IDA)** | **Gap Analysis (OA-TV)** | **CO Statements** | **Total CO's Count** |
| 1 | 20HS1101 | Communicative English-1 | 1YEAR - 1 SEM | CO1 | **L2** | **1.92** | **2.98** | **2.93** | 2.38 | 0.59 | 2.97 | 1.05 | Understand the concept of LSRW and basic grammar | 1 |
| 1 | 20HS1101 | Communicative English-1 | 1YEAR - 1 SEM | CO2 | **L3** | **1.92** | **2.50** | **2.53** | 2.00 | 0.51 | 2.51 | 0.59 | Apply grammar to various situations | 2 |
| 1 | 20HS1101 | Communicative English-1 | 1YEAR - 1 SEM | CO3 | **L3** | **1.92** | **2.49** | **2.53** | 1.99 | 0.51 | 2.50 | 0.58 | Practice different styles of Reading and Comprehending | 3 |
| 1 | 20HS1101 | Communicative English-1 | 1YEAR - 1 SEM | CO4 | **L4** | **1.92** | **2.30** | **2.40** | 1.84 | 0.48 | 2.32 | 0.40 | Illustrate the text to process the information for various purposes. | 4 |
| 1 | 20HS1101 | Communicative English-1 | 1YEAR - 1 SEM | CO5 | **L4** | **1.92** | **2.39** | **2.45** | 1.91 | 0.49 | 2.40 | 0.48 | Reframe the text for effective communication. | 5 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 20BS1101 | Calculus And Linear Algebra | 1YEAR - 1 SEM | CO1 | **L2** | **1.92** | **2.69** | **2.66** | 2.15 | 0.53 | 2.68 | 0.76 | Understand the basic concepts of calculus and linear algebra. | 6 |
| 2 | 20BS1101 | Calculus And Linear Algebra | 1YEAR - 1 SEM | CO2 | **L3** | **1.92** | **2.60** | **2.62** | 2.08 | 0.52 | 2.60 | 0.68 | Apply the echelon form to obtain the solution of system of linear equations and eigen vectors of a matrix. | 7 |
| 2 | 20BS1101 | Calculus And Linear Algebra | 1YEAR - 1 SEM | CO3 | **L3** | **1.92** | **2.50** | **2.73** | 2.00 | 0.55 | 2.55 | 0.63 | Apply the concepts of calculus to find the series expansion and extremum of a given function ,area enclosed by plane. | 8 |
| 2 | 20BS1101 | Calculus And Linear Algebra | 1YEAR - 1 SEM | CO4 | **L4** | **1.92** | **2.43** | **2.62** | 1.94 | 0.52 | 2.47 | 0.55 | Analyse the solution set of linear system of equations and nature of the quadratic forms. | 9 |
| 2 | 20BS1101 | Calculus And Linear Algebra | 1YEAR - 1 SEM | CO5 | **L4** | **1.92** | **2.46** | **2.73** | 1.97 | 0.55 | 2.51 | 0.59 | Analyse the behaviour of functions using mean value theorems, extremum of the given. | 10 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 20BS1101 | Calculus And Linear Algebra | 1YEAR - 1 SEM | CO6 | | **1.92** | **3.00** | **2.66** | 2.40 | 0.53 | 2.93 | 1.01 | Apply the concepts of calculus and linear algebra to the given problem and submit a report | 11 |
| 3 | 20BS1103 | Engineering Physics | 1YEAR - 1 SEM | CO1 | **L2** | **1.92** | **2.06** | **2.64** | 1.65 | 0.53 | 2.18 | 0.26 | Understand the electric, magnetic, optical communication and semiconductor principles in technical aspects. | 12 |
| 3 | 20BS1103 | Engineering Physics | 1YEAR - 1 SEM | CO2 | **L3** | **1.92** | **2.11** | **2.76** | 1.69 | 0.55 | 2.24 | 0.32 | Apply the knowledge of Physics and optical Principles in optoelectronic devices | 13 |
| 3 | 20BS1103 | Engineering Physics | 1YEAR - 1 SEM | CO3 | **L3** | **1.92** | **2.10** | **2.64** | 1.68 | 0.53 | 2.21 | 0.29 | Apply basic laws of electromagnetism and materials for engineering applications. | 14 |
| 3 | 20BS1103 | Engineering Physics | 1YEAR - 1 SEM | CO4 | **L4** | **1.92** | **2.17** | **2.76** | 1.74 | 0.55 | 2.29 | 0.37 | Analyze the theory of solids and deduce different analytical parameters. | 15 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 20BS1103 | Engineering Physics | 1YEAR - 1 SEM | CO5 | **L4** | **1.92** | **2.22** | **2.70** | 1.78 | 0.54 | 2.32 | 0.40 | Examine the mechanism of electromagnetic, in sensors and semiconductor devices. | 16 |
| 3 | 20BS1103 | Engineering Physics | 1YEAR - 1 SEM | CO6 | | **1.92** | **2.86** | **2.70** | 2.29 | 0.54 | 2.83 | 0.91 | Ability to understand the concepts of optical fibers, the theory of solids, laws of electromagnetism, principles of semiconductor devices and submit a report. | 17 |
| 4 | 20ES1101 | Basic Electrical & Electronics Engineering | 1YEAR - 1 SEM | CO1 | **L2** | **1.92** | **2.05** | **2.61** | 1.64 | 0.52 | 2.16 | 0.24 | Understand the basic concepts of DC circuits, Electrical Machines, Concepts of Electronic Devices and Circuits and realize the Applications of Electrical & Electronics in Interdisciplinary Engineering Domains. Domains | 18 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 20ES1101 | Basic Electrical & Electronics Engineering | 1YEAR - 1 SEM | CO2 | **L3** | **1.92** | **2.15** | **2.57** | 1.72 | 0.51 | 2.23 | 0.31 | Apply the basic knowledge of mathematics, science and electrical engineering to obtain the desired parameters of Electric circuits and Machines. | 19 |
| 4 | 20ES1101 | Basic Electrical & Electronics Engineering | 1YEAR - 1 SEM | CO3 | **L4** | **1.92** | **1.96** | **2.57** | 1.57 | 0.51 | 2.08 | 0.16 | Analyse the behaviour of Electric circuits, transformers and Electrical machines. | 20 |
| 4 | 20ES1101 | Basic Electrical & Electronics Engineering | 1YEAR - 1 SEM | CO4 | **L3** | **1.92** | **1.88** | **2.67** | 1.51 | 0.53 | 2.04 | 0.12 | Apply the basic principles of Electronics to solve Analog Circuits. | 21 |
| 4 | 20ES1101 | Basic Electrical & Electronics Engineering | 1YEAR - 1 SEM | CO5 | **L4** | **1.92** | **1.80** | **2.67** | 1.44 | 0.53 | 1.97 | 0.05 | Analyse the characteristics/ performance parameters of Electronic Circuits. | 22 |
| 4 | 20ES1101 | Basic Electrical & Electronics Engineering | 1YEAR - 1 SEM | CO6 | | **1.92** | **3.00** | **2.61** | 2.40 | 0.52 | 2.92 | 1.00 | Ability to investigate various problems in DC circuits, Electrical Machines and Electronic Devices and Circuits and submit a report. | 23 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 20ES1103 | Problem Solving Techniques | 1YEAR - 1 SEM | CO1 | **L2** | **1.92** | **2.00** | **2.81** | 1.60 | 0.56 | 2.16 | 0.24 | Understand the fundamental concepts of computers, algorithms, flowcharts and problem solving techniques. | 24 |
| 5 | 20ES1103 | Problem Solving Techniques | 1YEAR - 1 SEM | CO2 | **L3** | **1.92** | **2.12** | **2.76** | 1.70 | 0.55 | 2.25 | 0.33 | Apply the basic knowledge of mathematical factoring methods to model an algorithm, flowchart for a given problem. | 25 |
| 5 | 20ES1103 | Problem Solving Techniques | 1YEAR - 1 SEM | CO3 | **L3** | **1.92** | **1.76** | **2.63** | 1.41 | 0.53 | 1.93 | 0.01 | Apply merging, sorting, searching, text processing techniques to develop algorithms. | 26 |
| 5 | 20ES1103 | Problem Solving Techniques | 1YEAR - 1 SEM | CO4 | **L4** | **1.92** | **2.13** | **2.64** | 1.70 | 0.53 | 2.23 | 0.31 | Analyze the given problem, use appropriate array technique and write an effective report. | 27 |
| 6 | 20HS1151 | Communicative English-1 Lab | 1YEAR - 1 SEM | CO1 | **L3** | **1.98** | **2.95** | **2.52** | 2.36 | 0.50 | 2.86 | 0.88 | Acquire communication skills through various language learning | 28 |
| 6 | 20HS1151 | Communicative English-1 Lab | 1YEAR - 1 SEM | CO2 | **L3** | **1.98** | **2.96** | **2.54** | 2.37 | 0.51 | 2.88 | 0.90 | Construct meaningful sentences and Paragraphs | 29 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 20HS1151 | Communicative English-1 Lab | 1YEAR - 1 SEM | CO3 | **L4** | **1.98** | **2.95** | **2.49** | 2.36 | 0.50 | 2.86 | 0.88 | Analyze the text to develop comprehensive ability | 30 |
| 6 | 20HS1151 | Communicative English-1 Lab | 1YEAR - 1 SEM | CO4 | **L4** | **1.98** | **2.96** | **2.48** | 2.37 | 0.50 | 2.86 | 0.88 | Preparation of report based on the activity | 31 |
| 7 | 20BS1152 | Engineering Physics Lab | 1YEAR - 1 SEM | CO1 | **L3** | **1.98** | **2.27** | **2.64** | 1.82 | 0.53 | 2.34 | 0.36 | Demonstrate the importance of dielectric material and measure magnetic parameters. | 32 |
| 7 | 20BS1152 | Engineering Physics Lab | 1YEAR - 1 SEM | CO2 | **L3** | **1.98** | **2.26** | **2.76** | 1.81 | 0.55 | 2.36 | 0.38 | Identify the type of semiconductor using hall effect and measure the energy band gap. | 33 |
| 7 | 20BS1152 | Engineering Physics Lab | 1YEAR - 1 SEM | CO3 | **L4** | **1.98** | **2.43** | **2.70** | 1.94 | 0.54 | 2.48 | 0.50 | Examine the characteristics of photodiode, p-n junction diode and solar cell. | 34 |
| 7 | 20BS1152 | Engineering Physics Lab | 1YEAR - 1 SEM | CO4 | **L4** | **1.98** | **2.38** | **2.70** | 1.90 | 0.54 | 2.44 | 0.46 | Assess the intensity of the magnetic field of circular coil carrying current with distance and measure resistance. | 35 |
| 7 | 20BS1152 | Engineering Physics Lab | 1YEAR - 1 SEM | CO5 | **L4** | **1.98** | **2.47** | **2.76** | 1.98 | 0.55 | 2.53 | 0.55 | Estimate the acceptance angle of an optical fiber and numerical aperture. | 36 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | 20BS1152 | Engineering Physics Lab | 1YEAR - 1 SEM | CO6 | | **1.98** | **2.35** | **2.88** | 1.88 | 0.58 | 2.46 | 0.48 | Summarize and tabulate the experimental observations and output. | 37 |
| 8 | 20ES1151 | Basic Electrical & Electronics Engineering Lab | 1YEAR - 1 SEM | CO1 | **L3** | **1.98** | **1.98** | **2.61** | 1.59 | 0.52 | 2.11 | 0.13 | Apply techniques/procedures of Electrical & Electronics Engineering to solve problems. | 38 |
| 8 | 20ES1151 | Basic Electrical & Electronics Engineering Lab | 1YEAR - 1 SEM | CO2 | | **1.98** | **1.98** | **2.61** | 1.59 | 0.52 | 2.11 | 0.13 | Conduct experiments as a team / individual by using equipment available in the laboratory. | 39 |
| 8 | 20ES1151 | Basic Electrical & Electronics Engineering Lab | 1YEAR - 1 SEM | CO3 | **L4** | **1.98** | **2.22** | **2.72** | 1.77 | 0.54 | 2.32 | 0.34 | Examine the network theorems and Kirchhoff's laws for DC electrical circuits. | 40 |
| 8 | 20ES1151 | Basic Electrical & Electronics Engineering Lab | 1YEAR - 1 SEM | CO4 | **L4** | **1.98** | **2.04** | **2.50** | 1.64 | 0.50 | 2.14 | 0.16 | Analyse the open circuit characteristic of DC shunt generator and efficiency of single phase transformer. | 41 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 20ES1151 | Basic Electrical & Electronics Engineering Lab | 1YEAR - 1 SEM | CO5 | **L4** | **1.98** | **2.16** | **2.66** | 1.73 | 0.53 | 2.26 | 0.28 | Analyse the characteristics/ performance parameters of Electronic and Analog Circuits. | 42 |
| 8 | 20ES1151 | Basic Electrical & Electronics Engineering Lab | 1YEAR - 1 SEM | CO6 | | **1.98** | **1.98** | **2.61** | 1.59 | 0.52 | 2.11 | 0.13 | make an effective report based on experiments | 43 |
| | | | | | | | | | | | | | | |
| 9 | 20HS1201 | Communicative English-II | I YEAR - 2nd SEM | CO1 | **L2** | **1.92** | **2.51** | **2.56** | 2.01 | 0.51 | 2.52 | 0.60 | Understand various Linguistic aspects | 44 |
| 9 | 20HS1201 | Communicative English-II | I YEAR - 2nd SEM | CO2 | **L3** | **1.92** | **2.53** | **2.56** | 2.02 | 0.51 | 2.54 | 0.62 | Apply language to draft letters for various business purposes | 45 |
| 9 | 20HS1201 | Communicative English-II | I YEAR - 2nd SEM | CO3 | **L3** | **1.92** | **2.48** | **2.54** | 1.98 | 0.51 | 2.49 | 0.57 | Interpret the text for information processing and effective communication. | 46 |
| 9 | 20HS1201 | Communicative English-II | I YEAR - 2nd SEM | CO4 | **L4** | **1.92** | **2.50** | **2.64** | 2.00 | 0.53 | 2.53 | 0.61 | Analyze the data for report writing and précis writing. | 47 |
| 9 | 20HS1201 | Communicative English-II | I YEAR - 2nd SEM | CO5 | **L4** | **1.92** | **2.53** | **2.57** | 2.02 | 0.51 | 2.54 | 0.62 | Relate advanced writing skills for better employability. | 48 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 20BS1202 | Engineering Chemistry | I YEAR - 2nd SEM | CO1 | **L2** | **1.92** | **2.73** | **2.70** | 2.18 | 0.54 | 2.72 | 0.80 | Understand the basic principles related to renewable energy sources, energy systems, metal finishing and materials | 49 |
| 10 | 20BS1202 | Engineering Chemistry | I YEAR - 2nd SEM | CO2 | **L3** | **1.92** | **2.28** | **2.76** | 1.82 | 0.55 | 2.38 | 0.46 | Apply the knowledge of energy transformation principles to classify and describe the working of electrodes and cells | 50 |
| 10 | 20BS1202 | Engineering Chemistry | I YEAR - 2nd SEM | CO3 | **L3** | **1.92** | **2.50** | **2.88** | 2.00 | 0.58 | 2.58 | 0.66 | Apply suitable methods for metal finishing and advanced techniques for the characterization of nano materials | 51 |
| 10 | 20BS1202 | Engineering Chemistry | I YEAR - 2nd SEM | CO4 | **L4** | **1.92** | **2.50** | **2.88** | 2.00 | 0.58 | 2.58 | 0.66 | Analyse the performance of different electrochemical techniques, energy conversion systems, polymers and nano materials in their respective applications | 52 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 20BS1202 | Engineering Chemistry | I YEAR - 2nd SEM | CO5 | | **1.92** | **2.87** | **2.76** | 2.30 | 0.55 | 2.85 | 0.93 | Make an effective report on various concepts and technologies related to Engineering chemistry | 53 |
| 11 | 20BS1204 | Probability And Statisctics | I YEAR - 2nd SEM | CO1 | **L2** | **1.92** | **2.66** | **2.58** | 2.13 | 0.52 | 2.64 | 0.72 | Understand the basic concepts of probability and statistics | 54 |
| 11 | 20BS1204 | Probability And Statisctics | I YEAR - 2nd SEM | CO2 | **L3** | **1.92** | **2.58** | **2.58** | 2.06 | 0.52 | 2.58 | 0.66 | Calculate the measures of central tendencies, correlation and regression to the given data and apply appropriate probability distributions to the given problem | 55 |
| 11 | 20BS1204 | Probability And Statisctics | I YEAR - 2nd SEM | CO3 | **L3** | **1.92** | **2.44** | **2.52** | 1.95 | 0.50 | 2.46 | 0.54 | Apply the concepts of testing hypothesis for large and small samples | 56 |
| 11 | 20BS1204 | Probability And Statisctics | I YEAR - 2nd SEM | CO4 | **L4** | **1.92** | **2.37** | **2.55** | 1.90 | 0.51 | 2.41 | 0.49 | Connect the concepts of probability, correlation and regression to real life problems | 57 |
| 11 | 20BS1204 | Probability And Statisctics | I YEAR - 2nd SEM | CO5 | **L4** | **1.92** | **2.02** | **2.50** | 1.62 | 0.50 | 2.12 | 0.20 | Identify appropriate test statistic to test given hypothesis for statistical decision | 58 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 20BS1204 | Probability And Statisctics | I YEAR - 2nd SEM | CO6 | **L3** | **1.92** | **3.00** | **2.54** | 2.40 | 0.51 | 2.91 | 0.99 | Apply the concepts of probability and statistics to the given data and submit the report. | 59 |
| 12 | 20ES1202 | Programming For Problem Solving | I YEAR - 2nd SEM | CO1 | **L2** | **1.86** | **1.80** | **2.54** | 1.44 | 0.51 | 1.95 | 0.09 | Understand the principles of structured programming and C constructs for solving problems. | 60 |
| 12 | 20ES1202 | Programming For Problem Solving | I YEAR - 2nd SEM | CO2 | **L3** | **1.92** | **2.12** | **2.51** | 1.70 | 0.50 | 2.20 | 0.28 | Apply suitable control constructs and array concepts to solve problems. | 61 |
| 12 | 20ES1202 | Programming For Problem Solving | I YEAR - 2nd SEM | CO3 | **L3** | **1.92** | **1.93** | **2.30** | 1.54 | 0.46 | 2.00 | 0.08 | Apply the concept of pointers, user defined data types and files to solve problems. | 62 |
| 12 | 20ES1202 | Programming For Problem Solving | I YEAR - 2nd SEM | CO4 | **L4** | **1.92** | **2.17** | **2.43** | 1.74 | 0.49 | 2.22 | 0.30 | Analyze the given problem and use modular programming approach to develop solutions. | 63 |
| 13 | 20ES1204 | Engineering Graphics | I YEAR - 2nd SEM | CO1 | **L3** | **1.86** | **2.13** | **2.62** | 1.70 | 0.52 | 2.23 | 0.37 | Construct conic sections and curves used in Engineering practice | 64 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13 | 20ES1204 | Engineering Graphics | I YEAR - 2nd SEM | CO2 | **L3** | **1.92** | **1.93** | **2.48** | 1.54 | 0.50 | 2.04 | 0.12 | Construct orthographic projections of an object when its position is defined with respect to the reference planes | 65 |
| 13 | 20ES1204 | Engineering Graphics | I YEAR - 2nd SEM | CO3 | **L3** | **1.92** | **2.05** | **2.36** | 1.64 | 0.47 | 2.11 | 0.19 | Develop the isometric view for the given orthographic projections and vice versa. | 66 |
| 13 | 20ES1204 | Engineering Graphics | I YEAR - 2nd SEM | CO4 | **L3** | **1.92** | **1.82** | **2.61** | 1.46 | 0.52 | 1.98 | 0.06 | Develop the lateral surfaces of solids | 67 |
| 13 | 20ES1204 | Engineering Graphics | I YEAR - 2nd SEM | CO5 | **L3** | **1.92** | **2.12** | **2.36** | 1.70 | 0.47 | 2.17 | 0.25 | Identify the appropriate commands that are used to prepare the given drawing in CAD environment. | 68 |
| 14 | 20HS1251 | Communicative English-II Lab | I YEAR - 2nd SEM | CO1 | **L3** | **1.98** | **2.46** | **2.52** | 1.97 | 0.50 | 2.47 | 0.49 | Hone employability skills | 69 |
| 14 | 20HS1251 | Communicative English-II Lab | I YEAR - 2nd SEM | CO2 | **L3** | **1.98** | **2.63** | **2.54** | 2.10 | 0.51 | 2.61 | 0.63 | Develop an ability of making discussions, inferences and presentations | 70 |
| 14 | 20HS1251 | Communicative English-II Lab | I YEAR - 2nd SEM | CO3 | **L4** | **1.98** | **2.46** | **2.49** | 1.97 | 0.50 | 2.47 | 0.49 | Refine communication skills through various strategies | 71 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | 20HS1251 | Communicative English-II Lab | I YEAR - 2nd SEM | CO4 | **L4** | **1.98** | **2.57** | **2.48** | 2.06 | 0.50 | 2.55 | 0.57 | Process the information in different contexts | 72 |
| 15 | 20BS1251 | Engineering Chemistry Lab | 1YEAR - 2ND SEM | CO1 | **L3** | **1.98** | **3.00** | **2.64** | 2.40 | 0.53 | 2.93 | 0.95 | Demonstrate the working of instruments such as pH meter and Conduct meter. | 73 |
| 15 | 20BS1251 | Engineering Chemistry Lab | 1YEAR - 2ND SEM | CO2 | **L3** | **1.98** | **3.00** | **2.76** | 2.40 | 0.55 | 2.95 | 0.97 | Apply the acquired knowledge to determine the quantity | 74 |
| 15 | 20BS1251 | Engineering Chemistry Lab | 1YEAR - 2ND SEM | CO3 | **L4** | **1.98** | **3.00** | **2.77** | 2.40 | 0.55 | 2.95 | 0.97 | Estimate the amount of active chlorine in bleaching powder. | 75 |
| 15 | 20BS1251 | Engineering Chemistry Lab | 1YEAR - 2ND SEM | CO4 | **L4** | **1.98** | **3.00** | **2.70** | 2.40 | 0.54 | 2.94 | 0.96 | Compare the viscosities and surface tension of different liquids | 76 |
| 15 | 20BS1251 | Engineering Chemistry Lab | 1YEAR - 2ND SEM | CO5 | **L4** | **1.98** | **3.00** | **2.76** | 2.40 | 0.55 | 2.95 | 0.97 | Analyze different compounds and examine the preparation of different polymers. | 77 |
| 15 | 20BS1251 | Engineering Chemistry Lab | 1YEAR - 2ND SEM | CO6 | | **1.98** | **3.00** | **2.88** | 2.40 | 0.58 | 2.98 | 1.00 | Make an effective report based on experiments | 78 |
| 16 | 20ES1253 | Programming For Problem Solving Lab | I YEAR - 2nd SEM | CO1 | **L3** | **1.98** | **2.41** | **2.44** | 1.93 | 0.49 | 2.42 | 0.44 | Apply Structured Programming/C constructs for solving problems | 79 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 20ES1253 | Programming For Problem Solving Lab | I YEAR - 2nd SEM | CO2 | **L3** | **1.98** | **2.00** | **2.40** | 1.60 | 0.48 | 2.08 | 0.10 | Implement programs as an individual on different IDEs/ online platforms. | 80 |
| 16 | 20ES1253 | Programming For Problem Solving Lab | I YEAR - 2nd SEM | CO3 | **L3** | **1.98** | **2.03** | **2.32** | 1.62 | 0.46 | 2.09 | 0.11 | Develop an effective report based on various programs implemented. | 81 |
| 16 | 20ES1253 | Programming For Problem Solving Lab | I YEAR - 2nd SEM | CO4 | **L3** | **1.98** | **1.84** | **2.38** | 1.47 | 0.48 | 1.95 | -0.03 | Apply technical knowledge for a given problem and express with an effective oral communication. | 82 |
| 16 | 20ES1253 | Programming For Problem Solving Lab | I YEAR - 2nd SEM | CO5 | **L4** | **1.92** | **2.12** | **2.32** | 1.70 | 0.46 | 2.16 | 0.24 | Analyze outputs using given constraints/test cases. | 83 |
| 17 | 20MC1201 | Life Sciences For Engineers | I YEAR - 2nd SEM | CO1 | **L3** | **1.92** | **1.82** | **2.72** | 1.46 | 0.54 | 2.00 | 0.08 | Apply the concepts of biology to create tangible and economically viable engineering goods. | 84 |
| 17 | 20MC1201 | Life Sciences For Engineers | I YEAR - 2nd SEM | CO2 | **L4** | **1.92** | **1.75** | **2.70** | 1.40 | 0.54 | 1.94 | 0.02 | Analyse new technologies in Genetics pharmaceutical, medical and agricultural fields from the knowledge gained from DNA technology | 85 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | 20MC1201 | Life Sciences For Engineers | I YEAR - 2nd SEM | CO3 | **L3** | **1.92** | **1.84** | **2.70** | 1.47 | 0.54 | 2.01 | 0.09 | Apply the knowledge of biology to improve the living standards of societies | 86 |
| 17 | 20MC1201 | Life Sciences For Engineers | I YEAR - 2nd SEM | CO4 | **L3** | **1.92** | **2.06** | **2.72** | 1.65 | 0.54 | 2.20 | 0.28 | Apply the basic knowledge of genetics and DNA technology for disease diagnostics and therapy | 87 |
| 17 | 20MC1201 | Life Sciences For Engineers | I YEAR - 2nd SEM | CO5 | **L4** | **1.92** | **2.14** | **2.68** | 1.71 | 0.54 | 2.25 | 0.33 | Analyse new technologies in biotechnology, pharmaceutical, medical and agricultural fields from the knowledge gained from DNA technology | 88 |
| | | | | | | | | | | | | | | |
| 18 | 20BS1303 | Discrete Mathemetical Structures | II YEAR - 1st SEM | CO1 | **L2** | **1.92** | **2.13** | **2.69** | 1.70 | 0.54 | 2.24 | 0.32 | Understand the fundamental concepts of discrete mathematical structures | 89 |
| 18 | 20BS1303 | Discrete Mathemetical Structures | II YEAR - 1st SEM | CO2 | **L3** | **1.92** | **2.20** | **2.56** | 1.76 | 0.51 | 2.27 | 0.35 | Apply Normal forms/ Rules of Inference for solving suitable problems. | 90 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18 | 20BS1303 | Discrete Mathemetical Structures | II YEAR - 1st SEM | CO3 | **L3** | **1.92** | **2.21** | **2.62** | 1.77 | 0.52 | 2.29 | 0.37 | Apply the method of Characteristic roots for solving different recurrence relations and make an effective document | 91 |
| 18 | 20BS1303 | Discrete Mathemetical Structures | II YEAR - 1st SEM | CO4 | **L4** | **1.92** | **1.89** | **2.60** | 1.52 | 0.52 | 2.03 | 0.11 | Analyze various graph techniques to construct a tree. | 92 |
| 19 | 20CS3301 | Fundamentals Of Digital Logic Design | II YEAR - 1st SEM | CO1 | **L2** | **1.92** | **1.82** | **2.55** | 1.46 | 0.51 | 1.97 | 0.05 | Understand the basic concepts of digital circuits. | 93 |
| 19 | 20CS3301 | Fundamentals Of Digital Logic Design | II YEAR - 1st SEM | CO2 | **L3** | **1.92** | **2.00** | **2.56** | 1.60 | 0.51 | 2.11 | 0.19 | Apply minimization techniques to simplify Boolean expressions. | 94 |
| 19 | 20CS3301 | Fundamentals Of Digital Logic Design | II YEAR - 1st SEM | CO3 | **L3** | **1.92** | **1.97** | **2.44** | 1.58 | 0.49 | 2.06 | 0.14 | Apply the principles of digital electronics to design combinational and sequential circuits. | 95 |
| 19 | 20CS3301 | Fundamentals Of Digital Logic Design | II YEAR - 1st SEM | CO4 | **L4** | **1.92** | **2.02** | **2.43** | 1.62 | 0.49 | 2.10 | 0.18 | Analyze the functionality of combinational circuits and sequential circuits. | 96 |
| 20 | 20CS3302 | Object Oriented Programming Through C++ | II YEAR - 1st SEM | CO1 | **L2** | **1.92** | **2.11** | **2.93** | 1.69 | 0.59 | 2.27 | 0.35 | Understand the principles of OOP and key features of C++ | 97 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 20CS3302 | Object Oriented Programming Through C++ | II YEAR - 1st SEM | CO2 | **L3** | **1.92** | **2.17** | **2.86** | 1.74 | 0.57 | 2.31 | 0.39 | Apply object oriented concepts to develop solution for the given problem | 98 |
| 20 | 20CS3302 | Object Oriented Programming Through C++ | II YEAR - 1st SEM | CO3 | **L3** | **1.92** | **2.43** | **2.89** | 1.94 | 0.58 | 2.52 | 0.60 | Apply functions as per the problem requirement | 99 |
| 20 | 20CS3302 | Object Oriented Programming Through C++ | II YEAR - 1st SEM | CO4 | **L4** | **1.92** | **2.23** | **2.85** | 1.78 | 0.57 | 2.35 | 0.43 | Analyze the given scenario and choose appropriate generic programming aspects/ exception handling mechanism to solve the problem. | 100 |
| 21 | 20CS3303 | Computer Organization And Architecture | II YEAR - 1st SEM | CO1 | **L2** | **1.92** | **1.83** | **2.39** | 1.46 | 0.48 | 1.94 | 0.02 | Understand the basic functional units of a computer system and its organization. | 101 |
| 21 | 20CS3303 | Computer Organization And Architecture | II YEAR - 1st SEM | CO2 | **L3** | **1.92** | **2.21** | **2.31** | 1.77 | 0.46 | 2.23 | 0.31 | Apply appropriate instructions for processing various types of computer operations. | 102 |
| 21 | 20CS3303 | Computer Organization And Architecture | II YEAR - 1st SEM | CO3 | **L3** | **1.92** | **2.34** | **2.33** | 1.87 | 0.47 | 2.34 | 0.42 | Apply various types of organizations on registers. | 103 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | 20CS3303 | Computer Organization And Architecture | II YEAR - 1st SEM | CO4 | **L4** | **1.92** | **1.78** | **2.35** | 1.42 | 0.47 | 1.89 | -0.03 | Analyze memory hierarchy, I/O communication and pipelining. | 104 |
| 22 | 20ES1305 | Data Structures | II YEAR - 1st SEM | CO1 | **L2** | **1.86** | **1.90** | **2.38** | 1.52 | 0.48 | 2.00 | 0.14 | Understand the basic concepts of algorithm complexities and data structures | 105 |
| 22 | 20ES1305 | Data Structures | II YEAR - 1st SEM | CO2 | **L3** | **1.92** | **2.03** | **2.30** | 1.62 | 0.46 | 2.08 | 0.16 | Apply suitable searching, sorting algorithms for various applications. | 106 |
| 22 | 20ES1305 | Data Structures | II YEAR - 1st SEM | CO3 | **L3** | **1.86** | **1.96** | **2.31** | 1.57 | 0.46 | 2.03 | 0.17 | Apply suitable data structure to solve the problems. | 107 |
| 22 | 20ES1305 | Data Structures | II YEAR - 1st SEM | CO4 | **L4** | **1.92** | **2.04** | **2.34** | 1.63 | 0.47 | 2.10 | 0.18 | Analyze the problem to construct an algorithm using suitable DS | 108 |
| 23 | 20CS3351 | Object Oriented Programming Through C++ Lab | II YEAR - 1st SEM | CO1 | **L3** | **1.98** | **2.44** | **2.89** | 1.95 | 0.58 | 2.53 | 0.55 | Apply Object oriented principles/ C++ constructs for solving problems. | 109 |
| 23 | 20CS3351 | Object Oriented Programming Through C++ Lab | II YEAR - 1st SEM | CO2 | **L3** | **1.98** | **2.31** | **2.85** | 1.85 | 0.57 | 2.42 | 0.44 | Implement programs as an individual on different IDEs/ online platforms. | 110 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | 20CS3351 | Object Oriented Programming Through C++ Lab | II YEAR - 1st SEM | CO3 | **L3** | **1.98** | **3.00** | **2.88** | 2.40 | 0.58 | 2.98 | 1.00 | Develop an effective report based on various programs implemented. | 111 |
| 23 | 20CS3351 | Object Oriented Programming Through C++ Lab | II YEAR - 1st SEM | CO4 | **L3** | **1.98** | **2.54** | **2.88** | 2.03 | 0.58 | 2.61 | 0.63 | Apply technical knowledge for a given problem and express with an effective oral communication. | 112 |
| 23 | 20CS3351 | Object Oriented Programming Through C++ Lab | II YEAR - 1st SEM | CO5 | **L4** | **1.98** | **1.39** | **2.85** | 1.11 | 0.57 | 1.68 | -0.30 | Analyze outputs using given constraints/test cases. | 113 |
| 24 | 20ES1356 | Data Structures Lab | II YEAR - 1st SEM | CO1 | **L3** | **1.98** | **2.45** | **2.56** | 1.96 | 0.49 | 2.45 | 0.47 | Apply Linear and Non-linear data structures for solving problems. | 114 |
| 24 | 20ES1356 | Data Structures Lab | II YEAR - 1st SEM | CO2 | **L3** | **1.98** | **2.06** | **2.46** | 1.65 | 0.41 | 2.06 | 0.08 | Implement programs as an individual on different IDEs | 115 |
| 24 | 20ES1356 | Data Structures Lab | II YEAR - 1st SEM | CO3 | **L3** | **1.98** | **2.80** | **2.62** | 2.24 | 0.56 | 2.80 | 0.82 | Develop an effective report based on various programs implemented. | 116 |
| 24 | 20ES1356 | Data Structures Lab | II YEAR - 1st SEM | CO4 | **L3** | **1.98** | **2.22** | **2.49** | 1.78 | 0.44 | 2.22 | 0.24 | Apply technical knowledge for a given problem with an effective oral comm. | 117 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | 20ES1356 | Data Structures Lab | II YEAR - 1st SEM | CO5 | **L4** | **1.92** | **1.95** | **2.53** | 1.56 | 0.39 | 1.95 | 0.03 | Analyze outputs using given constraints/test cases. | 118 |
| 25 | 20CS3352 | Python Programming | II YEAR - 1st SEM | CO1 | **L3** | **1.92** | **2.51** | **2.69** | 2.01 | 0.54 | 2.55 | 0.63 | Apply Python programming constructs prolems | 119 |
| 25 | 20CS3352 | Python Programming | II YEAR - 1st SEM | CO2 | **L3** | **1.92** | **2.38** | **2.67** | 1.90 | 0.53 | 2.44 | 0.52 | Conduct experiments as an individual or team member by using PP | 120 |
| 25 | 20CS3352 | Python Programming | II YEAR - 1st SEM | CO3 | **L3** | **1.92** | **3.00** | **2.68** | 2.40 | 0.54 | 2.94 | 1.02 | Develop an effective report based on various programs implemented | 121 |
| 25 | 20CS3352 | Python Programming | II YEAR - 1st SEM | CO4 | **L3** | **1.92** | **2.14** | **2.57** | 1.71 | 0.51 | 2.23 | 0.31 | Apply technical knowledge for a given problem and express with an effective oral communication. | 122 |
| 25 | 20CS3352 | Python Programming | II YEAR - 1st SEM | CO5 | **L4** | **1.92** | **2.31** | **2.65** | 1.85 | 0.53 | 2.38 | 0.46 | Analyze outputs generated through Python programming | 123 |
| 26 | 20SO8355 | Introduction To Linux Operating Systems | II YEAR - 1st SEM | CO1 | **L3** | **1.98** | **1.63** | **2.58** | 1.30 | 0.52 | 1.82 | -0.16 | Apply suitable commands to perform various tasks on Linux Operating System. | 124 |
| 26 | 20SO8355 | Introduction To Linux Operating Systems | II YEAR - 1st SEM | CO2 | **L3** | **1.98** | **1.09** | **2.58** | 0.87 | 0.52 | 1.39 | -0.59 | Implement tasks as an individual on Linux Operating System. | 125 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | 20SO8355 | Introduction To Linux Operating Systems | II YEAR - 1st SEM | CO3 | **L3** | **1.98** | **2.83** | **2.56** | 2.26 | 0.51 | 2.78 | 0.80 | Develop an effective report based on various tasks implemented. | 126 |
| 26 | 20SO8355 | Introduction To Linux Operating Systems | II YEAR - 1st SEM | CO4 | **L3** | **1.98** | **2.49** | **2.57** | 1.99 | 0.51 | 2.51 | 0.53 | Apply technical knowledge for a given problem and express with an effective oral communication | 127 |
| 26 | 20SO8355 | Introduction To Linux Operating Systems | II YEAR - 1st SEM | CO5 | **L4** | **1.98** | **2.20** | **2.52** | 1.76 | 0.50 | 2.26 | 0.28 | Analyze outputs using given constraints | 128 |
| 27 | 20MC1301 | Environmental Sciences | II YEAR - 1st SEM | CO1 | **L3** | **1.92** | **2.02** | **2.61** | 1.61 | 0.52 | 2.13 | 0.21 | Apply advanced solutions to measure the threats and hazards in environment to link with human natural systems. | 129 |
| 27 | 20MC1301 | Environmental Sciences | II YEAR - 1st SEM | CO2 | **L4** | **1.92** | **2.02** | **2.80** | 1.61 | 0.56 | 2.17 | 0.25 | Analyze the ethical ,cultural and historical interactions between man and environment. | 130 |
| 27 | 20MC1301 | Environmental Sciences | II YEAR - 1st SEM | CO3 | **L4** | **1.92** | **2.10** | **2.63** | 1.68 | 0.53 | 2.20 | 0.28 | Analyze various environmental assets and record for better management | 131 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 27 | 20MC1301 | Environmental Sciences | II YEAR - 1st SEM | CO4 | **L4** | **1.92** | **2.13** | **2.68** | 1.70 | 0.54 | 2.24 | 0.32 | Analyze global issues to design and evaluate policies | 132 |
| 27 | 20MC1301 | Environmental Sciences | II YEAR - 1st SEM | CO5 | **L3** | **1.92** | **2.06** | **2.81** | 1.65 | 0.56 | 2.21 | 0.29 | Apply system concepts to methodological social and environmental issues | 133 |
| 28 | 20CS3391 | Community Service Project | II YEAR - 1st SEM | CO1 | **L4** | **2.01** | **2.18** | **2.82** | 1.74 | 0.56 | 2.31 | 0.30 | Analyze the issues that confront the vulnerable/marginalized section of society (village/community/habitation) and identify problem (s), objectives, requirements, and scope with proper planning in compilation of community service project. | 134 |
| 28 | 20CS3392 | Community Service Project | II YEAR - 1st SEM | CO2 | **L3** | **2.01** | **2.18** | **2.84** | 1.74 | 0.57 | 2.31 | 0.30 | Apply the engineering knowledge in project design and use methods to carry out the project work by justifying ethical principles. | 135 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 28 | 20CS3393 | Community Service Project | II YEAR - 1st SEM | CO3 | **L6** | **2.01** | **2.03** | **2.73** | 1.62 | 0.55 | 2.17 | 0.16 | Create an economic ecosystem using modern tools to meet societal needs and examine the results obtained to derive conclusions. | 136 |
| 28 | 20CS3394 | Community Service Project | II YEAR - 1st SEM | CO4 | **L5** | **2.01** | **2.13** | **2.87** | 1.70 | 0.57 | 2.28 | 0.27 | Evaluate the performance of the project task as an individual and / or team members based on their effective communication, presentation, and report to manage the task in time. | 137 |
| | | | | | | | | | | | | | | |
| 29 | 20BS1403 | Formal Languages and Automata Theory | II YEAR - 2ndSEM | CO1 | **L2** | **1.86** | **1.87** | **2.36** | 1.50 | 0.47 | 1.97 | 0.11 | Understand the fundamental concepts of Formal Languages and Automata. | 138 |
| 29 | 20BS1403 | Formal Languages and Automata Theory | II YEAR - 2ndSEM | CO2 | **L3** | **1.92** | **1.93** | **2.35** | 1.54 | 0.47 | 2.01 | 0.09 | Apply the knowledge of Automata Theory, Grammars & Regular Expressions for solving various problems. | 139 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 29 | 20BS1403 | Formal Languages and Automata Theory | II YEAR - 2nd SEM | CO3 | **L3** | **1.92** | **1.96** | **2.27** | 1.57 | 0.45 | 2.02 | 0.10 | Apply different Turing machines techniques to solve problems. | 140 |
| 29 | 20BS1403 | Formal Languages and Automata Theory | II YEAR - 2nd SEM | CO4 | **L4** | **1.92** | **1.97** | **2.32** | 1.58 | 0.46 | 2.04 | 0.12 | Analyze automata and their computational power to recognize languages. | 141 |
| 30 | 20CS3401 | Operating Systems | II YEAR - 2nd SEM | CO1 | **L2** | **1.92** | **2.11** | **2.49** | 1.69 | 0.50 | 2.19 | 0.27 | Understand the structure and functionalities of operating systems | 142 |
| 30 | 20CS3401 | Operating Systems | II YEAR - 2nd SEM | CO2 | **L3** | **1.86** | **2.10** | **2.54** | 1.68 | 0.51 | 2.19 | 0.33 | Apply different algorithms of CPU scheduling, Page replacement and disk scheduling. | 143 |
| 30 | 20CS3401 | Operating Systems | II YEAR - 2nd SEM | CO3 | **L3** | **1.92** | **2.22** | **2.47** | 1.78 | 0.49 | 2.27 | 0.35 | Apply various concepts to solve problems related to process | 144 |
| 30 | 20CS3401 | Operating Systems | II YEAR - 2nd SEM | CO4 | **L4** | **1.86** | **2.07** | **2.57** | 1.66 | 0.51 | 2.17 | 0.31 | Analyse and interpret the functionalities of operating system. | 145 |
| 31 | 20CS3402 | Advanced Data Structures | II YEAR - 2nd SEM | CO1 | **L2** | **1.86** | **1.87** | **2.46** | 1.50 | 0.49 | 1.99 | 0.13 | Understand the basic principles and operations of Data Structures | 146 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | 20CS3402 | Advanced Data Structures | II YEAR - 2nd SEM | CO2 | **L3** | **1.92** | **2.28** | **2.39** | 1.82 | 0.48 | 2.30 | 0.38 | Apply Hashing and String Matching Techniques for solving problems effectively | 147 |
| 31 | 20CS3402 | Advanced Data Structures | II YEAR - 2nd SEM | CO3 | **L3** | **1.92** | **2.41** | **2.38** | 1.93 | 0.48 | 2.40 | 0.48 | Apply the concept of advanced Trees and Graphs for Solving Problems effe tively | 148 |
| 31 | 20CS3402 | Advanced Data Structures | II YEAR - 2nd SEM | CO4 | **L4** | **1.92** | **2.32** | **2.37** | 1.86 | 0.47 | 2.33 | 0.41 | Analyze the given scenario and choose appropriate data structure for solving problems | 149 |
| 32 | 20CS3403 | Design and Analysis of Algorithms | II YEAR - 2nd SEM | CO1 | **L2** | **1.86** | **2.06** | **2.26** | 1.65 | 0.45 | 2.10 | 0.24 | Understand the fundamental concepts of algorithm analysis and design techniques | 150 |
| 32 | 20CS3403 | Design and Analysis of Algorithms | II YEAR - 2nd SEM | CO2 | **L3** | **1.92** | **2.03** | **2.19** | 1.62 | 0.44 | 2.06 | 0.14 | Apply various algorithm design techniques for solving problems | 151 |
| 32 | 20CS3403 | Design and Analysis of Algorithms | II YEAR - 2nd SEM | CO3 | **L4** | **1.92** | **2.03** | **2.20** | 1.62 | 0.44 | 2.06 | 0.14 | Analyze the performance of given problem using different algorithm techniques | 152 |
| 32 | 20CS3403 | Design and Analysis of Algorithms | II YEAR - 2nd SEM | CO4 | **L4** | **1.92** | **2.02** | **2.27** | 1.62 | 0.45 | 2.07 | 0.15 | Analyze the given problem and provide the feasible solution. | 153 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33 | 20ES1402 | Internet of Things | II YEAR - 2nd SEM | CO1 | **L2** | **1.92** | **2.67** | **2.39** | 2.14 | 0.48 | 2.61 | 0.69 | Summarize the genesis and impact of IoT applications, architectures in real world. | 154 |
| 33 | 20ES1402 | Internet of Things | II YEAR - 2nd SEM | CO2 | **L3** | **1.92** | **1.47** | **2.34** | 1.18 | 0.47 | 1.64 | -0.28 | Apply diverse methods in deploying smart objects and connecting them to network. | 155 |
| 33 | 20ES1402 | Internet of Things | II YEAR - 2nd SEM | CO3 | **L3** | **1.92** | **2.70** | **2.38** | 2.16 | 0.48 | 2.64 | 0.72 | Construct simple applications using Arduino. | 156 |
| 33 | 20ES1402 | Internet of Things | II YEAR - 2nd SEM | CO4 | **L4** | **1.92** | **2.19** | **2.32** | 1.75 | 0.46 | 2.22 | 0.30 | Analyze different protocols and select which protocol can be used for a specific application | 157 |
| 33 | 20ES1402 | Internet of Things | II YEAR - 2nd SEM | CO5 | **L3** | **1.92** | **2.37** | **2.49** | 1.90 | 0.50 | 2.39 | 0.47 | Identify and develop a solution for a given application using APIs. | 158 |
| 34 | 20ES1452 | Internet of Things Lab | II YEAR - 2nd SEM | CO1 | **L3** | **1.98** | **2.58** | **2.73** | 2.06 | 0.55 | 2.61 | 0.63 | Develop various sensor interfacing using Arduino IDE | 159 |
| 34 | 20ES1452 | Internet of Things Lab | II YEAR - 2nd SEM | CO2 | **L4** | **1.98** | **2.58** | **2.73** | 2.06 | 0.55 | 2.61 | 0.63 | Evaluate Wireless Control of Remote Devices | 160 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 34 | 20ES1452 | Internet of Things Lab | II YEAR - 2nd SEM | CO3 | **L5** | **1.98** | **2.58** | **2.65** | 2.06 | 0.53 | 2.59 | 0.61 | Design and develop Mobile Application which can interact with Sensors and Actuators. | 161 |
| 34 | 20ES1452 | Internet of Things Lab | II YEAR - 2nd SEM | CO4 | **L3** | **1.98** | **2.58** | **2.69** | 2.06 | 0.54 | 2.60 | 0.62 | Make an effective report based on experiments. | 162 |
| 35 | 20CS3451 | Advanced Data Structures through C++ Lab | II YEAR - 2nd SEM | CO1 | **L3** | **1.98** | **2.45** | **2.46** | 1.96 | 0.49 | 2.45 | 0.47 | Apply object oriented principles/c++ constructs for solving problems | 163 |
| 35 | 20CS3451 | Advanced Data Structures through C++ Lab | II YEAR - 2nd SEM | CO2 | **L3** | **1.98** | **1.74** | **2.44** | 1.39 | 0.49 | 1.88 | -0.10 | Implement programs as an individual on different IDEs/ online platforms. | 164 |
| 35 | 20CS3451 | Advanced Data Structures through C++ Lab | II YEAR - 2nd SEM | CO3 | **L3** | **1.98** | **1.73** | **2.47** | 1.38 | 0.49 | 1.88 | -0.10 | Develop an effective report based on various programs implemented. | 165 |
| 35 | 20CS3451 | Advanced Data Structures through C++ Lab | II YEAR - 2nd SEM | CO4 | **L3** | **1.92** | **2.23** | **2.43** | 1.78 | 0.49 | 2.27 | 0.35 | Apply technical knowledge for a given problem and express with an effective oral communication. | 166 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35 | 20CS3451 | Advanced Data Structures through C++ Lab | II YEAR - 2nd SEM | CO5 | **L4** | **1.98** | **2.33** | **2.46** | 1.86 | 0.49 | 2.36 | 0.38 | Analyze outputs using given constraints/test cases. | 167 |
| 36 | 20CS3452 | Design and Analysis of Algorithms Lab | II YEAR - 2nd SEM | CO1 | **L3** | **1.98** | **2.26** | **2.57** | 1.81 | 0.51 | 2.32 | 0.34 | Apply different design techniques for solving problems. | 168 |
| 36 | 20CS3452 | Design and Analysis of Algorithms Lab | II YEAR - 2nd SEM | CO2 | **L3** | **1.98** | **2.16** | **2.48** | 1.72 | 0.50 | 2.22 | 0.24 | Implement programs as an individual on different IDEs/ online platforms. | 169 |
| 36 | 20CS3452 | Design and Analysis of Algorithms Lab | II YEAR - 2nd SEM | CO3 | **L3** | **1.98** | **2.52** | **2.62** | 2.02 | 0.52 | 2.54 | 0.56 | Develop an effective report based on various programs implemented. | 170 |
| 36 | 20CS3452 | Design and Analysis of Algorithms Lab | II YEAR - 2nd SEM | CO4 | **L3** | **1.98** | **2.04** | **2.50** | 1.63 | 0.50 | 2.13 | 0.15 | Apply technical knowledge for a given problem and express with an effective oral communication. | 171 |
| 36 | 20CS3452 | Design and Analysis of Algorithms Lab | II YEAR - 2nd SEM | CO5 | **L4** | **1.98** | **2.14** | **2.54** | 1.71 | 0.51 | 2.22 | 0.24 | Analyze outputs using given constraints/test cases. | 172 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 37 | 20SO8454 | Programming with JAVA | II YEAR - 2nd SEM | CO1 | **L3** | **1.98** | **2.00** | **2.65** | 1.60 | 0.53 | 2.13 | 0.15 | Apply object oriented principles/ Java constructs for solving problems | 173 |
| 37 | 20SO8454 | Programming with JAVA | II YEAR - 2nd SEM | CO2 | **L3** | **1.98** | **1.86** | **2.58** | 1.49 | 0.52 | 2.00 | 0.02 | Implement programs as an individual on different IDE/ online platforms. | 174 |
| 37 | 20SO8454 | Programming with JAVA | II YEAR - 2nd SEM | CO3 | **L3** | **1.98** | **1.54** | **2.61** | 1.23 | 0.52 | 1.75 | -0.23 | Develop an effective report based on various programs implemented. | 175 |
| 37 | 20SO8454 | Programming with JAVA | II YEAR - 2nd SEM | CO4 | **L3** | **1.98** | **2.03** | **2.49** | 1.62 | 0.50 | 2.12 | 0.14 | Apply technical knowledge for a given problem and express with an effective oral communication | 176 |
| 37 | 20SO8454 | Programming with JAVA | II YEAR - 2nd SEM | CO5 | **L4** | **1.98** | **2.06** | **2.58** | 1.65 | 0.52 | 2.16 | 0.18 | Analyze outputs using given constraints/test cases. | 177 |
| | | | | | | | | | | | | | | |
| 38 | 20CS3501 | Software Engineering | III YEAR - 1st SEM | CO1 | **L2** | **1.92** | **2.01** | **2.76** | 1.61 | 0.55 | 2.16 | 0.24 | Understand the fundamentals of Software Engineering | 178 |
| 38 | 20CS3501 | Software Engineering | III YEAR - 1st SEM | CO2 | **L3** | **1.92** | **1.91** | **2.60** | 1.53 | 0.52 | 2.05 | 0.13 | Apply various life cycle activities for a project development | 179 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 38 | 20CS3501 | Software Engineering | III YEAR - 1st SEM | CO3 | **L3** | **1.92** | **2.10** | **2.70** | 1.68 | 0.54 | 2.22 | 0.30 | Apply Risk and Quality management Strategies for project development. | 180 |
| 38 | 20CS3501 | Software Engineering | III YEAR - 1st SEM | CO4 | **L4** | **1.92** | **2.23** | **2.69** | 1.78 | 0.54 | 2.32 | 0.40 | Analyze the various requirements, design and techniques to select the appropriate techniques for the software project development. | 181 |
| 39 | 20CS3502 | Database Management Systems | III YEAR - 1st SEM | CO1 | **L2** | **1.86** | **1.83** | **2.63** | 1.46 | 0.53 | 1.99 | 0.13 | Understand the basic concepts of database management systems | 182 |
| 39 | 20CS3502 | Database Management Systems | III YEAR - 1st SEM | CO2 | **L3** | **1.92** | **2.18** | **2.60** | 1.74 | 0.52 | 2.26 | 0.34 | Apply SQL or Relational Algebra operations to find solutions for a given application | 183 |
| 39 | 20CS3502 | Database Management Systems | III YEAR - 1st SEM | CO3 | **L3** | **1.92** | **2.08** | **2.61** | 1.66 | 0.52 | 2.19 | 0.27 | Apply normalization techniques to improve database design | 184 |
| 39 | 20CS3502 | Database Management Systems | III YEAR - 1st SEM | CO4 | **L4** | **1.92** | **2.08** | **2.59** | 1.66 | 0.52 | 2.18 | 0.26 | Analyze a real time scenario to use Conceptual and Relational data models for designing the database | 185 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | 20CS3503 | Computer Networks | III YEAR - 1st SEM | CO1 | **L2** | **1.92** | **2.01** | **2.53** | 1.61 | 0.51 | 2.11 | 0.19 | Understand the basic concepts and protocols of different layers. | 186 |
| 40 | 20CS3503 | Computer Networks | III YEAR - 1st SEM | CO2 | **L3** | **1.92** | **1.77** | **2.47** | 1.42 | 0.49 | 1.91 | -0.01 | Apply Error Correction or MAC Protocol mechanism for a given scenario. | 187 |
| 40 | 20CS3503 | Computer Networks | III YEAR - 1st SEM | CO3 | **L3** | **1.86** | **2.32** | **2.47** | 1.86 | 0.49 | 2.35 | 0.49 | Apply various Addressing mechanisms /Routing protocols for a given network.. | 188 |
| 40 | 20CS3503 | Computer Networks | III YEAR - 1st SEM | CO4 | **L3** | **1.86** | **1.84** | **2.47** | 1.47 | 0.49 | 1.97 | 0.11 | Apply appropriate Transport & Application layer protocol for a given context. | 189 |
| 40 | 20CS3503 | Computer Networks | III YEAR - 1st SEM | CO5 | **L4** | **1.92** | **2.23** | **2.49** | 1.78 | 0.50 | 2.28 | 0.36 | Analyze the given scenario and use appropriate methods/mechanisms/protocols for designing a network. | 190 |
| 41 | 20ME2501A | Design Thinking | III YEAR - 1st SEM | CO1 | **L2** | **1.92** | **2.04** | **2.67** | 1.63 | 0.53 | 2.17 | 0.25 | Understand the principles of design thinking and its approaches | 191 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 41 | 20ME2501A | Design Thinking | III YEAR - 1st SEM | CO2 | **L3** | **1.92** | **2.03** | **2.77** | 1.62 | 0.55 | 2.18 | 0.26 | Apply the empathy, the Define phase and develop an idea through ideation Techniques in human-centered design problems. | 192 |
| 41 | 20ME2501A | Design Thinking | III YEAR - 1st SEM | CO3 | **L3** | **1.92** | **2.07** | **2.71** | 1.66 | 0.54 | 2.20 | 0.28 | Apply the design thinking techniques for innovation processes | 193 |
| 41 | 20ME2501A | Design Thinking | III YEAR - 1st SEM | CO4 | **L4** | **1.92** | **2.30** | **2.80** | 1.84 | 0.56 | 2.40 | 0.48 | Analyze the prototype and test in a design thinking context. | 194 |
| 42 | 20CS4501A | Data Science | III YEAR - 1st SEM | CO1 | **L2** | **1.65** | **1.64** | **2.65** | 1.31 | 0.53 | 1.84 | 0.19 | Understand the life cycle process of data science. | 195 |
| 42 | 20CS4501A | Data Science | III YEAR - 1st SEM | CO2 | **L3** | **1.71** | **2.30** | **2.60** | 1.84 | 0.52 | 2.36 | 0.65 | Apply different data pre-processing techniques to improve data quality. | 196 |
| 42 | 20CS4501A | Data Science | III YEAR - 1st SEM | CO3 | **L3** | **1.65** | **2.10** | **2.56** | 1.68 | 0.51 | 2.19 | 0.54 | Apply statistical methods to evaluate the data. | 197 |
| 42 | 20CS4501A | Data Science | III YEAR - 1st SEM | CO4 | **L3** | **1.71** | **2.13** | **2.55** | 1.70 | 0.51 | 2.21 | 0.50 | Apply Statistical Learning techniques for model building, Assessment and Selection. | 198 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43 | 20CS4501D | Artificial Intelligence | III YEAR - 1st SEM | CO1 | **L2** | **1.71** | **1.99** | **2.64** | 1.59 | 0.53 | 2.12 | 0.41 | Understand the basic concepts of artificial intelligence. | 199 |
| 43 | 20CS4501D | Artificial Intelligence | III YEAR - 1st SEM | CO2 | **L3** | **1.71** | **1.90** | **2.60** | 1.52 | 0.52 | 2.04 | 0.33 | Apply the principles of AI in solutions that require problem solving, knowledge representation. | 200 |
| 43 | 20CS4501D | Artificial Intelligence | III YEAR - 1st SEM | CO3 | **L3** | **1.65** | **1.94** | **2.62** | 1.55 | 0.52 | 2.08 | 0.43 | Apply Planning and Learning for solving AI problems. | 201 |
| 43 | 20CS4501D | Artificial Intelligence | III YEAR - 1st SEM | CO4 | **L4** | **1.71** | **1.73** | **2.59** | 1.38 | 0.52 | 1.90 | 0.19 | Analyze a given problem and apply AI Techniques. | 202 |
| 44 | 20CS3551 | Database Management Systems Lab | III YEAR - 1st SEM | CO1 | **L3** | **1.98** | **2.18** | **2.41** | 1.74 | 0.48 | 2.23 | 0.25 | Apply database management techniques to solve problems | 203 |
| 44 | 20CS3551 | Database Management Systems Lab | III YEAR - 1st SEM | CO2 | **L3** | **1.98** | **2.07** | **2.34** | 1.66 | 0.47 | 2.12 | 0.14 | Implement experiments by using modern tools like MYSQL, Oracle | 204 |
| 44 | 20CS3551 | Database Management Systems Lab | III YEAR - 1st SEM | CO3 | **L3** | **1.98** | **3.00** | **2.40** | 2.40 | 0.48 | 2.88 | 0.90 | Develop an effective report based on various constructs implemented. | 205 |
| 44 | 20CS3551 | Database Management Systems Lab | III YEAR - 1st SEM | CO4 | **L3** | **1.98** | **2.00** | **2.35** | 1.60 | 0.47 | 2.07 | 0.09 | Apply technical knowledge for a given problem and express with an effective oral | 206 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 44 | 20CS3551 | Database Management Systems Lab | III YEAR - 1st SEM | CO5 | **L4** | **1.98** | **2.03** | **2.43** | 1.62 | 0.49 | 2.11 | 0.13 | Analyze outputs of queries for a given problem | 207 |
| 45 | 20CS3552 | Computer Networks Lab | III YEAR - 1st SEM | CO1 | **L3** | **1.98** | **2.71** | **2.70** | 2.17 | 0.54 | 2.71 | 0.73 | Demonstrate the commands and configuration of Networking in various environments. | 208 |
| 45 | 20CS3552 | Computer Networks Lab | III YEAR - 1st SEM | CO2 | **L3** | **1.98** | **2.07** | **2.67** | 1.66 | 0.53 | 2.19 | 0.21 | Analyze the Behavior and performance of network using network monitoring tools | 209 |
| 45 | 20CS3552 | Computer Networks Lab | III YEAR - 1st SEM | CO3 | **L3** | **1.98** | **3.00** | **2.73** | 2.40 | 0.55 | 2.95 | 0.97 | Develop an effective report based on various Functionalities of layers in TCP/IP | 210 |
| 45 | 20CS3552 | Computer Networks Lab | III YEAR - 1st SEM | CO4 | **L3** | **1.98** | **1.87** | **2.68** | 1.50 | 0.54 | 2.03 | 0.05 | Apply Technical knowledge for a given scenario and express with an effective oral communication | 211 |
| 45 | 20CS3552 | Computer Networks Lab | III YEAR - 1st SEM | CO5 | **L4** | **1.98** | **1.89** | **2.68** | 1.51 | 0.54 | 2.05 | 0.07 | Analyze the outputs and visualizations generated for different scenarios. | 212 |
| 46 | 20SS8551 | Soft Skills | III YEAR - 1st SEM | CO1 | **L3** | **1.92** | **1.81** | **2.83** | 1.45 | 0.57 | 2.01 | 0.09 | Develop logical and Analytical skill set through Case Studies | 213 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 46 | 20SS8552 | Soft Skills | III YEAR - 1st SEM | CO2 | **L3** | **1.92** | **1.81** | **2.81** | 1.45 | 0.56 | 2.01 | 0.09 | Proficient in giving Presentations | 214 |
| 46 | 20SS8553 | Soft Skills | III YEAR - 1st SEM | CO3 | **L2** | **1.92** | **1.81** | **2.83** | 1.45 | 0.57 | 2.01 | 0.09 | Understand the corporate etiquette | 215 |
| 46 | 20SS8554 | Soft Skills | III YEAR - 1st SEM | CO4 | **L3** | **1.92** | **1.81** | **2.81** | 1.45 | 0.56 | 2.01 | 0.09 | Develop Competency in group discussion & Interviews | 216 |
| 46 | 20SS8555 | Soft Skills | III YEAR - 1st SEM | CO5 | **L3** | **1.92** | **1.81** | **2.83** | 1.45 | 0.57 | 2.01 | 0.09 | Present themselves with corporate readiness | 217 |
| 47 | 20MC1501 | Constitution of India | III YEAR - 1st SEM | CO1 | **L2** | **1.92** | **2.90** | **2.68** | 2.32 | 0.54 | 2.86 | 0.94 | Understand about the historical background of Indian constitution and features | 218 |
| 47 | 20MC1501 | Constitution of India | III YEAR - 1st SEM | CO2 | **L3** | **1.92** | **2.96** | **2.59** | 2.37 | 0.52 | 2.89 | 0.97 | Apply provisions of citizenship Act and fundamental rights and responsibilities of the citizen | 219 |
| 47 | 20MC1501 | Constitution of India | III YEAR - 1st SEM | CO3 | **L4** | **1.92** | **2.98** | **2.60** | 2.38 | 0.52 | 2.90 | 0.98 | Analyze the structure and function of union government | 220 |
| 47 | 20MC1501 | Constitution of India | III YEAR - 1st SEM | CO4 | **L2** | **1.92** | **2.91** | **2.64** | 2.33 | 0.53 | 2.86 | 0.94 | Understand the knowledge about the legislature assembly of state government | 221 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47 | 20MC1501 | Constitution of India | III YEAR - 1st SEM | CO5 | **L4** | **1.92** | **2.93** | **2.65** | 2.34 | 0.53 | 2.87 | 0.95 | Analyze Indian statutory bodies and working of Election Commission | 222 |
| 48 | 20CS3581A | Summer Internship | III YEAR - 1st SEM | CO1 | **L3** | **1.98** | **2.08** | **2.63** | 1.66 | 0.53 | 2.19 | 0.21 | Apply domain knowledge during the course of internship | 223 |
| 48 | 20CS3581A | Summer Internship | III YEAR - 1st SEM | CO2 | **L3** | **1.98** | **2.04** | **2.58** | 1.63 | 0.52 | 2.15 | 0.17 | Demonstrate effective oral communication skills. | 224 |
| 48 | 20CS3581A | Summer Internship | III YEAR - 1st SEM | CO3 | **L3** | **1.98** | **2.06** | **2.46** | 1.65 | 0.49 | 2.14 | 0.16 | Work as an individual or a team member in a collaborative environment. | 225 |
| 48 | 20CS3581A | Summer Internship | III YEAR - 1st SEM | CO4 | **L3** | **1.98** | **2.04** | **2.41** | 1.63 | 0.48 | 2.11 | 0.13 | Exhibit integrity and ethical behavior while carrying out the internship. | 226 |
| 48 | 20CS3581A | Summer Internship | III YEAR - 1st SEM | CO5 | **L3** | **1.98** | **2.00** | **2.95** | 1.60 | 0.59 | 2.19 | 0.21 | Apply effective time management skills to complete the work within appropriate time | 227 |
| 48 | 20CS3581A | Summer Internship | III YEAR - 1st SEM | CO6 | **L3** | **1.98** | **2.07** | **2.98** | 1.66 | 0.60 | 2.25 | 0.27 | Develop an effective report based on the work completed during the internship. | 228 |
| | | | | | | | | | | | | | | |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 49 | 20CS3601 | Compiler Design | III YEAR - 2nd SEM | CO1 | **L2** | **1.92** | **1.89** | **2.77** | 1.51 | 0.55 | 2.07 | 0.15 | Understand the fundamental concepts of Compiler Design. | 229 |
| 49 | 20CS3601 | Compiler Design | III YEAR - 2nd SEM | CO2 | **L3** | **1.92** | **2.49** | **2.74** | 1.99 | 0.55 | 2.54 | 0.62 | Apply top-down parsing techniques to generate the parse trees. | 230 |
| 49 | 20CS3601 | Compiler Design | III YEAR - 2nd SEM | CO3 | **L3** | **1.92** | **2.41** | **2.73** | 1.93 | 0.55 | 2.47 | 0.55 | Apply bottom up parsing techniques to generate parse tree for the given grammar. | 231 |
| 49 | 20CS3601 | Compiler Design | III YEAR - 2nd SEM | CO4 | **L3** | **1.92** | **2.11** | **2.70** | 1.69 | 0.54 | 2.23 | 0.31 | Apply various code optimization techniques for intermediate code forms and Code Generation. | 232 |
| 49 | 20CS3601 | Compiler Design | III YEAR - 2nd SEM | CO5 | **L4** | **1.92** | **2.51** | **2.75** | 2.01 | 0.55 | 2.56 | 0.64 | Analyze the given grammar and apply suitable parsing . | 233 |
| 50 | 20CS3602 | Machine Learning | III YEAR - 2nd SEM | CO1 | **L2** | **1.86** | **1.95** | **2.46** | 1.56 | 0.49 | 2.05 | 0.19 | Understand the basic concepts of Machine Learning. | 234 |
| 50 | 20CS3602 | Machine Learning | III YEAR - 2nd SEM | CO2 | **L3** | **1.92** | **2.06** | **2.42** | 1.65 | 0.48 | 2.13 | 0.21 | Apply Supervised Learning Algorithms for various problems | 235 |
| 50 | 20CS3602 | Machine Learning | III YEAR - 2nd SEM | CO3 | **L3** | **1.86** | **2.21** | **2.44** | 1.77 | 0.49 | 2.26 | 0.40 | Apply Unsupervised Learning Algorithms for solving various problems | 236 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 20CS3602 | Machine Learning | III YEAR - 2nd SEM | CO4 | **L4** | **1.92** | **2.15** | **2.45** | 1.72 | 0.49 | 2.21 | 0.29 | Analyze the given application and use suitable Machine Learning Algorithm. | 237 |
| 51 | 20CS3603 | Mern Stack Development | III YEAR - 2nd SEM | CO1 | **L2** | **1.92** | **1.99** | **2.43** | 1.59 | 0.49 | 2.08 | 0.16 | Understand the fundamental concepts of web application development. | 238 |
| 51 | 20CS3603 | Mern Stack Development | III YEAR - 2nd SEM | CO2 | **L3** | **1.86** | **1.78** | **2.40** | 1.42 | 0.48 | 1.90 | 0.04 | Apply Node.JS restful APIs to Interact with HTTP services | 239 |
| 51 | 20CS3603 | Mern Stack Development | III YEAR - 2nd SEM | CO3 | **L3** | **1.86** | **2.00** | **2.34** | 1.60 | 0.47 | 2.07 | 0.21 | Apply React JS concepts to build an Application. | 240 |
| 51 | 20CS3603 | Mern Stack Development | III YEAR - 2nd SEM | CO4 | **L4** | **1.86** | **1.97** | **2.37** | 1.58 | 0.47 | 2.05 | 0.19 | Apply the concepts of Mongo DB to manipulate the DB | 241 |
| 52 | 20ME2601A | Value Engineering | III YEAR - 2nd SEM | CO1 | **L2** | **1.92** | **1.53** | **2.75** | 1.22 | 0.55 | 1.77 | -0.15 | Understand the basic concepts, techniques and applications of value engineering | 242 |
| 52 | 20ME2601A | Value Engineering | III YEAR - 2nd SEM | CO2 | **L2** | **1.86** | **2.13** | **2.72** | 1.70 | 0.54 | 2.25 | 0.39 | Describe job plan of value engineering. | 243 |
| 52 | 20ME2601A | Value Engineering | III YEAR - 2nd SEM | CO3 | **L3** | **1.92** | **2.00** | **2.77** | 1.60 | 0.55 | 2.15 | 0.23 | Illustrate different value engineering techniques and versatility of value engineering. | 244 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52 | 20ME2601A | Value Engineering | III YEAR - 2nd SEM | CO4 | **L3** | **1.92** | **1.81** | **2.70** | 1.45 | 0.54 | 1.99 | 0.07 | Illustrate the efforts of value engineering team during the process of value engineering | 245 |
| 53 | 20ME2601B | Human Factors in Engineering | III YEAR - 2nd SEM | CO1 | **L2** | **1.86** | **1.84** | **2.54** | 1.47 | 0.51 | 1.98 | 0.12 | Understand the fundamentals of Human factors, Physical work, Anthropometry, Ergonomics, Machine controls, Seating design, Colour - Light, Temperature - Humidity – Illuminations and Measurement of sound. | 246 |
| 53 | 20ME2601B | Human Factors in Engineering | III YEAR - 2nd SEM | CO2 | **L3** | **1.92** | **2.08** | **2.44** | 1.66 | 0.49 | 2.15 | 0.23 | Identify the role of Anthropometry and Ergonomics in product design. | 247 |
| 53 | 20ME2601B | Human Factors in Engineering | III YEAR - 2nd SEM | CO3 | **L3** | **1.92** | **2.19** | **2.41** | 1.75 | 0.48 | 2.23 | 0.31 | Choose the effective seating design and Machine controls for improvement of human workplace. | 248 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53 | 20ME2601B | Human Factors in Engineering | III YEAR - 2nd SEM | CO4 | **L3** | **1.92** | **1.93** | **2.41** | 1.54 | 0.48 | 2.03 | 0.11 | Represent the importance of colour and light, Temperature - Humidity – Illumination, Measurement of sound in human workplace. | 249 |
| 54 | 20CS4601C | Block chain | III YEAR - 2nd SEM | CO1 | **L2** | **1.71** | **1.91** | **2.52** | 1.53 | 0.50 | 2.03 | 0.32 | Understand the key dimensions of Blockchain Technology | 250 |
| 54 | 20CS4601C | Block chain | III YEAR - 2nd SEM | CO2 | **L3** | **1.71** | **1.83** | **2.51** | 1.47 | 0.50 | 1.97 | 0.26 | Apply the principles of Blockchain for a given application. | 251 |
| 54 | 20CS4601C | Block chain | III YEAR - 2nd SEM | CO3 | **L3** | **1.71** | **1.66** | **2.45** | 1.32 | 0.49 | 1.82 | 0.11 | Apply the features of Ethereum and Hyperledger to develop various applications | 252 |
| 54 | 20CS4601C | Block chain | III YEAR - 2nd SEM | CO4 | **L4** | **1.71** | **2.54** | **2.55** | 2.03 | 0.51 | 2.54 | 0.83 | Analyze the given scenario and design a block chain based solution | 253 |
| 55 | 20CS3651 | Compiler Design Lab | III YEAR - 2nd SEM | CO1 | **L3** | **1.98** | **2.52** | **2.68** | 2.02 | 0.54 | 2.55 | 0.57 | Apply C, LEX and YACC programming to write a solution for the phases of compiler problems. | 254 |
| 55 | 20CS3651 | Compiler Design Lab | III YEAR - 2nd SEM | CO2 | **L3** | **1.98** | **2.45** | **2.60** | 1.96 | 0.52 | 2.48 | 0.50 | Implement programs as an individual on IDE | 255 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55 | 20CS3651 | Compiler Design Lab | III YEAR - 2nd SEM | CO3 | **L3** | **1.98** | **2.10** | **2.66** | 1.68 | 0.53 | 2.21 | 0.23 | Develop an effective report based on various programs implemented. | 256 |
| 55 | 20CS3651 | Compiler Design Lab | III YEAR - 2nd SEM | CO4 | **L3** | **1.98** | **2.19** | **2.62** | 1.75 | 0.52 | 2.28 | 0.30 | Apply technical knowledge for a given problem and express with an effective oral communication. | 257 |
| 55 | 20CS3651 | Compiler Design Lab | III YEAR - 2nd SEM | CO5 | **L4** | **1.98** | **1.81** | **2.66** | 1.45 | 0.53 | 1.98 | 0.00 | Analyze outputs generated by executing C, LEX and YACC programs for different test cases. | 258 |
| 56 | 20CS3652 | Machine Learning Lab | III YEAR - 2nd SEM | CO1 | **L3** | **1.98** | **2.92** | **2.42** | 2.34 | 0.48 | 2.82 | 0.84 | Apply various pre-processing techniques and Machine Learning methods on different datasets for a given problem. | 259 |
| 56 | 20CS3652 | Machine Learning Lab | III YEAR - 2nd SEM | CO2 | **L3** | **1.98** | **2.93** | **2.36** | 2.34 | 0.47 | 2.82 | 0.84 | Implement various experiments in Jupyter Notebook Environment and Google Colab. | 260 |
| 56 | 20CS3652 | Machine Learning Lab | III YEAR - 2nd SEM | CO3 | **L3** | **1.98** | **2.99** | **2.38** | 2.39 | 0.48 | 2.87 | 0.89 | Develop an effective report based on various learning methods implemented. | 261 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)-IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56 | 20CS3652 | Machine Learning Lab | III YEAR - 2nd SEM | CO4 | **L3** | **1.98** | **1.96** | **2.42** | 1.57 | 0.48 | 2.05 | 0.07 | Apply technical knowledge for a given scenario and express with an effective oral communication. | 262 |
| 56 | 20CS3652 | Machine Learning Lab | III YEAR - 2nd SEM | CO5 | **L4** | **1.98** | **2.49** | **2.39** | 1.99 | 0.48 | 2.47 | 0.49 | Analyze the outputs and visualizations generated for different datasets. | 263 |
| 57 | 20CS3653 | Mern Stack Development Lab | III YEAR - 2nd SEM | CO1 | **L3** | **1.98** | **2.38** | **2.58** | 1.90 | 0.52 | 2.42 | 0.44 | Apply Mern technologies to develop web applications. | 264 |
| 57 | 20CS3653 | Mern Stack Development Lab | III YEAR - 2nd SEM | CO2 | **L3** | **1.98** | **2.7** | **2.52** | 2.16 | 0.50 | 2.66 | 0.68 | Implement various applications as an individual or team member | 265 |
| 57 | 20CS3653 | Mern Stack Development Lab | III YEAR - 2nd SEM | CO3 | **L3** | **1.98** | **2.56** | **2.53** | 2.05 | 0.51 | 2.55 | 0.57 | Develop an effective report based on various programs implemented. | 266 |
| 57 | 20CS3653 | Mern Stack Development Lab | III YEAR - 2nd SEM | CO4 | **L3** | **1.98** | **1.97** | **2.51** | 1.58 | 0.50 | 2.08 | 0.10 | Apply technical knowledge for a given problem and express with an effective oral communication. | 267 |
| 57 | 20CS3653 | Mern Stack Development Lab | III YEAR - 2nd SEM | CO5 | **L4** | **1.92** | **2.59** | **2.53** | 2.07 | 0.51 | 2.58 | 0.66 | Analyze outputs of web based applications | 268 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58 | 20SA8651 | Mobile Application Development | III YEAR - 2nd SEM | CO1 | L3 | 1.92 | 2.02 | 2.72 | 1.61 | 0.54 | 2.16 | 0.24 | Apply the basics of android to develop android applications | 269 |
| 58 | 20SA8651 | Mobile Application Development | III YEAR - 2nd SEM | CO2 | L3 | 1.92 | 1.92 | 2.71 | 1.54 | 0.54 | 2.08 | 0.16 | Develop various applications as an individual or team | 270 |
| 58 | 20SA8651 | Mobile Application Development | III YEAR - 2nd SEM | CO3 | L3 | 1.98 | 1.82 | 2.71 | 1.46 | 0.54 | 2.00 | 0.02 | Develop an effective report based on various programs implemented | 271 |
| 58 | 20SA8651 | Mobile Application Development | III YEAR - 2nd SEM | CO4 | L3 | 1.98 | 1.08 | 2.72 | 0.86 | 0.54 | 1.41 | -0.57 | Apply technical knowledge for a given problem and express with an effective oral communication | 272 |
| 58 | 20SA8651 | Mobile Application Development | III YEAR - 2nd SEM | CO5 | L4 | 1.92 | 1.81 | 3.00 | 1.45 | 0.60 | 2.05 | 0.13 | Analyze outputs generated using android application | 273 |
| 59 | 20MC1602 | Universal Human Values | III YEAR - 2nd SEM | CO1 | L2 | 1.92 | 2.09 | 2.97 | 1.67 | 0.59 | 2.27 | 0.35 | Understand the importance of universal human values and value education | 274 |
| 59 | 20MC1602 | Universal Human Values | III YEAR - 2nd SEM | CO2 | L2 | 1.92 | 1.95 | 2.95 | 1.56 | 0.59 | 2.15 | 0.23 | Understand the Harmony in human being, Family and society | 275 |
| 59 | 20MC1602 | Universal Human Values | III YEAR - 2nd SEM | CO3 | L3 | 1.92 | 1.95 | 2.98 | 1.56 | 0.60 | 2.16 | 0.24 | Apply a holistic perception of harmony at all levels of Exercise | 276 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 59 | 20MC1603 | Universal Human Values | III YEAR - 2nd SEM | CO4 | **L3** | **1.92** | **1.97** | **2.97** | 1.58 | 0.59 | 2.17 | 0.25 | Apply human values and professional ethics to the self, family, society, and day-to-day activities of real life. | 277 |
| | | | | | | | | | | | | | | |
| 60 | 20CS4701A | Deep Learning | IV YEAR - 1st SEM | CO1 | **L2** | **1.65** | **2.11** | **2.76** | 1.69 | 0.55 | 2.24 | 0.59 | Understand the fundamental concepts of Deep learning. | 278 |
| 60 | 20CS4701A | Deep Learning | IV YEAR - 1st SEM | CO2 | **L3** | **1.71** | **2.13** | **2.72** | 1.70 | 0.54 | 2.25 | 0.54 | Apply concepts of deep networks to analyze various architectures. | 279 |
| 60 | 20CS4701A | Deep Learning | IV YEAR - 1st SEM | CO3 | **L3** | **1.71** | **2.20** | **2.62** | 1.76 | 0.52 | 2.28 | 0.57 | Apply deep learning models to build applications in various domains. | 280 |
| 60 | 20CS4701A | Deep Learning | IV YEAR - 1st SEM | CO4 | **L4** | **1.71** | **2.31** | **2.64** | 1.85 | 0.53 | 2.38 | 0.67 | Analyze the given problem and apply suitable deep learning algorithm. | 281 |
| 61 | 20CS4701C | Cloud Computing | IV YEAR - 1st SEM | CO1 | **L2** | **1.92** | **2.38** | **2.76** | 1.90 | 0.55 | 2.46 | 0.54 | Understand the basic concepts of virtualization and Cloud Computing | 282 |
| 61 | 20CS4701C | Cloud Computing | IV YEAR - 1st SEM | CO2 | **L3** | **1.92** | **2.45** | **2.66** | 1.96 | 0.53 | 2.49 | 0.57 | Apply cloud computing framework to build and deploy customized applications | 283 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61 | 20CS4701C | Cloud Computing | IV YEAR - 1st SEM | CO3 | **L4** | **1.92** | **1.63** | **2.73** | 1.30 | 0.55 | 1.85 | -0.07 | Analyze the given application and choose a suitable platform for deploying the cloud. | 284 |
| 62 | 20CS4702B | Software Project Management | IV YEAR - 1st SEM | CO1 | **L2** | **1.92** | **1.74** | **2.49** | 1.39 | 0.50 | 1.89 | -0.03 | Understand the fundamentals of Project Management principles while developing software. | 285 |
| 62 | 20CS4702B | Software Project Management | IV YEAR - 1st SEM | CO2 | **L3** | **1.92** | **2.19** | **2.54** | 1.75 | 0.51 | 2.26 | 0.34 | Apply a suitable software process model to develop a project. | 286 |
| 62 | 20CS4702B | Software Project Management | IV YEAR - 1st SEM | CO3 | **L3** | **1.86** | **2.19** | **2.47** | 1.76 | 0.49 | 2.25 | 0.39 | Apply the effort Estimation techniques to prepare accurate project estimation | 287 |
| 62 | 20CS4702B | Software Project Management | IV YEAR - 1st SEM | CO4 | **L4** | **1.86** | **1.99** | **2.57** | 1.59 | 0.51 | 2.11 | 0.25 | Analyze and estimate cost, risk and outline the project plan | 288 |
| 63 | 20CS4702C | Cyber Security | IV YEAR - 1st SEM | CO1 | **L2** | **1.92** | **1.90** | **2.42** | 1.52 | 0.48 | 2.00 | 0.08 | Understand the basic concepts of cybercrime and offences | 289 |
| 63 | 20CS4702C | Cyber Security | IV YEAR - 1st SEM | CO2 | **L3** | **1.92** | **1.90** | **2.39** | 1.52 | 0.48 | 2.00 | 0.08 | Apply various methods and tools to identify various Cyber Crimes | 290 |
| 63 | 20CS4702C | Cyber Security | IV YEAR - 1st SEM | CO3 | **L3** | **1.92** | **2.06** | **2.44** | 1.65 | 0.49 | 2.14 | 0.22 | Apply different security measures on mobile devices. | 291 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63 | 20CS4702C | Cyber Security | IV YEAR - 1st SEM | CO4 | **L4** | **1.92** | **1.91** | **2.47** | 1.53 | 0.49 | 2.02 | 0.10 | Analyze the cyber security requirements/measures for an IT Infrastructure | 292 |
| 64 | 20CS4703C | User Interface Design | IV YEAR - 1st SEM | CO1 | **L2** | **1.92** | **2.01** | **2.70** | 1.61 | 0.54 | 2.15 | 0.23 | Understand the concepts and principles of graphical user interface design | 293 |
| 64 | 20CS4703C | User Interface Design | IV YEAR - 1st SEM | CO2 | **L3** | **1.92** | **1.90** | **2.62** | 1.52 | 0.52 | 2.04 | 0.12 | Apply concepts of interaction devices to identify appropriate devices for an application | 294 |
| 64 | 20CS4703C | User Interface Design | IV YEAR - 1st SEM | CO3 | **L4** | **1.92** | **2.07** | **2.61** | 1.66 | 0.52 | 2.18 | 0.26 | Analyze given scenario and apply screen elements and windows to design a screen | 295 |
| 64 | 20CS4703C | User Interface Design | IV YEAR - 1st SEM | CO4 | **L4** | **1.92** | **2.21** | **2.62** | 1.77 | 0.52 | 2.29 | 0.37 | Analyze human physical and mental limitations for using computers to provide solutions. | 296 |
| 65 | 20EC2701B | E – Waste Management | IV YEAR - 1st SEM | CO1 | **L2** | **1.92** | **2.83** | **2.62** | 2.26 | 0.52 | 2.79 | 0.87 | Understand the environmental impacts of e-waste. | 297 |
| 65 | 20EC2701B | E – Waste Management | IV YEAR - 1st SEM | CO2 | **L3** | **1.92** | **2.83** | **2.66** | 2.26 | 0.53 | 2.80 | 0.88 | Apply concepts of e-waste management hierarchy. | 298 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65 | 20EC2701B | E – Waste Management | IV YEAR - 1st SEM | CO3 | **L4** | **1.92** | **2.89** | **2.64** | 2.31 | 0.53 | 2.84 | 0.92 | Distinguish the role of various national and internal act and laws applicable for e-waste management and handling. | 299 |
| 65 | 20EC2701B | E – Waste Management | IV YEAR - 1st SEM | CO4 | **L4** | **1.92** | **2.85** | **2.65** | 2.28 | 0.53 | 2.81 | 0.89 | Analyze the e – waste management measures proposed under national and global legislations. | 300 |
| 66 | 20EE2701A | Non-Conventional Energy Resources | IV YEAR - 1st SEM | CO1 | **L2** | **1.92** | **1.31** | **2.52** | 1.05 | 0.50 | 1.55 | -0.37 | Understand the process of energy collection, quantification, storage, conversion and applications of non-conventional sources. | 301 |
| 66 | 20EE2701A | Non-Conventional Energy Resources | IV YEAR - 1st SEM | CO2 | **L3** | **1.86** | **2.13** | **2.52** | 1.70 | 0.50 | 2.21 | 0.35 | Apply the knowledge of energy conversion for harvesting energy from different sources like light, heat, wind etc. | 302 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66 | 20EE2701A | Non-Conventional Energy Resources | IV YEAR - 1st SEM | CO3 | **L3** | **1.92** | **2.19** | **2.52** | 1.75 | 0.50 | 2.26 | 0.34 | Apply basic laws of physics for the production of energy from Solar, wind, ocean, biomass, geothermal, fuel cell and hydrogen energy sources. | 303 |
| 66 | 20EE2701A | Non-Conventional Energy Resources | IV YEAR - 1st SEM | CO4 | **L4** | **1.92** | **1.79** | **2.43** | 1.43 | 0.49 | 1.92 | 0.00 | Analyze the theory and designing wind mills, MHD, Fuel cells. | 304 |
| 66 | 20EE2701A | Non-Conventional Energy Resources | IV YEAR - 1st SEM | CO5 | **L4** | **1.92** | **1.88** | **2.43** | 1.50 | 0.49 | 1.99 | 0.07 | Examine the performance of solar and wind generating units and economic aspects of MHD biomass and Ocean energy sources. | 305 |
| 66 | 20EE2701A | Non-Conventional Energy Resources | IV YEAR - 1st SEM | CO6 | | **1.92** | **3.00** | **2.47** | 2.40 | 0.49 | 2.89 | 0.97 | Ability to apply the various energy generation techniques and to measure the basic parameters and submit a report. | 306 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67 | 20ME2701B | Management Information Systems | IV YEAR - 1st SEM | CO1 | **L2** | **1.92** | **1.95** | **2.70** | 1.6 | 0.54 | 2.1 | 0.2 | Discuss the basic concepts of MIS, Decision making, Applications of MIS, Decision support systems, BPR and E-Commerce. | 307 |
| 67 | 20ME2701B | Management Information Systems | IV YEAR - 1st SEM | CO2 | **L3** | **1.92** | **1.93** | **2.60** | 1.54 | 0.52 | 2.06 | 0.14 | Interpret the MIS decision making and its applications. | 308 |
| 67 | 20ME2701B | Management Information Systems | IV YEAR - 1st SEM | CO3 | **L3** | **1.92** | **1.94** | **2.57** | 1.55 | 0.51 | 2.07 | 0.15 | Categorise Decision support systems and Business Process Re-Engineering | 309 |
| 67 | 20ME2701B | Management Information Systems | IV YEAR - 1st SEM | CO4 | **L3** | **1.92** | **1.89** | **2.63** | 1.51 | 0.53 | 2.04 | 0.12 | Summarise the Electronic commerce environment and its opportunities. | 310 |
| 68 | 20CE2702A | Environmental Managment and Audit | IV YEAR - 1st SEM | CO1 | **L3** | **1.92** | **1.88** | **2.45** | 1.50 | 0.49 | 1.99 | 0.07 | Apply basic knowledge on solid waste managment | 311 |
| 68 | 20CE2702A | Environmental Managment and Audit | IV YEAR - 1st SEM | CO2 | **L4** | **1.92** | **2.19** | **2.47** | 1.75 | 0.49 | 2.24 | 0.32 | Analyze the various hazards, handling techniques and disposal | 312 |
| 68 | 20CE2702A | Environmental Managment and Audit | IV YEAR - 1st SEM | CO3 | **L3** | **1.92** | **2.23** | **2.48** | 1.78 | 0.50 | 2.28 | 0.36 | Design E-waste disposal procedures for different E-waste | 313 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68 | 20CE2702A | Environmental Managment and Audit | IV YEAR - 1st SEM | CO4 | **L4** | **1.92** | **2.05** | **2.48** | 1.64 | 0.50 | 2.13 | 0.21 | Outline the basic principles and importance of EIA and analyze the effect of developmental activities on the environment. | 314 |
| 68 | 20CE2702A | Environmental Managment and Audit | IV YEAR - 1st SEM | CO5 | **L3** | **1.92** | **2.13** | **2.47** | 1.71 | 0.49 | 2.20 | 0.28 | Understand the activities in environmental auditing and applying them to industries to improve their environmental impact and sustainability performance | 315 |
| 69 | 20ME2702B | Robotics | IV YEAR - 1st SEM | CO1 | **L2** | **1.86** | **1.78** | **2.72** | 1.42 | 0.54 | 1.97 | 0.11 | Understand the basic anatomy of robots, actuators, end effectors, robot sensors, programming and applications. | 316 |
| 69 | 20ME2702B | Robotics | IV YEAR - 1st SEM | CO2 | **L2** | **1.92** | **2.07** | **2.78** | 1.66 | 0.56 | 2.21 | 0.29 | Understand the working principles of robot actuators, end effectors | 317 |
| 69 | 20ME2702B | Robotics | IV YEAR - 1st SEM | CO3 | **L3** | **1.92** | **2.13** | **2.67** | 1.70 | 0.53 | 2.24 | 0.32 | Apply robot programming skills | 318 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69 | 20ME2702B | Robotics | IV YEAR - 1st SEM | CO4 | **L3** | **1.92** | **1.95** | **2.70** | 1.56 | 0.54 | 2.10 | 0.18 | Apply knowledge of robot sensors and their applications in industries | 319 |
| 70 | 20HS7701C | Entrepreneurship Management | IV YEAR - 1st SEM | CO1 | **L2** | **1.92** | **1.82** | **2.57** | 1.46 | 0.51 | 1.97 | 0.05 | Understand the basic concepts and factors for starting and successful running of different forms of an enterprise. | 320 |
| 70 | 20HS7701C | Entrepreneurship Management | IV YEAR - 1st SEM | CO2 | **L2** | **1.92** | **1.95** | **2.73** | 1.56 | 0.55 | 2.11 | 0.19 | Describe characteristics, values and attitudes of an entrepreneur. | 321 |
| 70 | 20HS7701C | Entrepreneurship Management | IV YEAR - 1st SEM | CO3 | **L3** | **1.92** | **1.83** | **2.65** | 1.46 | 0.53 | 1.99 | 0.07 | Illustrate different forms of Entrepreneurial structures and Intrapreneurship. | 322 |
| 70 | 20HS7701C | Entrepreneurship Management | IV YEAR - 1st SEM | CO4 | **L3** | **1.86** | **1.85** | **2.58** | 1.48 | 0.52 | 2.00 | 0.14 | Summarize critical Factors for starting a new enterprise and ethics to be followed during running of enterprise. | 323 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71 | 20SA8755 | Sales Force Technologies | IV YEAR - 1st SEM | CO1 | **L3** | **1.98** | **2.00** | **3.00** | 1.60 | 0.60 | 2.20 | 0.22 | Apply basics of CRM, multi-tenancy, Data modelling and management in Sales force for solving problems in Apex. | 324 |
| 71 | 20SA8755 | Sales Force Technologies | IV YEAR - 1st SEM | CO2 | **L3** | **1.98** | **2.00** | **3.00** | 1.60 | 0.60 | 2.20 | 0.22 | Implement programming constructs of Apex like class, interface triggers as an individual on different IDEs/Online Platforms. | 325 |
| 71 | 20SA8755 | Sales Force Technologies | IV YEAR - 1st SEM | CO3 | **L3** | **1.98** | **2.9** | **3.00** | 2.32 | 0.60 | 2.92 | 0.94 | Develop an effective report based on various programs implemented | 326 |
| 71 | 20SA8755 | Sales Force Technologies | IV YEAR - 1st SEM | CO4 | **L3** | **1.92** | **2.4** | **3.00** | 1.92 | 0.60 | 2.52 | 0.60 | Apply technical knowledge for a given problem and express with an effective oral Communication. | 327 |
| 71 | 20SA8755 | Sales Force Technologies | IV YEAR - 1st SEM | CO5 | **L4** | **1.98** | **2** | **3.00** | 1.60 | 0.60 | 2.20 | 0.22 | Analyze outputs using given constraints/test case/ debugging and deployment tools | 328 |
| 72 | 20CS3781 B/C | Industrial/Research Internship | IV YEAR - 1st SEM | CO1 | **L3** | **2.01** | **2.05** | **3.00** | 1.64 | 0.60 | 2.24 | 0.23 | Apply domain knowledge during the course of internship | 329 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72 | 20CS3781 B/C | Industrial/Research Internship | IV YEAR - 1st SEM | CO2 | **L3** | **2.01** | **2.00** | **3.00** | 1.60 | 0.60 | 2.20 | 0.19 | Demonstrate effective oral communication skills. | 330 |
| 72 | 20CS3781 B/C | Industrial/Research Internship | IV YEAR - 1st SEM | CO3 | **L3** | **2.01** | **2.02** | **3.00** | 1.62 | 0.60 | 2.22 | 0.21 | Work as an individual or a team member in a collaborative environment. | 331 |
| 72 | 20CS3781 B/C | Industrial/Research Internship | IV YEAR - 1st SEM | CO4 | **L3** | **2.01** | **2.05** | **3.00** | 1.64 | 0.60 | 2.24 | 0.23 | Exhibit integrity and ethical behavior while carrying out the internship. | 332 |
| 72 | 20CS3781 B/C | Industrial/Research Internship | IV YEAR - 1st SEM | CO5 | **L3** | **2.01** | **2.02** | **3.00** | 1.62 | 0.60 | 2.22 | 0.21 | Apply effective time management skills to complete the work within appropriate time | 333 |
| 72 | 20CS3781 B/C | Industrial/Research Internship | IV YEAR - 1st SEM | CO6 | **L3** | **2.01** | **2.01** | **3.00** | 1.61 | 0.60 | 2.21 | 0.20 | Develop an effective report based on the work completed during the internship. | 334 |
| | | | | | | | | | | | | | | |
| 73 | 20CS3861 | Project work, seminar and internship in industry | IV YEAR - 2nd SEM | CO1 | **L3** | **2.01** | **2.25** | **2.81** | 1.80 | 0.56 | 2.36 | 0.35 | Apply the knowledge of mathematics, computer science fundamentals, and computer science specializations to the solution of engineering problems. | 335 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73 | 20CS3861 | Project work, seminar and internship in industry | IV YEAR - 2nd SEM | CO2 | **L4** | **2.01** | **2.12** | **2.74** | 1.70 | 0.55 | 2.24 | 0.23 | Analyze problem solution, its requirements, feasibility study and scope with appropriate planning in compiling the projects work using literature review. | 336 |
| 73 | 20CS3861 | Project work, seminar and internship in industry | IV YEAR - 2nd SEM | CO3 | **L3** | **2.01** | **2.10** | **2.79** | 1.68 | 0.56 | 2.24 | 0.23 | Apply the engineering knowledge in project design and use methods to carry out the project work by justifying ethical principles | 337 |
| 73 | 20CS3861 | Project work, seminar and internship in industry | IV YEAR - 2nd SEM | CO4 | **L6** | **2.01** | **2.26** | **2.70** | 1.81 | 0.54 | 2.35 | 0.34 | Create an economic ecosystem using modern tools to meet societal needs and examine the results obtained to derive conclusions | 338 |

| S.No | COURSE CODE | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%) - DA*0.8 | IDA (20%)- IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Total CO's Count |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73 | 20CS3865 | Project work, seminar and internship in industry | IV YEAR - 2nd SEM | CO5 | **L5** | **2.01** | **2.22** | **2.77** | 1.78 | 0.55 | 2.33 | 0.32 | Evaluate the performance of the project task as an individual and / or team members based on their effective communication, presentation, and report to manage the task in time | 339 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

# 8.1.1A Documentary evidences of identification of gaps in CO's attainment

| PVP-21 Admitted Batch | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO -DIRECT & INDIRECT ATTAINMENTS** | | | | | | | | | | | | | | |
| **S.No** | **Course Code** | **Course Name** | **SEM & YEAR** | **CO's** | **Level** | **Target Value** | **Direct Attainment Value(DA)** | **Indirect Attainment Value(IDA)** | **DA(80%)-DA*0.8** | **IDA(20%)-IDA*0.2** | **Overall CO Attainment (DA+IDA)** | **Gap Analysis (OA-TV)** | **CO Statements** | **Identified Gap** |
| 1 | 20ES1253 | Programming For Problem Solving Lab | I YEAR - 2nd SEM | CO4 | **L3** | **1.98** | **1.84** | **2.38** | 1.47 | 0.48 | 1.95 | -0.03 | Apply technical knowledge for a given problem and express with an effective oral communication. | Students may have technical skills but struggle with systematic problem analysis and structured debugging. They also face difficulties in confidently and fluently explaining solutions using accurate technical terminology. |

| S.No | Course Code | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%)-DA*0.8 | IDA(20%)-IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Identified Gap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 20CS3303 | Computer Organization And Architecture | II YEAR - 1st SEM | CO4 | **L4** | **1.92** | **1.78** | **2.35** | 1.42 | 0.47 | 1.89 | -0.03 | Analyze memory hierarchy, I/O communication and pipelining. | Students have basic theoretical understanding but struggle to apply memory hierarchy, I/O communication, and pipelining concepts to complex architectures. They face difficulties in system-level performance analysis, pipeline optimization, and explaining design trade-offs effectively. |

| S.No | Course Code | Course Name | SEM & YEAR | CO's | Level | Target Value | Direct Attainment Value(DA) | Indirect Attainment Value(IDA) | DA(80%)-DA*0.8 | IDA(20%)-IDA*0.2 | Overall CO Attainment (DA+IDA) | Gap Analysis (OA-TV) | CO Statements | Identified Gap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 20CS3351 | Object Oriented Programming Through C++ Lab | II YEAR - 1st SEM | CO5 | **L4** | **1.98** | **1.39** | **2.85** | 1.11 | 0.57 | 1.68 | -0.30 | Analyze outputs using given constraints/test cases. | Students exhibit basic programming abilities but face difficulties in analyzing outputs for complex constraints and test cases. They often lack structured debugging skills and struggle to explain output discrepancies using object-oriented concepts. |
| 4 | 20SO8355 | Introduction To Linux Operating Systems | II YEAR - 1st SEM | CO1 | **L3** | **1.98** | **1.63** | **2.58** | 1.30 | 0.52 | 1.82 | -0.16 | Apply suitable commands to perform various tasks on Linux Operating System. | Students gain basic familiarity with Linux commands but struggle to choose suitable commands for different situations and use |

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| | | | | | | | | | | | | | | options effectively. They also face difficulties integrating commands, troubleshooting errors, and writing simple scripts. |
| 5 | 20SO8355 | Introduction To Linux Operating Systems | II YEAR - 1st SEM | CO2 | **L3** | **1.98** | **1.09** | **2.58** | 0.87 | 0.52 | 1.39 | -0.59 | Implement tasks as an individual on Linux Operating System. | Students need to build confidence in combining commands, troubleshooting errors, and completing tasks independently on the Linux Operating System. |
| 6 | 20ES1402 | Internet of Things | II YEAR - 2ndSEM | CO2 | **L3** | **1.92** | **1.47** | **2.34** | 1.18 | 0.47 | 1.64 | -0.28 | Apply diverse methods in deploying smart objects and connecting them to network. | Students need to enhance their skills in connecting hardware components, selecting suitable communication protocols, and resolving |

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| | | | | | | | | | | | | | | connectivity issues. They also need to gain experience in integrating and managing reliable IoT networks. |
| 7 | 20CS3451 | Advanced Data Structures through C++ Lab | II YEAR - 2nd SEM | CO2 | **L3** | **1.98** | **1.74** | **2.44** | 1.39 | 0.49 | 1.88 | -0.10 | Implement programs as an individual on different IDEs/ online platforms. | Students are able to write basic programs but face difficulties when independently implementing complex data structures, optimizing algorithms, debugging across different IDEs, and effectively using online coding platforms. They need to strengthen problem decomposition, error handling, STL usage, and platform-specific |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 20CS3451 | Advanced Data Structures through C++ Lab | II YEAR - 2nd SEM | CO3 | **L3** | **1.98** | **1.73** | **2.47** | 1.38 | 0.49 | 1.88 | -0.10 | Develop an effective report based on various programs implemented. | Students are able to document basic code functionality but encounter difficulties in clearly presenting problem statements, describing algorithmic approaches, rationalizing data structure selection, performing complexity analysis, and interpreting outcomes in their reports. Improvement is needed in technical writing, logical structuring, and drawing meaningful conclusions supported by performance |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | analysis. |
| 9 | 20SO8454 | Programming with JAVA | II YEAR - 2nd SEM | CO3 | **L3** | **1.98** | **1.50** | **2.61** | 1.20 | 0.52 | 1.72 | -0.26 | Develop an effective report based on various programs implemented. | Students can explain basic Java code implementation but face challenges in documenting object-oriented design concepts, detailing class interactions, justifying the use of inheritance, interfaces, and exception handling, and evaluating program performance. They need to enhance the clarity, organization, and depth of their reports by incorporating |

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| | | | | | | | | | | | | | | appropriate diagrams, code examples, and analytical discussions. |
| 10 | 20CS3503 | Computer Networks | III YEAR - 1st SEM | CO2 | **L3** | **1.92** | **1.77** | **2.47** | 1.42 | 0.49 | 1.91 | -0.01 | Apply Error Correction or MAC Protocol mechanism for a given scenario. | Students understand error correction and MAC protocol concepts but struggle to select appropriate mechanisms, analyze trade-offs, and implement algorithms for specific scenarios. They need more hands-on practice, simulations, and scenario-based problem solving to connect theory with real-world applications. |
| 11 | 20ME2601A | Value Engineering | III YEAR - 2nd SEM | CO1 | **L2** | **1.92** | **1.53** | **2.75** | 1.22 | 0.55 | 1.77 | -0.15 | Understand the basic concepts, techniques and applications of | Students recall basic value engineering concepts but |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | value engineering | struggle to apply techniques like function analysis, cost-value assessment, and problem-solving to real-world scenarios. They need more case-based learning, industry examples, and hands-on exercises to strengthen application skills. |
| 12 | 20SA8651 | Mobile Application Development | III YEAR - 2nd SEM | CO4 | **L5** | **1.98** | **1.08** | **2.72** | 0.86 | 0.54 | 1.41 | -0.57 | Apply technical knowledge for a given problem and express with an effective oral communication | Students have fundamental knowledge of mobile application development but struggle to apply it to real-world problems and effectively communicate their solutions. They require more practice in explaining design |

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| | | | | | | | | | | | | | | choices, demonstrating app functionalities, and presenting their work confidently and clearly. |
| 13 | 20CS4701C | Cloud Computing | IV YEAR - 1st SEM | CO3 | **L3** | **1.92** | **1.63** | **2.73** | 1.30 | 0.55 | 1.85 | -0.07 | Analyze the given application and choose a suitable platform for deploying the cloud. | Students know cloud platforms and deployment models but face difficulty in selecting appropriate solutions based on application requirements. Increased hands-on practice with platform evaluation, cost considerations, and real-world deployments is needed to enhance their decision-making abilities. |

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| 14 | 20CS4702B | Software Project Management | IV YEAR - 1st SEM | CO1 | **L2** | **1.92** | **1.74** | **2.49** | 1.39 | 0.50 | 1.89 | -0.03 | Understand the fundamentals of Project Management principles while developing software. | Students grasp basic project management concepts but face challenges in applying them to planning, scheduling, resource management, and risk handling in software projects. More hands-on practice with real-world cases and tool-based simulations is needed to develop practical project management skills. |
| 15 | 20EE2701A | Non-Conventional Energy Resources | IV YEAR - 1st SEM | CO1 | **L2** | **1.92** | **1.31** | **2.52** | 1.05 | 0.50 | 1.55 | -0.37 | Need focus on Solar concepts and instruments. | Students understand the basics of non-conventional energy but struggle with deeper knowledge of solar energy |

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| | | | | | | | | | | | | | | concepts, system design, and instrumentation. More hands-on training with solar technologies, equipment usage, and performance evaluation is needed to enhance practical skills. |

## 8.1.1B Plan of action to bridge the gaps /Improvement

**PVP-21 Admitted Batch**

| S. No | Course Code | Course Name | Identified Gap | Plan of Action |
|---|---|---|---|---|
| 1 | 20ES1253 | Programming For Problem Solving Lab | Students may have technical skills but struggle with systematic problem analysis and structured debugging. They also face difficulties in confidently and fluently explaining solutions using accurate technical terminology. | Strengthen students' analytical and debugging skills through focused practice and guided mentoring. Foster clear technical communication by incorporating oral presentations and consistent use of correct terminology during lab sessions. |
| 2 | 20CS3303 | Computer Organization And Architecture | Students have basic theoretical understanding but struggle to apply memory hierarchy, I/O communication, and pipelining concepts to complex architectures. They face difficulties in system-level performance analysis, pipeline optimization, and explaining design trade-offs effectively. | Include analytical exercises to enable students to apply memory hierarchy, I/O communication, and pipelining concepts, improve pipeline optimization strategies, and effectively communicate system-level design trade-offs. |
| 3 | 20CS3351 | Object Oriented Programming Through C++ Lab | Students exhibit basic programming abilities but face difficulties in analyzing outputs for complex constraints and test cases. They often lack structured debugging skills and struggle to explain output discrepancies using object-oriented concepts. | Conduct lab sessions on debugging and test case analysis to enhance students' problem-solving with complex constraints. Strengthen understanding of object-oriented concepts through hands-on coding tasks and verbal explanation of program outputs. |
| 4 | 20SO8355 | Introduction To Linux Operating Systems | Students gain basic familiarity with Linux commands but struggle to choose suitable commands for different situations and use options effectively. They also face difficulties integrating commands, troubleshooting errors, and writing simple scripts. | Implement scenario-based Linux lab activities to improve students' ability to select appropriate commands, utilize options effectively, and integrate multiple commands for practical tasks. |
| 5 | 20SO8355 | Introduction To Linux Operating Systems | Students need to build confidence in combining commands, troubleshooting errors, and completing tasks independently on the Linux Operating System. | Design real-world Linux lab activities that encourage students to integrate commands and resolve issues independently. Incorporate phased debugging support to gradually build their confidence and foster independent problem-solving skills. |

| S. No | Course Code | Course Name | Identified Gap | Plan of Action |
|---|---|---|---|---|
| 6 | 20ES1402 | Internet of Things | Students need to enhance their skills in connecting hardware components, selecting suitable communication protocols, and resolving connectivity issues. They also need to gain experience in integrating and managing reliable IoT networks. | Provide students with insights into real-world IoT implementations and practical strategies for achieving reliable network performance. |
| 7 | 20CS3451 | Advanced Data Structures through C++ Lab | Students are able to write basic programs but face difficulties when independently implementing complex data structures, optimizing algorithms, debugging across different IDEs, and effectively using online coding platforms. They need to strengthen problem decomposition, error handling, STL usage, and platform-specific debugging techniques. | Implement structured lab sessions and coding challenges that emphasize complex data structure implementation, algorithm optimization, and effective STL usage. Integrate IDE-specific debugging, platform-oriented tasks, and problem decomposition exercises to enhance independent coding and robust error-handling capabilities. |
| 8 | 20CS3451 | Advanced Data Structures through C++ Lab | Students are able to document basic code functionality but encounter difficulties in clearly presenting problem statements, describing algorithmic approaches, rationalizing data structure selection, performing complexity analysis, and interpreting outcomes in their reports. Improvement is needed in technical writing, logical structuring, and drawing meaningful conclusions supported by performance analysis. | Conduct technical documentation sessions and collaborative reviews to improve clarity in presenting problem statements, algorithmic logic, and data structure choices. Integrate exercises on complexity analysis, structured reporting, and result interpretation to develop coherent reasoning and data-driven conclusions. |
| 9 | 20SO8454 | Programming with JAVA | Students can explain basic Java code implementation but face challenges in documenting object-oriented design concepts, detailing class interactions, justifying the use of inheritance, interfaces, and exception handling, and evaluating program performance. They need to enhance the clarity, organization, and depth of their reports by incorporating appropriate diagrams, code examples, and analytical discussions. | Conduct focused sessions on technical documentation to help students clearly present object-oriented concepts using diagrams, code examples, and analysis to justify design choices and assess program performance. |

| S. No | Course Code | Course Name | Identified Gap | Plan of Action |
|---|---|---|---|---|
| 10 | 20CS3503 | Computer Networks | Students understand error correction and MAC protocol concepts but struggle to select appropriate mechanisms, analyze trade-offs, and implement algorithms for specific scenarios. They need more hands-on practice, simulations, and scenario-based problem solving to connect theory with real-world applications. | Demonstrate lab sessions, simulation exercises, and real-life scenario analyses to enhance students' ability to apply error correction and MAC protocols, analyze design trade-offs, and implement effective algorithms in practical network environments. |
| 11 | 20ME2601A | Value Engineering | Students recall basic value engineering concepts but struggle to apply techniques like function analysis, cost-value assessment, and problem-solving to real-world scenarios. They need more case-based learning, industry examples, and hands-on exercises to strengthen application skills. | Demonstrate case-based learning, industry-relevant examples, and hands-on activities centered on function analysis, cost-value evaluation, and structured problem-solving to strengthen students' practical application of value engineering concepts. |
| 12 | 20SA8651 | Mobile Application Development | Students have fundamental knowledge of mobile application development but struggle to apply it to real-world problems and effectively communicate their solutions. They require more practice in explaining design choices, demonstrating app functionalities, and presenting their work confidently and clearly. | Encourage students to build real-world mobile app projects by emphasizing design, development, and the rationale behind their design decisions while highlighting app functionalities. Host recurring presentation sessions to strengthen their skills in conveying technical solutions clearly, confidently, and effectively. |
| 13 | 20CS4701C | Cloud Computing | Students know cloud platforms and deployment models but face difficulty in selecting appropriate solutions based on application requirements. Increased hands-on practice with platform evaluation, cost considerations, and real-world deployments is needed to enhance their decision-making abilities. | Demostrate the sessions on evaluating cloud platforms considering application requirements, performance metrics, and cost factors. Integrate real-world deployment tasks and case-based decision-making to enhance students' solution selection abilities. |

| S. No | Course Code | Course Name | Identified Gap | Plan of Action |
|---|---|---|---|---|
| 14 | 20CS4702B | Software Project Management | Students grasp basic project management concepts but face challenges in applying them to planning, scheduling, resource management, and risk handling in software projects. More hands-on practice with real-world cases and tool-based simulations is needed to develop practical project management skills. | Demonstrate the project management tools and real-world case studies to develop skills in planning, scheduling, resource allocation, and risk handling. Integrate simulations and mini-projects to strengthen the application of project management principles. |
| 15 | 20EE2701A | Non- Conventional Energy Resources | Students understand the basics of non-conventional energy but struggle with deeper knowledge of solar energy concepts, system design, and instrumentation. More hands-on training with solar technologies, equipment usage, and performance evaluation is needed to enhance practical skills. | Demonstrate solar energy system design, equipment usage, and instrumentation. Include field visits, mini-projects, and performance evaluation exercises to strengthen practical understanding and application skills. |

# 8.1.1C Implementation

## PVP-21 Admitted Batch

| S.No | Course Code | Course Name | Plan of Action | Implementation |
|---|---|---|---|---|
| 1 | 20ES1253 | Programming For Problem Solving Lab | Strengthen students' analytical and debugging skills through focused practice and guided mentoring. Foster clear technical communication by incorporating oral presentations and consistent use of correct terminology during lab sessions. | Conducted focused lab activities and provided guided mentoring to develop students' analytical and debugging skills. Promoted technical presentations and the consistent use of accurate terminology to strengthen communication abilities. |
| 2 | 20CS3303 | Computer Organization And Architecture | Include analytical exercises to enable students to apply memory hierarchy, I/O communication, and pipelining concepts, improve pipeline optimization strategies, and effectively communicate system-level design trade-offs. | Demonstrated concepts of memory hierarchy, I/O communication, and pipelining. Use simulation tools and facilitate group discussions to refine pipeline optimization techniques and strengthen students' ability to communicate system-level design decisions. |
| 3 | 20CS3351 | Object Oriented Programming Through C++ Lab | Conduct lab sessions on debugging and test case analysis to enhance students' problem-solving with complex constraints. Strengthen understanding of object-oriented concepts through hands-on coding tasks and verbal explanation of program outputs. | Enhanced object-oriented programming skills through hands-on coding tasks and verbal articulation of program logic and outcomes by students. |
| 4 | 20SO8355 | Introduction To Linux Operating Systems | Implement scenario-based Linux lab activities to improve students' ability to select appropriate commands, utilize options effectively, and integrate multiple commands for practical tasks. | Demonstrated Linux lab exercises that challenge students to select appropriate commands, use options effectively, and integrate multiple commands for real-world solutions. Incorporate periodic assessments to strengthen practical command-line skills. |
| 5 | 20SO8355 | Introduction To Linux Operating Systems | Design real-world Linux lab activities that encourage students to integrate commands and resolve issues independently. Incorporate phased debugging support to gradually build their confidence and foster independent problem-solving skills. | Practical Linux lab tasks that involve integrating multiple commands and independently resolving issues. Implement phased debugging assistance, progressively minimizing support to enhance student confidence and foster autonomous problem-solving skills. |

| S.No | Course Code | Course Name | Plan of Action | Implementation |
|---|---|---|---|---|
| 6 | 20ES1402 | Internet of Things | Provide students with insights into real-world IoT implementations and practical strategies for achieving reliable network performance. | Introduced case studies and expert talks to expose students to real-world IoT implementations. Facilitate hands-on activities and discussions focused on practical strategies for building and maintaining reliable IoT network performance. |
| 7 | 20CS3451 | Advanced Data Structures through C++ Lab | Implement structured lab sessions and coding challenges that emphasize complex data structure implementation, algorithm optimization, and effective STL usage. Integrate IDE-specific debugging, platform-oriented tasks, and problem decomposition exercises to enhance independent coding and robust error-handling capabilities. | Lab sessions and coding challenges focused on complex data structures, algorithm optimization, effective STL usage, and IDE-based debugging to enhance independent coding and robust error-handling skills. |
| 8 | 20CS3451 | Advanced Data Structures through C++ Lab | Conduct technical documentation sessions and collaborative reviews to improve clarity in presenting problem statements, algorithmic logic, and data structure choices. Integrate exercises on complexity analysis, structured reporting, and result interpretation to develop coherent reasoning and data-driven conclusions. | Facilitated technical documentation and peer review sessions, integrating complexity analysis, structured reporting, and result interpretation to enhance clarity, analytical reasoning, and data-informed decision-making. |
| 9 | 20SO8454 | Programming with JAVA | Conduct focused sessions on technical documentation to help students clearly present object-oriented concepts using diagrams, code examples, and analysis to justify design choices and assess program performance. | Conducted focused technical documentation sessions to guide students in presenting object-oriented concepts through diagrams, code examples, and analytical justifications of design decisions and program performance. |
| 10 | 20CS3503 | Computer Networks | Demonstrate lab sessions, simulation exercises, and real-life scenario analyses to enhance students' ability to apply error correction and MAC protocols, analyze design trade-offs, and implement effective algorithms in practical network environments. | Conducted lab sessions, simulation-based exercises, and real-world scenario analyses to strengthen students' skills in applying error correction and MAC protocols, evaluating design trade-offs, and implementing efficient algorithms in practical network settings. |

| S.No | Course Code | Course Name | Plan of Action | Implementation |
|---|---|---|---|---|
| 11 | 20ME2601A | Value Engineering | Demonstrate case-based learning, industry-relevant examples, and hands-on activities centered on function analysis, cost-value evaluation, and structured problem-solving to strengthen students' practical application of value engineering concepts. | Demostrated case-based learning, industry-focused examples, and hands-on activities that emphasize function analysis, cost-value assessment, and structured problem-solving to enhance students' practical understanding of value engineering principles. |
| 12 | 20SA8651 | Mobile Application Development | Encourage students to build real-world mobile app projects by emphasizing design, development, and the rationale behind their design decisions while highlighting app functionalities. Host recurring presentation sessions to strengthen their skills in conveying technical solutions clearly, confidently, and effectively. | Encourage real-world mobile app projects emphasizing design, functionality, and design rationale, supported by regular presentations to build clarity, confidence, and effective technical communication. |
| 13 | 20CS4701C | Cloud Computing | Demostrate the sessions on evaluating cloud platforms considering application requirements, performance metrics, and cost factors. Integrate real-world deployment tasks and case-based decision-making to enhance students' solution selection abilities. | Facilitate sessions on cloud platform evaluation considering application needs, performance, and cost, paired with real-world deployments and case-based decision-making to improve solution selection skills. |
| 14 | 20CS4702B | Software Project Management | Demonstrate the project management tools and real-world case studies to develop skills in planning, scheduling, resource allocation, and risk handling. Integrate simulations and mini-projects to strengthen the application of project management principles. | Utilize project management tools and real-world case studies to build competencies in planning, scheduling, resource allocation, and risk management, supported by simulations and projects to reinforce practical application of project management principles. |
| 15 | 20EE2701A | Non- Conventional Energy Resources | Demonstrate solar energy system design, equipment usage, and instrumentation. Include field visits, mini-projects, and performance evaluation exercises to strengthen practical understanding and application skills. | Demonstrated solar energy system design, equipment handling, and instrumentation, complemented by field visits, mini-projects, and performance evaluation activities to enhance practical understanding and application skills. |