**Department of Computer Engineering**

1. **CO attainment of all courses of Batch 2020-21:**

**Table B.3.2.2a CO attainment of all courses of Batch 2020-21**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr. No.** | **Course Name** | **Course Code** | **Course** | **CO Target** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** | **CO6** | **CO Attainment** | **Attainment Status** |
| **First Year** | | | | | | | | | | | | |
| **2017 – 18 Semester - I** | | | | | | | | | | | | |
| 1 | Engineering Mathematics I | 107001 | CO101 | 1.50 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | Attained |
| 2 | Engineering Physics | 107002 | CO102 | 1.50 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| 3 | Fundamentals of Programming Languages I | 110003 | CO103 | 1.50 | 3.00 | 3.00 | 3.00 | 3.00 | - | - | 3.00 | Attained |
| 4 | Basic Electrical Engineering | 103004 | CO104 | 1.50 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| 5 | Basic Civil and Environmental Engineering | 101005 | CO105 | 1.50 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| 6 | Engineering Graphics I | 102006 | CO106 | 1.50 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| 7 | Workshop Practice | 111007 | CO107 | 1.50 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| **2017 – 18 Semester - II** | | | | | | | | | | | | |
| 8 | Engineering Mathematics II | 107008 | CO108 | 1.50 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | Not Attained |
| 9 | Engineering Chemistry | 107009 | CO109 | 1.50 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | Attained |
| 10 | Fundamentals of Programming Languages II | 110010 | CO110 | 1.50 | 3.00 | 3.00 | 3.00 | 3.00 | - | - | 3.00 | Attained |
| 11 | Engineering Mechanics | 101011 | CO111 | 1.50 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| 12 | Basic Electronics Engineering | 104012 | CO112 | 1.50 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| 13 | Basic Mechanical Engineering | 102013 | CO113 | 1.50 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| 14 | Engineering Graphics II | 102014 | CO114 | 1.50 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| **Second Year** | | | | | | | | | | | | |
| **Sr. No.** | **Course Name** | **Course Code** | **Course** | **CO Target** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** | **CO6** | **CO Attainment** | **Attainment Status** |
| **2018 – 19 Semester - I** | | | | | | | | | | | | |
| 15 | Discrete Mathematics | 210241 | CO201 | 1.50 | 2.80 | 2.80 | 3.00 | 3.00 | 2.80 | 2.80 | 2.87 | Attained |
| 16 | Digital Electronics and Logic Design | 210242 | CO202 | 1.50 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| 17 | Data Structures and Algorithms | 210243 | CO203 | 1.50 | 2.60 | 2.40 | 2.80 | 2.80 | 2.40 | 2.40 | 2.57 | Attained |
| 18 | Computer Organization and Architecture | 210244 | CO204 | 1.59 | 1.60 | 1.60 | 1.80 | 1.80 | 2.00 | 2.00 | 1.80 | Attained |
| 19 | Object Oriented Programming | 210245 | CO205 | 1.74 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | Not Attained |
| 20 | Digital Electronics Lab | 210246 | CO206 | 4.20 | 3.00 | 3.00 | 2.80 | 3.00 | 3.00 | 3.00 | 2.97 | Not Attained |
| 21 | Data Structures Lab | 210247 | CO207 | 2.10 | 3.00 | 3.00 | 3.00 | 3.00 |  |  | 3.00 | Attained |
| 22 | Object Oriented Programming Lab | 210248 | CO208 | 2.10 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 |  | 2.80 | Attained |
| 23 | Soft Skills | 210249 | CO209 | 2.10 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | Attained |
| **2018 – 19 Semester - II** | | | | | | | | | | | | |
| 24 | Engineering Mathematics III | 207003 | CO211 | 1.50 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | Attained |
| 25 | Computer Graphics | 210251 | CO212 | 1.77 | 2.80 | 2.40 | 2.80 | 2.40 | 2.40 | 2.40 | 2.53 | Attained |
| 26 | Advanced Data Structures | 210252 | CO213 | 1.65 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | Not Attained |
| 27 | Microprocessor | 210253 | CO214 | 1.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Not Attained |
| 28 | Principles of Programming Languages | 210254 | CO215 | 1.74 | 1.60 | 1.60 | 1.60 | 1.60 | 1.80 | 1.80 | 1.67 | Not Attained |
| 29 | Computer Graphics Lab | 210255 | CO216 | 2.10 | 2.80 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 2.97 | Attained |
| 30 | Advanced Data Structures Lab | 210256 | CO217 | 2.10 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| 31 | Microprocessor Lab | 210257 | CO218 | 1.80 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | Not Attained |
| **Third Year** | | | | | | | | | | | | |
| **Sr. No.** | **Course Name** | **Course Code** | **Course** | **CO Target** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** | **CO6** | **CO Attainment** | **Attainment Status** |
| **2019 – 20 Semester - I** | | | | | | | | | | | | |
| 32 | Theory of Computation | 310241 | CO301 | 1.65 | 3.00 | 2.80 | 3.00 | 3.00 | 3.00 | 3.00 | 2.97 | Attained |
| 33 | Database Management Systems (DBMS) | 310242 | CO302 | 1.65 | 2.20 | 2.20 | 2.00 | 2.00 | 1.60 | 1.60 | 1.93 | Attained |
| 34 | Software Engineering & Project Management | 310243 | CO303 | 1.65 | 0.80 | 0.80 | 1.20 | 1.00 | 1.00 | 1.00 | 0.97 | Not Attained |
| 35 | Information Systems & Engineering Economics | 310244 | CO304 | 1.65 | 2.40 | 2.40 | 2.60 | 2.40 | 2.40 | 2.40 | 2.43 | Attained |
| 36 | Computer Networks (CN) | 310245 | CO305 | 1.50 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | Attained |
| 37 | Skills Development Lab | 310246 | CO306 | 2.10 | 1.80 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.13 | Attained |
| 38 | DBMS Lab | 310247 | CO307 | 1.80 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |  | 2.20 | Attained |
| 39 | CN Lab | 310248 | CO308 | 1.80 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 2.40 | 2.90 | Attained |
| **2019 – 20 Semester - II** | | | | | | | | | | | | |
| 40 | Design & Analysis of Algorithms | 310250 | CO310 | 1.65 | 2.40 | 2.40 | 2.80 | 2.60 | 3.00 | 3.00 | 2.70 | Attained |
| 41 | Systems Programming & Operating System (SP&OS) | 310251 | CO311 | 1.65 | 1.80 | 1.80 | 1.80 | 1.80 | 1.60 | 1.60 | 1.73 | Attained |
| 42 | Embedded Systems & Internet of Things (ES&IoT) | 310252 | CO312 | 1.65 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| 43 | Software Modeling and Design | 310253 | CO313 | 1.65 | 2.40 | 2.40 | 2.40 | 2.40 | 3.00 | 3.00 | 2.60 | Attained |
| 44 | Web Technology | 310254 | CO314 | 1.95 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | Attained |
| 45 | Seminar & Technical Communication | 310255 | CO315 | 2.10 | 3.00 | 3.00 | 3.00 | 3.00 |  |  | 3.00 | Attained |
| 46 | Web Technology Lab | 310256 | CO316 | 2.10 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| 47 | SP & OS Lab | 310257 | CO317 | 1.95 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| 48 | ES & IoT Lab | 310258 | CO318 | 1.95 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| **Final Year** | | | | | | | | | | | | |
| **Sr. No.** | **Course Name** | **Course Code** | **Course** | **CO Target** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** | **CO6** | **CO Attainment** | **Attainment Status** |
| **2020 – 21 Semester - I** | | | | | | | | | | | | |
| 49 | High Performance Computing | 410241 | CO401 | 1.80 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| 50 | Artificial Intelligence and Robotics | 410242 | CO402 | 1.80 | 2.60 | 2.40 | 3.00 | 2.80 | 3.00 | 2.40 | 2.70 | Attained |
| 51 | Data Analytics | 410243 | CO403 | 1.80 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |  | 3.00 | Attained |
| 52 | Elective I: Data Mining and Warehousing | 410244 D | CO404 | 2.10 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| 53 | Elective II: Software Testing and Quality Assurance | 410245 B | CO405B | 1.80 | 2.40 | 2.40 | 3.00 | 3.00 | 3.00 | 3.00 | 2.80 | Attained |
| 54 | Laboratory Practice I | 410246 | CO406 | 2.40 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| 55 | Laboratory Practice II | 410247 | CO407 | 2.40 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | Attained |
| 56 | Project Work Stage I | 410248 | CO408 | 2.40 | 3.00 | 3.00 | 3.00 | 3.00 |  |  | 3.00 | Attained |
| **2020 – 21 Semester - II** | | | | | | | | | | | | |
| 57 | Machine Learning | 410250 | CO410 | 1.80 | 3.00 | 3.00 | 3.00 | 3.00 | 2.40 | 2.40 | 2.80 | Attained |
| 58 | Information and Cyber Security | 410251 | CO411 | 1.80 | 3.00 | 3.00 | 3.00 | 3.00 | 2.40 | 2.40 | 2.80 | Attained |
| 59 | Elective III : Compilers | 410252 B | CO412 | 1.80 | 3.00 | 3.00 | 2.80 | 2.80 | 3.00 | 3.00 | 2.93 | Attained |
| 60 | Elective IV: Cloud Computing | 410253 C | CO413 | 1.80 | 3.00 | 3.00 | 3.00 | 3.00 | 2.40 | 2.40 | 2.80 | Attained |
| 61 | Laboratory Practice III | 410254 | CO414 | 2.40 | 3.00 | 3.00 | 3.00 | 2.80 | 3.00 | 3.00 | 2.97 | Attained |
| 62 | Laboratory Practice IV | 410255 | CO415 | 2.40 | 2.60 | 2.40 | 3.00 | 2.80 | 2.60 | 3.00 | 2.73 | Attained |
| 63 | Project Work Stage II | 410256 | CO416 | 2.40 | 3.00 | 3.00 | 3.00 | 3.00 |  |  | 3.00 | Attained |

**PO Attainment**

**Table B.3.3.2.a PO attainment of all courses of Batch 2020-21**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr. No.** | **Course Name** | **Course Code** | **Course** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **First Year** | | | | | | | | | | | | | | | |
| **2017 – 18 Semester - I** | | | | | | | | | | | | | | | |
| 1 | Engineering Mathematics I | 107001 | CO101 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | - | - | - | - | - | - | - |
| 2 | Engineering Physics | 107002 | CO102 | 3.00 | 3.00 | 3.00 | - | 3.00 | - | - | - | 3.00 | - | - | 3.00 |
| 3 | Fundamentals of Programming Languages I | 110003 | CO103 | 3.00 | 3.00 | 3.00 | - | - | - | - | - | - | - | - | 3.00 |
| 4 | Basic Electrical Engineering | 103004 | CO104 | 3.00 | 3.00 | - | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | - | 3.00 | - | 3.00 |
| 5 | Basic Civil and Environmental Engineering | 101005 | CO105 | 3.00 | 3.00 | - | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | - | 3.00 | - | 3.00 |
| 6 | Engineering Graphics I | 102006 | CO106 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | - | - | - | - | - | - | 3.00 |
| 7 | Workshop Practice | 111007 | CO107 | 3.00 | 3.00 | - | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | - | 3.00 | - | 3.00 |
| **2017 – 18 Semester - II** | | | | | | | | | | | | | | | |
| 8 | Engineering Mathematics II | 107008 | CO108 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - | - | - | - | - | - | - |
| 9 | Engineering Chemistry | 107009 | CO109 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | - | - | - | - | - |
| 10 | Fundamentals of Programming Languages II | 110010 | CO110 | 3.00 | - | 3.00 | - | 3.00 | - | - | - | - | - | - | 3.00 |
| 11 | Engineering Mechanics | 101011 | CO111 | 3.00 | 3.00 | - | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | - | 3.00 | - | 3.00 |
| 12 | Basic Electronics Engineering | 104012 | CO112 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| 13 | Basic Mechanical Engineering | 102013 | CO113 | 3.00 | 3.00 | - | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | - | 3.00 | - | 3.00 |
| 14 | Engineering Graphics II | 102014 | CO114 | 3.00 | 3.00 | - | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | - | 3.00 | - | 3.00 |
| **Second Year** | | | | | | | | | | | | | | | |
| **Sr. No.** | **Course Name** | **Course Code** | **Course** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **2018 – 19 Semester - I** | | | | | | | | | | | | | | | |
| 15 | Discrete Mathematics | 210241 | CO201 | 2.87 | 2.87 | 2.80 | 2.87 | 2.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.87 |
| 16 | Digital Electronics and Logic Design | 210242 | CO202 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 0.00 | 3.00 | 0.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| 17 | Data Structures and Algorithms | 210243 | CO203 | 2.58 | 2.56 | 2.57 | 2.56 | 2.56 | 2.57 | 0.00 | 2.59 | 2.57 | 0.00 | 2.60 | 2.57 |
| 18 | Computer Organization and Architecture | 210244 | CO204 | 1.80 | 1.76 | 1.83 | 1.80 | 1.80 | 1.70 | - | - | 1.82 | 1.80 | 1.80 | 1.80 |
| 19 | Object Oriented Programming | 210245 | CO205 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 |
| 20 | Digital Electronics Lab | 210246 | CO206 | 2.96 | 2.96 | 2.98 | 2.96 | 2.98 | 0.00 | 3.00 | 0.00 | 2.93 | 3.00 | 2.97 | 2.95 |
| 21 | Data Structures Lab | 210247 | CO207 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 0.00 | 3.00 | 3.00 | 0.00 | 3.00 | 3.00 |
| 22 | Object Oriented Programming Lab | 210248 | CO208 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 |
| 23 | Soft Skills | 210249 | CO209 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| **2018 – 19 Semester - II** | | | | | | | | | | | | | | | |
| 24 | Engineering Mathematics III | 207003 | CO211 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 25 | Computer Graphics | 210251 | CO212 | 2.55 | 2.58 | 2.52 | 2.51 | 2.52 | 2.51 | 2.51 | 2.54 | 2.51 | 2.47 | 2.56 | 2.57 |
| 26 | Advanced Data Structures | 210252 | CO213 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 27 | Microprocessor | 210253 | CO214 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 28 | Principles of Programming Languages | 210254 | CO215 | 1.67 | 0.00 | 1.68 | 0.00 | 1.68 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.67 |
| 29 | Computer Graphics Lab | 210255 | CO216 | 2.97 | 2.96 | 2.98 | 2.97 | 2.98 | 2.97 | 2.97 | 2.96 | 2.98 | 2.95 | 2.98 | 2.97 |
| 30 | Advanced Data Structures Lab | 210256 | CO217 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| 31 | Microprocessor Lab | 210257 | CO218 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| **Third Year** | | | | | | | | | | | | | | | |
| **Sr. No.** | **Course Name** | **Course Code** | **Course** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **2019 – 20 Semester - I** | | | | | | | | | | | | | | | |
| 32 | Theory of Computation | 310241 | CO301 | 2.96 | 2.96 | 2.96 | 2.96 | 2.97 | 2.96 | 2.90 | 3.00 | 2.98 | 3.00 | 3.00 | 2.96 |
| 33 | Database Management Systems (DBMS) | 310242 | CO302 | 1.95 | 1.93 | 1.94 | 1.92 | 1.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.83 | 1.60 |
| 34 | Software Engineering & Project Management | 310243 | CO303 | 0.97 | 0.96 | 0.97 | 0.97 | 1.00 | 0.98 | 0.93 | 0.91 | 0.92 | 1.00 | 0.93 | 0.96 |
| 35 | Information Systems & Engineering Economics | 310244 | CO304 | 2.47 | 2.46 | 2.49 | 2.45 | 2.52 | 2.40 | 2.44 | 2.40 | 2.40 | 2.40 | 2.43 | 2.43 |
| 36 | Computer Networks (CN) | 310245 | CO305 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 0.00 | 2.40 | 2.40 | 2.40 | 2.40 |
| 37 | Skills Development Lab | 310246 | CO306 | 2.09 | 2.10 | 2.09 | 2.10 | 2.20 | 2.20 | 2.20 | 2.20 | 0.00 | 0.00 | 2.16 | 2.14 |
| 38 | DBMS Lab | 310247 | CO307 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.20 | 2.20 |
| 39 | CN Lab | 310248 | CO308 | 2.90 | 2.91 | 2.88 | 2.91 | 2.88 | 3.00 | 3.00 | 0.00 | 2.93 | 2.90 | 2.88 | 2.91 |
| **2019 – 20 Semester - II** | | | | | | | | | | | | | | | |
| 40 | Design & Analysis of Algorithms | 310250 | CO310 | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 | 0.00 | 2.70 | 0.00 | 0.00 | 0.00 | 0.00 | 2.70 |
| 41 | Systems Programming & Operating System (SP&OS) | 310251 | CO311 | 1.75 | 1.75 | 1.73 | 1.75 | 1.77 | 0.00 | 0.00 | 0.00 | 1.80 | 1.73 | 1.73 | 1.74 |
| 42 | Embedded Systems & Internet of Things (ES&IoT) | 310252 | CO312 | 3.00 | 3.00 | 3.00 | 0.00 | 3.00 | 0.00 | 3.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.00 |
| 43 | Software Modeling and Design | 310253 | CO313 | 2.63 | 2.63 | 2.64 | 0.00 | 2.40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 44 | Web Technology | 310254 | CO314 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 | 2.40 |
| 45 | Seminar & Technical Communication | 310255 | CO315 | 3.00 | 3.00 | 3.00 | 3.00 | 0.00 | 0.00 | 0.00 | 3.00 | 3.00 | 3.00 | 0.00 | 0.00 |
| 46 | Web Technology Lab | 310256 | CO316 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| 47 | SP & OS Lab | 310257 | CO317 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.00 | 3.00 | 3.00 |
| 48 | ES & IoT Lab | 310258 | CO318 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.00 | 3.00 |
| **Final Year** | | | | | | | | | | | | | | | |
| **Sr. No.** | **Course Name** | **Course Code** | **Course** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **2020 – 21 Semester - I** | | | | | | | | | | | | | | | |
| 49 | High Performance Computing | 410241 | CO401 | 3.00 | 3.00 | 3.00 | 3.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.00 |
| 50 | Artificial Intelligence and Robotics | 410242 | CO402 | 2.74 | 2.71 | 2.70 | 2.77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 51 | Data Analytics | 410243 | CO403 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 0.00 | 0.00 | 0.00 | 3.00 | 0.00 |
| 52 | Elective I: Data Mining and Warehousing | 410244 D | CO404 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 0.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| 53 | Elective II: Software Testing and Quality Assurance | 410245 B | CO405B | 2.78 | 2.70 | 2.64 | 2.70 | 3.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.80 | 2.70 |
| 54 | Laboratory Practice I | 410246 | CO406 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| 55 | Laboratory Practice II | 410247 | CO407 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.00 |
| 56 | Project Work Stage I | 410248 | CO408 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 0.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| **2020 – 21 Semester - II** | | | | | | | | | | | | | | | |
| 57 | Machine Learning | 410250 | CO410 | 2.78 | 2.84 | 2.70 | 2.82 | 2.77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.82 | 0.00 |
| 58 | Information and Cyber Security | 410251 | CO411 | 2.80 | 2.82 | 2.78 | 2.82 | 2.78 | 2.78 | 0.00 | 2.82 | 2.87 | 2.80 | 0.00 | 2.80 |
| 59 | Elective III : Compilers | 410252 B | CO412 | 2.93 | 2.90 | 2.93 | 2.91 | 2.92 | 2.93 | 2.93 | 2.92 | 2.91 | 2.95 | 2.93 | 2.95 |
| 60 | Elective IV: Cloud Computing | 410253 C | CO413 | 2.84 | 2.84 | 2.87 | 2.77 | 2.77 | 2.88 | 2.74 | 2.88 | 2.78 | 2.85 | 2.85 | 2.70 |
| 61 | Laboratory Practice III | 410254 | CO414 | 2.95 | 2.98 | 2.95 | 2.96 | 2.98 | 2.91 | 0.00 | 2.93 | 2.96 | 3.00 | 2.95 | 2.97 |
| 62 | Laboratory Practice IV | 410255 | CO415 | 2.95 | 2.76 | 2.71 | 2.68 | 2.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.80 |
| 63 | Project Work Stage II | 410256 | CO416 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| **Direct Attainment** | | | | **2.60** | **2.60** | **2.55** | **2.58** | **2.57** | **2.61** | **2.63** | **2.65** | **2.60** | **2.66** | **2.57** | **2.66** |

**PO Attainment Level**

**Table B.3.3.2.b Average PO attainment of all courses of Batch 2020-21**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PO Attainment Level** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| Direct Attainment | 2.60 | 2.60 | 2.55 | 2.58 | 2.57 | 2.61 | 2.63 | 2.65 | 2.60 | 2.66 | 2.57 | 2.66 |
| Indirect Attainment | 2.99 | 2.99 | 2.98 | 2.99 | 3.00 | 2.96 | 2.91 | 3.00 | 2.96 | 2.96 | 2.97 | 2.97 |
| Total Attainment | **2.68** | **2.68** | **2.64** | **2.66** | **2.66** | **2.68** | **2.69** | **2.72** | **2.67** | **2.72** | **2.65** | **2.72** |

**PSO Attainment**

**Table B.3.2.2c PSO attainment of all courses of Batch 2020-21**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Second Year** | | | | | | |
| **Sr. No.** | **Course Name** | **Course Code** | **Course** | **PSO1** | **PSO2** | **PSO3** |
| **2018 – 19 Semester - I** | | | | | | |
| 1 | Discrete Mathematics | 210241 | CO201 | 2.87 | 2.85 | 0.00 |
| 2 | Digital Electronics and Logic Design | 210242 | CO202 | 0.00 | 0.00 | 0.00 |
| 3 | Data Structures and Algorithms | 210243 | CO203 | 2.59 | 2.57 | 2.62 |
| 4 | Computer Organization and Architecture | 210244 | CO204 | 1.82 | 1.82 | 1.80 |
| 5 | Object Oriented Programming | 210245 | CO205 | 1.40 | 1.40 | 1.40 |
| 6 | Digital Electronics Lab | 210246 | CO206 | 0.00 | 0.00 | 0.00 |
| 7 | Data Structures Lab | 210247 | CO207 | 3.00 | 3.00 | 3.00 |
| 8 | Object Oriented Programming Lab | 210248 | CO208 | 2.80 | 2.80 | 2.80 |
| 9 | Soft Skills | 210249 | CO209 | 2.20 | 2.20 | 2.20 |
| **2018 – 19 Semester - II** | | | | | | |
| 10 | Engineering Mathematics III | 207003 | CO211 | 1.60 | 0.00 | 0.00 |
| 11 | Computer Graphics | 210251 | CO212 | 2.56 | 2.55 | 2.55 |
| 12 | Advanced Data Structures | 210252 | CO213 | 1.60 | 1.60 | 1.60 |
| 13 | Microprocessor | 210253 | CO214 | 0.00 | 0.00 | 0.00 |
| 14 | Principles of Programming Languages | 210254 | CO215 | 1.66 | 1.66 | 1.65 |
| 15 | Computer Graphics Lab | 210255 | CO216 | 2.97 | 2.95 | 2.96 |
| 16 | Advanced Data Structures Lab | 210256 | CO217 | 3.00 | 3.00 | 3.00 |
| 17 | Microprocessor Lab | 210257 | CO218 | 1.00 | 1.00 | 1.00 |
| **Third Year** | | | | | | |
| **Sr. No.** | **Course Name** | **Course Code** | **Course** | **PSO1** | **PSO2** | **PSO3** |
| **2019 – 20 Semester - I** | | | | | | |
| 18 | Theory of Computation | 310241 | CO301 | 2.96 | 2.96 | 2.96 |
| 19 | Database Management Systems (DBMS) | 310242 | CO302 | 1.98 | 1.96 | 1.60 |
| 20 | Software Engineering & Project Management | 310243 | CO303 | 0.97 | 0.95 | 0.96 |
| 21 | Information Systems & Engineering Economics | 310244 | CO304 | 2.47 | 2.46 | 2.43 |
| 22 | Computer Networks (CN) | 310245 | CO305 | 2.40 | 2.40 | 2.40 |
| 23 | Skills Development Lab | 310246 | CO306 | 2.13 | 2.13 | 2.14 |
| 24 | DBMS Lab | 310247 | CO307 | 2.20 | 2.20 | 2.20 |
| 25 | CN Lab | 310248 | CO308 | 2.89 | 2.90 | 2.87 |
| **2019 – 20 Semester - II** | | | | | | |
| 26 | Design & Analysis of Algorithms | 310250 | CO310 | 2.68 | 2.69 | 2.72 |
| 27 | Systems Programming & Operating System (SP&OS) | 310251 | CO311 | 1.73 | 1.75 | 1.75 |
| 28 | Embedded Systems & Internet of Things (ES&IoT) | 310252 | CO312 | 0.00 | 3.00 | 3.00 |
| 29 | Software Modeling and Design | 310253 | CO313 | 2.60 | 2.60 | 0.00 |
| 30 | Web Technology | 310254 | CO314 | 2.40 | 2.40 | 2.40 |
| 31 | Seminar & Technical Communication | 310255 | CO315 | 3.00 | 3.00 | 3.00 |
| 32 | Web Technology Lab | 310256 | CO316 | 3.00 | 3.00 | 3.00 |
| 33 | SP & OS Lab | 310257 | CO317 | 3.00 | 3.00 | 3.00 |
| 34 | ES & IoT Lab | 310258 | CO318 | 3.00 | 3.00 | 3.00 |
| **Final Year** | | | | | | |
| **Sr. No.** | **Course Name** | **Course Code** | **Course** | **PSO1** | **PSO2** | **PSO3** |
| **2020 – 21 Semester - I** | | | | | | |
| 35 | High Performance Computing | 410241 | CO401 | 3.00 | 3.00 | 0.00 |
| 36 | Artificial Intelligence and Robotics | 410242 | CO402 | 2.67 | 2.62 | 0.00 |
| 37 | Data Analytics | 410243 | CO403 | 3.00 | 3.00 | 3.00 |
| 38 | Elective I: Data Mining and Warehousing | 410244 D | CO404 | 3.00 | 3.00 | 3.00 |
| 39 | Elective II: Software Testing and Quality Assurance | 410245 B | CO405B | 2.80 | 2.80 | 0.00 |
| 40 | Laboratory Practice I | 410246 | CO406 | 3.00 | 3.00 | 3.00 |
| 41 | Laboratory Practice II | 410247 | CO407 | 3.00 | 3.00 | 0.00 |
| 42 | Project Work Stage I | 410248 | CO408 | 3.00 | 3.00 | 3.00 |
| **2020 – 21 Semester - II** | | | | | | |
| 43 | Machine Learning | 410250 | CO410 | 2.78 | 2.83 | 0.00 |
| 44 | Information and Cyber Security | 410251 | CO411 | 2.79 | 2.80 | 2.78 |
| 45 | Elective III : Compilers | 410252 B | CO412 | 2.96 | 2.93 | 2.91 |
| 46 | Elective IV: Cloud Computing | 410253 C | CO413 | 2.85 | 2.80 | 2.85 |
| 47 | Laboratory Practice III | 410254 | CO414 | 2.95 | 2.95 | 0.00 |
| 48 | Laboratory Practice IV | 410255 | CO415 | 2.73 | 2.73 | 2.73 |
| 49 | Project Work Stage II | 410256 | CO416 | 3.00 | 3.00 | 3.00 |
| **Direct PSO Attainment** | | | | **2.53** | **2.56** | **2.49** |

**PSO Attainment Level**

**Table B.3.2.2d Average PSO attainment of all courses of Batch 2020-21**

|  |  |  |  |
| --- | --- | --- | --- |
| **PSO Attainment Level** | **PSO1** | **PSO2** | **PSO3** |
| Direct Attainment | **2.53** | **2.56** | **2.49** |
| Indirect Attainment | **2.98** | **2.98** | **2.97** |
| Total Attainment | **2.62** | **2.64** | **2.59** |

**Department of Electronics & Telecommunication Engineering**

**CO-PO ATTAINMENT DATA Batch 2020-21**

**Course Outcomes (COs)**

**Table 1 CO Statements of all courses of Batch 2020-21**

|  |  |  |  |
| --- | --- | --- | --- |
| **AY 2018-19 SE 2015 Pattern Semester I** | | | |
| **Subject Name** | **Subject Code** | **CO code** | **CO statement** |
| Signals and Systems | 204181 | CO201.1 | Comprehend the mathematical description and representation of continuous and discrete time signals and systems. |
| CO201.2 | Develop input output relationship for linear shift invariant system and understand the convolution operator for continuous and discrete time system. |
| CO201.3 | Classify and represent the signals in frequency domain using Fourier series. |
| CO201.4 | Classify and represent the signals in frequency domain using Fourier transforms. |
| CO201.5 | Outline the limitations of Fourier transform and Laplace transform and develop the ability to analyze the system in s- domain. |
| CO201.6 | Explain the basic concept of probability, random variables & random signals and develop the ability to find correlation, CDF, PDF and probability of a given event. |
| Electronics Devices and Circuits | 204182 | CO202.1 | Comply and verify parameters after exciting devices by any stated method. |
| CO202.2 | Implement circuit and test the performance. |
| CO202.3 | Analyze small signal model of FET and MOSFET. |
| CO202.4 | Explain behavior of FET at low frequency. |
| CO202.5 | Design an adjustable voltage regulator circuits. |
| Electrical Circuits and Machines | 204183 | CO203.1 | Analyze basic AC & DC circuit for voltage, current and power by using KVL, KCL and network theorems |
| CO203.2 | Explain the working principle of different electrical machines |
| CO203.3 | Select proper electric motor for a given application |
| CO203.4 | Design and analyze transformers |
| CO203.5 | Comprehend constructional details and applications of special motors |
| CO203.6 | Explain constructional details and applications of brushless DC motors |
| Data Structures and Algorithms | 204184 | CO204.1 | Implement the programs that use arrays & pointers in C. |
| CO204.2 | Explain the computational efficiency of the principal algorithms such as sorting & searching. |
| CO204.3 | Implement stacks & queues for various applications. |
| CO204.4 | Describe how arrays, records, linked structures are represented in memory and use them in algorithms. |
| CO204.5 | Demonstrate various terminologies and traversals of trees and use them for various applications. |
| CO204.6 | Demonstarte various terminologies and traversals of graphs and use them for various applications. |
| Digital Electronics | 204185 | CO205.1 | Use the basic logic gates and various reduction techniques of digital logic circuit in detail. |
| CO205.2 | Design combinational and sequential circuits. |
| CO205.3 | Design and implement hardware circuit to test performance and application. |
| CO205.4 | Understand the architecture and use of microcontrollers for basic operations and Simulate using simulation software. |
| Electronic Measuring Instruments and Tools | 204186 | CO206.1 | Understand fundamental of various electrical measurements. |
| CO206.2 | Understand and describe specifications, features and capabilities of electronic instruments. |
| CO206.3 | Finalize the specifications of instrument and select an appropriate instrument for given measurement |
| CO206.4 | Carry out required measurement using various instruments under different setups. |
| CO206.5 | Able to compare measuring instruments for performance parameters |
| CO206.6 | Select appropriate instrument for the measurement of electrical parameter professionally |
| **AY 2018-19 SE 2015 Pattern Semester II** | | | |
| Engineering Mathematics III | 207005 | CO208.1 | Solve higher order linear differential equations using appropriate techniques for modelling and analysing electrical circuits. |
| CO208.2 | Solve problems related to fourier transform, Z-transform and applications to communication systemsand signal processing. |
| CO208.3 | Obtain interpolating polynomials, numerically differentiate and integrate functions, numerical solutions of differential equations by using single step and multistep iterative methods used in modern scientific computing. |
| CO208.4 | Perform vector differentiation, analyse the vector fields and apply to electro-magnetic fields. |
| CO208.5 | Perform vector integration and use the results to solve flow problems by using Stoke's and Green's theorem. |
| CO208.6 | Analyse conformal mappings, transformations and perform contour integration of complex functions in the study of electrostatics and signal processing. |
| Integrated Circuits | 204187 | CO209.1 | Understand basics of op-amp and determine various performance based parameters |
| CO209.2 | Analyze and identify linear applications of op-amp |
| CO209.3 | Analyze and identify non- linear applications of op-amp |
| CO209.4 | Understand the appliation of op-amp for convertor circuits |
| CO209.5 | Understand and apply the functionalities of PLL to Frequency synthesizer, multiplier, FM, and AM demodulators |
| CO209.6 | Design and frequency scaling various active filters |
| Control System | 204188 | CO210.1 | Determine and use models of physical systems in forms suitable for use in the analysis and design of control system. |
| CO210.2 | Determine the (absolute) stability of a closed loop control system. |
| CO210.3 | Perform time domain analysis and apply root locus for stability anlaysis so as to analyze control systems. |
| CO210.4 | Perform frequency domain analysis and frequency plots techniques so as to analyze control systems. |
| CO210.5 | Express and solve system equations in state variable form. |
| CO210.6 | Understand and design PID controllers and digital control system. |
| Analog Communication | 204189 | CO211.1 | Understand and identify the fundamental concepts and various components of analog communication systems. |
| CO211.2 | Explain signal to noise ratio, noise figure and noise temperature for single and cascaded stages in a communication system. |
| CO211.3 | Describe analog pulse modulation techniques and digital modulation technique. |
| CO211.4 | Develop the ability to compare and contrast the strengths and weaknesses of various communication systems. |
| CO211.5 | Exhibit the importance of Sampling Theorem and correlate with Pulse Modulation technique (PAM, PWM, and PPM). |
| CO211.6 | Characterize the quantization process and elaborate digital representation techniques PCM. |
| Object Oriented Programming | 204190 | CO212.1 | Describe the principles of object oriented programming. |
| CO212.2 | Apply the concepts of data encapsulation, inheritance in C++. |
| CO212.3 | Understand basic program constructs in Java. |
| CO212.4 | Apply the concepts of classes, methods and inheritance to write programs Java. |
| CO212.5 | Use arrays, vectors and strings concepts and interfaces to write programs in Java. |
| CO212.6 | Describe and use the concepts in Java to develop user friendly program. |
| Employability Skill Development | 204191 | CO213.1 | Have skills and preparedness for aptitude tests |
| CO213.2 | Be equipped with essential communication skills (writing, verbal and non-verbal) |
| CO213.3 | Master the presentation skill and be ready for facing interviews |
| CO213.4 | Build team and lead it for problem solving |
| CO213.5 | Function effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships and understanding professional etiquette |
| CO213.6 | Develop language skills essential for professional communication |
| **AY 2019-20 TE 2015 Pattern Semester I** | | | |
| Digital Communication | 304181 | CO301.1 | Understand the working of waveform coding techniques and analyse their performance. |
| CO301.2 | Analyze the performance of a baseband and pass band digital communication system in terms of error rate and spectrum efficiency. |
| CO301.3 | Understand the effect of random signal and noise on digital signals |
| CO301.4 | perform the time frequency domain analysis of the signals in a digital communication system. |
| CO301.5 | Design of digital comunication system. |
| CO301.6 | Understand the working of spread spectrum communication system and analyze it's perfomance |
| Digital Signal Processing | 304182 | CO302.1 | Analyze the discrete time signals and system using different transform domain techniques. |
| CO302.2 | Design and implement LTI filters for filtering different real world signals. |
| CO302.3 | Develop different signal processing applications using DSP processor. |
| CO302.4 | Capable of calibrating and resolving different frequencies existing in any signal. |
| Electromagnetics | 304183 | CO303.1 | Understand the basic mathematical concepts related to electromagnetic vector fields. |
| CO303.2 | Apply the principles of electrostatics to the solutions of problems relating to electric field and electric potential, boundary conditions and electric energy density. |
| CO303.3 | Apply the principles of magnetostatics to the solutions of problems relating to magnetic field and magnetic potential, boundary conditions and magnetic energy density. |
| CO303.4 | Understand the concepts related to Faraday‘s law, induced emf and Maxwell‘s equations. |
| CO303.5 | Apply Maxwell‘s equations to solutions of problems relating to transmission lines and uniform plane wave propagation. |
| CO303.6 | Analyze the transmission line problem, use the Smith chart for impedance calculations |
| Microcontrollers | 304184 | CO304.1 | Learn importance of microcontroller in designing embedded application |
| CO304.2 | Learn use of hardware and software tools. |
| CO304.3 | Develope interfacing to real world devices. |
| CO304.4 | Learn programming language for real world devices |
| CO304.5 | Interface different peripherals with 8051 & PIC microcontroller |
| CO304.6 | Implement embedded systems for communication of peripherals with microcontroller |
| Mechatronics | 304185 | CO305.1 | Identify key elements of mechatronics system and represente it in terms of block diagram. |
| CO305.2 | Demonstrate use of appropriate sensor and actuator for an engineering   application. |
| CO305.3 | Explain Hydraulic System and its components. |
| CO305.4 | Summurize Pneumatic System and its components. |
| CO305.5 | Interpret concept of Electrical and Electro-Mechanical Actuators. |
| CO305.6 | Explain working principle of Mechatronics Systems in Automobile. |
| Signal Processing and Communications Lab (DC/DSP) | 304191 | CO306.1 | Understand working of waveform coding techniques and analyse their performance. |
| CO306.2 | Understand the time and frequency domain analysis of line codes |
| CO306.3 | Acquired knowldwge about diffrent M-ary modulation techniques |
| CO306.4 | Understand the Effect of random signal and noise on digital signals |
| CO306.5 | Understand working of spread spectrum communication system and analyze its performance. |
| CO306.6 | Analyse the discrete time signal and system using different transform domain techniques and their properties. |
| CO306.7 | Design and implement LTI filters for filtering different real world signals. |
| CO306.8 | Develop different signal processing applications using DSP processor. |
| CO306.9 | Analyse effect of different windowing function on filter response. |
| CO306.10 | Analyse effect of different sampling frequencies. |
| Microcontrollers and Mechatronics Lab | 304192 | CO307.1 | Learn to programe microcontroller using assembly language and embedded c language |
| CO307.2 | Learn to use different hardware and software tools to be used for different microcontroller |
| CO307.3 | Interface different peripherals with 8051 & PIC microcontroller |
| CO307.4 | To develop a simulation model for simple physical systems and explain mechatronics design process |
| CO307.5 | To design and implement data acquisition system |
| CO307.6 | To design and implement various case studies of Mechatronics systems. |
| Electronics System Design | 304193 | CO308.1 | Design switch mode power supply by applying the fundamental concepts, working principles of electronics devices, selecting appropriate components and devices by interpreting datasheets and validate its performance by simulating the same using EDA tool. |
| CO308.2 | Design prototype of Data Acquisition system. by applying the fundamental concepts, working principles of electronics devices, selection of appropriate components and devices, transducer and signal conditioning circuit by interpreting datasheets. |
| CO308.3 | Create, manage the database and query handling using suitable tools. |
| CO308.4 | Design prototype of communication block by applying the fundamental concepts, working principles of electronics devices, select appropriate components and devices by interpreting datasheets. |
| CO308.5 | Shall be able to use PCB Design tool for schemetic and layout design. |
| **AY 2019-20 TE 2015 Pattern Semester II** | | | |
| Power Electronics | 304186 | CO309.1 | Explain working of power devices with gate drive circuits. |
| CO309.2 | Perform & analyze AC to DC controlled power converters. |
| CO309.3 | Perform & analyze DC to AC controlled power converters. |
| CO309.4 | Perform & analyze DC to DC controlled power converters. |
| CO309.5 | Explain Resonant Converters & protection of Power Circuits. |
| CO309.6 | Explain working principle of electronic applications using power devices. |
| Information Theory, Coding and Communication Networks | 304187 | CO310.1 | Perform information theoretic analysis of communication system and source coding techniques |
| CO310.2 | Understand information capacity & design a channel coding scheme for a communication system. |
| CO310.3 | Design cyclic coding scheme for a communication system. |
| CO310.4 | Design BCH & convolutional coding scheme for a communication system. |
| CO310.5 | Understand and apply fundamental principles of data communication and networking. |
| CO310.6 | Apply flow and error control techniques in communication networks. |
| Business Management | 304188 | CO311.1 | Get overview of Management Science aspects useful in business |
| CO311.2 | Overview of marketing & importance of social media in marketing |
| CO311.3 | Understand the crypto currency concept. |
| CO311.4 | Develop project management aspect and entrepreneurship skills |
| CO311.5 | Get motivation for Entrepreneurship |
| CO311.6 | Get Quality Aspects for Systematically Running the business |
| Advanced Processors | 304189 | CO312.1 | Describe the ARM microprocessor architectures and its feature. |
| CO312.2 | To understand ARM7 based architecture of ARM series microprocessor and output devices |
| CO312.3 | Interface the advanced peripherals to ARM based microcontroller |
| CO312.4 | Design embedded syatem with available resources |
| CO312.5 | To understand DSP based architecture TMS320Cxx |
| CO312.6 | Use of DSP processor and resources for signal processing applications |
| System Programming and Operating System | 304190 | CO313.1 | To analyze and synthesize role played by system softwares such as assembler, interpreter, linker, loader etc in the development of IT solutions. |
| CO313.2 | To apply the knowledge and techniqes to develop macro, loaders and linkes. |
| CO313.3 | Compare and analyse the different implementation approach of system programming & operating system abstracttions. |
| CO313.4 | Interpret varous operatng system functions. |
| CO313.5 | Formulate the problem and develop the solutions for the same. |
| CO313.6 | To understand varios memory management techniques, inluding paging and segmentation. |
| Power and ITCT Lab | 304194 | CO314.1 | Design & implement a triggering / gate drive circuit for a power device. |
| CO314.2 | Perform & analyze different controlled converters. |
| CO314.3 | Evaluate performance of various motors and SMPS |
| CO314.4 | Perform information theoretic analysis of communication system. |
| CO314.5 | Design a source & channel coding scheme for a communication system. |
| CO314.6 | Apply fundamental principles of data communication and networking |
| Advanced Processors and System Programming Lab | 304195 | CO315.1 | To understand ARM7 based architecture LPC2148 |
| CO315.2 | Interface the advanced peripherals to ARM based Microcontroller |
| CO315.3 | Design Embedded systems designwith available resources |
| CO315.4 | Demonstrate the knowledge of Systems Programming and Operating Systems, Formulate the Problem and develop the solution for same. |
| CO315.5 | Compare and analyse the different implementation approach of system programming operating system  abstractions. |
| CO315.6 | Interpret various OS functions used in Linux / Ubuntu |
| Employability Skills and Mini Project | 304196 | CO316.1 | Understand, plan and execute a Mini Project with team. |
| CO316.2 | Implement electronic hardware by learning PCB artwork design, soldering techniques, testing and troubleshooting etc. |
| CO316.3 | Prepare a technical report based on the Mini project. |
| CO316.4 | Deliver technical seminar based on the Mini Project work carried out. |
| **AY 2020-21 BE 2015 Pattern Semester I** | | | |
| VLSI & Design Technology | 404181 | CO401.1 | Write effective HDL coding for digital design |
| CO401.2 | Apply knowledge of real time issues in digital design |
| CO401.3 | Model digital circuit with HDL, simulate, synthesis and prototype in PLDs |
| CO401.4 | Design CMOS circuits for specified applications |
| CO401.5 | Analyze various issues and constraints in design of an ASIC |
| CO401.6 | Apply knowledge of testability in design and build self test circuit |
| Computer Networks & Security | 404182 | CO402.1 | Understand fundamentals of TCP/IP Protocol suite & LANs |
| CO402.2 | Exemplify the Network layer Services & Protocols |
| CO402.3 | Explain Routing Alogirthms & Next generation IPs |
| CO402.4 | Describe the Transport Layer Protocols |
| CO402.5 | Select various Application Layer Protocols & Network Management |
| CO402.6 | Comphrend the the use of cryptography and network security. |
| Radiation & Microwave Techniques | 404183 | CO403.1 | Differentiate various performance parameters of radiating elements. |
| CO403.2 | Analyze various radiating elements and arrays. |
| CO403.3 | Apply the knowledge of waveguide fundamentals in design of transmission lines. |
| CO403.4 | Design and set up a system consisting of various passive microwave components. |
| CO403.5 | Analyze tube based and solid state active devices along with their applications. |
| CO403.6 | Measure various performance parameters of microwave components |
| Elective-I (Digital Image and Video Processing) | 404184A | CO404A.1 | Develop and implement basic mathematical operations on digital images. |
| CO404A.2 | Analyze and solve image enhancement and image restoration problems. |
| CO404A.3 | Identify and design image processing techniques for object segmentation and recognition. |
| CO404A.4 | Represent objects and region of the image with appropriate method. |
| CO404A.5 | Apply 2-D data compression techniques for digital images. |
| CO404A.6 | Explore video signal representation and different algorithm for video processing |
| Elective-I ( Internet of Things) | 404184D | CO404D.1 | Understand the various concepts and terminologies and architecture of IoT systems. |
| CO404D.2 | Use sensors and actuators for design of IoT. |
| CO404D.3 | Understand wireless technologoes for design of IoT systems |
| CO404D.4 | Understand and apply various protocols for design of IoT systems |
| CO404D.5 | Use various techniques of data storage and analytics in IoT |
| CO404D.6 | Understand various applications of IoT |
| Elective-II (Artificial Intelligence) | 404185 | CO405.1 | Design and implement key components of intelligent agents and expert systems. |
| CO405.2 | To apply knowledge representation techniques and problem solving strategies to common AI applications. |
| CO405.3 | Applyand integrate various artificial intelligence techniques in intelligent system development as well as understand the importance of maintaining intelligent systems. |
| CO405.4 | Build rule-based and other knowledge-intensive problem solvers. |
| CO405.5 | To apply an undestanding of pattern recognition in application & apply them |
| CO405.6 | To be able to analize natural language |
| Lab Practice -I (CNS+ RMT) | 404186 | CO406.1 | Understand fundamental underlying principles of computer networking & basic knowledge of installing and configuring networking applications. |
| CO406.2 | Describe and analyze the hardware, software, components of a network and their interrelations. |
| CO406.3 | Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies |
| CO406.4 | Analyze various radiating elements and arrays. |
| CO406.5 | To understand design principles of various radiating elements. |
| CO406.6 | To understand theory of passive and active components of microwave systems. |
| Lab Practice -II ( VLSI + Elective I) | 404187 | CO407.4 | A. To use sensors, actuators and wireless technologies for desion of IoT B. Develop and implement basic mathematical operations on digital images |
| CO407.5 | A. To apply different protocols for IoT design B. Analyze and solve image enhancement and image restoration problems |
| CO407.6 | A. To use data handling and analytics tools in IoT B. To perform image filtering in spatial and frequency domain |
| Project Phase I | 404188 | CO408.1 | Identify and formulate the engineering problem that will benefit to society/community/environment after Liturature Survey. |
| CO408.2 | Ability to demonstrate compliance to the prescribed standards/ safety norms through implementation of the identified engineering problem. |
| CO408.3 | Ability to perform & apply resource requirement analysis to arrive at design solution(s) as accepted by professional ethics. |
| CO408.4 | Ability to engage in effective oral and written communication through presentation of the project work, demonstration of the project and preparation of the video about the project. |
| CO408.5 | Ability to perform in the team, contribute to the team and mentor/lead the team. |
| CO408.6 | Ability to prepare the Gantt Chart for scheduling the project work and designate responsibility of every member in the team. |
| **AY 2020-21 BE 2015 Pattern Semester II** | | | |
| Mobile Communication | 404189 | CO409.1 | Apply the concepts of switching technique and traffic engineering to design multistage networks. |
| CO409.2 | Explore the architecture of GSM. |
| CO409.3 | Differentiate thoroughly the generations of mobile technologies. |
| CO409.4 | Explain the concept of signalling in telecommunication networks. |
| CO409.5 | Analyze radio channel and cellular capacity for cellular system. |
| CO409.6 | Compare different multiple access techniques in mobile communication. |
| Broadband Communication | 404190 | CO410.1 | Understand Charactristics of LED & Laser for selection as fiber optics source |
| CO410.2 | Carry out Link power budget and Rise Time Budget for optical network by proper selection of components and check its viability |
| CO410.3 | Study WDM component and optical amplifier. |
| CO410.4 | Study orbital mechanics and orbital effects required for satellite communication. |
| CO410.5 | Study & Draw satellite subsystems block diagram |
| CO410.6 | Carry out Satellite Link design for Up Link and Downlink satellite Link Design for C and Ku band. |
| Elective -III (Audio Video Engineering) | 404191E | CO411.1 | Students will demonstrate the basic knoledge of analysis and synthesis of TV Pictures, Composite Video Signal, Receiver, Picture Tubes and Television Camera Tubes. |
| CO411.2 | Students will demonstrate an ability to model the various Colour Television systems with a greater emphasis on television standards. |
| CO411.3 | Student will study and know the advanced topics in Digital Television and High Definition Television. |
| CO411.4 | Students will demonstrate an ability to analysis and use the video recording, disply devices and advanced TV systems |
| CO411.5 | Students will demonstrate an ability to analysis and compare audio recording systems such CD/DVD recording, Audio Standards. |
| CO411.6 | Students will demonstrate an ability to apply the Acoustics principles. |
| Elective -III (Machine Learning ) | 404191A | CO411A.1 | To compare and contrast pros and cons of machine learning techniques and to get an in sight of when to apply a particular machine learning approach. |
| CO411A.2 | Design and Implement Models for Linear Regression and Classification |
| CO411A.3 | To apply preprocessing methods to prepare training data set for machine learning.and clustering |
| CO411A.4 | To acquire knowledge of Artificial Neural Networks, Multilayer Perceptron and backpropagation algorithm. |
| CO411A.5 | To mathematically analyze various machine learning approaches and paradigms. |
| CO411A.6 | To implement convolution neural networks in recognition applications. |
| Elective -IV (Wireless Sensor Network) | 404192 | CO412.1 | Explain various concepts and terminologies used in WSN |
| CO412.2 | Describe importance and use of radio communication and link management in WSN |
| CO412.3 | Explain various wireless standards and protocols associated with WSN |
| CO412.4 | Recognize importance of localization and routing techniques used in WSN |
| CO412.5 | Comprehend techniques of data aggregation and importance of security in WSN |
| CO412.6 | Examine the issues involved in design and deployment of WSN |
| Lab Practice -III (MC+BCS) | 404193 | CO413.1 | Apply the concepts of switching technique and traffic engineering to design multistage networks. |
| CO413.2 | Explore the architecture of GSM. |
| CO413.3 | Differentiate thoroughly the generations of mobile technologies. |
| CO413.4 | Understand Charactristics of LED & Laser for selection as fiber optics source |
| CO413.5 | Carry out Link power budget and Rise Time Budget by proper selection of components and check its viability |
| CO413.6 | Establish & test satellite link.Carry out Satellite Link design for Up Link Down Link |
| Lab Practice -IV (Elective III) | 404194 | CO414.1 | To compare and contrast pros and cons of machine learning techniques and to get an in sight of when to apply a particular machine learning approach. |
| CO414.2 | To mathematically analyze various machine learning approaches and paradigms. |
| CO414.3 | To implement convolution neural networks in recognition applications. |
| CO414.4 | To apply the fundamentals of Analog Television and Colour Television standards. |
| CO414.5 | To understand the fundamentals of Digital Television, DTV standards, parameters, Digital TV broadcasting systems and understand various HDTV standards and acquainted with different types of HDTV systems. |
| CO414.6 | To understandacoustic fundamentals and various acoustic systems. |
| Project Stage II | 404195 | CO415.1 | Ability to analyze and interpret results of experiments conducted on the designed solution(s) to arrive at valid conclusions. |
| CO415.2 | Ability to demonstrate compliance to the prescribed standards/ safety norms through implementation of the identified engineering problem. |
| CO415.3 | Ability to perform & apply resource requirement analysis to arrive at design solution(s) as accepted by professional ethics. |
| CO415.4 | Ability to engage in effective oral and written communication through presentation of the project work, demonstration of the project and preparation of the video about the project. |
| CO415.5 | Ability to perform in the team, contribute to the team and mentor/lead the team. |
| CO415.6 | Ability to prepare the Gantt Chart for scheduling the project work and designate responsibility of every member in the team. |

**Attainment of Course Outcomes**

**CO attainment of all courses of Batch 2020-21:**

**Table 2 CO attainment of all courses of Batch 2020-21**

| **Sr. No.** | **Course Name** | **Course Code** | **Course** | **CO Target** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** | **CO6** | **CO Attainment** | **Attainment Status** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **First Year** | | | | | | | | | | | | |
| **2017 – 18 Semester - I** | | | | | | | | | | | | |
| 1 | Engineering Mathematics I | 107001 | CO101 | 1.5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | Attained | |
| 2 | Engineering Physics | 107002 | CO102 | 1.5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | Attained | |
| 3 | Engineering Graphics I | 102006 | CO106 | 1.5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | Attained | |
| 4 | Basic Electrical Engineering | 103004 | CO104 | 1.5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | Attained | |
| 5 | Basic Civil and Environmental Engineering | 101005 | CO105 | 1.5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | Attained | |
| 6 | Fundamentals of Programming Languages I | 110003 | CO103 | 1.5 | 2 | 2 | 2 | 2 | - | - | 2 | Attained | |
| 7 | Workshop Practice | 111007 | CO107 | 1.5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | Attained | |
| **2017 – 18 Semester - II** | | | | | | | | | | | | |
| 8 | Engineering Mathematics II | 107008 | CO108 | 1.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | Not Attained | |
| 9 | Engineering Chemistry | 107009 | CO109 | 1.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | Not Attained | |
| 10 | Basic Mechanical Engineering | 102013 | CO113 | 1.5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | Attained | |
| 11 | Engineering Mechanics | 101011 | CO111 | 1.5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | Attained | |
| 12 | Basic Electronics Engineering | 104012 | CO112 | 1.5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | Attained | |
| 13 | Fundamentals of Programming Languages II | 110010 | CO110 | 1.5 | 3 | 3 | 3 | 3 | - | - | 3 | Attained | |
| 14 | Engineering Graphics II | 102014 | CO114 | 1.5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | Attained | |
| **Second Year** | | | | | | | | | | | | |
| **2018 – 19 Semester - I** | | | | | | | | | | | | |
| Sr. No. | Course Name | Course Code | Course | CO Target | CO1 | CO2 | CO3 | CO4 | CO5 | CO6 | CO Attainment | Attainment Status | |
| 15 | Signals & Systems | 204181 | CO201 | 1 | 1.1 | 1.1 | 1.3 | 1.3 | 1.4 | 1.3 | 1.3 | Attained | |
| 16 | Electronic Devices & Circuits | 204182 | CO202 | 1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | - | 1.1 | Attained | |
| 17 | Electrical Circuits and Machines | 204183 | CO203 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.3 | 1.4 | 1.4 | Attained | |
| 18 | Data Structures and Algorithms | 204184 | CO204 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.4 | 1.3 | 1.3 | Attained | |
| 19 | Digital Electronics | 204185 | CO205 | 1 | 1.9 | 1.9 | 1.9 | 1.9 | - | - | 1.9 | Attained | |
| 20 | Electronic Measuring  Instruments & Tools | 204186 | CO206 | 1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | Attained | |
| **2018 – 19 Semester - II** | | | | | | | | | | | | |
| 21 | Engineering Mathematics III | 207005 | CO208 | 1 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | Not Attained | |
| 22 | Integrated Circuits | 204187 | CO209 | 1.1 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.6 | 1.9 | Attained | |
| 23 | Control Systems | 204188 | CO210 | 1 | 0.6 | 0.2 | 0.4 | 0 | 0.6 | 0 | 0.3 | Not Attained | |
| 24 | Analog Communication | 204189 | CO211 | 1 | 1.4 | 1.3 | 1.2 | 1.4 | 1.4 | 1.1 | 1.3 | Attained | |
| 25 | Object Oriented Programming | 204190 | CO212 | 1 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | Attained | |
| 26 | Employability Skill Development | 204191 | CO213 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3.0 | Attained | |
| **Third Year** | | | | | | | | | | | | |
| **2019 – 20 Semester - I** | | | | | | | | | | | | |
| Sr. No. | Course Name | Course Code | Course | CO Target | CO1 | CO2 | CO3 | CO4 | CO5 | CO6 | CO Attainment | Attainment Status | |
| 27 | Digital Communication | 304181 | CO301 | 2.4 | 2.6 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | Attained | |
| 28 | Digital Signal Processing | 304182 | CO302 | 2 | 3 | 3 | 2.6 | 2.6 | - | - | 2.8 | Attained | |
| 29 | Electromagnetics | 304183 | CO303 | 2.4 | 2.6 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | Attained | |
| 30 | Microcontrollers | 304184 | CO304 | 2 | 2.4 | 2.4 | 2.4 | 2.4 | 2.6 | 3 | 2.5 | Attained | |
| 31 | Mechatronics | 304185 | CO305 | 2 | 2.2 | 2.2 | 2.2 | 2.2 | 2 | 2.2 | 2.2 | Attained | |
| 32 | Signal Processing and Communications Lab (DC/DSP) | 304191 | CO306 | 2 | 3 | 2.7 | 3 | 3 | 2.7 | - | 2.9 | Attained | |
| 33 | Microcontrollers and Mechatronics Lab | 304192 | CO307 | 1.4 | 0.4 | 0.4 | 0.6 | 0.6 | 0.6 | 0.6 | 0.5 | Not Attained | |
| 34 | Electronics System Design | 304193 | CO308 | 1.6 | 1.6 | 2.2 | 1.6 | 1.8 | 1.6 | - | 1.8 | Attained | |
| **2019 – 20 Semester - II** | | | | | | | | | | | | |
| 35 | Power Electronics | 304186 | CO309 | 2.5 | 3 | 3 | 3 | 3 | 3 | 3 | 3.0 | Attained | |
| 36 | Information Theory, Coding and Communication Networks | 304187 | CO310 | 2 | 2.2 | 1.6 | 2.2 | 2.2 | 2.2 | 2.2 | 2.1 | Attained | |
| 37 | Business Management | 304188 | CO311 | 1 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | Not Attained | |
| 38 | Advanced Processors | 304189 | CO312 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 3 | 3 | 2.6 | Attained | |
| 39 | System Programming and Operating Systems | 304190 | CO313 | 1 | 0.8 | 0.8 | 0.8 | 0.8 | 1.4 | 1.4 | 1.0 | Attained | |
| 40 | Power and ITCT Lab | 304194 | CO314 | 2 | 3 | 3 | 2.4 | 3 | 3 | 3 | 2.9 | Attained | |
| 41 | Advanced Processors and System Prograaming. Lab | 304195 | CO315 | 2 | 2.4 | 3 | 3 | 2.4 | 2.8 | 3 | 2.8 | Attained | |
| 42 | Employability Skills and Mini Project | 304196 | CO316 | 2 | 3 | 3 | 3 | 3 | - | - | 3.0 | Attained | |
| **Final Year** | | | | | | | | | | | | |
| **2020 – 21 Semester - I** | | | | | | | | | | | | |
| Sr. No. | Course Name | Course Code | Course | CO Target | CO1 | CO2 | CO3 | CO4 | CO5 | CO6 | CO Attainment | Attainment Status | |
| 43 | VLSI Design& Technology | 404181 | CO401 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3.0 | Attained | |
| 44 | Computer Networks & Security | 404182 | CO402 | 2 | 2.6 | 2.6 | 3 | 3 | 3 | 3 | 2.9 | Attained | |
| 45 | Radiation & Microwave Techniques | 404183 | CO403 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3.0 | Attained | |
| 46 | Elective I(Digital Image Processing) | 404184 | CO404A | 2.4 | 3 | 2.6 | 3 | 3 | 3 | 3 | 2.9 | Attained | |
| 47 | Elective I (IoT) | 404184 | CO404D | 2.4 | 3 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.5 | Attained | |
| 48 | Elective II (  Artificial Intelligence  ) | 404185 | CO405 | 2.4 | 2.4 | 2.4 | 2.4 | 2.6 | 2.6 | 2.8 | 2.5 | Attained | |
| 49 | Lab Practice -I (CNS+ RMT) | 404186 | CO406 | 1.4 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | Attained | |
| 50 | Lab Practice -II ( VLSI + Elective I) | 404187 | CO407 | 1 | 0.8 | 0.8 | 1 | 0.8 | 1.4 | 0.8 | 0.9 | Not Attained | |
| 51 | Project Stage I | 404188 | CO408 | 1 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | Not Attained | |
| **2020 – 21 Semester - II** | | | | | | | | | | | | |
| 52 | Mobile Communication | 404189 | CO409 | 2.4 | 3 | 3 | 3 | 3 | 2.4 | 2.4 | 2.8 | Attained | |
| 53 | Broadband Communication Systems | 404190 | CO410 | 2.4 | 3 | 3 | 3 | 3 | 2.4 | 2.4 | 2.8 | Attained | |
| 54 | Elective III (Machine Learning) | 404191 | CO411A | 2.4 | 2.8 | 2.6 | 3 | 2.6 | 2.4 | 2.4 | 2.6 | Attained | |
| 55 | Elective III (Audio Video Engineering) | 404191 | CO411E | 1.6 | 3 | 3 | 3 | 3 | 2.4 | 2.4 | 2.8 | Attained | |
| 56 | Elective IV (Wireless Sensor Network) | 404192 | CO412 | 2.4 | 3 | 3 | 3 | 3 | 2.4 | 2.4 | 2.8 | Attained | |
| 57 | Lab Practice –III (MC+BCS) | 404193 | CO413 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3.0 | Attained | |
| 58 | Lab Practice –IV ( Elective III) | 404194 | CO414 | 2.4 | 2.8 | 3 | 2.8 | 3 | 3 | 2.8 | 2.9 | Attained | |
| 59 | Project Stage II | 404195 | CO415 | 1 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | Not Attained | |

**Attainment of Program Outcomes and Program Specific Outcomes**

**PO Attainment**

**Table 3 PO attainment of a courses of Batch 2020-21 (DIRECT)**

| **Sr. No.** | **Course Name** | **Course Code** | **Course** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **First Year** | | | | | | | | | | | | | | | |
| **2017 – 18 Semester - I** | | | | | | | | | | | | | | | |
| 1 | Engineering Mathematics I | 107001 | CO101 | 2 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - |
| 2 | Engineering Physics | 107002 | CO102 | 3 | 3 | 3 | - | 3 | - | - | - | 3 | - | - | 3 |
| 3 | Engineering Graphics I | 102006 | CO104 | 2 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | 2 |
| 4 | Basic Electrical Engineering | 103004 | CO105 | 3 | 3 | - | 3 | 3 | 3 | 3 | 3 | - | 3 | - | 3 |
| 5 | Basic Civil and Environmental Engineering | 101005 | CO107 | 3 | 3 | - | 3 | 3 | 3 | 3 | 3 | - | 3 | - | 3 |
| 6 | Fundamentals of Programming Languages I | 110003 | CO108 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 2 |
| 7 | Workshop Practice | 111007 | CO109 | 3 | 3 | - | 3 | 3 | 3 | 3 | 3 | - | 3 | - | 3 |
| **2017 – 18 Semester - II** | | | | | | | | | | | | | | | |
| 8 | Engineering Mathematics II | 107008 | CO111 | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - |
| 9 | Engineering Chemistry | 107009 | CO112 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - | - | - | - | - |
| 10 | Basic Mechanical Engineering | 102013 | CO114 | 3 | 3 | - | 3 | 3 | 3 | 3 | 3 | - | 3 | - | 3 |
| 11 | Engineering Mechanics | 101011 | CO115 | 2 | 2 | - | 2 | 2 | 2 | 2 | 2 | - | 2 | - | 2 |
| 12 | Basic Electronics Engineering | 104012 | CO116 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 13 | Fundamentals of Programming Languages II | 110010 | CO118 | 3 | - | 3 | - | 3 | - | - | - | - | - | - | 3 |
| 14 | Engineering Graphics II | 102014 | CO119 | 3 | 3 | - | 3 | 3 | 3 | 3 | 3 | - | 3 | - | 3 |
| **Second Year** | | | | | | | | | | | | | | | |
| **2018 – 19 Semester - I** | | | | | | | | | | | | | | | |
| Sr. No. | Course Name | Course Code | Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| 15 | Signals & Systems | 204181 | CO201 | 1.24 | 1.22 | 1.28 | 1.25 | - | - | - | - | - | - | - | 1.25 |
| 16 | Electronic Devices & Circuits | 204182 | CO202 | 1.1 | 1.1 | 1.1 | - | - | - | - | - | 1.1 | - | - | 1.1 |
| 17 | Electrical Circuits and Machines | 204183 | CO203 | 1.38 | 1.39 | 1.39 | 1.38 | 1.4 | 1.38 | 1.4 | - | - | - | - | 1.38 |
| 18 | Data Structures and Algorithms | 204184 | CO204 | 1.32 | 1.32 | - | 1.32 | 1.32 | - | - | 1.32 | - | - | - | - |
| 19 | Digital Electronics | 204185 | CO205 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 |
| 20 | Electronic Measuring  Instruments & Tools | 204186 | CO206 | 2.2 | 2.2 | - | 2.2 | - | - | - | 2.2 | 2.2 | - | - | 2.2 |
| **2018 – 19 Semester - II** | | | | | | | | | | | | | | | |
| 21 | Engineering Mathematics III | 207005 | CO208 | 0.3 | 0.3 | 0.3 | - | 0.3 | 0.3 | 0.3 | - | - | - | - | - |
| 22 | Integrated Circuits | 204187 | CO209 | 1.85 | 1.85 | 1.85 | 1.85 | - | - | - | 1.85 | 1.88 | 1.9 | - | 1.85 |
| 23 | Control Systems | 204188 | CO210 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | - | - | - | - | - | - | 0.3 |
| 24 | Analog Communication | 204189 | CO211 | 1.32 | 1.31 | 1.31 | 1.33 | 1.30 | - | - | - | 1.3 | 1.33 | - | 1.34 |
| 25 | Object Oriented Programming | 204190 | CO212 | 1.11 | 1.12 | 1.12 | 1.12 | 1.11 | 1.12 | 1.11 | 1.12 | 1.12 | 1.12 | 1.11 | 1.11 |
| 26 | Employability Skill Development | 204191 | CO213 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Third Year** | | | | | | | | | | | | | | | |
| **2019 – 20 Semester - I** | | | | | | | | | | | | | | | |
| Sr. No. | Course Name | Course Code | Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| 27 | Digital Communication | 304181 | CO301 | 2.4 | 2.4 | 2.4 | 2.4 | - | - | - | - | 2.4 | 2.4 | - | 2.4 |
| 28 | Digital Signal Processing | 304182 | CO302 | 2.8 | 2.8 | 2.8 | 2.8 | 2.9 | - | - | - | 2.8 | 2.8 | 2.8 | 2.8 |
| 29 | Electromagnetics | 304183 | CO303 | 2.4 | 2.4 | - | 2.4 | 2.4 | - | - | 2.4 | - | - | - | - |
| 30 | Microcontrollers | 304184 | CO304 | 2.6 | - | 2.5 | 2.5 | 2.4 | - | 2.6 | - | - | - | - | 2.5 |
| 31 | Mechatronics | 304185 | CO305 | 2.2 | 2.2 | 2.2 | - | - | - | 2.2 | - | - | - | - | - |
| 32 | Signal Processing and Communications Lab (DC/DSP) | 304191 | CO306 | 2.87 | 2.87 | 2.85 | 2.85 | - | - | - | - | 2.88 | 2.91 | - | 2.88 |
| 33 | Microcontrollers and Mechatronics Lab | 304192 | CO307 | 0.54 | 0.6 | 0.52 | - | 0.47 | - | 0.6 | - | 0.53 | - | 0.53 | 0.51 |
| 34 | Electronics System Design | 304193 | CO308 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | - | - | 1.8 | - | - | - |
| **2019 – 20 Semester - II** | | | | | | | | | | | | | | | |
| 35 | Power Electronics | 304186 | CO309 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | - |
| 36 | Information Theory, Coding and Communication Networks | 304187 | CO310 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | - | - | - | - | - | - | - |
| 37 | Business Management | 304188 | CO311 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | - | - | - | - | - | 0.6 | 0.6 |
| 38 | Advanced Processors | 304189 | CO312 | 2.6 | - | 2.6 | 2.6 | 2.4 | - | 2.7 | - | - | - | - | 2.6 |
| 39 | System Programming and Operating Systems | 304190 | CO313 | 1 | 1 | 1 | 1 | 1 | - | - | - | 1 | 1 | 1 | 1 |
| 40 | Power and ITCT Lab | 304194 | CO314 | 2.9 | 3.0 | 2.9 | 3.0 | - | 3.0 | - | - | - | 3.0 | - | - |
| 41 | Advanced Processors and System Programming. Lab | 304195 | CO315 | 2.78 | 2.8 | 2.72 | 3.0 | 2.8 | 3.0 | 3.0 | - | 2.8 | - | 2.8 | 2.8 |
| 42 | Employability Skills and Mini Project | 304196 | CO316 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | - | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| **Final Year** | | | | | | | | | | | | | | | |
| **2020 – 21 Semester - I** | | | | | | | | | | | | | | | |
| Sr. No. | Course Name | Course Code | Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| 43 | VLSI Design & Technology | 404181 | CO401 | 3.0 | - | 3.0 | 3.0 | 3.0 | - | - | - | - | - | - | 3.0 |
| 44 | Computer Networks & Security | 404182 | CO402 | 2.9 | 2.9 | 2.9 | 3.0 | 2.8 | - | - | - | - | - | - | 2.8 |
| 45 | Radiation & Microwave Techniques | 404183 | CO403 | 3.0 | 3.0 | 3.0 | - | 3.0 | - | 3.0 | - | - | - | - | 3.0 |
| 46 | Elective I(Digital Image Processing) | 404184 | CO404A | 2.9 | 2.9 | 2.9 | 2.9 | 2.9 | 2.9 | - | - | - | - | - | 2.9 |
| 47 | Elective I (IoT) | 404184 | CO404D | 2.5 | 2.6 | 2.5 | 2.4 | - | 2.4 | 2.4 | - | - | - | - | - |
| 48 | Elective II (  Artificial Intelligence  ) | 404185 | CO405 | 2.5 | 2.5 | 2.6 | - | - | 2.8 | 2.6 | - | - | 2.6 | - | 2.5 |
| 49 | Lab Practice -I (CNS+ RMT) | 404186 | CO406 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 |
| 50 | Lab Practice -II ( VLSI + Elective I) | 404187 | CO407 | 0.94 | 0.8 | 0.95 | 0.8 | 0.8 | 0.8 | 0.8 | - | 0.8 | 0.8 | - | 0.8 |
| 51 | Project Stage I | 404188 | CO408 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| **2020 – 21 Semester - II** | | | | | | | | | | | | | | | |
| 52 | Mobile Communication | 404189 | CO409 | 2.9 | 2.8 | 2.8 | 2.9 | 2.7 | - | - | - | - | 3.0 | - | 3.0 |
| 53 | Broadband Communication Systems | 404190 | CO410 | 2.9 | 2.9 | 2.4 | - | 3.0 | - | - | - | - | - | - | 2.7 |
| 54 | Elective III (Machine Learning) | 404191 | CO411A | 2.6 | 2.5 | 2.5 | 2.4 | - | 2.4 | 2.4 | - | - | - | - | - |
| 55 | Elective III (Audio Video Engineering) | 404191 | CO411E | 2.9 | 2.8 | 2.7 | 2.8 | 2.8 | - | - | - | - | - | 3 | 2.8 |
| 56 | Elective IV (Wireless Sensor Network) | 404192 | CO412 | 2.8 | 2.8 | 2.8 | 2.7 | 2.8 | 2.8 | 2.5 | 2.4 | 2.4 | 2.4 | 2.4 | 2.8 |
| 57 | Lab Practice –III (MC+BCS) | 404193 | CO413 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | - | 3.0 | - | - | 3.0 | 3.0 | 3.0 |
| 58 | Lab Practice –IV ((Elective III) | 404194 | CO414 | 2.9 | 2.8 | 2.9 | 2.9 | 2.9 | 2.8 | 2.8 | - | - | - | - | 2.9 |
| 59 | Project Stage II | 404195 | CO415 | - | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |

**PO Attainment**

**Table 4 Average PO attainment of all courses of Batch 2020-21**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PO Attainment Level** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| Direct Attainment | 2.19 | 2.11 | 2.07 | 2.16 | 2.11 | 2.20 | 2.15 | 2.22 | 1.91 | 2.28 | 1.95 | 2.21 |
| Indirect Attainment | 3 | 3 | 2.9 | 3 | 3 | 2.9 | 3 | 3 | 2.9 | 3 | 3 | 3 |
| Total Attainment | 2.35 | 2.29 | 2.24 | 2.33 | 2.29 | 2.34 | 2.32 | 2.38 | 2.10 | 2.42 | 2.16 | 2.37 |

**PSO Attainment**

**Table 5 PSO attainment of all courses of Batch 2020-21**

| **Sr. No.** | **Course Name** | **Course Code** | **Course** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Second Year** | | | | | | | | |
| **2018 – 19 Semester - I** | | | | | | | | |
| 1 | Signals & Systems | 204181 | CO201 | 1.25 | - | 1.25 | NA |
| 2 | Electronic Devices & Circuits | 204182 | CO202 | 1.1 | 1.1 | - | NA |
| 3 | Electrical Circuits and Machines | 204183 | CO203 | 1.38 | 1.38 | 1.38 | NA |
| 4 | Data Structures and Algorithms | 204184 | CO204 | - | 1.32 | 1.32 | NA |
| 5 | Digital Electronics | 204185 | CO205 | 1.9 | 1.9 | 1.9 | NA |
| 6 | Electronic Measuring  Instruments & Tools | 204186 | CO206 | 2.2 | 2.2 | 2.2 | NA |
| **2018 – 19 Semester - II** | | | | | | | | |
| 7 | Engineering Mathematics III | 207005 | CO208 | 0.3 | 0.3 | - | - |
| 8 | Integrated Circuits | 204187 | CO209 | 1.85 | - | 1.85 | - |
| 9 | Control Systems | 204188 | CO210 | 0.3 | - | 0.3 | - |
| 10 | Analog Communication | 204189 | CO211 | 1.32 | 1.4 | 1.3 | - |
| 11 | Object Oriented Programming | 204190 | CO212 | 1.12 | 1.12 | 1.12 | - |
| 12 | Employability Skill Development | 204191 | CO213 | 3 | 3 | 3 | 3 |
| **Sr. No.** | **Course Name** | **Course Code** | **Course** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **Third Year** | | | | | | | | |
| **2019 – 20 Semester - I** | | | | | | | | |
| 13 | Digital Communication | 304181 | CO301 | 2.4 | 2.4 | - | - |
| 14 | Digital Signal Processing | 304182 | CO302 | 2.8 | 2.8 | 3 | - |
| 15 | Electromagnetics | 304183 | CO303 | 2.4 | 2.4 | 2.4 | 2.4 |
| 16 | Microcontrollers | 304184 | CO304 | 2.5 | 2.5 | - | - |
| 17 | Mechatronics | 304185 | CO305 | 2.2 | - | - | - |
| 18 | Signal Processing and Communications Lab (DC/DSP) | 304191 | CO306 | 2.9 | 2.83 | 3.0 | - |
| 19 | Microcontrollers and Mechatronics Lab | 304192 | CO307 | 0.53 | 0.53 | - | - |
| 20 | Electronics System Design | 304193 | CO308 | 1.8 | 1.8 | 1.8 | - |
| **2019 – 20 Semester - II** | | | | | | | | |
| 21 | Power Electronics | 304186 | CO309 | 3.0 | - | - | 3.0 |
| 22 | Information Theory, Coding and Communication Networks | 304187 | CO310 | 2.1 | 2.1 | 2.1 | - |
| 23 | Business Management | 304188 | CO311 | 0.6 | 0.6 | 0.6 | 0.6 |
| 24 | Advanced Processors | 304189 | CO312 | 2.6 | 2.6 | 2.6 | - |
| 25 | System Programming and Operating Systems | 304190 | CO313 | 1 | 1 | 1 | - |
| 26 | Power and ITCT Lab | 304194 | CO314 | 2.9 | 3.0 | 3.0 | - |
| 27 | Advanced Processors and System Programming. Lab | 304195 | CO315 | 2.85 | 2.75 | 3.0 | 3.0 |
| 28 | Employability Skills and Mini Project | 304196 | CO316 | 3.0 | 3.0 | 3.0 | - |
| **Sr. No.** | **Course Name** | **Course Code** | **Course** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| **Final Year** | | | | | | | | |
| **2020 – 21 Semester - I** | | | | | | | | |
| 29 | VLSI Design & Technology | 404181 | CO401 | 3.0 | 3.0 | - | - |
| 30 | Computer Networks & Security | 404182 | CO402 | 2.8 | 3.0 | 2.8 | - |
| 31 | Radiation & Microwave Techniques | 404183 | CO403 | 3.0 | 3.0 | 3.0 | 3.0 |
| 32 | Elective I(Digital Image Processing) | 404184 | CO404A | 2.9 | 2.9 | 2.9 | - |
| 33 | Elective I (IoT) | 404184 | CO404D | 2.5 | 2.6 | - | - |
| 34 | Elective II (  Artificial Intelligence  ) | 404185 | CO405 | 2.5 | - | 2.5 | 2.7 |
| 35 | Lab Practice -I (CNS+ RMT) | 404186 | CO406 | 1.8 | 1.8 | 1.8 | - |
| 36 | Lab Practice -II ( VLSI + Elective I) | 404187 | CO407 | 0.93 | 0.9 | - | - |
| 37 | Project Stage I | 404188 | CO408 | 0.6 | 0.6 | 0.6 | 0.6 |
| **2020 – 21 Semester - II** | | | | | | | | |
| 38 | Mobile Communication | 404189 | CO409 | 2.8 | 2.8 | 2.8 | 2.4 |
| 39 | Broadband Communication Systems | 404190 | CO410 | 2.9 | - | 2.8 | - |
| 40 | Elective III (Machine Learning) | 404191 | CO411A | 2.6 | 2.6 | - | - |
| 41 | Elective III (Audio Video Engineering) | 404191 | CO411E | 2.9 | 3 | 2.7 | - |
| 42 | Elective IV (Wireless Sensor Network) | 404192 | CO412 | 2.8 | 2.7 | 2.7 | 2.8 |
| 43 | Lab Practice –III (MC+BCS) | 404193 | CO413 | 3.0 | 3.0 | 3.0 | - |
| 44 | Lab Practice –IV ((Elective III) | 404194 | CO414 | 2.9 | 2.9 | - | 2.9 |
| 45 | Project Stage II | 404195 | CO415 | 0.6 | 0.6 | 0.6 | 0.6 |
| **Direct PSO Attainment** | | | | 2.09 | 2.09 | 2.10 | 2.25 |

**PSO Attainment Level**

**Table 6 Average PSO attainment of all courses of Batch 2020-21**

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|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PSO Attainment Level** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| Direct Attainment | 2.09 | 2.09 | 2.1 | 2.25 |
| Indirect Attainment | 3 | 2.9 | 3 | 3 |
| Total Attainment | 2.27 | 2.25 | 2.28 | 2.40 |