Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

*(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)*

**(Accredited 'A++' Grade by NAAC with a score of 3.6)**

Hingna Road, Wanadongri, Nagpur - 441 110

# Bachelor of Technology

# SoE & Syllabus 2023

## 1st to 4th Semester

**(Department of Electronics & Telecommunication Engineering)**

## B. Tech in Electronics & Telecommunication Engineering

Nagar Yuwak Shikshan Sanstha's

**Yeshwantrao Chavan College of Engineering**

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B.TECH SCHEME OF EXAMINATION 2023**

(Scheme of Examination w.e.f. 2023-24 onward)

**(Department of Electronics & Telecommunication Engineering)**

**B.Tech. in Electronics & Telecommunication Engineering**

SoE No. 23ET-101

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject | T/P | Contact Hours | | | | Credits | % Weightage | | | ESE Duration Hours |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L | T | P | Hrs | | MSEs* | TA** | ESE | |
| **FIRST SEMESTER (GROUP-A)** | | | | | | | | | | | | | | | |
| 1 | 1 | BS | GE | 23GE1101 | Calculus and Vector | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 2 | 1 | BS | GE | 23GE1104 | Applied Chemistry | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 3 | 1 | BS | GE | 23GE1105 | **Lab:** Applied Chemistry | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 4 | 1 | HS/AEC1 | GE | 23GE1112 | Professional Communication | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 2 |
| 5 | 1 | HS/IKS | GE | 23GE1115 | Indian Knowledge System | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 2 |
| 6 | 1 | BES | CV | 23CV1101 | Engineering Mechanics | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 7 | 1 | BES | CV | 23CV1102 | **Lab:** Engineering Mechanics | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 8 | 1 | BES | IT | 23IT1103 | Programming for Problem Solving | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 2 |
| 9 | 1 | BES | IT | 23IT1104 | **Lab:** Programming for Problem Solving | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 10 | 1 | VSEC | GE | 23GE1117 | Get Set Go | … | … | … | … | … | 2 | | 60 | 40 | |
| 11 | 1 | CC1 | GE | | **Liberal Learning Course (LLC1)** | … | … | … | … | … | 2 | | 60 | 40 | |
| | | | | | **TOTAL FIRST SEM** | | **15** | **0** | **6** | **21** | **22** | **180** | | | |
| **SECOND SEMESTER (GROUP-A)** | | | | | | | | | | | | | | | |
| 1 | 2 | BS | GE | 23GE1202 | Differential Equations, Matrices and Statistics | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 2 | 2 | BS | GE | 23GE1208 | Engineering Physics | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 3 | 2 | BS | GE | 23GE1209 | **Lab:** Engineering Physics | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 4 | 2 | BES | ME | 23ME1201 | Engineering Graphics | T | 1 | 0 | 0 | 1 | 1 | 30 | 20 | 50 | 3 |
| 5 | 2 | BES | ME | 23ME1202 | **Lab :** Engineering Graphics | P | 0 | 0 | 4 | 4 | 2 | | 60 | 40 | |
| 6 | 2 | BES | EL | 23EL1201 | Basic Electrical and Electronics Engineering | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 7 | 2 | BES | EL | 23EL1205 | Lab : Electrical and Electronics Workshop | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 8 | 2 | PC | ETC | 23ET1201 | Digital Electronics and Logic Design | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 9 | 2 | PC | ETC | 23ET1202 | **Lab :** Digital Electronics and Logic Design | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 10 | 2 | VSEC | GE | 23GE1218 | Functional English | … | … | … | … | … | 2 | | 60 | 40 | |
| 11 | 2 | CC2 | GE | | **Liberal Learning Course (LLC2)** | … | … | … | … | … | 2 | | 60 | 40 | |
| | | | | | **TOTAL SECOND SEM** | | **13** | **0** | **10** | **23** | **22** | | | | |

**Liberal Learning Course**

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject |
|---|---|---|---|---|---|
| 1 | 1 | CC1 | GE | 23LLC1101 | Music (Vocal) |
| 2 | 1 | CC1 | GE | 23LLC1102 | Music (Instrumental) |
| 3 | 1 | CC1 | GE | 23LLC1103 | Indian Classical Dance |
| 4 | 1 | CC1 | GE | 23LLC1104 | Other forms of Dances |
| 5 | 1 | CC1 | GE | 23LLC1105 | Painting |
| 6 | 1 | CC1 | GE | 23LLC1106 | Theatre and acting |
| 7 | 1 | CC1 | GE | 23LLC1107 | Photography |
| 8 | 1 | CC1 | GE | 23LLC1108 | Yoga |
| 9 | 1 | CC1 | GE | 23LLC1109 | Chess |
| 10 | 1 | CC1 | GE | 23LLC1110 | Athletics |
| 11 | 1 | CC1 | GE | 23LLC1111 | Basket Ball |
| 12 | 1 | CC1 | GE | 23LLC1112 | Judo |
| 13 | 1 | CC1 | GE | 23LLC1113 | Elements of Japanese Language |
| 14 | 1 | CC1 | GE | 23LLC1114 | Elements of German Language |
| 15 | 1 | CC1 | GE | 23LLC1115 | Elements of French Language |
| 16 | 1 | CC1 | GE | 23LLC1116 | Elements of Spanish Language |
| 17 | 1 | CC1 | GE | 23LLC1117 | Basics of Vedic Maths |
| 18 | 1 | CC1 | GE | 23LLC1118 | Skilling in Microsoft Visio and Inkscape |

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(Scheme of Examination w.e.f. 2023-24 onward)

**(Department of Electronics & Telecommunication Engineering)**

**B.Tech. in Electronics & Telecommunication Engineering**

SoE No. 23ET-101

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject | T/P | Contact Hours | | | | Credits | % Weightage | | | ESE Duration Hours |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L | T | P | Hrs | | MSEs* | TA** | ESE | |

**Liberal Learning Course**

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject |
|---|---|---|---|---|---|
| 1 | 2 | CC2 | GE | 23LLC1201 | Music (Vocal) |
| 2 | 2 | CC2 | GE | 23LLC1202 | Music (Instrumental) |
| 3 | 2 | CC2 | GE | 23LLC1203 | Indian Classical Dance |
| 4 | 2 | CC2 | GE | 23LLC1204 | Other forms of Dances |
| 5 | 2 | CC2 | GE | 23LLC1205 | Painting |
| 6 | 2 | CC2 | GE | 23LLC1206 | Theatre and acting |
| 7 | 2 | CC2 | GE | 23LLC1207 | Photography |
| 8 | 2 | CC2 | GE | 23LLC1208 | Yoga |
| 9 | 2 | CC2 | GE | 23LLC1209 | Chess |
| 10 | 2 | CC2 | GE | 23LLC1210 | Athletics |
| 11 | 2 | CC2 | GE | 23LLC1211 | Basket Ball |
| 12 | 2 | CC2 | GE | 23LLC1212 | Judo |
| 13 | 2 | CC2 | GE | 23LLC1213 | Elements of Japanese Language |
| 14 | 2 | CC2 | GE | 23LLC1214 | Elements of German Language |
| 15 | 2 | CC2 | GE | 23LLC1215 | Elements of French Language |
| 16 | 2 | CC2 | GE | 23LLC1216 | Elements of Spanish Language |
| 17 | 2 | CC2 | GE | 23LLC1217 | Basics of Vedic Maths |
| 18 | 2 | CC2 | GE | 23LLC1218 | Skilling in Microsoft Visio and Inkscape |

| MANDATORY LEARNING COURSES | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | HS | | GE2131 | Universal Human Values (UHV) | A | 2 | 0 | 0 | 2 | 0 | | |

**MSEs* = Two MSEs of 15 Marks each will conducted and marks of these 2 MSEs will be considered for Continuous Assessment**

**TA ** = for Theory : TA1-5 marks on Proctored Online Exam, TA2-12 marks on activities decided by course teacher, TA3 - 3 marks on class attendance**

**TA** = for Practical : MSPA will be 15 marks each**

| | | | |
|---|---|---|---|
| Chairperson | Dean (Acad. Matters) | July, 2023 | 1.00 |
| | | Date of Release | Version |

**Applicable for AY 2023-24 Onwards**

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L | T | P | Hrs | | MSEs* | TA** | ESE | |
| **THIRD SEMESTER** | | | | | | | | | | | | | | | |
| 1 | 3 | HSSM-1 | GE | 23GE1301 | Fundamentals of Management & Economics | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| 2 | 3 | VEC-1 | CV | 23CV1311 | Environmental Sustainability, Pollution and Management | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| 3 | 3 | PC | ET | 23ET1301 | Signals & Systems | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 4 | 3 | PC | ET | 23ET1302 | **Lab :** Signals & Systems | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 5 | 3 | PC | ET | 23ET1303 | Electronic Devices and Circuits | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 6 | 3 | PC | ET | 23ET1304 | **Lab :** Electronic Devices and Circuits | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 7 | 3 | PC | ET | 23ET1305 | Electromagnetic Fields | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 8 | 3 | CEP | ET | 23ET1306 | **Lab** : Field Project | P | 0 | 0 | 2 | 4 | 2 | | 60 | 40 | |
| 9 | 3 | OE1 | OE | | **Open Elective -I** | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| 10 | 3 | MDM | ET | | **MD Minor Course-I** | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| | | | | | **TOTAL** | | **17** | **0** | **6** | **25** | **21** | | | | |

| List of Mandatory Learning Course (MLC) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | HS | T&P | MLC2123 | **YCAP3 :** YCCE Communication Aptitude Preparation | **A** | 3 | 0 | 0 | 3 | **0** | | | | |

**Open Elective - I**

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject |
|---|---|---|---|---|---|
| 1 | 3 | OE1 | GE | 23OE1301 | OE-I : Combinatorics |
| 2 | 3 | OE1 | GE | 23OE1302 | OE-I : Fuzzy Set Theory, Arithmetic And Logic |
| 3 | 3 | OE1 | GE | 23OE1303 | OE-I : Green Chemistry & Sustainability |
| 4 | 3 | OE1 | GE | 23OE1304 | OE-I : Hydrogen Fuel |
| 5 | 3 | OE1 | GE | 23OE1305 | OE-I : Electronic Materials And Applications |
| 6 | 3 | OE1 | GE | 23OE1306 | OE-I : Laser Technology And Applications |
| 7 | 3 | OE1 | MGT | 23OE1307 | OE-I : Finance And Cost Management |
| 8 | 3 | OE1 | MGT | 23OE1308 | OE-I : Operation Research Techniques |
| 9 | 3 | OE1 | MGT | 23OE1309 | OE-I : Project Evaluation & Management |
| 10 | 3 | OE1 | MGT | 23OE1310 | OE-I : Total Quality Management |
| 11 | 3 | OE1 | MGT | 23OE1311 | OE-I : Value Engineering |
| 12 | 3 | OE1 | MGT | 23OE1312 | OE-I : Maintenance Management |
| 13 | 3 | OE1 | MGT | 23OE1313 | OE-I : Industrial Safety |
| 14 | 3 | OE1 | MGT | 23OE1314 | OE-I : Industry 4.0 |
| 15 | 3 | OE1 | MGT | 23OE1315 | OE-I : Operation Management |
| 16 | 3 | OE1 | MGT | 23OE1316 | OE-I : Material Management |
| 17 | 3 | OE1 | MGT | 23OE1317 | OE-I : Hospitality Management |
| 18 | 3 | OE1 | MGT | 23OE1318 | OE-I : Human Resource Management & Organizational Behaviour |
| 19 | 3 | OE1 | MGT | 23OE1319 | OE-I : Agri-Business Management |
| 20 | 3 | OE1 | MGT | 23OE1320 | OE-I : Rural Marketing |
| 21 | 3 | OE1 | MGT | 23OE1321 | OE-I : Marketing Management |
| 22 | 3 | OE1 | MGT | 23OE1322 | OE-I : Health Care Management |

| | | July, 2023 | 1.00 | Applicable for AY 2023-24 Onwards |
|---|---|---|---|---|
| Chairperson | Dean (Acad. Matters) | Date of Release | Version | |

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(Scheme of Examination w.e.f. 2023-24 onward)

**(Department of Electronics & Telecommunication Engineering)**

**B. Tech. in Electronics & Telecommunication Engineering**

SoE No. 23ET-101

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject | T/P | Contact Hours | | | | Credits | % Weightage | | | ESE Duration Hours |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L | T | P | Hrs | | MSEs* | TA** | ESE | |
| **FOURTH SEMESTER** | | | | | | | | | | | | | | | |
| 1 | 4 | BS | GE | 23GE1404 | Probability Theory and Sampling Theory | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 2 | 4 | HSSM-2 | GE | 23GE1401 | Entrepreneurship Development | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| 3 | 4 | **AEC-2** | GE | 23GE1405<br>23GE1406 | Marathi Language<br>Hindi Language | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| 4 | 4 | PC | ET | 23ET1401 | Analog Communication | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 5 | 4 | PC | ET | 23ET1402 | **Lab** : Analog Communication | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 6 | 4 | PC | ET | 23ET1403 | Microcontroller and Interfacing | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 7 | 4 | PC | ET | 23ET1404 | **Lab** : Microcontroller and Interfacing | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 8 | 4 | VSEC-3 | ET | 23ET1405 | **Lab :** Electronic workshop and Equipment Maintenance | P | 0 | 0 | 2 | 4 | 2 | | 60 | 40 | |
| 9 | 4 | VEC-2 | ET | 23ET1406 | Python for Data Science | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| 10 | 4 | OE-2 | OE | | **Open Elective-II** | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| 11 | 4 | MDM | ET | | **MD Minor Course-II** | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| | | | | | **TOTAL** | | **19** | **0** | **6** | **27** | **23** | | | | |

| **List of Mandatory Learning Course (MLC)** | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4 | HS | T&P | MLC2124 | **YCAP4 :** YCCE Communication Aptitude Preparation | **A** | 3 | 0 | 0 | 3 | **0** | | | | |

**Open Elective - II**

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject |
|---|---|---|---|---|---|
| 1 | 4 | OE2 | GE | 23OE2401 | OE-II : Combinatorics |
| 2 | 4 | OE2 | GE | 23OE2402 | OE-II : Fuzzy Set Theory, Arithmetic And Logic |
| 3 | 4 | OE2 | GE | 23OE2403 | OE-II : Green Chem. & Sustainability |
| 4 | 4 | OE2 | GE | 23OE2404 | OE-II : Hydrogen Fuel |
| 5 | 4 | OE2 | GE | 23OE2405 | OE-II : Electronic Materials And Applications |
| 6 | 4 | OE2 | GE | 23OE2406 | OE-II : Laser Technology And Applications |
| 7 | 4 | OE2 | MGT | 23OE2407 | OE-II : Finance And Cost Management |
| 8 | 4 | OE2 | MGT | 23OE2408 | OE-II : Operation Research Techniques |
| 9 | 4 | OE2 | MGT | 23OE2409 | OE-II : Project Evaluation & Management |
| 10 | 4 | OE2 | MGT | 23OE2410 | OE-II : Total Quality Management |
| 11 | 4 | OE2 | MGT | 23OE2411 | OE-II : Value Engineering |
| 12 | 4 | OE2 | MGT | 23OE2412 | OE-II : Maintenance Management |
| 13 | 4 | OE2 | MGT | 23OE2413 | OE-II : Industrial Safety |
| 14 | 4 | OE2 | MGT | 23OE2414 | OE-II : Industry 4.0 |
| 15 | 4 | OE2 | MGT | 23OE2415 | OE-II : Operation Management |
| 16 | 4 | OE2 | MGT | 23OE2416 | OE-II : Material Management |
| 17 | 4 | OE2 | MGT | 23OE2417 | OE-II : Hospitality Management |
| 18 | 4 | OE2 | MGT | 23OE2418 | OE-II : Human Resource Management & Organizational Behaviour |
| 19 | 4 | OE2 | MGT | 23OE2419 | OE-II : Agri-Business Management |
| 20 | 4 | OE2 | MGT | 23OE2420 | OE-II : Rural Marketing |
| 21 | 4 | OE2 | MGT | 23OE2421 | OE-II : Marketing Management |
| 22 | 4 | OE2 | MGT | 23OE2422 | OE-II : Health Care Management |

| | | July, 2023 | 1.00 | Applicable for AY 2023-24 Onwards |
|---|---|---|---|---|
| Chairperson | Dean (Acad. Matters) | Date of Release | Version | |

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Hingna Road, Wanadongri, Nagpur - 441 110


# Bachelor of Technology

# SoE & Syllabus 2023

## 1st Semester

**(Department of Electronics & Telecommunication Engineering)**

## B. Tech in Electronics & Telecommunication Engineering

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**B.TECH SCHEME OF EXAMINATION 2023**

(Scheme of Examination w.e.f. 2023-24 onward)

**(Department of Electronics & Telecommunication Engineering)**

**B.Tech. in Electronics & Telecommunication Engineering**

SoE No. 23ET-101

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject | T/P | Contact Hours | | | | Credits | % Weightage | | | ESE Duration Hours |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L | T | P | Hrs | | MSEs* | TA** | ESE | |
| **FIRST SEMESTER (GROUP-A)** | | | | | | | | | | | | | | | |
| 1 | 1 | BS | GE | 23GE1101 | Calculus and Vector | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 2 | 1 | BS | GE | 23GE1104 | Applied Chemistry | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 3 | 1 | BS | GE | 23GE1105 | **Lab:** Applied Chemistry | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 4 | 1 | HS/AEC1 | GE | 23GE1112 | Professional Communication | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 2 |
| 5 | 1 | HS/IKS | GE | 23GE1115 | Indian Knowledge System | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 2 |
| 6 | 1 | BES | CV | 23CV1101 | Engineering Mechanics | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 7 | 1 | BES | CV | 23CV1102 | **Lab:** Engineering Mechanics | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 8 | 1 | BES | IT | 23IT1103 | Programming for Problem Solving | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 2 |
| 9 | 1 | BES | IT | 23IT1104 | **Lab:** Programming for Problem Solving | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 10 | 1 | VSEC | GE | 23GE1117 | Get Set Go | … | … | … | … | … | 2 | | 60 | 40 | |
| 11 | 1 | CC1 | GE | | **Liberal Learning Course (LLC1)** | … | … | … | … | … | 2 | | 60 | 40 | |
| | | | | | **TOTAL FIRST SEM** | | **15** | **0** | **6** | **21** | **22** | **180** | | | |
| **SECOND SEMESTER (GROUP-A)** | | | | | | | | | | | | | | | |
| 1 | 2 | BS | GE | 23GE1202 | Differential Equations, Matrices and Statistics | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 2 | 2 | BS | GE | 23GE1208 | Engineering Physics | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 3 | 2 | BS | GE | 23GE1209 | **Lab:** Engineering Physics | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 4 | 2 | BES | ME | 23ME1201 | Engineering Graphics | T | 1 | 0 | 0 | 1 | 1 | 30 | 20 | 50 | 3 |
| 5 | 2 | BES | ME | 23ME1202 | **Lab :** Engineering Graphics | P | 0 | 0 | 4 | 4 | 2 | | 60 | 40 | |
| 6 | 2 | BES | EL | 23EL1201 | Basic Electrical and Electronics Engineering | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 7 | 2 | BES | EL | 23EL1205 | Lab : Electrical and Electronics Workshop | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 8 | 2 | PC | ETC | 23ET1201 | Digital Electronics and Logic Design | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 9 | 2 | PC | ETC | 23ET1202 | **Lab :** Digital Electronics and Logic Design | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 10 | 2 | VSEC | GE | 23GE1218 | Functional English | … | … | … | … | … | 2 | | 60 | 40 | |
| 11 | 2 | CC2 | GE | | **Liberal Learning Course (LLC2)** | … | … | … | … | … | 2 | | 60 | 40 | |
| | | | | | **TOTAL SECOND SEM** | | **13** | **0** | **10** | **23** | **22** | | | | |

**Liberal Learning Course**

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject |
|---|---|---|---|---|---|
| 1 | 1 | CC1 | GE | 23LLC1101 | Music (Vocal) |
| 2 | 1 | CC1 | GE | 23LLC1102 | Music (Instrumental) |
| 3 | 1 | CC1 | GE | 23LLC1103 | Indian Classical Dance |
| 4 | 1 | CC1 | GE | 23LLC1104 | Other forms of Dances |
| 5 | 1 | CC1 | GE | 23LLC1105 | Painting |
| 6 | 1 | CC1 | GE | 23LLC1106 | Theatre and acting |
| 7 | 1 | CC1 | GE | 23LLC1107 | Photography |
| 8 | 1 | CC1 | GE | 23LLC1108 | Yoga |
| 9 | 1 | CC1 | GE | 23LLC1109 | Chess |
| 10 | 1 | CC1 | GE | 23LLC1110 | Athletics |
| 11 | 1 | CC1 | GE | 23LLC1111 | Basket Ball |
| 12 | 1 | CC1 | GE | 23LLC1112 | Judo |
| 13 | 1 | CC1 | GE | 23LLC1113 | Elements of Japanese Language |
| 14 | 1 | CC1 | GE | 23LLC1114 | Elements of German Language |
| 15 | 1 | CC1 | GE | 23LLC1115 | Elements of French Language |
| 16 | 1 | CC1 | GE | 23LLC1116 | Elements of Spanish Language |
| 17 | 1 | CC1 | GE | 23LLC1117 | Basics of Vedic Maths |
| 18 | 1 | CC1 | GE | 23LLC1118 | Skilling in Microsoft Visio and Inkscape |

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SoE No. 23ET-101

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L | T | P | Hrs | | MSEs* | TA** | ESE | |

**Liberal Learning Course**

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject |
|---|---|---|---|---|---|
| 1 | 2 | CC2 | GE | 23LLC1201 | Music (Vocal) |
| 2 | 2 | CC2 | GE | 23LLC1202 | Music (Instrumental) |
| 3 | 2 | CC2 | GE | 23LLC1203 | Indian Classical Dance |
| 4 | 2 | CC2 | GE | 23LLC1204 | Other forms of Dances |
| 5 | 2 | CC2 | GE | 23LLC1205 | Painting |
| 6 | 2 | CC2 | GE | 23LLC1206 | Theatre and acting |
| 7 | 2 | CC2 | GE | 23LLC1207 | Photography |
| 8 | 2 | CC2 | GE | 23LLC1208 | Yoga |
| 9 | 2 | CC2 | GE | 23LLC1209 | Chess |
| 10 | 2 | CC2 | GE | 23LLC1210 | Athletics |
| 11 | 2 | CC2 | GE | 23LLC1211 | Basket Ball |
| 12 | 2 | CC2 | GE | 23LLC1212 | Judo |
| 13 | 2 | CC2 | GE | 23LLC1213 | Elements of Japanese Language |
| 14 | 2 | CC2 | GE | 23LLC1214 | Elements of German Language |
| 15 | 2 | CC2 | GE | 23LLC1215 | Elements of French Language |
| 16 | 2 | CC2 | GE | 23LLC1216 | Elements of Spanish Language |
| 17 | 2 | CC2 | GE | 23LLC1217 | Basics of Vedic Maths |
| 18 | 2 | CC2 | GE | 23LLC1218 | Skilling in Microsoft Visio and Inkscape |

| MANDATORY LEARNING COURSES | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | HS | | GE2131 | Universal Human Values (UHV) | A | 2 | 0 | 0 | 2 | 0 | | |

**MSEs* = Two MSEs of 15 Marks each will conducted and marks of these 2 MSEs will be considered for Continuous Assessment**

**TA ** = for Theory : TA1-5 marks on Proctored Online Exam, TA2-12 marks on activities decided by course teacher, TA3 - 3 marks on class attendance**

**TA** = for Practical : MSPA will be 15 marks each**

| | | | |
|---|---|---|---|
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Nagar Yuwak Shikshan Sanstha's

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(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B. Tech SoE and Syllabus 2023**

**(Scheme of Examination w.e.f. 2023-24 onward)**

(Department of Mathematics & Humanities)

**B.Tech First Year**

**SoE No. 23FY-101**

## I SEMESTER

## 23GE1101: Calculus and Vector

| **Course Outcomes :** |
|---|
| **The students will be able to**<br>1. Apply the knowledge of differentiation to solve the Engineering problems.<br>2. Determine the derivatives of functions of several variables and develop the relations among the derivatives of variables.<br>3. Apply the knowledge of Beta and Gamma functions to find area, volume and mass.<br>4. Discuss Calculus of Scalar and vector point function and use appropriate theorems to evaluate integrals of functions of single and multiple variables. |

| **Unit I: Differential Calculus** | **(6 Hrs.)** |
|---|---|
| Successive differentiation, $n^{th}$ derivative of rational function, Trigonometrical transformations, $n^{th}$ derivative of the product of two functions (Leibnitz's theorem), Taylor's theorem, Use of Maclaurin's theorem for one variable, standard expansions, Examples on Taylor's Theorem. **(Contemporary Issues related to Topic)** | |
| **Unit II: Partial Differentiation** | **(7 Hrs.)** |
| Functions of several variables, First and higher order derivatives, Homogeneous functions, Euler's theorem on homogeneous function, Chain rule and total differential coefficient of composite functions. Jacobians. **(Contemporary Issues related to Topic)** | |
| **Unit III: Integral Calculus** | **(6 Hrs.)** |
| Improper integrals: Gamma and Beta functions, applications of integral calculus in computing area, length, volumes, and surface of solids of revolutions. **(Contemporary Issues related to Topic)** | |
| **Unit IV: Multiple integrals** | **(6 Hrs.)** |
| Double integral, change of order of integral, change of variables, triple integrals and its applications. **(Contemporary Issues related to Topic)** | |
| **Unit V: Vector Calculus** | **(7 Hrs.)** |
| Vector fields, Vector differentiation, Gradient, Divergence and Curl, Directional derivatives with physical interpretation, Solenoidal and irrotational motions. **(Contemporary Issues related to Topic)** | |
| **Unit VI: Vector Integration & Applications** | **(7 Hrs.)** |
| Vector integration: Line, surface and volume integrals, Statement of Stoke's theorem, Gauss divergence theorem and Green's theorem (without proof), Simple applications of these theorems. **(Contemporary Issues related to Topic)** | |
| **Total Lecture** | **39 Hours** |

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|---|---|---|---|---|---|
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| **Textbooks:** | |
|---|---|
| 1. | Erwin Kreyzig, Advance Engineering Mathematics, 10th Edition, John Wiley and Sons, INC. |
| 2. | H.K. Dass, Engineering Mathematics, 11th revised edition, S. Chand, Delhi. |
| 3. | H.K. Dass, Advanced Engineering Mathematics, 8th revised edition, S. Chand, Delhi. |
| 4. | Dr. B.S. Grewal, Higher Engineering Mathematics, 42th edition, Khanna Publishers. |
| 5. | P.N.Wartikar and J.N.Wartikar, Applied Mathematics, 4th Edition, Vidyarthi GrihaPrakashan. |

| **Reference Books:** | |
|---|---|
| 1. | G B Thomas and R L Finney, Calculus and Analytical Geometry, 9th edition, Addison-Wesley, 1999. |
| 2. | Michael Spivak and Tom Apostol, Calculus, VolI & Vol II 2nd edition, Wiley. |
| 3. | N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, 10th edition, Laxmi Prakashan. |

| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
|---|---|
| 1 | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Mathematics%20and%20Humanities/ |

| **MOOCs Links and additional reading, learning, video material** | |
|---|---|
| 1. | https://nptel.ac.in/courses/111/106/111106146/ |
| 2. | https://nitkkr.ac.in/docs/5-Multiple%20Integrals%20and%20their%20Applications.pdf |

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(Department of Chemistry)

**B.Tech First Year**

**SoE No. 23FY-101**

## I SEMESTER

## 23GE1104 : Applied Chemistry

| **Course Outcomes:** |
|---|
| **Upon successful completion of the course students will be able to**<br>1. **Illustrate** qualitative and quantitative aspects of water for industrial and domestic applications. (L3)<br>2. **Apply** concepts of electrochemistry for energy storage devices and corrosion. (L3)<br>3. **Establish** significance of engineering materials in technological applications. (L3)<br>4. **Develop** insight into advanced materials. (L3) |

| **Unit I: Water Chemistry** | **(7 Hrs.)** |
|---|---|
| Introduction, Potable water quality parameters. Hardness, Types of hardness. Sterilization. Desalination of water by R.O. Softening of water by Zeolite process and Ion Exchange Process (principle, advantages, and limitations). Numerical based on Hardness and Zeolite process. Boiler trouble (Scale and sludge).<br>Contemporary issues related to the topic | |
| **Unit II: Electrochemistry** | **(7 Hrs.)** |
| **Electrochemistry:** Introduction, metallic and electrolytic conductance, resistance, specific resistance, conductance, specific conductance, equivalent and molar conductance. Variation of conductance with dilution. Electrode and electrode potential. Nernst Equation and applications. Faraday's laws and Numerical.<br>Industrial applications: Electroplating, Electrolytic refining, Electroforming, Electrowinning.<br>**Corrosion**- Definition, Causes, theories of corrosion- dry, wet and differential aeration.<br>Contemporary issues related to the topic | |
| **Unit III: Energy storage device:** | **(6 Hrs.)** |
| Introduction, Characteristics, and general applications.<br>Lithium-ion battery, Glass battery, $H_2$-$O_2$ Fuel cell. Differences between battery and a fuel cell.<br>Supercapacitors: Definition, types, characteristics, and application.<br>**$H_2$ as a green fuel:** Introduction, production, storage, and utilization. | |
| **Unit IV: Fuels** | **(7 Hrs.)** |
| Introduction, Calorific value, HCV & LCV. Determination of calorific value of fuels by Bomb & Boy's calorimeter. Dulong's formula numericals.<br>Significance of Proximate and Ultimate analysis.<br>Knocking in Internal combustion petrol and diesel engines, Octane and Cetane number, Knocking and its relationship with structure of fuels. Catalytic cracking & advantages. | |
| **Unit V: Engineering Materials** | **(6 Hrs.)** |
| **Cement:**<br>Introduction, Manufacturing of Portland cement. Role of microscopic constituents. Properties-setting and hardening, heat of hydration and soundness. Types of cement-Rapid hardening cement, Low heat cement, High alumina cement. Ready-mix concrete.<br>**Lubricants:**<br>Introduction, Classification, Mechanisms.<br>Properties & Significance of liquid lubricants–Viscosity and viscosity index, Flash and fire point, Cloud and pour point, Aniline point, acid value, saponification number. Numerical on V.I. | |

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| | |
|---|---|
| **Unit VI: Advanced Materials** | **(6 Hrs.)** |

**Advanced Materials**

**Nanomaterials:** Definition, Carbon Nanotubes and types. Applications of Nanomaterials in electronics, environment and medicine.

**Liquid Crystal Polymers:** Introduction**,** General properties and applications.

**Polymers in electronic industries**: Introduction**,** Piezo, pyroelectric, Ferroelectric polymers.

**Smart materials:** Introduction**,** Properties and applications of Chromoactive, Photoactive and Magneto rheological materials.

**Spectroscopic techniques:** Introduction and applications

| | |
|---|---|
| **Total Lecture** | **39 Hours** |

**Textbooks:**


| | |
|---|---|
| 1. | S S. Dara , A Text book of Engineering Chemistry , S.Chand & Co New Delhi. Eleventh Edition. |
| 2. | P.C. Jain and Monica Jain , Engineering Chemistry , Dhanpat Rai & sons New Delhi , Sixteenth Edition. |
| 3. | P. W. Atkins, Physical Chemistry ,Oxford Publications, Eighth edition . |


**Reference Books:**


| | |
|---|---|
| 1. | Eskel Nordell , Water treatment for industrial and other use ,Rein hold Publishing Corporation, New York. |
| 2. | Lloyd A.Munro, Chemistry in Engineering, Prentice-hall, Inc Nj, 2nd Edition. |
| 3. | Robert B Leighou Mc Graw, Chemistry of Engineering Materials, Hill Book Company, Inc New York. |
| 4. | B.K.Sharma Krishna, Engineering Chemistry, Prakashan media private LTD. 1st Edition, 2014. |
| 5. | R.V.Gadag, A.Nityananda Shetty, Engineering Chemistry ,I K International Publishing House New Delhi , First Edition. |
| 6 | Fred. Billmeyer Jr., A textbook of polymer science, Wiley India ,Third Edition. |


**YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]**

| | |
|---|---|
| 1 | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/SERIES%20WISE%20BOOKS/CHEMISTRY/ |

**MOOCs Links and additional reading, learning, video material**

| | |
|---|---|
| 1. | https://www.youtube.com/watch?v=XTt3gXB0a84 |
| 2. | https://www.youtube.com/watch?v=iihYXx79QiE |
| 3. | https://www.youtube.com/watch?v=JfJ7MlP9Dco |
| 4. | https://www.youtube.com/watch?v=L2VSOccUrSk |
| 5. | https://www.youtube.com/watch?v=p5pk4Um6lsk |
| 6. | https://youtu.be/-R7s17hD104 |
| 7. | https://youtu.be/Bmj85Ihfv7w |

## I SEMESTER

## 23GE1105 : Lab. Applied Chemistry

| **Course Outcomes** |
|---|
| **Upon successful completion of the course the students will be able to**<br>1. **Illustrate** qualitative and quantitative aspects of water for industrial and domestic applications. (L3)<br>2. **Apply** concepts of electrochemistry for energy storage devices and corrosion. (L3)<br>3. **Establish** significance of engineering materials in technological applications. (L3)<br>4. **Develop** insight into advanced materials. (L3) |

**Total 10 experiments are to be performed**
**(4 each from Phase I and Phase II and two demonstration experiments)**

| SN | **Experiments based on** |
|---|---|
| | **List of Experiments-Phase I** |
| 1 | Determination of total hardness of water sample. |
| 2 | Determination of alkalinity present in the water sample. |
| 3 | Estimation of $Fe^{2+}$ ions by redox titration |
| 4 | Determination of copper by iodometric titration |
| 5 | Estimation of Nickel. |
| 6 | To determine the strength of a given potassium dichromate solution with N/20 sodium thiosulphate solution |
| 7 | Determination of COD of water sample. |
| 8 | Synthesis of urea formaldehyde and phenol formaldehyde resin.. |
| 9 | Determination of rate of the reaction of hydrolysis of ethyl acetate at room temperature and analysis of experimental data using Computational Software. |
| | **List of Experiments-Phase II** |
| 1 | Determination of viscosity of lubricating oil by Redwood Viscometer I or II |
| 2 | Determination of Cation exchange capacity of an ion exchange resin |
| 3 | Determination of molecular weight of a polymer. |
| 4 | Oil Testing for Flash Point / Cloud Point/Pour Point/Aniline Point |
| 5 | Proximate analysis of coal |
| 6 | Determination of surface tension of liquids using stalagmometer. |
| 7 | Determination of electrochemical equivalence of copper using Faradays Law |

| | |
|---|---|
| 8 | To determine the heat of solution of potassium nitrate calorimetrically. |
| 9 | Determination of strength of the given acid conductometrically. |
| 10. | To verify Beer-Lambert law for $KMnO_4$ calorimetrically and determine the concentration of the given solution of $KMnO_4$. |
| | **List of Demonstration Experiments** |
| 1 | Determination of pH of water sample by pH meter |
| 2 | Synthesis of polyaniline |

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(Department of Mathematics & Humanities)

**B.Tech First Year**

**SoE No. 23FY-101**

## I SEMESTER

## 23GE1112 : Professional Communication

| **Course Outcomes :** |
|---|
| **Upon successful completion of the course the students will be able to:**<br>1.Apply different modes for effective communication<br>2.Produce competently the Phonology of English language<br>3.Apply nuances of LSRW skills<br>4.Practice Communication through different channels |

| **Unit I: Basics of Communication** | **(6 Hrs.)** |
|---|---|
| Process of Communication, Levels of Communication, Flow of Communication, Networks of Communication, Classification of Barriers (Intrapersonal, Interpersonal, Organizational). | |
| **Unit II: English Phonetics** | **(7 Hrs.)** |
| Speech Mechanism, Organs of speech, Consonant and Vowels sounds symbols, word stress rules | |
| **Unit III: Presentation & Interview Skills** | **(6 Hrs.)** |
| Presentation-Nuances of presentation- Kinesics, Proxemics, Chronemics, Vocalics, Modes of Presentation,<br>Interview-Purpose , expectations of employer and preparation for Interview, Types, Types of Questions &Answering Techniques, Telephonic Interviews – preparation and guidelines | |
| **Unit IV: Technical Reports, Memo & E-Mail Etiquettes** | **(7 Hrs.)** |
| Report -Types, Characteristics, prewriting aspects of report and preparing writing of reports<br>Memo- Objectives, Types, Structure and Layout<br>Email-Etiquettes, acronyms. | |
| **Total Lecture** | **26 Hours** |

| **Textbooks:** | |
|---|---|
| 1. | Meenakshi Raman & Sangeeta Sharma, Technical Communication, Raman & Sharma, Oxford University Press Orford University Press |
| 2. | T. Balasubramaniam, Textbook of English Phonetics for Indian Students, Macmillan India Ltd |
| 3. | |

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| Reference Books: | |
|---|---|
| 1. | Dale Carnegie ,How to Develop Self – Confidence & Influence People by Public Speaking |
| 2. | Asha Kaul, Communication Skills |
| 3. | Allen Peas ,Body Language |
| 4. | Gerson's Gerson, Technical Communication |

| MOOCs Links and additional reading, learning, video material | |
|---|---|
| 1. | https://dl.uswr.ac.ir/bitstream/Hannan/141245/1/9781138219120.pdf |
| 2. | https://www.pdfdrive.com/word-power-made-easy-the-complete-handbook-for-building-a-superiorvocabulary-e157841139.html |
| 3. | https://www.pdfdrive.com/improve-your-communication-skills-present-with-confidence-write-with-stylelearn-skills-of-persuasion-e156963640.html |
| 4. | https://www.pdfdrive.com/21-days-of-effective-communication-everyday-habits-and-exercises-to-improveyour-communication-skills-and-social-intelligence-e158273760.html |

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(Department of Mathematics & Humanities)

**B.Tech First Year**

**SoE No. 23FY-101**

## I SEMESTER

## 23GE1115 : Indian Knowledge System

| Course Outcomes: |
|---|
| **Upon successful completion of the course the students will be able to** |
| **1.** Apply primary requirements pertaining towards awareness of Indian Knowledge System. |
| 2. Analyze various Indian society, culture and literature to enhance their traditions. |
| **3.** Evaluate structure of Indian art. |
| **4.** Understand Indian heritage and architectural skills. |

| | | |
|---|---|---|
| **Unit:1** | **Introduction to Indian Civilization** | **6 Hours** |
| Development of Human Civilization with specific reference:<br>Stone age: Tool Technology and Cultural Development, Indus Valley civilization, Vedic Civilization.<br>**(Contemporary Issues related to Topic)** | | |
| **Unit:2** | **Indian Society, Culture and Literature** | **6 Hours** |
| Society and its types, Culture and its Characteristics, Foundational Literature.<br>**(Contemporary Issues related to Topic)** | | |
| **Unit:3** | **Tradition of Indian Art and Painting** | **7 Hours** |
| Indian Traditional Painting, Art style folk, mural with Gandhara and Mathura school of art.<br>**(Contemporary Issues related to Topic)** | | |
| **Unit:4** | **Indic Traditions of Architecture, Design and Planning** | **7 Hours** |
| Monumental studies of architectural skill: Rock Cut Caves, Stupa and Temple Architecture, The Ancient cities of Indus Saraswati region. Town Planning and drainage system.<br>**(Contemporary Issues related to Topic)** | | |
| | **Total Lecture Hours** | **26 Hours** |

| **Textbooks** | |
|---|---|
| 1 | Reader's Digest: Vanished Civilizations, THE READER'S DIGEST ASSOCIATION LIMITED, LONDON,NEWYORK. |
| 2 | Qaiser Zoha Alam ; Language and Literature Divers Indian Experience |
| 3 | Bal Ram Singh (Author), Nath Girish (Author) ; Science and Technology in Ancient Indian Texts |
| 4 | NCERT Books |

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| | **Reference Books** |
|---|---|
| 1 | B S Harishankar; Art and Archaeology of India: Stone Age to the Present, 2003. |
| 2 | Gupte R S and Mahajan B D; Ajanta, Ellora and Aurangabad, 1962. |
| 3 | Dharampal, Some Aspects of Earlier Indian Society and Polity and Their Relevance Today, New Quest Publications, Pune, 1987. |
| 4 | Michel Lorblanchet, "Rock Art In The Old World" IGNCA series, in India |
| 5 | Percy Brown, "Indian Architecture" D. B. Taraporevala sons & co. Pvt. Ltd. Bombay(1959). |

| | **PPT's/Research papers** |
|---|---|
| **1** | https://www.researchgate.net/publication/360889208_STONE_AGE_TOOL_TECHNOLOGY_and_CULTURAL_DEVELOPMENT |
| **2** | https://scholar.google.com/citations?view_op=view_citation&hl=en&user=iT1KSV8AAAAJ&sortby=pubdate&citation_for_view=iT1KSV8AAAAJ:UeHWp8X0CEIC |

| | **MOOCs Links and additional reading, learning, video material** |
|---|---|
| **1** | https://prepp.in/news/e-492-indian-architecture-art-and-culture-notes |
| **2** | https://www.artzolo.com/blog/most-famous-indian-painting-styles |
| **3** | https://www.researchgate.net/publication/360889332_Stone_Age_Tool_Technology_Cultural_Development |
| **4** | https://testbook.com/ias-preparation/ancient-history-16-mahajanapadas |

## I SEMESTER

## 23CV1101 : Engineering Mechanics

| **Course Outcomes :** |
|---|
| **Upon successful completion of the course the students will be able to**<br>1. Describe the fundamental concepts of statics and dynamics.<br>2. Apply the basic concepts of applied mechanics for solution of problems on planar force system.<br>3. Determine the properties of surface like centroid, moment of inertia, etc. for planar surfaces and mass moment of inertia for rigid body.<br>4. Analyze pin jointed truss frame structure and beam structure analytically and graphically.<br>5. Evaluate the dynamic variables of kinetics of particles and simple lifting machine |

| **Unit I: Resultant of planar force System** | **(7 Hrs.)** |
|---|---|
| Fundamental concepts, system of forces, laws of mechanics, principle of transmissibility of force, Moment of force, Principle of moment, Couple, Resultant of a planar force system, Equivalent force couple system. **(Contemporary Issues related to Topic)** | |
| **Unit II: Equilibrium of planar force System** | **(6 Hrs.)** |
| Free body diagrams, Conditions of equilibrium, types of supports, types of beams, types of loads on beam, Equilibrium of a planar force system **(Contemporary Issues related to Topic)** | |
| **Unit III: Friction and Trusses** | **(7 Hrs.)** |
| Friction: Coulomb's laws of dry friction, plane friction, belt friction.<br>Trusses: Types of trusses, assumptions in analysis of truss, Analysis of truss by method of joint. **(Contemporary Issues related to Topic)** | |
| **Unit IV: Properties of Surfaces** | **(6 Hrs.)** |
| Centroid: Introduction, First Moment of Area, Centroid of composite areas.<br>Moment of Inertia: Introduction, Second Moment of Area, Polar moment of Inertia, Radius of Gyration, Transfer formula for moment of Inertia, Product of Inertia, Moment of Inertia, and product of inertia for composite areas, Principal Moments of Inertia. **(Contemporary Issues related to Topic)** | |
| **Unit V: Virtual Work Method and Kinetics of Particle** | **(7 Hrs.)** |
| Virtual Work Method: Introduction, Principle of virtual work, Application to beam and frame.<br>Kinetics of Particle: Introduction, Newton's law of motion for a Particle, D' Alembert's principle, Translation of particle and connected system. **(Contemporary Issues related to Topic)** | |
| **Unit VI: Work Energy and Impulse Momentum Method** | **(6 Hrs.)** |
| Work Energy Method: Introduction, Work energy equation for translation, Work energy applied to particle motion and connected system.<br>Impulse Momentum Method: Introduction, Linear Impulse momentum, Conservation of linear momentum, coefficient of restitution, elastic impact, Impulse momentum in plane motion. **(Contemporary Issues related to Topic)** | |
| **Total Lecture** | **39 Hours** |

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| | |
|---|---|
| **Textbooks:** | |
| 1. | Nelson A., Engineering Mechanics (Statics and Dynamics), ed 2009, Tata Mc. Grew Hill Education Pvt. Ltd., New Delhi, 2009. |
| 2. | Dubey N.H., Engineering Mechanics (Statics and Dynamics) first edition 2013, Tata Mc. Graw Hill Education Pvt. Ltd., New Delhi, 2013. |
| 3. | Singer F.L, Engineering Mechanics (Statics and Dynamics), Harper and Rowe publication, New Delhi, 1994. |
| **Reference Books:** | |
| 1. | Timoshenko S, Young D.H and Rao J.V, Engineering Mechanics, Mc. Graw Hill Publication, New Delhi, 2007. |
| 2. | Bhattacharyya B., Engineering Mechanics, Oxford University Press, New Delhi, 2008. |
| 3. | Hibbeler R.C, Engineering Mechanics (Statics and Dynamics), Pearson Publication, Singapore, 2000. |
| 4. | Shames I.H. and Rao J.V., Engineering Mechanics (Statics and Dynamics), First Edition, Pearson Publication, New Delhi, 2003. |
| 5. | Beer F.P. and Johnston E.R; Vector Mechanics for Engineers, 9th edition Tata Mc. Graw Hill Publication, New Delhi. 2007. |
| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
| 1 | chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Civil%20Engineering/78.%20Engineering-Mechanics-Statics-and-Dinamics-E-W-Nelson-C-L-Best-W-G-McLean-1st-Ed-1997-Schaum-Outline-McGraw-Hill%20(1).pdf |
| 2 | chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Civil%20Engineering/79.%20Engineering%20Mechanics.%20Statics-%20MERIAM%20%20AND%20KRAIGE.pdf |
| 3 | chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Civil%20Engineering/81.%20Engineering%20Mechanics%201.pdf |
| **MOOCs Links and additional reading, learning, video material** | |
| 1. | https://www.youtube.com/watch?v=nGfVTNfNwnk |
| 2. | https://www.youtube.com/watch?v=6nguX-cEsvw |
| 3. | https://nptel.ac.in/courses/112103108 |

## I SEMESTER

## 23CV1102 : Lab. Engineering Mechanics

| Course Outcomes |
|---|
| **Upon successful completion of the course the students will be able to**<br>1. Describe the fundamental concepts of statics and dynamics.<br>2. Apply the basic concepts of applied mechanics for solution of problems on planar force system.<br>3. Determine the properties of surface like centroid, moment of inertia, etc. for planar surfaces and mass moment of inertia for rigid body.<br>4. Analyze pin jointed truss frame structure and beam structure analytically and graphically.<br>5. Evaluate the dynamic variables of kinetics of particles and simple lifting machine |

**Minimum Eight Practical's to be performed from the list as below**

| SN | Experiments based on |
|---|---|
| 1 | To find determine the support reactions of a Simply Supported Beam experimentally and analytically. |
| 2 | To determine the forces in the members of a Jib Crane Apparatus experimentally and graphically. |
| 3 | To determine the coefficient of friction between two surfaces of different material on Plane Friction Apparatus. |
| 4 | To determine the coefficient of friction of Coil Friction Apparatus. |
| 5 | To determine the forces in members of a Shear Leg Apparatus experimentally and manually. |
| 6 | To determine the mass moment of inertia of a fly wheel using Fly Wheel Apparatus |
| 7 | To determine efficiency and law of machine of Differential Axel & Wheel machine. |
| 8 | To determine efficiency and Law of machine of Single Purchase Crab machine. |
| 9 | To determine efficiency and Law of machine of Double Purchase Crab machine. |
| 10 | To verify law of polygonal of forces using Law of Polygon Apparatus. |
| 11 | To find support reactions of a simply supported beam using graphical method and hand calculation. |
| 12. | To find the forces in the member of truss using graphical method and hand calculation. |
| 13. | To find (1) Principle moment of inertia and (2) Moment of inertia and product of inertia about any inclined axis for a composite figure using Mohr's circle and hand calculation, |

## I SEMESTER

## 23IT1103 : Programming for Problem Solving

| **Course Outcomes :** |
|---|
| 1) Understand the basics of computer system operations and algorithms, flowcharts. |
| 2) Apply the basics of C programming for problem solving. |
| 3) Apply and analyze the different dimensional arrays for problem solving. |
| 4) Understand the basics of string, structure, and union and apply them to problem solving. |

| **Unit I: Computer System Basics:** | **(3 Hrs.)** |
|---|---|
| Basics of programming and problem solving. Introduction to algorithms and flowcharts, Types of programming errors, basic input/output statements and functions (scanf, printf, getch, putch, gets, puts ), Introduction to library functions, | |
| **Unit II: Basic of C Programming** | **(6 Hrs.)** |
| **Basic building blocks of C:** Character set, variables, identifiers & keywords, Data types, Operators: arithmetic, logical and relational operators, , bitwise operators, precedence of operators, Expressions, sizeof() operator, constants, typedef statement, writing straight line programs. Decision control statements: if, if - else and nested if-else statements, else-if ladder statement, switch-case control statement. | |
| **Unit III: Loop Structures:** | **(5 Hrs.)** |
| While, do while and for loops, break and continue statement, "goto" statement, real life programming examples based on these loop structures, real life programming examples. | |
| **Unit IV: Modular Programming:** | **(6 Hrs.)** |
| Concept of functions, user defined functions, function prototypes, formal parameters, actual parameters, return types, call by value , call by reference, C programs using functions, Recursive functions, comparing recursion against iteration, C programs using recursive functions, real life programming examples | |
| **Unit V: Arrays:** | **(6 Hrs.)** |
| One dimensional array, array manipulation, insertion, deletion of an element, searching techniques- Linear and binary search, sorting technique – Bubble sort. Two-dimensional arrays: matrix representation, programs for basic matrix operations such as addition, multiplication and transpose, Array as function arguments. real life programming examples | |
| **Unit VI: String, Structure and Union:** | **(4 Hrs.)** |
| Strings: string representation and string handling functions, Introduction to pointer, structure and union. real life programming examples | |
| **Total Lecture** | **30 Hours** |

| | | | | | |
|---|---|---|---|---|---|
| | | | July,2023 | 1.00 | Applicable for AY 2023-24 Onwards |
| Chairperson | Dean (Acad. Matters) | Dean OBE | Date of Release | Version | |

| Text books | |
|---|---|
| 1 | The C Programming Language, J.B.W.Kernighan & D.M.Ritchie, Prentice Hall |
| 2 | Mastering C, K.R.Venugopal & S.R. Prasad, TMH, 2007. |
| 3 | Programming in ANSI C, E. Balaguruswamy, Mc Graw Hill Education |

| Reference Books | |
|---|---|
| 1 | Problem Solving And Program Design In C, Jeri. R. Hanly, Elliot B. Koffman, Pearson Education. |
| 2 | Programming with C, Byron Gottfried, Schaum;s Outline Series |
| 3 | How to solve it by computers, R. G. Dromey, Prentice Hall India |

| YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS] | |
|---|---|
| 1 | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books |

| MOOCs Links and additional reading, learning, video material | |
|---|---|
| 1 | https://nptel.ac.in/courses/106104128 |
| 2 | https://nptel.ac.in/courses/106104128 |
| 3 | https://www.youtube.com/watch?v=rQoqCP7LX60&list=PLxgZQoSe9cg1drBnejUaDD9GEJBGQ5hMt |

## I SEMESTER

## 23IT1104 : Lab. Programming for Problem Solving

| **Course Outcomes: Students will be able to** |
|---|
| 1) Understand the basics of computer system operations and algorithms, flowcharts.<br>2) Apply the basics of C programming for problem solving.<br>3) Apply and analyze the different dimensional arrays for problem solving.<br>4) Understand the basics of string, structure, and union and apply them to problem solving. |

| | |
|---|---|
| **Unit I: Computer System Basics:** | **(3 Hrs.)** |
| Basics of programming and problem solving. Introduction to algorithms and flowcharts, Types of programming errors, basic input/output statements and functions (scanf, printf, getch, putch, gets, puts ), Introduction to library functions, | |
| **Unit II: Basic of C Programming** | **(6 Hrs.)** |
| **Basic building blocks of C:** Character set, variables, identifiers & keywords, Data types, Operators: arithmetic, logical and relational operators, , bitwise operators, precedence of operators, Expressions, sizeof() operator, constants, typedef statement, writing straight line programs. Decision control statements: if, if - else and nested if-else statements, else-if ladder statement, switch-case control statement. | |
| **Unit III: Loop Structures:** | **(5 Hrs.)** |
| While, do while and for loops, break and continue statement, "goto" statement, real life programming examples based on these loop structures, real life programming examples. | |
| **Unit IV: Modular Programming:** | **(6 Hrs.)** |
| Concept of functions, user defined functions, function prototypes, formal parameters, actual parameters, return types, call by value , call by reference, C programs using functions, Recursive functions, comparing recursion against iteration, C programs using recursive functions, real life programming examples | |
| **Unit V: Arrays:** | **(6 Hrs.)** |
| One dimensional array, array manipulation, insertion, deletion of an element, searching techniques- Linear and binary search, sorting technique – Bubble sort. Two-dimensional arrays: matrix representation, programs for basic matrix operations such as addition, multiplication and transpose, Array as function arguments. real life programming examples | |
| **Unit VI: String, Structure and Union:** | **(4 Hrs.)** |
| Strings: string representation and string handling functions, Introduction to pointer, structure and union. real life programming examples | |
| **Total Lecture** | 30 Hours |

| | | | | | |
|---|---|---|---|---|---|
| | | | July,2023 | 1.00 | Applicable for AY 2023-24 Onwards |
| Chairperson | Dean (Acad. Matters) | Dean OBE | Date of Release | Version | |

| **Text books** | |
|---|---|
| **1** | The C Programming Language, J.B.W.Kernighan & D.M.Ritchie, Prentice Hall |
| **2** | Mastering C, K.R.Venugopal & S.R. Prasad, TMH, 2007. |
| **3** | Programming in ANSI C, E. Balaguruswamy, Mc Graw Hill Education |

| **Reference Books** | |
|---|---|
| **1** | Problem Solving And Program Design In C, Jeri. R. Hanly, Elliot B. Koffman, Pearson Education. |
| **2** | Programming with C, Byron Gottfried, Schaum;s Outline Series |
| **3** | How to solve it by computers, R. G. Dromey, Prentice Hall India |

| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
|---|---|
| **1** | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books |

| **MOOCs Links and additional reading, learning, video material** | |
|---|---|
| **1** | https://nptel.ac.in/courses/106104128 |
| **2** | https://nptel.ac.in/courses/106104128 |
| **3** | https://www.youtube.com/watch?v=rQoqCP7LX60&list=PLxgZQoSe9cg1drBnejUaDD9GEJBGQ5hMt |

## List of Practical

| SN | Unit | Name Of The Practical | Remark | CO'S Mapped | PO'S Mapped |
|---|---|---|---|---|---|
| 1(A) | | Introduction to Linux Operating system & it's different commands. | **Manual** | **CO 1** | **PO1** |
| 1(B) | | Introduction to Vi editor, Compilation and Execution of a program in Linux. | **Manual** | **CO 1** | **PO1** |
| 2 | **II** | Practical based on Arithmetic and Conditional operators. | **Operators** | **CO 1** | **PO1** |
| 3 | **II** | Practical based on Conditional and Unconditional Statements. | **Conditional Statements** | **CO 1** | **PO1** |
| 4 | **III** | Practical based on Entry Controlled Looping Statements. | **For / While Loop** | **CO 2** | **PO 1, PO 2** |
| 5 | **III** | Practical based on Exit Controlled Looping Statement | **Do while Loop** | **CO 2** | **PO 1, PO 2** |
| 6 | **IV** | Practical based on Functions and Recursion. | **Functions / Recursion** | **CO 3** | **PO2, PO3** |
| 7 | **V** | Practical based on 1-D Array. | **1D Array** | **CO 3** | **PO2, PO3** |
| 8 | **V** | Practical based on 2-D Array. | **2D Array** | **CO 3** | **PO2, PO3** |
| 9 | **VI** | Practical based on Strings. | **Strings & Pointers** | **CO 3** | **PO2, PO3** |
| 10 | **VI** | Practical based on Structures. | **Structures** | **CO 4** | **PO1, PO2, PO3** |

Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B. Tech SoE and Syllabus 2023**

**(Scheme of Examination w.e.f. 2023-24 onward)**

(Department of Civil Engineering)

**B.Tech in FYC**

**SoE No. 23FY-101**

## I SEMESTER

## 23GE1117-Get Set Go

**Course Outcomes:**

**Upon successful completion of the course the students will be able to**

1. Students will understand the importance of building trust in communication and learn how to use the 3Vs of communication (Visual, Vocal, Verbal) to energize their interactions.
2. The course will focus on leadership principles and styles, emphasizing how effective communication can motivate others and gain willing cooperation. Students will participate in activities like skits and team presentations to demonstrate their leadership skills.
3. The course will equip students with team management and organization skills, enabling them to lead and participate in team-building activities effectively.

| Unit:1 | Build a foundation for success | 6 Hours |
|---|---|---|
| Explain the Importance of Process of improvement, stating<br>your Name with Impact, Recall and Use Names, Name Remembering Formula o LIRA o<br>PACE – Individual Activity o BRAMMS o Chaining Method, Introduce "My Vision"<br>Communication Fundamentals for Building Trust- Be a good listener, use conversation links, show genuine interest Hi-Five of Success ♣ Build on Memory Skills and Enhance Relationships ♣ PEG words ♣ Explain Permanent PEG Memory System, energize our Communications – Explain 3Vs of communication – Visual-Vocal-Verbal<br>Activity – Practice Conversations, Pause-Part-Punch, Group Activity | | |
| **Unit:2** | **Increase Self Confidence** | **6 Hours** |
| Use our experiences to communicate more confidently • Communicate with clarity and conciseness • Discover how past experiences influence behaviour ,Motivate Others and Enhance Relationships- • Learning Objectives • Explain Gain Willing Cooperation Principles • Group Presentation • Explain Demonstration of Leadership Principles • Explain "Evidence" critical in establishing credibility<br>Individual Activity – Sharing of defining moment, Skit to demonstrate Leadership Principles, Stranded on Island . | | |
| **Unit:3** | **Fundamentals of Communication** | **6 Hours** |
| Fundamentals of Communication (Earn the right – Excite -Eagerness) ♣ Elevator Pitch ♣ Develop more Flexibility, ♣ Recap and Summarize<br>Activities - – Individual Presentation, Flexibility Drills, Individual Presentations – My Vision Assignment | | |
| **Unit:4** | **Team Management and Organization skills** | **5 Hours** |
| Team Management and Organization skills, Leadership Styles, Effective Communication<br>Activity- Team Presentation, Team building activities. | | |
| **EVALUATION** | **1 Hour** | **EVALUATION** |
| **WRITTEN TEST** | | |
| | | |
| **Total Lecture Hours** | | **24 Hours** |

| | | | | | |
|---|---|---|---|---|---|
| | | | July,2023 | 1.00 | Applicable for AY 2023-24 Onwards |
| Chairperson | Dean (Acad. Matters) | Dean OBE | Date of Release | Version | |

| Reference Books | |
|---|---|
| 1 | Soft Skills - Enhancing Employability: Connecting Campus with Corporate. - M S Rao |
| 2 | Soft Skills Training: A Workbook to Develop Skills for Employment - Frederick H Wentz |
| 3 | Soft Skills: Know Yourself and Know the World - Alex |

Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

*(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)*

**(Accredited 'A++' Grade by NAAC with a score of 3.6)**

Hingna Road, Wanadongri, Nagpur - 441 110


# Bachelor of Technology

# SoE & Syllabus 2023

## 2nd Semester

**(Department of Electronics & Telecommunication Engineering)**

## B. Tech in Electronics & Telecommunication Engineering

Nagar Yuwak Shikshan Sanstha's

**Yeshwantrao Chavan College of Engineering**

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B.TECH SCHEME OF EXAMINATION 2023**

(Scheme of Examination w.e.f. 2023-24 onward)

**(Department of Electronics & Telecommunication Engineering)**

**B.Tech. in Electronics & Telecommunication Engineering**

SoE No. 23ET-101

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject | T/P | Contact Hours | | | | Credits | % Weightage | | | ESE Duration Hours |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L | T | P | Hrs | | MSEs* | TA** | ESE | |
| **FIRST SEMESTER (GROUP-A)** | | | | | | | | | | | | | | | |
| 1 | 1 | BS | GE | 23GE1101 | Calculus and Vector | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 2 | 1 | BS | GE | 23GE1104 | Applied Chemistry | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 3 | 1 | BS | GE | 23GE1105 | **Lab:** Applied Chemistry | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 4 | 1 | HS/AEC1 | GE | 23GE1112 | Professional Communication | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 2 |
| 5 | 1 | HS/IKS | GE | 23GE1115 | Indian Knowledge System | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 2 |
| 6 | 1 | BES | CV | 23CV1101 | Engineering Mechanics | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 7 | 1 | BES | CV | 23CV1102 | **Lab:** Engineering Mechanics | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 8 | 1 | BES | IT | 23IT1103 | Programming for Problem Solving | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 2 |
| 9 | 1 | BES | IT | 23IT1104 | **Lab:** Programming for Problem Solving | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 10 | 1 | VSEC | GE | 23GE1117 | Get Set Go | … | … | … | … | … | 2 | | 60 | 40 | |
| 11 | 1 | CC1 | GE | | **Liberal Learning Course (LLC1)** | … | … | … | … | … | 2 | | 60 | 40 | |
| | | | | | **TOTAL FIRST SEM** | | **15** | **0** | **6** | **21** | **22** | **180** | | | |
| **SECOND SEMESTER (GROUP-A)** | | | | | | | | | | | | | | | |
| 1 | 2 | BS | GE | 23GE1202 | Differential Equations, Matrices and Statistics | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 2 | 2 | BS | GE | 23GE1208 | Engineering Physics | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 3 | 2 | BS | GE | 23GE1209 | **Lab:** Engineering Physics | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 4 | 2 | BES | ME | 23ME1201 | Engineering Graphics | T | 1 | 0 | 0 | 1 | 1 | 30 | 20 | 50 | 3 |
| 5 | 2 | BES | ME | 23ME1202 | **Lab :** Engineering Graphics | P | 0 | 0 | 4 | 4 | 2 | | 60 | 40 | |
| 6 | 2 | BES | EL | 23EL1201 | Basic Electrical and Electronics Engineering | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 7 | 2 | BES | EL | 23EL1205 | Lab : Electrical and Electronics Workshop | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 8 | 2 | PC | ETC | 23ET1201 | Digital Electronics and Logic Design | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 9 | 2 | PC | ETC | 23ET1202 | **Lab :** Digital Electronics and Logic Design | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 10 | 2 | VSEC | GE | 23GE1218 | Functional English | … | … | … | … | … | 2 | | 60 | 40 | |
| 11 | 2 | CC2 | GE | | **Liberal Learning Course (LLC2)** | … | … | … | … | … | 2 | | 60 | 40 | |
| | | | | | **TOTAL SECOND SEM** | | **13** | **0** | **10** | **23** | **22** | | | | |

**Liberal Learning Course**

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject |
|---|---|---|---|---|---|
| 1 | 1 | CC1 | GE | 23LLC1101 | Music (Vocal) |
| 2 | 1 | CC1 | GE | 23LLC1102 | Music (Instrumental) |
| 3 | 1 | CC1 | GE | 23LLC1103 | Indian Classical Dance |
| 4 | 1 | CC1 | GE | 23LLC1104 | Other forms of Dances |
| 5 | 1 | CC1 | GE | 23LLC1105 | Painting |
| 6 | 1 | CC1 | GE | 23LLC1106 | Theatre and acting |
| 7 | 1 | CC1 | GE | 23LLC1107 | Photography |
| 8 | 1 | CC1 | GE | 23LLC1108 | Yoga |
| 9 | 1 | CC1 | GE | 23LLC1109 | Chess |
| 10 | 1 | CC1 | GE | 23LLC1110 | Athletics |
| 11 | 1 | CC1 | GE | 23LLC1111 | Basket Ball |
| 12 | 1 | CC1 | GE | 23LLC1112 | Judo |
| 13 | 1 | CC1 | GE | 23LLC1113 | Elements of Japanese Language |
| 14 | 1 | CC1 | GE | 23LLC1114 | Elements of German Language |
| 15 | 1 | CC1 | GE | 23LLC1115 | Elements of French Language |
| 16 | 1 | CC1 | GE | 23LLC1116 | Elements of Spanish Language |
| 17 | 1 | CC1 | GE | 23LLC1117 | Basics of Vedic Maths |
| 18 | 1 | CC1 | GE | 23LLC1118 | Skilling in Microsoft Visio and Inkscape |

Nagar Yuwak Shikshan Sanstha's

**Yeshwantrao Chavan College of Engineering**

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B.TECH SCHEME OF EXAMINATION 2023**

(Scheme of Examination w.e.f. 2023-24 onward)

**(Department of Electronics & Telecommunication Engineering)**

**B.Tech. in Electronics & Telecommunication Engineering**

SoE No. 23ET-101

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject | T/P | Contact Hours | | | | Credits | % Weightage | | | ESE Duration Hours |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L | T | P | Hrs | | MSEs* | TA** | ESE | |

**Liberal Learning Course**

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject |
|---|---|---|---|---|---|
| 1 | 2 | CC2 | GE | 23LLC1201 | Music (Vocal) |
| 2 | 2 | CC2 | GE | 23LLC1202 | Music (Instrumental) |
| 3 | 2 | CC2 | GE | 23LLC1203 | Indian Classical Dance |
| 4 | 2 | CC2 | GE | 23LLC1204 | Other forms of Dances |
| 5 | 2 | CC2 | GE | 23LLC1205 | Painting |
| 6 | 2 | CC2 | GE | 23LLC1206 | Theatre and acting |
| 7 | 2 | CC2 | GE | 23LLC1207 | Photography |
| 8 | 2 | CC2 | GE | 23LLC1208 | Yoga |
| 9 | 2 | CC2 | GE | 23LLC1209 | Chess |
| 10 | 2 | CC2 | GE | 23LLC1210 | Athletics |
| 11 | 2 | CC2 | GE | 23LLC1211 | Basket Ball |
| 12 | 2 | CC2 | GE | 23LLC1212 | Judo |
| 13 | 2 | CC2 | GE | 23LLC1213 | Elements of Japanese Language |
| 14 | 2 | CC2 | GE | 23LLC1214 | Elements of German Language |
| 15 | 2 | CC2 | GE | 23LLC1215 | Elements of French Language |
| 16 | 2 | CC2 | GE | 23LLC1216 | Elements of Spanish Language |
| 17 | 2 | CC2 | GE | 23LLC1217 | Basics of Vedic Maths |
| 18 | 2 | CC2 | GE | 23LLC1218 | Skilling in Microsoft Visio and Inkscape |

| MANDATORY LEARNING COURSES | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | HS | | GE2131 | Universal Human Values (UHV) | A | 2 | 0 | 0 | 2 | 0 | | |

**MSEs* = Two MSEs of 15 Marks each will conducted and marks of these 2 MSEs will be considered for Continuous Assessment**

**TA ** = for Theory : TA1-5 marks on Proctored Online Exam, TA2-12 marks on activities decided by course teacher, TA3 - 3 marks on class attendance**

**TA** = for Practical : MSPA will be 15 marks each**

| | | | |
|---|---|---|---|
| Chairperson | Dean (Acad. Matters) | July, 2023 | 1.00 |
| | | Date of Release | Version |

**Applicable for AY 2023-24 Onwards**

# II SEMESTER

# 23GE1202 : Differential Equations, Matrices and Statistics

| Course Outcomes |
|---|
| **The students will be able to** |
| 1. Use appropriate Methods to solve first order and higher order differential equations and apply it to find solution of engineering problems. |
| 2. Use Matrix method to solve linear system of equations, evaluate eigen values - eigen vectors and its applications. |
| 3. Make use of probability distributions to solve real life problems. |
| 4. Inspect scientific data, use proper curve fitting and find correlation, regression of variables. |

| **Unit I: Differential Equations I** | **(7 Hrs.)** |
|---|---|
| Linear differential equations of first order and first degree, Differential equation reducible to linear form, Exact differential equations (excluding the case of integrating factor) and their applications to various fields. **(Contemporary Issues related to Topic)** | |
| **Unit II: Differential Equations II** | **(7 Hrs.)** |
| Higher order linear differential equations with constant coefficients, Complementary functions and Particular Integral for different cases, Method of variation of parameters, Examples on application to various fields. **(Contemporary Issues related to Topic)** | |
| **Unit III: Differential Equations III** | **(6 Hrs.)** |
| Cauchy's homogeneous linear differential equations, Legendre's linear differential equation, Applications of differential equations to various fields (only up to second order). **(Contemporary Issues related to Topic)** | |
| **Unit IV: Partial Differential Equations** | **(6 Hrs.)** |
| Partial Differential Equations of first order, first degree i.e. Lagrange's form, linear homogeneous equations of higher order with constant coefficient. Application of variable separable method to solve first and second order partial differential equations. **(Contemporary Issues related to Topic)** | |
| **Unit IV: Matrices** | **(7 Hrs.)** |
| Rank of a matrix, Consistency of system of equations using rank, Characteristics equations, Eigen values and Eigen vectors, Cayley Hamilton Theorem (without proof) statement and verification, Sylvester's theorem-statement and its application. **(Contemporary Issues related to Topic)** | |
| **Unit VI: Statistics** | **(6 Hrs.)** |
| Fitting of straight line, $y = a + bx$, a parabola $y = a + bx + cx^2$, exponential curves and power curves by method of least squares; Lines of regression and correlation; Rank correlation. **(Contemporary Issues related to Topic)** | |
| **Total Lecture** | **39 Hours** |

| **Textbooks:** | |
|---|---|
| 1. | Erwin Kreyzig, Advance Engineering Mathematics, 6th Edition, John Wiley and Sons, INC. |
| 2. | H.K. Dass, Engineering Mathematics, 11th revised edition, S. Chand, Delhi. |
| 3. | H.K. Dass, Advanced Engineering Mathematics, 8th revised edition, S. Chand, Delhi. |
| 4. | Dr. B.S. Grewal, Higher Engineering Mathematics, 42th edition, Khanna Publishers. |
| 5. | P.N.Wartikar and J.N.Wartikar, Applied Mathematics, 4th Edition, Vidyarthi GrihaPrakashan. |

| **Reference Books:** | |
|---|---|
| 1. | G B Thomas and R L Finney, Calculus and Analytical Geometry, 9th edition, Addison-Wesley, 1999. |
| 2. | N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, 10th edition, Laxmi Prakashan. |

| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
|---|---|
| 1 | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Mathematics%20and%20Humanities/ |

| **MOOCs Links and additional reading, learning, video material** | |
|---|---|
| 1. | https://nptel.ac.in/courses/111103070 |
| 2. | https://onlinecourses.nptel.ac.in/noc19_ma28/preview |
| 3. | https://nptel.ac.in/courses/111/106/111106100/ |

Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B. Tech SoE and Syllabus 2023**

**(Scheme of Examination w.e.f. 2023-24 onward)**

(Department of Physics)

**B.Tech First Year**

**SoE No. 23FY-101**

## II SEMESTER

## 23GE1208 : Engineering Physics

**Course Outcomes :**

**Upon successful completion of the course the students will be able to**

1. Correlate fundamentals of quantum mechanics to solve problems dealing with quantum particles.
2. Assess the characteristics of semiconductor materials in terms of crystal structures, charge carriers and Energy bands.
3. Examine the intensity variation of light due to interference, diffraction, laser and its applications.
4. Analyze the motion of charged particles in electric and magnetic field and its applications to electron optic devices.
5. Illustrate the nature and characterization of magnetic materials and superconductors for engineering applications.

| **Unit I: Quantum Physics** | **(7 Hrs.)** |
|---|---|
| Wave-particle duality, de-Broglie's hypothesis, Wave packet, Heisenberg's uncertainty principle: significance and applications, Wave function and its probability interpretation, Schrodinger Equation, Particle in infinite potential well. **(Contemporary Issues related to Topic)** | |
| **Unit II: Semiconductor Physics** | **(7 Hrs.)** |
| Formation of energy bands in solids; Classification of solids, Energy band diagram of Si and Ge, Intrinsic and extrinsic semiconductors, Conductivity, Law of mass action, Fermi function, Fermi level in intrinsic and extrinsic semiconductors, Dependence of Fermi level on impurity concentration and temperature, Hall effect. **(Contemporary Issues related to Topic)** | |
| **Unit III: Geometrical Optics** | **(7 Hrs.)** |
| Interference: Interference in thin films, Wedge shaped film, Newton's rings, Applications of interference Diffraction: Fraunhofer diffraction from a single slit. **(Contemporary Issues related to Topic)** | |
| **Unit IV: Laser** | **(6 Hrs.)** |
| Coherence and its types, Interaction of radiation with matter, Population Inversion, Pumping: methods and schemes, Optical resonant cavity, Ruby laser, Semiconductor diode laser, Properties and engineering applications of laser. **(Contemporary Issues related to Topic)** | |
| **Unit V: Electron Ballistics** | **(7 Hrs.)** |
| Motion of a charged particle in uniform electric and magnetic field, Cross field configuration; Electron refraction, Electron lens. Cathode ray oscilloscope and its application. **(Contemporary Issues related to Topic)** | |
| **Unit VI: Magnetic Materials & Superconductors** | **(6 Hrs.)** |
| Introduction to magnetic materials, Interpretation of Hysteresis curves, Superconductors: Type-I and Type-II, Meissner effect, Applications. **(Contemporary Issues related to Topic)** | |
| **Total Lecture** | **40 Hours** |

| | | | | | |
|---|---|---|---|---|---|
| | | | July,2023 | 1.00 | Applicable for AY 2023-24 Onwards |
| Chairperson | Dean (Acad. Matters) | Dean OBE | Date of Release | Version | |

| **Textbooks** | |
|---|---|
| **1** | M. N. Avadhanulu, P.G.Kshirsagar, A Textbook of Engg. Physics, S.Chand and Company. |
| **2** | Hitendra K Malik , A K Singh , Engineering Physics, 2nd Edition, Tata McGraw Hill Education Private Limited, |

| **Reference Books** | |
|---|---|
| **1** | David Halliday, Robert Resnick and Jerle Walker, John-Wiley India, Fundamentals of Physics, 10th John Wiley & Sons Inc. |
| **2** | Brijlal and Subramanyam, Text Book of Optics, Revised edition, S. Chand and Company. |
| **3** | M.N. Avadhanulu, 2nd Edition, Laser, S.Chand and Company. |
| **4** | A.Beiser, Concept of Modern Physics, 6th Edition, Laser, Tata McGraw-Hill. |
| **5** | Thyagarajan K. and Ghatak A.K, LASERS: Theory and Applications, 2nd Edition, Macmillan Publication |
| **6** | S.O.Pillai, Solid State Physics, 9th Edition, New Edge International Publishers. |
| **7** | Palanisamy, Solid State Physics, 8th Edition, New Edge International Publishers. |
| **8** | C. Kittel, Solid State Physics, 8th Edition, Willey Publication. |
| **9** | B. K. Pandey, S. Chaturvedi, Engineering Physics, 1st Edition, Cengage Learning. |
| **10** | John Allision, Electronic Engineering Materials and Devices, TMH edition, 10th reprint, Tata McGraw Hill. |

| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
|---|---|
| **1** | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Physics/Eisberg%20&%20Resnick%20-%20Quantum%20Physics.pdf |
| **2** | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Physics/2016_Book_ThePhysicsOfSemiconductors.pdf |
| **3** | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Physics/Dekker%20-%20Solid%20State%20Physics.pdf |

| **MOOCs Links and additional reading, learning, video material** | |
|---|---|
| **1** | https://nptel.ac.in/courses/115106066 - Quantum Physics |
| **2** | https://archive.nptel.ac.in/courses/115/105/115105121/ -CRO |
| **3** | www.digimat.in/nptel/courses/video/115102124/L36.html- Laser |

## II SEMESTER
## 23GE1209 : Lab. Engineering Physics

| Course Outcomes: |
|---|
| **Upon successful completion of the course the students will be able to**<br>1. Correlate fundamentals of quantum mechanics to solve problems dealing with quantum particles.<br>2. Assess the characteristics of semiconductor materials in terms of crystal structures, charge carriers and Energy bands.<br>3. Examine the intensity variation of light due to interference, diffraction, laser and its applications.<br>4. Analyze the motion in electric field and magnetic field and its applications to electron optic devices.<br>5. Illustrate the nature and characterization of magnetic materials and superconductors for engineering Applications. |

**List of Experiments :**

| Sr. No. | Experiments based on |
|---|---|
| 1 | Determination of Planck's constant. |
| 2 | Study of Tunnel Diode. |
| 3 | Determination of Hall coefficient and density of charge carriers using Hall effect. |
| 4 | Dependence of Hall coefficient on temperature. |
| 5 | Determination of Band gap in a semiconductor by four probe method. |
| 6 | Determination of Band gap in a semiconductor using reverse biased p-n junction diode. |
| 7 | Determination of radius of curvature of Plano convex lens using Newton's rings. |
| 8 | Determination of thickness of thin paper using air wedge. |
| 9 | Determination of wavelength of sodium light using diffraction grating. |
| 10 | Determination of wavelength of laser using diffraction grating. |
| 11 | Determination of divergence of laser beam. |
| 12 | Determination of amplitude and frequency of sinusoidal signal using CRO. |
| 13 | To measure the phase shift introduced by a phase shift network using Dual beam CRO. |
| 14 | Determination of the velocity of Ultrasonic waves in a non -electrolytic liquid by ultrasonic interferometer. |

## II SEMESTER

## 23ME1201 : Engineering Graphics

| **Course Outcomes :** |
|---|
| **Upon successful completion of the course the students will be able to** |
| 1. Construct orthographic drawing and isometric drawing of a given object |
| 2. Evaluate Projections of various One Dimensional, Two dimensional, Three dimensional objects |
| 3. Develop the lateral surfaces of various solids, their section and intersection**.** |
| 4. Practice the use of software tools used for Two dimensional drawings. |

| | |
|---|---|
| **Unit I: Theory of Orthographic Projections:** | **(3 Hrs.)** |
| Introduction, Quadrant system, Theory of orthographic projection, Projection method and principal planes, First and Third angle projections, | |
| **Unit II: Theory of Isometric Projections:** | **(2 Hrs.)** |
| Theory of isometric projection, Method for drawing isometric views, Different problems on isometric projections. | |
| **Unit III: Lines:** | **(2 Hrs.)** |
| Projection of points, Projection of lines, True lengths and inclinations, apparent lengths and inclinations, various positions of lines in different quadrants, Traces of lines, projection of line on auxiliary plane. | |
| **Unit IV: Planes and Solids:** | **(4 Hrs.)** |
| Projection planes: (Polygonal Lamina, Circular Lamina), Projection of Perpendicular planes and oblique planes. Auxiliary views (Auxiliary planes) Projection of Solids :(Inclined to One Plane Only) - Polyhedra (Regular and Irregular Polyhedra), Solids of Revolution | |
| **Unit V: Section of Solids and Development of Surfaces:** | **(2 Hrs.)** |
| Types of Section planes, Sectional top view, True shape.<br>Development of different solids using Radial line and parallel line methods. | |
| **Unit VI: Intersection of Surfaces of solids:** | **(2 Hrs.)** |
| Intersection between similar solids, Intersection between dissimilar solids, Lines and Curves of Intersection. | |
| **Total Lecture** | **15 Hours** |

| **Textbooks:** | |
|---|---|
| 1. | D.M. Kulkarni, A. P. Rastogi and A. K. Sarkar , Engineering Graphics with AutoCAD PHI learning Pvt. Ltd., Revised Edition(2014), |
| 2. | N. D. Bhatt ,Engineering Drawing Charotar Publishing House Pvt. Ltd, 53 rd Edition 2017 |

| **Reference Books:** | |
|---|---|
| 1. | D. A. Jolhe Engineering Drawing , Tata McGraw Hill Publications , 2008, |
| 2. | K. L. Narayana & P. Kannaiah , Engineering Drawing SciTech Publication , 2010 |
| 3. | R. K. Dhawan Engineering Drawing S. Chand Publication Multicolor revised edition 2015 |

| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
|---|---|
| 1 | Intranet on address 172.16.1.10. data/CCC/software / AutoCAD Software Setup. |

| **MOOCs Links and additional reading, learning, video material** | |
|---|---|
| 1. | https://youtube.com/playlist?list=PLLy_2iUCG87Bw9XPfEF3r3EW5UlAOv8iz |
| 2. | Eng https://nptel.ac.in/courses/112105294 |

## II SEMESTER

## 23ME1202 : Lab. Engineering Graphics

| **Course Outcomes :** |
|---|
| **Upon successful completion of the course the students will be able to** |
| 1. Construct orthographic drawing and isometric drawing of a given object |
| 2. Evaluate Projections of various One Dimensional, Two dimensional, Three dimensional objects |
| 3. Develop the lateral surfaces of various solids, their section and intersection**.** |
| 4. Practice the use of software tools used for Two dimensional drawings. |

**Practical's to be performed from the list as below**

| SN | **Experiments based on** | **No.of Practical's** |
|---|---|---|
| 1 | Introduction of AutoCAD Basic Commands | 02 |
| 2 | Orthographic Projection | 03 |
| 3 | Isometric Projection | 03 |
| 4 | Projection of Straight Line | 03 |
| 5 | Projection of Planar Surface | 03 |
| 6 | Projection of Solid | 03 |
| 7 | Section and Development of Solid | 04 |
| 8 | Intersection of Surfaces | 03 |
| 9 | Drawing Sheet 1: Convention for various lines, Dimensioning and Orthographic Projection | 02 |
| 10 | Drawing Sheet 2: Projection of line, planar surface or solid. (Any one) | 02 |
| | **Total Practical's** | **28 Hours** |

Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B. Tech SoE and Syllabus 2023**

**(Scheme of Examination w.e.f. 2023-24 onward)**

(Department of Electrical Engineering)

**B.Tech in Electrical Engineering**

**SoE No. 23EL-101**

## II SEMESTER

## 23EL1201 : Basic Electrical and Electronics Engineering

**Course Outcomes:**

1. Understand the fundamental concepts of Analog Electronic and Electrical Circuits
2. Apply the concepts of Electrical and Electronic Circuits to obtain the desired parameter
3. Analyze analog Electrical Circuits for given application.
4. Analyze analog Electronic Circuits for given application

| **Unit I: Circuit Elements and Energy Sources** | **(7 Hrs.)** |
|---|---|
| Circuit Elements, Series and Parallel Combination of Resistances, Inductance and Capacitances, Energy Sources, Source Transformation, Sources with Periodic Waveforms, A.C. in Inductance and Capacitance, Star-Delta Connection. **(Contemporary Issues related to Topic)** | |
| **Unit II: Analysis of Network** | **(7 Hrs.)** |
| Kirchhof's Laws, Current Division, Voltage Division, Nodal and Mesh Analysis of Electric Circuits, Thevenin's Theorem **(Contemporary Issues related to Topic)** | |
| **Unit III: Generator and Motors** | **(7 Hrs.)** |
| Introduction to Generator, Construction, working principle, Types of Generators, Introduction to DC Motor,Working Principle of DC Motor, Types of Motors. **(Contemporary Issues related to Topic)** | |
| **Unit IV: Diode and Transistor** | **(6 Hrs.)** |
| Introduction to Semiconductor, P-N junction diodes, Biasing & Characteristics of diodes. Diode Circuits - Half wave rectifier, full wave rectifier, bridge rectifier. Introduction to BJT- NPN and PNP, Modes of operation,. **(Contemporary Issues related to Topic)** | |
| **Unit V: Operational Amplifier and Its Application** | **(7 Hrs.)** |
| Introduction to Op-Amp, Inverting and Non-Inverting Amplifier, Linear Applications of OP-AMP like adder, Subtractor, integrator, differentiator and non-linear application using Comparator. **(Contemporary Issues related to Topic)** | |
| **Unit VI: Electronics Measurement** | **(6 Hrs.)** |
| Introduction to Measurement System, Generalized block diagram of Measurement System, Static & dynamic characteristics of measurement system, Types of errors & their sources, Statistical analysis. **(ContemporaryIssues related to Topic)** | |
| **Total Lecture** | **40 Hours** |

| | | | | | |
|---|---|---|---|---|---|
| | | | July,2023 | 1.00 | Applicable for AY 2023-24 Onwards |
| Chairperson | Dean (Acad. Matters) | Dean OBE | Date of Release | Version | |

| Textbooks: | |
|---|---|
| 1. | Basic Electrical Engineering, T. K. Nagsarkar and M. S. Sukhija, Oxford Higher Education, First Edition2005 |
| 2. | Electronics Devices and circuits, Millman Jacob, McGraw Hill Education, Fourth Edition (2015) |
| 3. | Circuit Theory (Analysis and Synthesis) , by A. Chakrabarti, Dhanpat Rai & Co., Reprint Edition 2014 |

| Reference Books: | |
|---|---|
| 1. | OP-AMP and Linear Integrated Circuit, by Ramakant A. Gayakwad, Prentice Hall India Learnin Private Limited, Published in 2002 |
| 2. | Electrical & Electronic measurement & Instrument, A. K. Sawhney, Dhanpat Rai & Co.,18th edition 2008 |

| YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS] | |
|---|---|
| 1 | http://link.springer.com/openurl?genre=book&isbn=978-1-4613-6193-0 |
| 2 | https://onlinelibrary.wiley.com/doi/book/10.1002/9780470168042 |

| MOOCs Links and additional reading, learning, video material | |
|---|---|
| 1. | https://onlinecourses.nptel.ac.in/noc22_ee113/preview |

## II SEMESTER

## 23ET1201 : Digital Electronics and Logic Design

| Course Outcomes: |
|---|
| **Upon successful completion of the course the students will be able to** |
| 1. Apply the laws of Boolean algebra to simplify logical equations and understand the various codes. |
| 2. Simplify the logical functions using minimization techniques |
| 3. Design and analyze combinational Circuits |
| 4. Design and analyze Synchronous and Asynchronous sequential Circuits. |

| | | |
|---|---|---|
| **Unit:1** | **Digital System, Number system and codes** | **7 Hours** |
| Decimal, Binary, Octal & Hexadecimal Number systems and their inter conversion, BCD codes (8421-2421), BCD Arithmetic, Excess three code, Gray code. Representation of Signed Numbers, Binary addition, and subtraction.<br>**Contemporary Issues related to Topic** | | |
| **Unit:2** | **Logic Gates & Switching Algebra** | **7 Hours** |
| Basic logic circuits: Logic gates (AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR and their truth tables), Universal Gates, Switching Algebra, basic theorems and properties of Boolean algebra, Boolean functions, canonical and standard forms, Introduction to Logic Families.<br>**Contemporary Issues related to Topic** | | |
| **Unit:3** | **Minimization of Switching Function** | **8 Hours** |
| Minimization of SOP & POS expression, K-map method, NAND and NOR implementation, Quine-McCluskey Method (Tabular Method) for the determination of Prime Implicants, Essential and Non-essential prime Implicants.<br>**Contemporary Issues related to Topic** | | |
| **Unit:4** | **Combinational Logic Circuit** | **8 Hours** |
| Adder & Subtractor Circuit, BCD Adder, Look Ahead Carry Adder, Magnitude Comparator, Decoders, Encoders, Multiplexers, and Demultiplexers, Code converters.<br>**Contemporary Issues related to Topic** | | |
| **Unit:5** | **Sequential Circuit & Programmable logic circuits** | **7 Hours** |
| Sequential circuits, latches & flip-flops, excitation table of flip-flops. Flip-Flop to flip-flop conversion.<br>Programmable logic circuits: Read only Memory, Programmable read-only memory (ROM/PROM), Programmable Logic Devices, PAL, Programmable Logic Arrays, and field programmable gate arrays (FPGA).<br>**Contemporary Issues related to Topic** | | |

| Unit:6 | Registers & Counters | 7 Hours |
|---|---|---|
| Serial in/Serial out shift register, Serial in/parallel out shift register, parallel in/parallel out shift register, parallel in/Serial out shift register, Bi-directional register, Synchronous/Asynchronous counter: Ring Counter, Ripple Counter Johnson's Counter operation, Up/down synchronous counter, application of counter.<br>**Contemporary Issues related to Topic** | | |
| **Total Lecture Hours** | | **44 Hours** |

| **Textbooks** | |
|---|---|
| **1** | R.P Jain, Modern Digital Electronics, Tata McGraw Hill,3rd Edition |
| **2** | Morris Mano, Digital Design, 3rd edition, 2005, Pearson. |
| **3** | Anand kumar- Fundamental of digital circuit. 3rd edition. PHI |
| **Reference Books** | |
| **1** | Fundamentals of Logic Design, C.H.Roth, Public Work & Services, 3rd edition 2007. |
| **2** | Engg Approach to Digital Design, Fletcher, Prentice Hall of India 1993. |
| **3** | Donald P.Leach and Albert Paul Malvino, Digital Principles and Applications, 6thEdition, TMH, 2003. |
| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
| **1** | http://103.152.199.179/YCCE/yccelibrary.html |
| **MOOCs Links and additional reading, learning, video material** | |
| **1** | https://onlinecourses.nptel.ac.in/noc21_ee75 |

## II SEMESTER

## 23ET1202 : Lab. Digital Electronics and Logic Design

**Course Outcomes:**

**Upon successful completion of the course the students will be able to**

1. Apply the laws of Boolean algebra to simplify logical equations and understand the various codes.
2. Simplify the logical functions using minimization techniques
3. Design and analyze combinational Circuits
4. Design and analyze Synchronous and Asynchronous sequential Circuits.

| Sr. No. | Experiments based on |
|---|---|
| 1 | Implement basic gates using universal gates. |
| 2 | Construction of half/full adder using XOR and NAND gates and verification of its operation. |
| 3 | Verify Binary to Gray and Gray to Binary conversion. |
| 4 | Implementation of 4x1 multiplexer and 1x4 demultiplexer using logic gates. |
| 5 | Verify the truth table of D-flip-flops and JK- flip-flops. |
| 6 | Design of 4-bit Shift Registers |
| 7 | Design and verify the 4-Bit Synchronous Counter. |
| 8 | Verify Truth Tables of basic Logic gates & Universal Gates using MULTISIM. |
| 9 | Design & verify Truth Table of Half adder & Full adder circuits Logic simulator. |
| 10 | Mini project |

## II SEMESTER

## 23EL1205 : Lab : Electrical and Electronics Workshop

| **Course Outcomes:** |
|---|
| **Upon successful completion of the course the students will be able** |
| 1. To choose the electrical and electronics components/equipment for various application<br>2. To select various sensors and measuring instruments for different applications.<br>3. To build the various electrical wiring for different application |

| Sr. No. | Experiments based on |
|---|---|
| 1 | Introduction of Tools, Electrical Materials and Electrical Drawing Symbols |
| 2 | Introduction to basic Electrical Components (R, L, C) with its number and color coding. |
| 3 | Introduction to Different types of Measuring Instruments and its demonstration. |
| 4 | To implement 12 V DC power supply using 7812 IC |
| 5 | Fabrication of four switch socket Electrical Distribution Board |
| 6 | To fabricate Staircase Wiring and Godown Wiring |
| 7 | Fabrication of solar powered electric fan |
| 8 | To monitor the output voltage of solar panel using voltage Sensor |
| 9 | Introduction to Different sensor devices and its demonstration. |
| 10 | To Study different protection devices and Importance of Earthing. |

Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B. Tech SoE and Syllabus 2023**

**(Scheme of Examination w.e.f. 2023-24 onward)**

(Department of Mathematics & Humanities)

**SoE No. 23FY-101**

## B.Tech First Year

## II SEMESTER

## 23GE1218 : Functional English

| Course Outcomes: |
|---|
| **Upon successful completion of the course the students will be able to**<br>1. Understand the concept of FE (Functional English) and its application in various real-life scenarios.<br>2. Develop basic interactive communication skills, including greetings, asking for information, stating opinions, and providing feedback.<br>3. Acquire knowledge of social networking, texting, instant messaging, blogs, and discussion boards, along with the ethical considerations associated with online communication.<br>4. Successfully complete quizzes and assignments assessing knowledge in the covered topics of FE, social media, tenses, and effective communication. |

| Unit:1 | Introduction to Functional English | 6 Hours |
|---|---|---|
| What is FE? And Areas of application. Basic Interactive sentences - Greetings & Replies, Asking for information, Telling people what you do, Asking somebody's opinion, Giving your opinion, Saying someone is correct, Saying that someone is wrong, Apologizing, Praising someone's work, Saying goodbye. Introduction & Basics of Common Expressions – Offer, Request, Gratitude, Apology. Modal Verbs - Words used often: Can- could, Will – would, Shall – should, Ought to-Must, May-might.<br>Practice exercises, Practice Conversations, Script Activity | | |
| **Unit:2** | **Internet & Social Media Communication** | **6 Hours** |
| Introduction & Basics to Social Networking, Texting & Instant messaging, Blogs & Discussion Board- discussion with examples, Ethics of social media & communication<br>Topic: Introduction to Creative Ads Why Ads, What's in it for me? Characteristics of ads.<br>Assignment Quiz on the above Topics, Exercises for Evaluation | | |
| **Unit:3** | **TENSES** | **6 Hours** |
| Introduction & Basics, Simple Tense (Past, Present, Future), Continuous Tense (Past, Present, Future) – discussion with examples.<br>Introduction & Basics, Perfect Tense (Past, Present, Future), Perfect Continuous Tense (Past, Present, Future) – discussion with examples<br>Introduction to Movie Magic, Learn English with films, Film Vocabulary, Describing a film, Types of Films<br>Assessment – Letter and Email Writing, Tenses – Quiz | | |
| **Unit:4** | **Written Communication** | **5 Hours** |
| Introduction & Basics of Writing, five methods of communication, Mind your grammar, Commonly confusing words<br>Letters – Format, Parts of a business letter, When does communication fail?, Things to remember, Positive language not negative language, Active voice not passive voice<br>Effective emailing -How to make an effective e-mail, Few common e-mail habits that cause problems, Parts of an e-mail, Some other important aspects. | | |

| | | | | | |
|---|---|---|---|---|---|
| | | | July,2023 | 1.00 | Applicable for AY 2023-24 Onwards |
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Assignment Presentation on Mad Ads, Quiz on Tenses and social media-Internet Communication
Topic: Activity Extempore

| | | | |
|---|---|---|---|
| **EVALUATION** | | | **1 Hour** |
| **WRITTEN TEST** | **TA=60** | **ESE=40** | **TOTAL=100** |
| | | | |
| **Total Lecture Hours** | | | **24 Hours** |

| **Reference Books** | |
|---|---|
| **1** | How to win friends & influence people – Dale Carnegie |
| **2.** | Functional English for Communication - Ujjwala Kakarla |
| **3** | Functional English for Technical Students – Dr Prathibha Mahato & Dr Dora Thompson |

Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

*(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)*

**(Accredited 'A++' Grade by NAAC with a score of 3.6)**

Hingna Road, Wanadongri, Nagpur - 441 110


# Bachelor of Technology

# SoE & Syllabus 2023

## 3rd Semester

**(Department of Electronics & Telecommunication Engineering)**

## B. Tech in Electronics & Telecommunication Engineering

Nagar Yuwak Shikshan Sanstha's

**Yeshwantrao Chavan College of Engineering**

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B.TECH SCHEME OF EXAMINATION 2023**

(Scheme of Examination w.e.f. 2023-24 onward)

**(Department of Electronics & Telecommunication Engineering)**

**B. Tech. in Electronics & Telecommunication Engineering**

SoE No. 23ET-101

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject | T/P | Contact Hours | | | | Credits | % Weightage | | | ESE Duration Hours |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L | T | P | Hrs | | MSEs* | TA** | ESE | |
| **THIRD SEMESTER** | | | | | | | | | | | | | | | |
| 1 | 3 | HSSM-1 | GE | 23GE1301 | Fundamentals of Management & Economics | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| 2 | 3 | VEC-1 | CV | 23CV1311 | Environmental Sustainability, Pollution and Management | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| 3 | 3 | PC | ET | 23ET1301 | Signals & Systems | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 4 | 3 | PC | ET | 23ET1302 | **Lab :** Signals & Systems | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 5 | 3 | PC | ET | 23ET1303 | Electronic Devices and Circuits | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 6 | 3 | PC | ET | 23ET1304 | **Lab :** Electronic Devices and Circuits | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 7 | 3 | PC | ET | 23ET1305 | Electromagnetic Fields | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 8 | 3 | CEP | ET | 23ET1306 | **Lab** : Field Project | P | 0 | 0 | 2 | 4 | 2 | | 60 | 40 | |
| 9 | 3 | OE1 | OE | | **Open Elective -I** | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| 10 | 3 | MDM | ET | | **MD Minor Course-I** | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| | | | | | **TOTAL** | | **17** | **0** | **6** | **25** | **21** | | | | |

| List of Mandatory Learning Course (MLC) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | HS | T&P | MLC2123 | **YCAP3 :** YCCE Communication Aptitude Preparation | **A** | 3 | 0 | 0 | 3 | **0** | | | | |

**Open Elective - I**

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject |
|---|---|---|---|---|---|
| 1 | 3 | OE1 | GE | 23OE1301 | OE-I : Combinatorics |
| 2 | 3 | OE1 | GE | 23OE1302 | OE-I : Fuzzy Set Theory, Arithmetic And Logic |
| 3 | 3 | OE1 | GE | 23OE1303 | OE-I : Green Chemistry & Sustainability |
| 4 | 3 | OE1 | GE | 23OE1304 | OE-I : Hydrogen Fuel |
| 5 | 3 | OE1 | GE | 23OE1305 | OE-I : Electronic Materials And Applications |
| 6 | 3 | OE1 | GE | 23OE1306 | OE-I : Laser Technology And Applications |
| 7 | 3 | OE1 | MGT | 23OE1307 | OE-I : Finance And Cost Management |
| 8 | 3 | OE1 | MGT | 23OE1308 | OE-I : Operation Research Techniques |
| 9 | 3 | OE1 | MGT | 23OE1309 | OE-I : Project Evaluation & Management |
| 10 | 3 | OE1 | MGT | 23OE1310 | OE-I : Total Quality Management |
| 11 | 3 | OE1 | MGT | 23OE1311 | OE-I : Value Engineering |
| 12 | 3 | OE1 | MGT | 23OE1312 | OE-I : Maintenance Management |
| 13 | 3 | OE1 | MGT | 23OE1313 | OE-I : Industrial Safety |
| 14 | 3 | OE1 | MGT | 23OE1314 | OE-I : Industry 4.0 |
| 15 | 3 | OE1 | MGT | 23OE1315 | OE-I : Operation Management |
| 16 | 3 | OE1 | MGT | 23OE1316 | OE-I : Material Management |
| 17 | 3 | OE1 | MGT | 23OE1317 | OE-I : Hospitality Management |
| 18 | 3 | OE1 | MGT | 23OE1318 | OE-I : Human Resource Management & Organizational Behaviour |
| 19 | 3 | OE1 | MGT | 23OE1319 | OE-I : Agri-Business Management |
| 20 | 3 | OE1 | MGT | 23OE1320 | OE-I : Rural Marketing |
| 21 | 3 | OE1 | MGT | 23OE1321 | OE-I : Marketing Management |
| 22 | 3 | OE1 | MGT | 23OE1322 | OE-I : Health Care Management |

| | | July, 2023 | 1.00 | Applicable for AY 2023-24 Onwards |
|---|---|---|---|---|
| Chairperson | Dean (Acad. Matters) | Date of Release | Version | |

## III SEMESTER
## 23GE1301: Fundamentals of Management & Economics

| **Course Outcomes:** |
|---|
| **Upon successful completion of the course the students will be able to**<br>1. Develop the Managerial Perspective and perform the various functions of management for optimum utilization of Engineering Resources<br>2. Identify and Analyze the role of Financial Accountancy and Marketing Management in the Organization<br>3. Develop perspective about economy based on logical reasoning and estimate the economic outcomes.<br>4. Interprets comparative advantage of resources. |

| **Unit I:** | **7 Hrs.** |
|---|---|
| **Principles of Management**: Evolution of Management Thought: Scientific and Administrative Theory of Management, Definition and Concept of Management, Functions of Management: Planning, Organizing, Directing, Staffing and Controlling, Motivational Theories, Concept of Leadership. | |
| **Unit II:** | **8 Hrs.** |
| **Marketing and Financial Management:** Marketing and Financial Management –Marketing Theories and Concept-Marketing Mix, Market Segmentation, Targeting and Positioning and Functions<br>Financial Management and Accountancy- Accountancy Rules and Capital, Preparation of Books of Account- Journal posting of Transaction into ledger and preparation of trial Balance, Introduction of Trading Account, Profit and loss account and balance sheet. | |
| **Unit III:** | **7 Hrs.** |
| **Introduction to Microeconomics:** Nature and Scope of Microeconomics, Demand Analysis: Meaning and determinants of demand, law of demand, Elasticity of Demand - types and degrees, Utility analysis, Law of diminishing marginal utility, supply- law of supply, Law of Variable proportions and Return to Scale, Classification of market structure. | |
| **Unit IV:** | **8 Hrs.** |
| **Introduction to Macroeconomics:** Nature and Scope of Macroeconomics, Concept of GDP, GNP, NDP, NNP, Measurement of GDP; Economic Growth and development, Money – definition, types and function of money, Inflation – meaning, types, causes and measure to control, concept of deflation, functions of central and commercial bank , Sources of public revenue - direct and indirect taxes. | |
| | **Total Lecture** **30 Hours** |

| | | | | | |
|---|---|---|---|---|---|
| Chairperson | Dean (Acad. Matters) | Dean OBE | June,2024<br>Date of Release | 1.00<br>Version | Applicable for<br>AY 2024-25 Onwards |

| Textbooks: | |
|---|---|
| 1 | Principle of Management, 9thedition , Harold Koontz Ramchandra, Tata McGrow hills |
| 2 | Marketing Management: Planning, Implementation and Control, 3rd Edition, Ramaswamy V.S. and Namakumari S, Macmillian |
| 3 | Fundamentals of Accounting Gupta R.L. & Radhaswamy ; |
| 4 | Modern Economics, 13th Edition, H. L. Ahuja, S. Chand Publisher, 2009 |
| 5 | Modern Economic Theory, 3rd edition, K. K. Devett, S. Chand Publisher,2007 |
| 6 | Principle of Economics, 7th edition, Mankiw N. Gregory, Thomson, 2013 |

| Reference Books: | |
|---|---|
| 1 | Foundations of Financial Markets and Institutions, 3rd Edition, Fabozzi, Pretice Hall |
| 2 | Fundamentals of Financial Instruments , 2nd Edition, Parameshwaran, Wiley India |
| 3 | Marketing Management , 3rd Edition , RajanSaxena, Tata McGraw Hill |
| 4 | Advance Economic Theory, 17th Edition, H. L. Ahuja, S. Chand Publisher, 2009 |
| 5 | International Trade, 12th edition, M. L. Zingan, Vindra Publication, 2007 |
| 6 | Macro Economics, 11th edition, M. L. Zingan, Vindra Publication, 2007 |
| 7 | Monitory Economics:,1st Edition, M. L. Sheth, Himayalaya Publisher, 1995 |

| YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS] | |
|---|---|
| **1** | http://link.springer.com/openurl?genre=book&isbn=978-1-4613-6193-0 |
| **2** | https://onlinelibrary.wiley.com/doi/book/10.1002/9780470168042 |

| MOOCs Links and additional reading, learning, video material | |
|---|---|
| **1** | https://onlinecourses.nptel.ac.in/noc22_mg104/preview |
| **2** | https://archive.nptel.ac.in/courses/110/101/110101131/ |
| **3** | https://onlinecourses.nptel.ac.in/noc23_mg122/preview |
| **4** | https://onlinecourses.nptel.ac.in/noc21_hs52/preview |
| **5** | https://onlinecourses.nptel.ac.in/noc22_hs67/preview |

# III/IV SEMESTER
# 23CV1311/23CV1411
# Environmental Sustainability, Pollution and Management

| **Course Outcomes :** |
|---|
| **Upon successful completion of the course, the students will be able to**<br>The student will be able to<br>1. Gain insights into the efforts to safeguard the Earth's environment and resources.<br>2. Develop a critical understanding of the contemporary environmental issues of concern<br>3. Have an overview of pollution, climate change and national and global efforts to address adaptation and mitigation to changing environment through environmental management.<br>4. Learn about the major international treaties and our country's stand on and responses to the major international agreements. |

| **Unit:1** | **Environment and Sustainable Development** | **8 Hours** |
|---|---|---|
| The man-environment interaction; Overview of natural resources: renewable, and non-renewable energy resources; Introduction to sustainable development: Sustainable Development Goals (SDGs)- targets and indicators, challenges and strategies for SDGs; Environmental issues: Global change, Climate Change and Mitigation. | | |
| **Unit:2** | **Environmental Pollution and Health** | **7 Hours** |
| Understanding pollution: Production processes and generation of wastes, Air pollution, Water pollution, Soil pollution and solid waste, Noise pollution, Thermal and Radioactive pollution. Impact on biotic and abiotic things. | | |
| **Unit:3** | **Environmental Management** | **8 Hours** |
| Environmental management system: ISO 14001, Concept of Circular Economy, Life cycle analysis; Cost-benefit analysis, Environmental audit and impact assessment; Waste Management and sustainability; Ecolabeling /Eco mark scheme | | |
| **Unit:4** | **Environmental Treaties and Legislation** | **7 Hours** |
| Introduction to environmental laws and regulation, An overview of instruments of international cooperation, Major International Environmental Agreements, Major Indian Environmental Legislations, Major International organizations, and initiatives | | |
| | **Total Lecture** | **30 Hours** |

| **Text books** | |
|---|---|
| 1 | Chiras, D. D and Reganold, J. P. (2010). Natural Resource Conservation: Management for a Sustainable Future.10th edition, Upper Saddle River, N. J. Benjamin/Cummins/Pearson |
| 2 | Rajagopalan, R. (2011). Environmental Studies: From Crisis to Cure. India: Oxford University Press |
| 3 | Krishnamurthy, K.V. (2003) Textbook of Biodiversity, Science Publishers, Plymouth, UK |
| 4 | Jackson, A. R., & Jackson, J. M. (2000). Environmental Science: The Natural Environment and Human Impact. Pearson Education |
| 5 | Pittock, Barrie (2009) Climate Change: The Science, Impacts and Solutions. 2nd Edition. Routledge. |

| | |
|---|---|
| 6 | Theodore, M. K. and Theodore, Louis (2021) Introduction to Environmental Management, 2nd Edition. CRC Press |
| 7 | Kanchi Kohli and Manju Menon (2021) Development of Environment Laws in India, Cambridge University Press |


| **Reference Books** | |
|---|---|
| 1 | Headrick, Daniel R. (2020) Humans versus Nature- A Global Environmental History, Oxford University Press |
| 2 | Gilbert M. Masters and W. P. (2008). An Introduction to Environmental Engineering and Science, Ela Publisher (Pearson) |
| 3 | William P. Cunningham and Mary A. (2015). Cunningham Environmental Science: A global concern, Publisher (Mc-Graw Hill, USA) |
| 4 | Varghese, Anita, Oommen, Meera Anna, Paul, Mridula Mary, Nath, Snehlata (Editors) (2022) Conservation through Sustainable Use: Lessons from India. Routledge. |
| 5 | Central Pollution Control Board Web page for various pollution standards. https://cpcb.nic.in/ standards |
| 6 | Barnett, J. & S. O'Neill (2010). Maladaptation. Global Environmental Change—Human and Policy Dimensions 20: 211–213 |
| 7 | Richard A. Marcantonio, Marc Lame (2022). Environmental Management: Concepts and Practical Skills. Cambridge University Press |
| 8 | Ministry of Environment, Forest and Climate Change (2019) A Handbook on International Environment Conventions & Programmes. https://moef.gov.in/wp- content/uploads/2020/02/ convention-V-16-CURVE-web.pdf |
| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
| 1 | |
| **MOOCs Links and additional reading, learning, video material** | |
| 1 | |

# III SEMESTER
# 23ET1301- Signals & Systems

| **Course Outcomes:** |
|---|
| **Upon successful completion of the course the students will be able to**<br>1. Classify systems based on their properties and determine the response of LTI system.<br>2. Analyze system properties based on impulse response and Fourier analysis.<br>3. Sample and reconstruct the signals.<br>4. Apply the Laplace transform for analysis of continuous-time system<br>5. Apply the Z- transform for analysis of discrete-time systems. |

| **Unit:1** | **Signals and Systems** | **8 Hours** |
|---|---|---|
| Continuous-Time and Discrete-Time Signals. Transformations of the Independent Variable. Continuous-Time and Discrete-Time Systems. Basic System Properties.<br><br>**Contemporary Issues related to Topic** | | |
| **Unit:2** | **Convolution** | **7 Hours** |
| Discrete-Time LTI Systems: The Convolution Sum. Continuous-Time LTI Systems: The Convolution Integral.<br>Properties of Linear Time-Invariant Systems.<br>**Contemporary Issues related to Topic** | | |
| **Unit:3** | **Fourier Series Representation of Continuous Time Periodic Signals and Continuous Time Fourier Transform.** | **8 Hours** |
| The Response of LTI Systems to Complex Exponentials. Fourier Series Representation of Continuous-Time Periodic Signals. Convergence of the Fourier Series. The Continuous-Time Fourier Transform. Representation of Aperiodic Signals: The Continuous-Time Fourier Transform. The Fourier Transform for Periodic Signals. Properties of the Continuous-Time Fourier Transform.<br><br>Representation of a Continuous-Time Signal by its Samples: The Sampling Theorem. Reconstruction of a Signal from Its Samples Using Interpolation. Aliasing.<br><br>**Contemporary Issues related to Topic** | | |
| **Unit:4** | **Fourier Series Representation of Discrete Time Periodic Signals and Discrete Time Fourier Transform.** | **7 Hours** |
| Fourier Series Representation of Discrete-Time Periodic Signals. The Discrete-Time Fourier Transform. Representation of Aperiodic Signals: The Discrete-Time Fourier Transform. The Fourier Transform for Periodic Signals. Properties of the Discrete-Time Fourier Transform.<br>**Contemporary Issues related to Topic** | | |

| Unit:5 | The Laplace Transform. | 8 Hours |
|---|---|---|
| The Laplace Transform. The Region of Convergence for Laplace Transforms. The Inverse Laplace Transform. Geometric Evaluation of the Fourier Transform from the Pole-Zero Plot. Properties of the Laplace Transform. Analysis and Characterization of LTI Systems Using the Laplace Transform. System Function Algebra and Block Diagram Representations.<br>**Contemporary Issues related to Topic** | | |
| **Unit :6** | **The Z-Transform.** | **7 Hours** |
| The z-Transform. The Region of Convergence for the z-Transform. The Inverse z-Transform. Geometric Evaluation of the Fourier Transform from the Pole-Zero Plot. Properties of the z-Transform. Analysis and Characterization of LTI Systems Using z-Transforms. System Function Algebra and Block Diagram Representations.<br>**Contemporary Issues related to Topic** | | |
| **Total Lecture Hours** | | **45 Hours** |

| **Textbooks** | |
|---|---|
| **1** | Alan V. Oppenheim,Alan S. Willsky, with S. Hamid, Signals and Systems, 2nd edition, Prentice Hall. Publications |
| **2** | Hwei Hsu, Schaum's Outline of Signals and Systems, 4th edition 2002 McGraw-Hill |
| **Reference Books** | |
| **1** | B. P. Lathi, Principles of Signal Processing and Linear Systems, 1st edition, Oxford university |
| **2** | Simon Haykin and Van Veen, Wiley, Signals & Systems, 2nd Edition. 2005,TMH |
| **3** | Robert ,Signals & Systems Analysis Using Transformation Methods & MAT Lab, 1st edition 2003,McGraw-Hill Companies |
| **4** | C. L. Philips, J.M.Parr ,and Eve A.Riskin, Signals, Systems and Transforms, 3rd Edition,2004. Pearson education |
| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
| **1** | https://eee.guc.edu.eg/Courses/Communications/COMM401%20Signal%20&%20System%20Theory/Alan%20V.%20Oppenheim,%20Alan%20S.%20Willsky,%20with%20S.%20Hamid-Signals%20and%20Systems-Prentice%20Hall%20(1996).pdf |
| **2** | http://people.disim.univaq.it/~costanzo.manes/EDU_stuff/Theory%20and%20Problems%20of%20Signals%20&%20Systems_Hsu_Schaum95.pdf |
| **MOOCs Links and additional reading, learning, video material** | |
| **1** | https://youtube.com/playlist?list=PLyqSpQzTE6M8KJ-XQ1m2vl3nd2ZUqKEN8 |

# III Semester
# 23ET1302- Lab: Signals & Systems

**Course Outcomes:**

**Upon successful completion of the course the students will be able to**

1. Classify systems based on their properties and determine the response of LTI system.
2. Analyze system properties based on impulse response and Fourier analysis.
3. Sample and reconstruct the signals.
4. Apply the Laplace transform and Z- transform for analysis of continuous-time and discrete-time signals and systems.

| Sr. No. | Experiments based on |
|---|---|
| 1 | Understanding the Basic Signals |
| 2 | Properties of signals and their transformations |
| 3 | Introduction to systems and their classification. |
| 4 | Characterizations of System. |
| 5 | Convolution of Continuous Time and Discrete Time Signals |
| 6 | Implementation of Fourier series |
| 7 | Implementation of Continuous time Fourier Transform |
| 8 | Implementation of Discrete time Fourier Transform |
| 9 | Implementation of Laplace Transform |
| 10 | Implementation of z-Transform |
| 11 | Sampling and reconstruction |

# III Semester
# 23ET1303 - Electronic Devices and Circuits

**Course Outcomes:**

**Upon successful completion of the course the students will be able to**

1. Analyze the transistor circuits for different configurations.
2. Design transistor circuit with suitable biasing and stabilization techniques.
3. Analyze the response of transistors at low and high frequency
4. Analyze the effect of feedback on gain and frequency of amplifiers
5. Analyze power amplifier circuits.

| Unit:1 | Bipolar Junction Transistors | 8Hours |
|---|---|---|

PN junction diode and its application ,Bipolar Junction Transistors : Physical structure and operation modes, Active region operation of transistor, DC analysis of transistor circuits, Ebor-Moll model ,Current voltage characteristics of CE, CB, CC configuration Transistor as an amplifier, Transistor as a switch.

**Contemporary Issues related to Topic**

| Unit:2 | Transistor Biasing Techniques | 7 Hours |
|---|---|---|

Transistor Biasing, The Operating Point, Bias Stability, Self-Bias, Fixed bias, collector to base bias, Emitter feedback bias, Stabilization against Variations in Ico, VBE, AND β, Collector-Current Stability, Thermal Runaway

**Contemporary Issues related to Topic**

| Unit:3 | MOSFET and Biasing Techniques | 8Hours |
|---|---|---|

Field-effect Transistors -The Junction Field-effect Transistor, The Pinch-off Voltage Vp, The JFET Volt-Ampere Characteristics, MOSFET Device Structure and Physical Operation of MOSFET, Finite Output Resistance in Saturation, Characteristics of the MOSFET, Small Signal Equivalent Model, MOSFET Biasing by Fixing VGS, Biasing by Fixing VG and Connecting a Resistance in the Source, Biasing Using a Drain-to-Gate Feedback Resistor, Biasing Using a Constant-Current Source.

**Contemporary Issues related to Topic**

| Unit:4 | MOSFET Amplifiers and Small signal operation of MOSFET | 7 Hours |
|---|---|---|

MOSFET Amplifiers: Common Source, Common Drain and Common Gate Amplifiers. Small signal operation of MOSFET using π model and T model, Internal capacitances and high frequency model of MOSFET. Small signal operation of BJT.

**Contemporary Issues related to Topic**

| Unit:5 | Feedback Amplifiers and Oscillators | 8 Hours |
|---|---|---|
| Feedback Amplifier : The General Feedback Structure, Various properties of Negative and positive Feedback, The Four Basic Feedback Topologies. The series-shunt Feedback amplifier, The series-series Feedback amplifier, The shunt-shunt Feedback amplifier, The shunt-series Feedback amplifier, RC phase shift<br>**Contemporary Issues related to Topic** | | |
| **Unit :6** | **Power Amplifier** | **7 Hours** |
| Power Amplifier: Class A, Class B, Class AB and Class C, Class D. Power Efficiency, Power Dissipation, Cross-Over Distortion in Class AB Circuits, Class A Transformer Coupled Power Amplifier, and Harmonic Distortion due to Large Signal operation.<br>**Contemporary Issues related to Topic** | | |
| **Total Lecture Hours** | | **45 Hours** |

| **Textbooks** | |
|---|---|
| **1** | Sedra Smith, Microelectronics Circuits , 5th Edition 2010-01-07, Oxford Uni. Press |
| **2** | MillMan Halkias, Integrated Electronics , 7th edition 2009, Tata McGraw Hills |
| **Reference Books** | |
| **1** | Electronic Devices and Theory, BoyleStad, Nashelsky, 9th. Edition May 2010, PHI |
| **2** | Electronic Devices and Circuits, S Salivahanan, N Suresh Kumar, 3rd Edition, Tata McGraw Hills |
| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
| **1** | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/3.MillmanHalkias-ElectronicDevicesCircuits.pdf |
| **2** | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/ecopies%20of%20books/Electronics%20and%20Telecommunication/2.Microelectronic%20Circuits%20by%20Sedra%20Smith,5th%20edition.pdf |
| **MOOCs Links and additional reading, learning, video material** | |
| **1** | https://www.youtube.com/playlist?list=PL350612601E2DBFDE |
| **2** | https://onlinecourses.nptel.ac.in/noc21_ee80/preview |

# III Semester
# 23ET1304 – Lab: Electronic Devices and Circuits

| **Course Outcomes:** |
|---|
| **Upon successful completion of the course the students will be able to**<br>1. Analyze the transistor circuits for different configurations.<br>2. Design transistor circuit with suitable biasing and stabilization techniques.<br>3. Analyze the response of transistors at low and high frequency<br>4. Analyze the effect of feedback on gain and frequency of amplifiers<br>5. Analyze power amplifier circuits. |

| Sr. No. | Experiments based on |
|---|---|
| 1 | V- I characteristics of PN junction diode (Silicon), Zener diode, LED. |
| 2 | Find the i) Voltage regulation ii) Load Regulation of a Zener shunt regulator |
| 3 | Design Half wave & Full Wave Rectifier with filter |
| 4 | I/P & O/P Characteristics of Common Base Transistor |
| 5 | I/P & O/P Characteristics of Common Emitter Transistor Configuration |
| 6 | Obtain Frequency Response of single stage CE Amplifier |
| 7 | Drain and Transfer characteristics of Field Effect Transistor (FET) |
| 8 | Drain and Transfer characteristics of Metal Oxide Semiconductor Field Effect Transistor (MOSFET) |
| 9 | The frequency response of Common Source amplifier. |
| 10 | Design Fixed Bias circuit and Self Bias circuit and observe the effect of temperature variation on transistor parameters |
| 11 | Design Class B Amplifier with Cross Over Distortion. |
| 12 | Orcad based simulation of class AB power Amplifier. |
| 13 | Design RC Phase Shift Oscillator. |

## III Semester
## 23ET1305- Electromagnetic Fields

**Course Outcomes:**

**Upon successful completion of the course the students will be able to**

1. Use appropriate co-ordinate systems for solving electromagnetic fields problems.
2. Apply the principles of electrostatics & magneto-statics for the solution of problems relating to electric and magnetic field.
3. Analyze static and time varying fields using Maxwell's equations.
4. Examine wave propagation in different medium.

| Unit:1 | Coordinate systems | 8 Hours |
|---|---|---|

Orthogonal coordinate systems: Cartesian, cylindrical, spherical and transformations, Gradient of a Scalar Field. Divergence of a Vector Field , Curl of a Vector Field , Laplacian Operator, Irrotational and solenoidal field.

**Contemporary Issues related to Topic**

| Unit:2 | Electric Field Intensity | 7 Hours |
|---|---|---|

Coulomb's law , Electric field intensity for different charge distribution : point , line surface , volume , Concept of electric flux , Gauss's law and it's application to field computation in symmetric structures and non symmetric structures , Divergence theorem

**Contemporary Issues related to Topic**

| Unit:3 | Concept of energy & work done | 8 Hours |
|---|---|---|

Concept of energy & work done in moving a point charge : linear and circular path , Electric scalar potential :Absolute Potential and potential difference , Conservative property of Potential field , Potential field of a system of charges : circular ring and disk Dipole moment, electric field at a distant point due to electric dipole, Electrostatic energy density. Poisson's and Laplace's equation and its examples of solutions, Uniqueness of electrostatic solution

**Contemporary Issues related to Topic**

| Unit:4 | Magnetic Field Intensity | 8 Hours |
|---|---|---|

Biot –Savart law and applications to infinite and finite current filament, Ampere's Circuital law and applications to line charge, coaxial transmission cables, uniform current sheet charge, solenoid, toroid ,Stoke's Theorem Magnetic flux and magnetic flux density , Scalar and vector magnetic potential, Nature of magnetic materials , boundary conditions at interface of two magnetic fields , Potential energy.

**Contemporary Issues related to Topic**

| Unit:5 | Maxwell's equations | 7 Hours |
|---|---|---|
| Time varying fields and Maxwell's equations: Faradays law, Displacement current, Maxwell's equation in point form, Maxwell's equations in integral form.<br>**Contemporary Issues related to Topic** | | |
| **Unit :6** | **Uniform plane wave** | **7 Hours** |
| Uniform plane wave, wave propagation in free space, wave propagation in Dielectrics, Poynting's Theorem and wave equations<br>**Contemporary Issues related to Topic** | | |
| | **Total Lecture Hours** | **45 Hours** |

| **Textbooks** | |
|---|---|
| **1** | William H. Hayt,Engineering Electromagnetics,Seventh Edition,Tata McGraw – Hill. |
| **2** | J D Kraus,Electromagnetics,4th edition1992,McGraw – Hill |
| **3** | David K. Cheng,Field and Wave Electromagnetics,Second Edition 21 Jan 2010,Addison Wesley. |
| **Reference Books** | |
| **1** | Ashutosh Pramanik,Electromagetism Theory and application,2nd Edition2009,Prentice Hall |
| **2** | M. N. O. Sadku,Elements of Electromagnetis,Oxford Press |
| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
| **1** | chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/elements-of-electromagnetics-by-matthew-n-o-sadiku.pdf |
| **2** | chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/Engineering%20Electromagnetics%20-%20William%20%20Hayt.pdf |
| **3** | chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/EM_Hayt_6th.pdf |
| **MOOCs Links and additional reading, learning, video material** | |
| **1** | https://youtube.com/playlist?list=PLuv3GM6-gsE3-hVNaw-YEb7EeY5XVPZdz |
| **2** | https://www.youtube.com/watch?v=pGdr9WLto4A<br>https://www.youtube.com/watch?v=NNny9gMh_jo |
| **3** | https://www.youtube.com/watch?v=6FZusYyg0Po |

## III SEMESTER

## 23ET1306- Lab : Field Project

## III SEMESTER
## Multidisciplinary Minor Courses

### Track 1

| Courses | Sem | MDMT1ET101 : Instrumentation |
|---|---|---|
| MDM-I | 3 | (MDM1ET101) Electronic Measurement |
| MDM-II | 4 | (MDM2ET102) Sensors & Transducers |
| MDM-III | 5 | (MDM3ET103) Industrial Instrumentation |
| MDM-IV | 6 | (MDM4ET104) Biomedical Instrumentation I |
| MDM-V | 7 | (MDM5ET105) Biomedical Instrumentation II |
| MDM-VI | 8 | (MDM6ET106) Industrial Automation |

### Track 2

| Courses | Sem | MDMT2ET201 : Wireless Communication |
|---|---|---|
| MDM-I | 3 | (MDM1ET201) Analog Communication I |
| MDM-II | 4 | (MDM2ET202) Analog Communication II |
| MDM-III | 5 | (MDM3ET203) Digital Communication |
| MDM-IV | 6 | (MDM4ET204) Fundamentals of Communication Networks |
| MDM-V | 7 | (MDM5ET205) Mobile Communication |
| MDM-VI | 8 | (MDM6ET206) 5G Communication |

### Track 3

| Courses | Sem | MDMT3ET301 : Microcontroller systems design |
|---|---|---|
| MDM-I | 3 | (MDM1ET301) Basic Electronics |
| MDM-II | 4 | (MDM2ET302) Digital Circuits |
| MDM-III | 5 | (MDM3ET303) Microcontroller |
| MDM-IV | 6 | (MDM4ET304) Advanced Processor |
| MDM-V | 7 | (MDM5ET305) Fundamentals of IoT |
| MDM-VI | 8 | (MDM6ET306) Fundamentals of PLC |

## III Semester
## Track1 : MDMT1ET101 : Instrumentation
## MDM1ET101 –Electronic Measurement

**Course Outcomes:**

**Upon successful completion of the course the students will be able to**

1. Explore basic measurement system with different types of standards and errors
2. Analyze the behavior of bridge circuits for the measurement of different electrical quantities.
3. Demonstrate the working of measuring instrument, display devices.
4. Acquire the knowledge of various generators & analyzers.

| | | |
|---|---|---|
| **Unit:1** | **Introduction to Measurement System** | **7 Hours** |

Introduction, standards, Static & dynamic characteristics of measurement system, need of calibration, Types of errors & their sources, limiting errors & Statistical analysis.

**Contemporary Issues related to Topic**

| | | |
|---|---|---|
| **Unit:2** | **AC & DC Bridges** | **8 Hours** |

DC bridges - Wheatstone bridge, Kelvin's double bridge. AC bridges – Inductance measurement- Maxwell's Induction bridge, Maxwell's Induction capacitance bridge, Hays Bridge, Capacitance measurement- Schering bridge, Frequency measurement- Wien bridge.

**Contemporary Issues related to Topic**

| | | |
|---|---|---|
| **Unit:3** | **Electronic Instruments** | **8 Hours** |

DC meters, AC Voltmeter, Electronic Multimeter, Digital Multimeter, LCR-Q meter, Dual trace CRO, Digital Storage Oscilloscope.

**Contemporary Issues related to Topic**

| | | |
|---|---|---|
| **Unit:4** | **Signal Generators & Analyzers** | **7 Hours** |

AF Generator, Pulse characteristics, Pulse Generators, Function Generator, Wave analyzer, Spectrum analyzer, Distortion analyzer .

**Contemporary Issues related to Topic**

| | |
|---|---|
| **Total Lecture Hours** | **30 Hours** |

| | |
|---|---|
| **Textbooks** | |
| **1** | Electrical and Electronic Measurements AND Instrumentation, A. K. Sawhney, Dhanpat Rai &Co. |
| **2** | Modern Electronic Instrumentation and Measurement Techniques,Albert D. Helfrick ,William D. Cooper,2007 Edition PHI Publication. |
| **Reference Books** | |
| **1** | Electrical and Electronic Measurement PHI Publication, R. K. Rajput,1st Edition 2008. |
| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
| **1** | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/ |
| **MOOCs Links and additional reading, learning, video material** | |
| **1** | https://nptel.ac.in/courses/108105153 |

## III Semester
## Track2 : MDMT2ET201 : Wireless Communication
## (MDM1ET201) Analog Communication I

| Course Outcomes: |
|---|
| **Upon successful completion of the course the students will be able to**<br>1. Analyze different analog modulation techniques.<br>2. Analyze communication receiver and evaluate different parameters |

| Unit:1 | Amplitude Modulation | 7 Hours |
|---|---|---|
| Block Diagram of Communication system, Need for modulation, Amplitude Modulation (AM), Mathematical Analysis, modulation index, frequency spectrum, power requirement of these Systems, AM Generation Method.<br>**Contemporary Issues related to Topic** | | |
| **Unit:2** | **DSB-SC and SSB Modulation** | **8 Hours** |
| DSB-SC modulation, time domain and frequency domain description, Generation of DSB-SC waves, SSB Modulation, generation of AM- SSB Modulated wave, Demodulation of SSB Waves, Vestigial side band modulation, Generation of VSB modulated wave, Applications of different AM waves.<br>**Contemporary Issues related to Topic** | | |
| **Unit:3** | **Angle Modulation** | **8 Hours** |
| Frequency Modulation (FM), mathematical Analysis, modulation index, frequency spectrum, narrowband & wideband FM, noise triangle in FM, Pre-emphasis & De-emphasis techniques, Phase modulation, power contents of the carrier & the sidebands in angle modulation, FM Generation Method.<br>**Contemporary Issues related to Topic** | | |
| **Unit:4** | **Radio Receivers** | **7 Hours** |
| Basic TRF Receiver, Super heterodyne receiver, performance parameters for receiver such as sensitivity, selectivity, fidelity, image frequency rejection etc., AM Detectors, FM discriminators, AGC technique.<br>**Contemporary Issues related to Topic** | | |
| | **Total Lecture Hours** | **30 Hours** |

| Textbooks | |
|---|---|
| **1** | Gorge Kennedy, "Electronic Communication System", Tata McGraw-Hill, 4thEdition-(Year: 1999). |
| **2** | Simon Haykin, " Principles of Communication Systems", John Wiley, 2nd Ed. |

| Reference Books | |
|---|---|
| 1 | K. Sam Shanmugam, "Digital and Analog communication systems", John Wiley & Sons, 1st edition 2005. |
| 2 | Frenzel "Communication Electronics", MGH. Third Edition 2001 |
| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
| 1 | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/KENNEDY%204th%20edition.pdf. |
| 2 | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/ANALOG%20COMMUNICATIONS%20-%20Dr.%20B.V.Raju%20Institute%20of%20(%20PDFDrive.com%20).pdf |
| 3 | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/Analog%20and%20Digital%20Communication%20Systems%20(%20PDFDrive.com%20).pdf |
| 4. | https://harshasnmp.files.wordpress.com/2017/11/monochrome-and-colour-television-r-r-gulati.pdf |
| **MOOCs Links and additional reading, learning, video material** | |
| 1 | NPTEL Course on Analog Communication by Prof. Goutam Das, IIT Kharagpur, https://nptel.ac.in/courses/117105143 |

## III Semester
## Track3 : MDMT3ET301 :Microcontroller systems design
## (MDM1ET301) Basic Electronics

**Course Outcomes:**

At the completion of this course, student will be able to

1. Analyse and describe the function and operation of diodes, rectifiers, transistors and amplifiers.
2. Analyze and describe architecture, functions & applications of Operational Amplifier

| Unit:1 | Semiconductors and Diodes | 8 Hours |
|---|---|---|

Semiconductors, Intrinsic Semiconductors, Extrinsic Semiconductors. Diode Theory: Basic Ideas, The ideal Diode, Forward and Reverse Bias, Diode Equation, Volt-Ampere Characteristic. Special diodes: symbol of Zener diode, operation, V-I characteristics, symbol of photo diode, working principle, LED symbol and principle

**Contemporary Issues related to Topic**

| Unit:2 | Rectifiers | 7 Hours |
|---|---|---|

Half-wave Rectifier, Full-wave and Bridge Rectifier, derivation of Ripple factor, efficiency of Half-wave, full-wave and Bridge rectifiers. Merits and demerits of Half-wave, full-wave and Bridge rectifiers, Comparisons of rectifiers.

**Contemporary Issues related to Topic**

| Unit:3 | Bipolar Junction Transistors | 8 Hours |
|---|---|---|

Symbols of pnp and npn transistors and their working principles, Transistor currents, input and output characteristics of Common base configuration, Common Emitter configuration Transistor Switch, Amplifiers: working principles of Common base amplifier, Common Emitter amplifier, Common collector amplifier and their applications, FET

**Contemporary Issues related to Topic**

| Unit:4 | Operational Amplifier and Its Application | 7 Hours |
|---|---|---|

Introduction to Op-Amp, Inverting and Non-Inverting Amplifier, Linear Applications of OP-AMP like adder, Subtractor, integrator, differentiator and non-linear application using Comparator.

**Contemporary Issues related to Topic**

| Total Lecture Hours | 30 Hours |
|---|---|

**Textbooks**


| | |
|---|---|
| 1 | Albert Malvino and David J Bates, " Electronic Principles" , 7th Edition, Tata McGraw –Hill. |
| 2 | Boyelstad, " Electronic Devices and Circuits Theory", Pearson Education, 8th Edition |
| 3 | Ramakanth A. Gayakwad, " Op-Amps and Linear Integrated Circuits" - PHI, 4th Edition |

| Reference Books | |
|---|---|
| 1 | S.Salivahanan, Kumar, Vallavaraj , "Electronic Devices and Circuits" , TATA McGraw Hill, 2nd Edition, |
| 2 | D. Roy Chowdhury, " Linear Integrated Circuits", New Age International Pvt.Ltd., 2nd Edition |
| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
| 1 | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/ |
| **MOOCs Links and additional reading, learning, video material** | |
| 1 | http://nptel.ac.in/courses.php http://jntuk-coeerd.in/ |

# III SEMESTER

## Open Elective -I : Basket

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject |
|---|---|---|---|---|---|
| 1 | 3 | OE1 | GE | 23OE1301 | OE-I : Combinatorics |
| 2 | 3 | OE1 | GE | 23OE1302 | OE-I : Fuzzy Set Theory, Arithmetic And Logic |
| 3 | 3 | OE1 | GE | 23OE1303 | OE-I : Green Chem. & Sustainability |
| 4 | 3 | OE1 | GE | 23OE1304 | OE-I : Hydrogen Fuel |
| 5 | 3 | OE1 | GE | 23OE1305 | OE-I : Electronic Materials And Applications |
| 6 | 3 | OE1 | GE | 23OE1306 | OE-I : Laser Technology And Applications |
| 7 | 3 | OE1 | MGT | 23OE1307 | OE-I : Finance And Cost Management |
| 8 | 3 | OE1 | MGT | 23OE1308 | OE-I : Operation Research Techniques |
| 9 | 3 | OE1 | MGT | 23OE1309 | OE-I : Project Evaluation & Management |
| 10 | 3 | OE1 | MGT | 23OE1310 | OE-I : Total Quality Management |
| 11 | 3 | OE1 | MGT | 23OE1311 | OE-I : Value Engineering |
| 12 | 3 | OE1 | MGT | 23OE1312 | OE-I : Maintenance Management |
| 13 | 3 | OE1 | MGT | 23OE1313 | OE-I : Industrial Safety |
| 14 | 3 | OE1 | MGT | 23OE1314 | OE-I : Industry 4.0 |
| 15 | 3 | OE1 | MGT | 23OE1315 | OE-I : Operation Management |
| 16 | 3 | OE1 | MGT | 23OE1316 | OE-I : Material Management |
| 17 | 3 | OE1 | MGT | 23OE1317 | OE-I : Hospitality Management |
| 18 | 3 | OE1 | MGT | 23OE1318 | OE-I : Human Resource Management & Organizational Behaviour |
| 19 | 3 | OE1 | MGT | 23OE1319 | OE-I : Agri-Business Management |
| 20 | 3 | OE1 | MGT | 23OE1320 | OE-I : Rural Marketing |
| 21 | 3 | OE1 | MGT | 23OE1321 | OE-I : Marketing Management |
| 22 | 3 | OE1 | MGT | 23OE1322 | OE-I : Health Care Management |

**Link for Open Electives syllabus:** https://ycce.edu/syllabus/

## III SEMESTER

## Mandatory Learning Course (MLC)

## MLC2123 : YCAP3

Nagar Yuwak Shikshan Sanstha's

# Yeshwantrao Chavan College of Engineering

*(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)*

**(Accredited 'A++' Grade by NAAC with a score of 3.6)**

Hingna Road, Wanadongri, Nagpur - 441 110


# Bachelor of Technology

# SoE & Syllabus 2023

## 4th Semester

**(Department of Electronics & Telecommunication Engineering)**

## B. Tech in Electronics & Telecommunication Engineering

Nagar Yuwak Shikshan Sanstha's

**Yeshwantrao Chavan College of Engineering**

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

**B.TECH SCHEME OF EXAMINATION 2023**

(Scheme of Examination w.e.f. 2023-24 onward)

**(Department of Electronics & Telecommunication Engineering)**

**B. Tech. in Electronics & Telecommunication Engineering**

SoE No. 23ET-101

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject | T/P | Contact Hours | | | | Credits | % Weightage | | | ESE Duration Hours |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L | T | P | Hrs | | MSEs* | TA** | ESE | |
| **FOURTH SEMESTER** | | | | | | | | | | | | | | | |
| 1 | 4 | BS | GE | 23GE1404 | Probability Theory and Sampling Theory | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 2 | 4 | HSSM-2 | GE | 23GE1401 | Entrepreneurship Development | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| 3 | 4 | **AEC-2** | GE | 23GE1405<br>23GE1406 | Marathi Language<br>Hindi Language | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| 4 | 4 | PC | ET | 23ET1401 | Analog Communication | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 5 | 4 | PC | ET | 23ET1402 | **Lab** : Analog Communication | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 6 | 4 | PC | ET | 23ET1403 | Microcontroller and Interfacing | T | 3 | 0 | 0 | 3 | 3 | 30 | 20 | 50 | 3 |
| 7 | 4 | PC | ET | 23ET1404 | **Lab** : Microcontroller and Interfacing | P | 0 | 0 | 2 | 2 | 1 | | 60 | 40 | |
| 8 | 4 | VSEC-3 | ET | 23ET1405 | **Lab :** Electronic workshop and Equipment Maintenance | P | 0 | 0 | 2 | 4 | 2 | | 60 | 40 | |
| 9 | 4 | VEC-2 | ET | 23ET1406 | Python for Data Science | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| 10 | 4 | OE-2 | OE | | **Open Elective-II** | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| 11 | 4 | MDM | ET | | **MD Minor Course-II** | T | 2 | 0 | 0 | 2 | 2 | 30 | 20 | 50 | 3 |
| | | | | | **TOTAL** | | **19** | **0** | **6** | **27** | **23** | | | | |

| **List of Mandatory Learning Course (MLC)** | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4 | HS | T&P | MLC2124 | **YCAP4 :** YCCE Communication Aptitude Preparation | **A** | 3 | 0 | 0 | 3 | **0** | | | | |

**Open Elective - II**

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject |
|---|---|---|---|---|---|
| 1 | 4 | OE2 | GE | 23OE2401 | OE-II : Combinatorics |
| 2 | 4 | OE2 | GE | 23OE2402 | OE-II : Fuzzy Set Theory, Arithmetic And Logic |
| 3 | 4 | OE2 | GE | 23OE2403 | OE-II : Green Chem. & Sustainability |
| 4 | 4 | OE2 | GE | 23OE2404 | OE-II : Hydrogen Fuel |
| 5 | 4 | OE2 | GE | 23OE2405 | OE-II : Electronic Materials And Applications |
| 6 | 4 | OE2 | GE | 23OE2406 | OE-II : Laser Technology And Applications |
| 7 | 4 | OE2 | MGT | 23OE2407 | OE-II : Finance And Cost Management |
| 8 | 4 | OE2 | MGT | 23OE2408 | OE-II : Operation Research Techniques |
| 9 | 4 | OE2 | MGT | 23OE2409 | OE-II : Project Evaluation & Management |
| 10 | 4 | OE2 | MGT | 23OE2410 | OE-II : Total Quality Management |
| 11 | 4 | OE2 | MGT | 23OE2411 | OE-II : Value Engineering |
| 12 | 4 | OE2 | MGT | 23OE2412 | OE-II : Maintenance Management |
| 13 | 4 | OE2 | MGT | 23OE2413 | OE-II : Industrial Safety |
| 14 | 4 | OE2 | MGT | 23OE2414 | OE-II : Industry 4.0 |
| 15 | 4 | OE2 | MGT | 23OE2415 | OE-II : Operation Management |
| 16 | 4 | OE2 | MGT | 23OE2416 | OE-II : Material Management |
| 17 | 4 | OE2 | MGT | 23OE2417 | OE-II : Hospitality Management |
| 18 | 4 | OE2 | MGT | 23OE2418 | OE-II : Human Resource Management & Organizational Behaviour |
| 19 | 4 | OE2 | MGT | 23OE2419 | OE-II : Agri-Business Management |
| 20 | 4 | OE2 | MGT | 23OE2420 | OE-II : Rural Marketing |
| 21 | 4 | OE2 | MGT | 23OE2421 | OE-II : Marketing Management |
| 22 | 4 | OE2 | MGT | 23OE2422 | OE-II : Health Care Management |

| | | July, 2023 | 1.00 | Applicable for AY 2023-24 Onwards |
|---|---|---|---|---|
| Chairperson | Dean (Acad. Matters) | Date of Release | Version | |

## IV SEMESTER

## 23GE1404 : Probability Theory and Sampling Theory

| **Course Outcomes:** |
|---|
| **Upon successful completion of the course the students will be able to** |
| 1. Identify an appropriate probability distribution for a given discrete or continuous random variable and compute probabilities. |
| 2. Use probability distributions to solve a given problem |
| 3. Apply concepts of sampling theory to find probabilities and estimate parameters of various problems. |
| 4. Test the hypothesis and estimate confidence intervals at different levels. |

| **Unit I:** | **8 Hrs.** |
|---|---|
| **Random Variables and Probability Distributions**: Conditional probability, Baye's theorem. Discrete and Continuous random variables, Probability function and Distribution function, Joint distributions. Independent Random variables, Conditional Distribution. | |
| **Unit II:** | **7 Hrs.** |
| **Mathematical Expectation:** Mathematical Expectation, Variance and Standard Deviation, Moments, Moment generating function, Skewness and Kurtosis. | |
| **Unit III:** | **7 Hrs.** |
| **Special Probability Distributions:** Binomial, Geometric, Poisson, Exponential, Normal, Central Limit theorem. | |
| **Unit IV:** | **8 Hrs.** |
| **Sampling Theory:** Unbiased and efficient estimates, Point estimates and interval estimates. Confidence interval for means, Confidence interval for proportions, Confidence interval for differences and sums of mean and proportions. | |
| **Unit V:** | **7 Hrs.** |
| **Estimation:** Unbiased and efficient estimates. Point estimates and interval estimates. Confidence interval for means, Confidence interval for proportions, Confidence interval for differences and sums of mean and proportions. | |
| **Unit VI:** | **8 Hrs.** |
| **Hypothesis Testing:** Definition of hypothesis, Testing of hypothesis for large samples using normal distributions. Testing of hypothesis for small distributions (student's t-test, F-test). Goodness of fit test (Chi-square distribution). | |
| **Total Lecture** | **45 Hours** |

| | | | | | |
|---|---|---|---|---|---|
| | | | June,2024 | 1.00 | Applicable for AY 2024-25 Onwards |
| Chairperson | Dean (Acad. Matters) | Dean OBE | Date of Release | Version | |

| Textbooks: | |
|---|---|
| 1 | M. R. Spiegel, The theory and problems of probability and Statistics, 3rd edition, Schaum series. (McGraw Hill) |
| 2 | Michael J. Evans and Jeffrey S. Rosenthal, Probability and Statistics, 2nd edition, W. H. Freeman publisher, 2009 |

| Reference Books: | |
|---|---|
| 1 | S. C.Gupta and V.K.Kapoor , Fundamentals of Mathematical statistics, 10th Edition, Sultan chand and son, 2001. |
| 2 | G Balaji, Probability and Statistics, 15th edition, G Balaji publisher, 2017 |

| YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS] | |
|---|---|
| 1 | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Applied%20Sciences%20&%20Humanities/Mathematics%20and%20Humanities/ |

| MOOCs Links and additional reading, learning, video material | |
|---|---|
| 1 | https://nptel.ac.in/courses/111106051 |
| 2 | https://archive.nptel.ac.in/courses/111/104/111104137/ |
| 3 | https://archive.nptel.ac.in/courses/111/106/111106135/ |

## IV SEMESTER
## 23GE1401 : Entrepreneurship Development

| **Course Outcomes:** |
|---|
| **Upon successful completion of the course the students will be able to** |
| 1. Appreciate role of entrepreneurs in society and develop entrepreneurial abilities by providing information about skill sets.<br>2. Develop an understanding of how and what form of business organization to choose for start up.<br>3. Stimulate to innovate, develop prototypes or ideas by applying theory into practice.<br>4. Identify the Support rendered by various Government Agencies. |

| **Unit I:** | **7 Hrs.** |
|---|---|
| **Entrepreneur & Entrepreneurship:** Meaning of Entrepreneur, Evolution of the concept – Theories and Models, Types of Entrepreneur, Stages in entrepreneurial process- Idea Generation, Screening, Selection and Managing Resources. | |
| **Unit II:** | **8 Hrs.** |
| **Legal Compliances for Incorporating Start up:** Fundamentals of choosing the Business Organization form for startup, Incorporation of Partnership, LL.P & Co – operative, Incorporation of One Person Company, Pvt. Ltd., Pub. Ltd. and not for profit company, Financing the legal Venture and Legal Compliances. | |
| **Unit III:** | **7 Hrs.** |
| **Entrepreneurship and IP Strategy:** Intellectual Property : Definition and Concept of Trade Mark, Patent, Copyright, Industrial Design, IP Strategy and Entrepreneurship. | |
| **Unit IV:** | **8 Hrs.** |
| **Support to Entrepreneurs:** Financing new ventures, Business Incubators – Government Policy for Small Scale Enterprises, Growth Strategies in small industry – Expansion, Diversification, Joint Venture, Merger and Subcontracting. | |
| **Total Lecture** | **30 Hours** |

| **Student activities:** | |
|---|---|
| 1. | Interview at least four entrepreneurs or businessman and identify Traits of successful entrepreneurs. |
| 2. | Analyse case studies of any two successful entrepreneurs. |
| 3. | Download product development and innovative films from internet. |
| 4. | Identify your hobbies and interests and convert them into business idea |

| | |
|---|---|
| **Textbooks** | |
| **1.** | Khanka. S.S., "Entrepreneurial Development" S.Chand & Co. Ltd.,Ram Nagar, New Delhi, 2013. |
| **2.** | Donald F Kuratko, "Entrepreneurship – Theory, Process and Practice", 9th Edition, Cengage Learning 2014. |
| **3.** | Corporate Law, 33rd ed. 2016, Taxman New Delhi. |
| **4.** | Narayanan, V. K., Managing technology and innovation for competitive advantage, first edition, Pearson education, New Delhi, (2006) |
| **5.** | Idris, K. (2003), Intellectual property: a power tool for economic growth, second edition, WIPO publication no. 888, Switzerland |
| **6.** | Khanka. S.S., "Entrepreneurial Development" S.Chand & Co. Ltd.,Ram Nagar, New Delhi, 2013. |
| **7.** | Ramaiya's Guide to the Companies Act, 18th ed. 2014, Lexis Nexis New Delhi. |
| **Reference Books** | |
| **1.** | Mehta, Monica- The Entrepreneurial Instinct : How everyone has the innate ability to start a successful small business – McGraw – Hill Education, New Delhi 2012, ISBN 978-0-07-179742-9 |
| **2** | Prasanna Chandra "Protect Preparation, Appraisal, Implementation" Tata McGraw Hill. New Delhi |
| **3** | S Anil Kumar "Entrepreneurship Development" New Age International Publishers |
| **4** | Nishith Dubey "Entrepreneurship Development" PHI Learning |
| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
| **1** | http://link.springer.com/openurl?genre=book&isbn=978-1-4613-6193-0 |
| **2** | https://onlinelibrary.wiley.com/doi/book/10.1002/9780470168042 |
| **MOOCs Links and additional reading, learning, video material** | |
| **1** | https://onlinecourses.swayam2.ac.in/cec23_mg24/course- entrepreneurship development |
| **2** | https://onlinecourses.nptel.ac.in/noc23_mg74/announcements?force=true-entrepreneur |
| **3** | https://onlinecourses.nptel.ac.in/noc23_mg126/announcements?force=true- Business fundamentals for entrepreneurship |

## IV SEMESTER
## 23GE1405 : Marathi Language

| Course Objectives |
|---|
| 1. मराठी भाषेच्या समृद्धीची जाणीव करून देणे.<br>2. विद्यार्थ्यांमध्ये भाषा कौशल्याचा विकास करणे आणि त्यातून रोजगाराच्या संधींचा शोध घेणे. |

| Course Outcomes |
|---|
| 3. भाषेचा जीवन व्यवहारात योग्य पद्धतीने वापर करण्याचा प्रयत्न करणे.<br>4. संत साहित्याच्या शिकवणुकीमुळे मानवता आणि मानवी व्यवहाराची सांगड घालणे, नैतिक मूल्ये रुजविणे.<br>5. विद्यार्थ्यांना रोजगाराभिमुख बनविणे. |

| Unit:1 | गद्य विभाग | 8 Hours |
|---|---|---|

| | | |
|---|---|---|
| १. | भारतीय लोकशाहीचे भवितव्य काय? | - डॉ. बाबासाहेब आंबेडकर |
| २. | काळी आई | - व्यंकटेश माडगूळकर |
| ३. | संत तुकारामांचे अभंग | - निर्मलकुमार फडकुले |
| ४. | माझी शाळा | - प्रकाश खरात |
| ५. | समतेचे वारकरी संत गाडगेबाबा आणि राष्ट्रसंत तुकडोजी महाराज | - अशोक राणा |
| ६. | लोककल्याणकारी राजा : | - शरयू तायवाडे |

| Unit:2 | पद्य विभाग | 8 Hours |
|---|---|---|

| | | |
|---|---|---|
| १. | ज्ञानेश्वरांचे अभंग | - संत ज्ञानेश्वर |
| २. | वनसुधा | - वामन पंडित |
| ३. | नवा शिपाई | - केशवसुत |
| ४. | मेंढरं | - विठ्ठल वाघ |
| ५. | पोरी | - अनुराधा पाटील |
| ६. | गाव | - हेमंतकुमार कांबळे |

| Unit:3 | व्यावहारिक मराठी | 7 Hours |
|---|---|---|

१. म्हणी
२. मुलाखतलेखन - डॉ. वैशाली धनविजय
३. वाक्प्रचार
४. जाहिरातलेखन - डॉ. अजय देशपांडे

| Unit:4 | रोजगाराभिमुख मराठी व्यावहारिक कौशल्ये | 7 Hours |
|---|---|---|

१. प्रत्यक्ष मुलाखत कौशल्य
२. वाचन कौशल्य - (अ) बातमी वाचन (ब) कथा वाचन
३. ऑनलाईन कौशल्य - (अ) ग्राहक सेवा केंद्राशी संवाद, (ब) ऑनलाईन अर्ज करणे

**Reference Books**

1. पाठ्यपुस्तक **: शब्दसाधना - भाग १**
2. रोजगाराभिमुख मराठी व्यावहारिक कौशल्ये

# IV SEMESTER
# 23GE1406 : Hindi Language

## Course Objectives

6. विद्यार्थियों में देशभक्तिपरक एवं पारिवारिक मूल्यों का विकास |
7. विद्यार्थियों पर्यावरण-संरक्षण के प्रति सजग करना |
8. एकांकी, कहानी, निबंध आदि विधाओं के मध्य का अंतर अवगत कराना |
9. हिंदी के प्रयोजनमूलक स्वरूप से परिचित कराना |
10. विद्यार्थियों को आधुनिक प्रौद्योगिकी (तकनीक) का प्रयोग करने में सक्षम बनाना |.

## Course Outcomes

1. पौराणिक अथवा ऐतिहासिक घटनाओं को तार्किक आधार पर स्वीकार करेंगे | अपने परिवेश के उचित और अनुचित व्यवहारों के प्रति आकलन शक्ति बढ़ेगी |
2. एकांकी, कहानी, निबंध आदि विधाओं के मध्य का अंतर बताने में सक्षम होंगे |
3. कविता का रसास्वादन करने में समर्थ होंगे |
4. 'अनुवाद' के स्वरूप एवं प्रक्रिया से अवगत होंगे |
5. 'मार्गिक नक़्शे' का दैनिक जीवन में उपयोग करने में सक्षम होंगे |

| Unit:1 | गद्य विभाग | 8 Hours |
|---|---|---|

१. भाईसाहब (कहानी) - प्रेमचंद
२. स्मृति (निबंध) - श्रीराम शर्मा
३. गिल्लू (रेखाचित्र) - महादेवी वर्मा
४. अभाव (कहानी) - विष्णु प्रभाकर
५. महाभारत की साँझ (एकांकी) - भारतभूषण
६. उखड़े खंबे (व्यंग्य)। - हरिशंकर परसाई

| Unit:2 | पद्य विभाग | 8 Hours |
|---|---|---|

१. कबीर के दोहे - कबीरदास
२. ले चल यहाँ भुलावा देकर - जयशंकर प्रसाद
३. स्नेह-निर्झर बह गया - हैसूर्यकांत त्रिपाठी "निराला"
४. प्रथम रश्मि - सुमित्रानंदन पंत
५. जीवन का झरना - आरसीप्रसाद सिंह
६. कविता के साथ - दामोदर खड़से

| Unit:3 | अन्य पाठ्य सामग्री | 7 Hours |
|---|---|---|

१. मुहावरे और लोकोक्तियाँ: पाठ्यपुस्तक में मुहावरे और लोकोक्तियाँ का अर्थ एवं वाक्य प्रयोग

२. विज्ञापन कला : अर्थ, परिभाषा, प्रकार, शीर्षक का महत्त्व, विज्ञापन के प्रयोजन, सत्य, लक्ष्य, विज्ञापन की भाषा, अच्छे विज्ञापन के गुण इत्यादि ।

| Unit:4 | कौशल्य आधारित घटक | 7 Hours |
|---|---|---|

१. वाचन कौशल्य (समाचार-वाचन, कहानी-वाचन)
२. सोशल मीडिया के शिष्टाचार
३. ऑनलाइन आवेदन, ग्राहक-सेवा केंद्र से संवाद

**Reference Books**

3. पाठ्यपुस्तक : **"पलाश"**

# IV Semester
# 23ET1401 : Analog Communication

| Course Outcomes: |
|---|
| **Upon successful completion of the course the students will be able to** |
| 1. Analyze different analog modulation techniques. |
| 2. Analyze communication receiver and Evaluate different parameters |
| 3. Analyze and comprehend concept of television transmission and reception. |
| 4. Describe and analyze noise, Pulse modulation techniques and wave propagation of signals |

| Unit:1 | Amplitude Modulation | 8 Hours |
|---|---|---|

Block Diagram of Communication system, Need for modulation, Amplitude Modulation (AM), DSB-SC, SSB, VSB Transmissions, Mathematical Analysis, modulation index, frequency spectrum, power requirement of these Systems, AM Generation Method.

**Contemporary Issues related to Topic**

| Unit:2 | Angle Modulation | 7 Hours |
|---|---|---|

Frequency Modulation (FM), mathematical Analysis, modulation index, frequency spectrum, narrowband & wideband FM, noise triangle in FM, Pre-emphasis & De-emphasis techniques, Phase modulation, power contents of the carrier & the sidebands in angle modulation, FM Generation Method.

**Contemporary Issues related to Topic**

| Unit:3 | Radio Receivers | 7 Hours |
|---|---|---|

Basic TRF Receiver, Super heterodyne receiver, performance parameters for receiver such as sensitivity, selectivity, fidelity, image frequency rejection etc., AM Detectors, FM discriminators, AGC technique.

**Contemporary Issues related to Topic**

| Unit:4 | Composite Video Signal | 8 Hours |
|---|---|---|

Color Composite Video Signal, Horizontal sync and blanking pulses, Vertical sync and blanking pulses, color burst signal, Interlaced and Sequential scanning, Resolutions, CCIR-B Standards, TV Fundamentals, TV Transmitter and Receiver Block diagram. HDTV Introduction and definition, Digital TV receiver, Merits of digital TV receiver.

**Contemporary Issues related to Topic**

| Unit:5 | Noise | 7 Hours |
|---|---|---|

Sources of noise, External Noises, Internal Noises, Thermal noise, noise calculations, equivalent noise bandwidth, noise figure of an amplifier, effective noise temperature, calculation of noise figure for cascaded stages.

**Contemporary Issues related to Topic**

| Unit :6 | Pulse Modulation, Radiation & Propagation of signals | 8 Hours |
|---|---|---|
| Generation and Demodulation of PAM, PWM, PPM.<br>Basics of Radiation, Mechanisms of propagation, Ground wave, space wave and sky wave propagation, fading, diversity reception.<br>**Contemporary Issues related to Topic** | | |
| | **Total Lecture Hours** | **45 Hours** |

| **Textbooks** | |
|---|---|
| **1** | Gorge Kennedy,"Electronic Communication System", Tata McGraw-Hill, 4thEdition-(Year: 1999). |
| **2** | G. K. Mithal," Radio Engineering (Principles Of Communication Systems)", Edition, 15 ; Publisher, Khanna, 1988. |
| **3** | R. R. Gulati, "Modern Television Practice", New Age International publishers, 3rdEdition 2006. |
| **Reference Books** | |
| **1** | K. Sam Shanmugam,"Digital and Analog communication systems", John Wiley & Sons, 1st edition 1979. |
| **2** | Frenzel,"Communication Electronics", MGH. Third Edition 2001 |
| **3** | Dhake. A. M," Television and Video Engineering" ,Tata McGraw Hill 2nd Edition MAY 2001. |
| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
| **1** | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/KENNEDY%204th%20edition.pdf. |
| **2** | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/ANALOG%20COMMUNICATIONS%20-%20Dr.%20B.V.Raju%20Institute%20of%20(%20PDFDrive.com%20).pdf |
| **3** | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/Analog%20and%20Digital%20Communication%20Systems%20(%20PDFDrive.com%20).pdf |
| **4.** | https://harshasnmp.files.wordpress.com/2017/11/monochrome-and-colour-television-r-r-gulati.pdf |
| **MOOCs Links and additional reading, learning, video material** | |
| **1** | NPTEL Course on Analog Communication by Prof. Goutam Das, IIT Kharagpur, https://nptel.ac.in/courses/117105143 |

# IV Semester
# 23ET1402 : Lab: Analog Communication

| Course Outcomes: |
|---|
| **Upon successful completion of the course the students will be able to** |
| 1. Analyze different analog modulation techniques. |
| 2. Analyze communication receiver and Evaluate different parameters |
| 3. Analyze and comprehend concept of television transmission and reception. |
| 4. Describe and analyze noise, Pulse modulation techniques and wave propagation of signals |

| Sr. No. | Experiments based on |
|---|---|
| 1 | Amplitude Modulation. Calculate Modulation Index, Bandwidth and plot its frequency spectrum. |
| 2 | Amplitude Demodulation. |
| 3 | DSB-SC AM using Diode ring modulator. Calculate Bandwidth and plot its frequency spectrum. |
| 4 | Frequency Modulation. Calculate Modulation Index, Bandwidth and plot its frequency spectrum. |
| 5 | Frequency Demodulation. |
| 6 | Signal analysis of AM Super heterodynes Radio Receiver. |
| 7 | Analyze Composite Video Signal (CVS) and Color Composite Video Signal (CCVS) |
| 8 | Analyze various signals at the different stages of CTV. |
| 9 | Pulse Amplitude Modulation and Demodulation |
| 10 | Pulse Position Modulation and Demodulation |
| 11 | Pulse Width Modulation and Demodulation |
| 12 | Mini Project |

## IV Semester
## 23ET1403 : Microcontroller and Interfacing

| Course Outcomes: |
|---|
| **Upon successful completion of the course the students will be able to**<br>1. Elaborate 8051 microcontroller architecture.<br>2. Develop assembly language programs.<br>3. Develop embedded C language program<br>4. Interface peripherals with 8051 microcontroller to solve real life problems. |

| Unit:1 | 8051 ARCHITECTURE | 6 Hours |
|---|---|---|
| Overview of 8051 Microcontroller family, Introduction to MCS 51 family, Architecture, Memory organization, Internal RAM, Flag Register, Register Banks, SFRs , Functional pin description and various resources of MCS 51. Hardware Overview.<br>**Contemporary Issues related to Topic** | | |

| Unit:2 | ASSEMBLY LANGUAGE PROGRAMMING | 7 Hours |
|---|---|---|
| Addressing modes, Instruction set and Assembly language programming Programs using look up table, Bit manipulation, 8051 I/O programming, Delay Programs.<br>**Contemporary Issues related to Topic** | | |

| Unit:3 | EMBEDDED C PROGRAMMING | 6 Hours |
|---|---|---|
| I/O Interfacing such as LED, switches, 7 segment display, 8051 programming in C: Data types and time delay, I/O programming, Logic operations, Data conversion programs, Lookup table access<br>**Contemporary Issues related to Topic** | | |

| Unit:4 | TIMERS AND SERIAL COMMUNICATION | 6 Hours |
|---|---|---|
| Timer programming in assembly and C: Various modes of operation, SFR related to timer operation. Serial Port programming in assembly and C: Basics of serial communication, 8051 connection to RS 232. Serial data transfer programs.<br>**Contemporary Issues related to Topic** | | |

| Unit:5 | INTERRUPTS AND OFF-CHIP INTERFACING | 7 Hours |
|---|---|---|
| 8051 interrupts, Interrupts programming in assembly and C, programming timer interrupt, external interrupt, serial interrupt Interfacing and programming for LCD, Interfacing RTC.<br>**Contemporary Issues related to Topic** | | |

| Unit :6 | INTERFACING OF OTHERS OFF- CHIP DEVICES | 7 Hours |
|---|---|---|
| Interfacing of ADC, DAC, stepper motor, DC motors.<br>**Contemporary Issues related to Topic** | | |
| | **Total Lecture Hours** | **39 Hours** |

| **Textbooks** | |
|---|---|
| **1** | Muhammad Ali Mazidi, The 8051 Microcontroller and Embedded systems using assembly & C, Pearson Education Asia LPE |
| **2** | Myke Predko, Programming and Customizing the 8051 Microcontroller, McGraw-Hill |
| **3** | Kenneth Ayala, The 8051 Microcontroller , CENGAGE Learning |
| **Reference Books** | |
| **1** | Douglas V Hall, Intel or Atmel MCS 51 Family Microcontrollers Data Sheets, Tata McGraw Hill |
| **2** | A. K. Ray, K. M. Bhurchandi Microprocessor & Interfacing, Tata McGraw Hill |
| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
| **1** | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/1.(eBook)%20Delmar%20Thomson%20-%20The%208051%20Microcontroller%20Architecture,%20Programming%20and%20Applications%201991.pdf |
| **2** | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/Book%208051microcontroller-ayala.pdf |
| **3** | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/the_8051_microcontroller_and_embedded_systems_using_assembly_and_c-2nd-ed_by_mazidi.pdf |
| **MOOCs Links and additional reading, learning, video material** | |
| **1** | https://archive.nptel.ac.in/courses/108/105/108105102/ |
| **2** | https://archive.nptel.ac.in/courses/106/108/106108100/ |
| **3** | https://archive.nptel.ac.in/courses/117/104/117104072/ |

## IV Semester
## 23ET1404 : Lab. Microcontroller and Interfacing

**Course Outcomes:**

**Upon successful completion of the course the students will be able to**

1. Elaborate 8051 microcontroller architecture.
2. Develop assembly language programs.
3. Develop embedded C language program
4. Interface peripherals with 8051 microcontroller to solve real life problems.

| Sr. No. | Experiments based on |
|---|---|
| 1 | Add data bytes in a internal RAM |
| 2 | Data block transfer |
| 3 | Find the maximum data byte in a block |
| 4 | Count even or odd numbers present in a data block |
| 5 | Conversion number to its equivalent another number |
| 6 | Toggle LED connected to port pin of micro-controller 8051 |
| 7 | Display BCD no. on seven segment display or Display character on LCD. |
| 8 | Rotate stepper motor into clockwise /counter clockwise direction |
| 9 | Generate sawtooth waveform using DAC |
| 10 | Interfacing of RTC DS12887 with 8051 microcontroller & display current date & time serially |
| 11 | Read Analog signal from channel 2 of ADC and store it to internal RAM |
| 12 | Interfacing of servo motor with 8051 |

## IV Semester
## 23ET1405 : Lab. Electronic workshop and Equipment Maintenance

| **Course Outcomes:** |
|---|
| **Upon successful completion of the course the students will be able to**<br>1. Identify and test passive and active electronic components and devices.<br>2. Design regulated DC Power supply and PCB Layout.<br>3. Fabricate Assemble, Test and Troubleshoot mini project.<br>4. Explore the maintenance of Electronic equipment |

| Sr. No. | Experiments based on |
|---|---|
| 1 | To study the safety precautions and use of an Analog and Digital Multimeter for the measurement of DC/AC Voltages and Currents. |
| 2 | Identification and Testing of Passive Electronic Components. |
| 3 | Identification and Testing of Active Electronic Components. |
| 4 | To Identify and Test wires, cables, connectors, Switches, Relays Interconnected components. |
| 5 | To study Operation and Testing of Microphones and Speakers. |
| 6 | To Design, Construct and Test Fixed DC regulated power supply of ± 5V and ± 12V/500mA on Zero PCB. |
| 7 | To Design PCB layout of a mini project. |
| 8 | To fabricate PCB of a mini project. |
| 9 | To Perform assembling of a mini project. |
| 10 | To Test and Troubleshoot a mini project. |

| Sr. No. | Maintenance of Electronic Equipment |
|---|---|
| 1 | Power Supply |
| 2 | Digital Multimeter |
| 3 | Mobile Charger |
| 4 | FM Radio |
| 5 | Audio Amplifier |
| 6 | Television (TV) |
| 7 | Telephone Instrument |
| 8 | Cell phone |
| 9 | Any other equipment |

# IV Semester
# 23ET1406 : Python for Data Science

| **Course Outcomes:** | | |
|---|---|---|
| **Upon successful completion of the course the students will be able to**<br>1. Describe and develop Python programming using data types, operators and loops<br>2. Describe and apply strings, lists, tuples, Python modules and dictionaries in Python programs.<br>3. Develop advanced applications using functionalities provided under various packages of python | | |
| **Unit:1** | | **7 Hours** |
| Introduction, Build-in Data types: Data type & Variables, Python Strings, Python Casting, Python Operator, Python built in data structures: Lists, Dictionaries, Tuples, Sets, and Arrays.<br>**Contemporary Issues related to Topic** | | |
| **Unit:2** | | **8 Hours** |
| Python Control Statements: if, if – else, statements, Loop statements: For, while, continue and break, try and except statement, Python Function, Python Object and Classes, File Handling.<br>**Contemporary Issues related to Topic** | | |
| **Unit:3** | | **7 Hours** |
| Python Modules: NumPy, Pandas, SciPy. Data visualization using Matplotlib.<br>**Contemporary Issues related to Topic** | | |
| **Unit:4** | | **8 Hours** |
| Data Processing: Concatenating Data Frames, Stacking and unstacking Data Frames, Filling missing values, Dealing with duplicate values, Performance optimization, Python application<br>**Contemporary Issues related to Topic** | | |
| **Total Lecture Hours** | | **30 Hours** |

| | |
|---|---|
| **Textbooks** | |
| **1** | Complete Reference, Martin C Brown, TATA McGraw Hill |
| **Reference Books** | |
| **1** | Core Python Programing, Wesley Chun, Prentice Hall publications |
| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
| **1** | |
| **MOOCs Links and additional reading, learning, video material** | |
| **1** | https://onlinecourses.nptel.ac.in/noc24_cs54/preview |
| **2** | https://onlinecourses.nptel.ac.in/noc24_cs57/preview |
| **3** | https://onlinecourses.nptel.ac.in/noc24_cs20/preview |

# IV SEMESTER
## Multidisciplinary Minor Courses

### Track 1

| Courses | Sem | MDMT1ET101 : Instrumentation |
|---|---|---|
| MDM-I | 3 | (MDM1ET101) Electronic Measurement |
| MDM-II | 4 | (MDM2ET102) Sensors & Transducers |
| MDM-III | 5 | (MDM3ET103) Industrial Instrumentation |
| MDM-IV | 6 | (MDM4ET104) Biomedical Instrumentation I |
| MDM-V | 7 | (MDM5ET105) Biomedical Instrumentation II |
| MDM-VI | 8 | (MDM6ET106) Industrial Automation |

### Track 2

| Courses | Sem | MDMT2ET201 : Wireless Communication |
|---|---|---|
| MDM-I | 3 | (MDM1ET201) Analog Communication I |
| MDM-II | 4 | (MDM2ET202) Analog Communication II |
| MDM-III | 5 | (MDM3ET203) Digital Communication |
| MDM-IV | 6 | (MDM4ET204) Fundamentals of Communication Networks |
| MDM-V | 7 | (MDM5ET205) Mobile Communication |
| MDM-VI | 8 | (MDM6ET206) 5G Communication |

### Track 3

| Courses | Sem | MDMT3ET301 : Microcontroller systems design |
|---|---|---|
| MDM-I | 3 | (MDM1ET301) Basic Electronics |
| MDM-II | 4 | (MDM2ET302) Digital Circuits |
| MDM-III | 5 | (MDM3ET303) Microcontroller |
| MDM-IV | 6 | (MDM4ET304) Advanced Processor |
| MDM-V | 7 | (MDM5ET305) Fundamentals of IoT |
| MDM-VI | 8 | (MDM6ET306) Fundamentals of PLC |

## IV Semester
## Track1 : MDMT1ET101 : Instrumentation
## (MDM2ET102) Sensors & Transducers

**Course Outcomes:**

**Upon successful completion of the course the students will be able to**

1. Understand the working principle, construction, operation, characteristics and features of sensors and transducers.
2. Examine the performance specifications of various transducers and Sensors.
3. Select sensors and transducers for measurement applications.

| Unit:1 | Introduction | 7 Hours |
|---|---|---|

Introduction to Transducers, Classification of transducers- Analog and Digital, Active and passive, Primary and Secondary transducers- Inverse transducer. Choice of transducer-Factors influencing choice of transducer. Need of transducers, Classification, selection criteria.

**Contemporary Issues related to Topic**

| Unit:2 | Pressure Measurements | 8 Hours |
|---|---|---|

Units of pressure - Types of Pressure transducers, manometers , Bourdon Tube, bellows, Diaphragms, Elastic elements with LVDT and strain gauges, Capacitive, Piezo-electric pressure sensor.
Testing and calibration of pressure gauges – Dead weight tester.

**Contemporary Issues related to Topic**

| Unit:3 | TEMPARATURE MEASUREMENT | 8 Hours |
|---|---|---|

Bimetallic thermometers, RTD, Thermistor, Thermocouples – Laws of thermocouple, Pyrometer and its Types. – Total radiation & selective radiation pyrometers – Optical pyrometer – Two color radiation pyrometers.

**Contemporary Issues related to Topic**

| Unit:4 | MISCELLANEOUS MEASUREMENT | 7 Hours |
|---|---|---|

Level transducers - Resistive, capacitive, ultrasonic level measurement
Rotary encoder, Proximity sensors- Inductive and capacitive, pH Measurement

**Contemporary Issues related to Topic**

| Total Lecture Hours | 30 Hours |
|---|---|

**Textbooks**


| | |
|---|---|
| 1 | Industrial Instrumentation and Control, 2003, S.K. Singh, Tata McGraw Hill, 2003 |
| 2 | Electrical and Electronic Measurements AND Instrumentation, A. K. Sawhney, Dhanpat Rai &Co |
| 3 | Transducers and Instrumentation, D V S Murthy, prentice Hall of India Pvt.Ltd., New Delhi |

| | |
|---|---|
| **Reference Books** | |
| **1** | Principles of Industrial Instrumentation, D. Patranabis , T McGraw Hill Publishing Company Ltd, 1996. |
| **2** | Measurement & Analysis, B.C. Nakra & K. K. Chaudary, Tata McGraw Hill Publishing Ltd |
| **3** | Industrial Instrumentation, D.P. Eckman ,Wiley Eastern Ltd. |
| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
| **1** | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/ |
| **MOOCs Links and additional reading, learning, video material** | |
| **1** | https://nptel.ac.in/courses/117105144 |

## IV Semester
## Track2 : MDMT2ET201 : Wireless Communication
## (MDM2ET202) Analog Communication II

| Course Outcomes: |
|---|
| **Upon successful completion of the course the students will be able to**<br>1. Describe and analyze noise in the analog system.<br>2. Elaborate radiation and propagation of signals.<br>3. Describe and analyze Pulse modulation techniques.<br>4. Describe and analyze random noise in the system |

| Unit:1 | Noise | 8 Hours |
|---|---|---|
| Sources of noise, External Noises, Internal Noises, Thermal noise, noise calculations, equivalent noise bandwidth, noise figure of an amplifier, effective noise temperature<br>**Contemporary Issues related to Topic** | | |
| **Unit:2** | **Radiation & Propagation of signals** | **7 Hours** |
| Basics of Radiation, Mechanisms of propagation, Ground wave, space wave and sky wave propagation, fading, diversity reception.<br>**Contemporary Issues related to Topic** | | |
| **Unit:3** | **Pulse Modulation** | **8 Hours** |
| Types of pulse modulation PAM (single polarity, double polarity, PWM, Generation and Demodulation of PWM, PPM, Generation and Demodulation of PPM, Frequency Division Multiplexing , Time Division Multiplexing.<br>**Contemporary Issues related to Topic** | | |
| **Unit :4** | **Random Noise** | **7 Hours** |
| Probability random variable, review of probability theory, random variable, probability density and distribution function, random process, periodic processes, auto correlation and cross correlation application to signal analysis.<br>**Contemporary Issues related to Topic** | | |
| | **Total Lecture Hours** | **30 Hours** |

| Textbooks | |
|---|---|
| **1** | Gorge Kennedy,"Electronic Communication System", Tata McGraw-Hill, 4thEdition-(Year: 1999). |
| **2** | G. K. Mithal," Radio Engineering (Principles Of Communication Systems)", Edition, 15 ; Publisher, Khanna, 1988. |
| **3** | R. R. Gulati, "Modern Television Practice", New Age International publishers, 3rdEdition 2006. |

| Reference Books | |
|---|---|
| 1 | K. Sam Shanmugam,"Digital and Analog communication systems", John Wiley & Sons, 1st edition 1979. |
| 2 | Frenzel,"Communication Electronics", MGH. Third Edition 2001 |
| 3 | Dhake. A. M," Television and Video Engineering" ,Tata McGraw Hill 2nd Edition MAY 2001. |
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| 2 | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/ANALOG%20COMMUNICATIONS%20-%20Dr.%20B.V.Raju%20Institute%20of%20(%20PDFDrive.com%20).pdf |
| 3 | http://103.152.199.179/YCCE/Suported%20file/Supprted%20file/e-copies%20of%20books/Electronics%20and%20Telecommunication/Analog%20and%20Digital%20Communication%20Systems%20(%20PDFDrive.com%20).pdf |
| 4. | https://harshasnmp.files.wordpress.com/2017/11/monochrome-and-colour-television-r-r-gulati.pdf |
| **MOOCs Links and additional reading, learning, video material** | |
| 1 | NPTEL Course on Analog Communication by Prof. Goutam Das, IIT Kharagpur, https://nptel.ac.in/courses/117105143 |

## IV Semester
## Track3 : MDMT3ET301 :Microcontroller systems design
## (MDM2ET302) Digital Circuits

**Course Outcomes:**

**Upon successful completion of the course the students will be able to**

1. Apply the laws of Boolean algebra to simplify logical equations .
2. Simplify the logical functions using minimization techniques
3. Design and analyze combinational Circuits
4. Design and analyze Synchronous and Asynchronous sequential Circuits

| Unit:1 | Logic gates and binary operations | 7 Hours |
|---|---|---|

AND, OR, NOT, NAND, NOR, Exclusive–OR and Exclusive–NOR Implementations of Logic Functions using gates, NAND–NOR implementations, Number Systems.

**Contemporary Issues related to Topic**

| Unit:2 | Boolean postulates and laws | 8 Hours |
|---|---|---|

De-Morgan's Theorem - Principle of Duality, Boolean function, Canonical and standard forms, Minimization of Boolean functions, Minterm, Maxterm, Sum of Products (SOP), Product of Sums (POS), Karnaugh map Minimization, Don't care conditions.

**Contemporary Issues related to Topic**

| Unit:3 | Combinational logic circuits | 8 Hours |
|---|---|---|

Adder & Subtractor Circuit, BCD Adder, Look Ahead Carry Adder, Magnitude Comparator, Decoders, Encoders, Multiplexers, and Demultiplexers, Code converters.

**Contemporary Issues related to Topic**

| Unit:4 | Sequential logic circuits | 7 Hours |
|---|---|---|

Sequential circuits, latches & flip-flops, excitation table of flip-flops. Flip-Flop to flip-flop conversion.

Shift Register, Synchronous/Asynchronous counter.

**Contemporary Issues related to Topic**

| Total Lecture Hours | 30 Hours |
|---|---|

| Textbooks | |
|---|---|
| 1 | R.P Jain, Modern Digital Electronics, Tata McGraw Hill,3rd Edition |
| 2 | Morris Mano, Digital Design, 3rd edition, 2005, Pearson. |
| 3 | Anand kumar- Fundamental of digital circuit. 3rd edition. PHI |

| | | | | | |
|---|---|---|---|---|---|
| | | | June,2024 | 1.00 | Applicable for AY 2024-25 Onwards |
| Chairperson | Dean (Acad. Matters) | Dean OBE | Date of Release | Version | |

| Reference Books | |
|---|---|
| 1 | Fundamentals of Logic Design, C.H.Roth, Public Work & Services, 3rd edition 2007. |
| 2 | Engg Approach to Digital Design, Fletcher, Prentice Hall of India 1993. |
| 3 | Donald P.Leach and Albert Paul Malvino, Digital Principles and Applications, 6thEdition, TMH, 2003. |
| **YCCE e- library book links [ACCESSIBLE FROM COLLEGE CAMPUS]** | |
| 1 | http://103.152.199.179/YCCE/yccelibrary.html |
| **MOOCs Links and additional reading, learning, video material** | |
| 1 | https://onlinecourses.nptel.ac.in/noc21_ee75 |

# IV SEMESTER

## Open Elective -II : Basket

| SN | Sem | Type | BoS/ Deptt | Sub. Code | Subject |
|---|---|---|---|---|---|
| 1 | 4 | OE2 | GE | 23OE2401 | OE-II : Combinatorics |
| 2 | 4 | OE2 | GE | 23OE2402 | OE-II : Fuzzy Set Theory, Arithmetic And Logic |
| 3 | 4 | OE2 | GE | 23OE2403 | OE-II : Green Chem. & Sustainability |
| 4 | 4 | OE2 | GE | 23OE2404 | OE-II : Hydrogen Fuel |
| 5 | 4 | OE2 | GE | 23OE2405 | OE-II : Electronic Materials And Applications |
| 6 | 4 | OE2 | GE | 23OE2406 | OE-II : Laser Technology And Applications |
| 7 | 4 | OE2 | MGT | 23OE2407 | OE-II : Finance And Cost Management |
| 8 | 4 | OE2 | MGT | 23OE2408 | OE-II : Operation Research Techniques |
| 9 | 4 | OE2 | MGT | 23OE2409 | OE-II : Project Evaluation & Management |
| 10 | 4 | OE2 | MGT | 23OE2410 | OE-II : Total Quality Management |
| 11 | 4 | OE2 | MGT | 23OE2411 | OE-II : Value Engineering |
| 12 | 4 | OE2 | MGT | 23OE2412 | OE-II : Maintenance Management |
| 13 | 4 | OE2 | MGT | 23OE2413 | OE-II : Industrial Safety |
| 14 | 4 | OE2 | MGT | 23OE2414 | OE-II : Industry 4.0 |
| 15 | 4 | OE2 | MGT | 23OE2415 | OE-II : Operation Management |
| 16 | 4 | OE2 | MGT | 23OE2416 | OE-II : Material Management |
| 17 | 4 | OE2 | MGT | 23OE2417 | OE-II : Hospitality Management |
| 18 | 4 | OE2 | MGT | 23OE2418 | OE-II : Human Resource Management & Organizational Behaviour |
| 19 | 4 | OE2 | MGT | 23OE2419 | OE-II : Agri-Business Management |
| 20 | 4 | OE2 | MGT | 23OE2420 | OE-II : Rural Marketing |
| 21 | 4 | OE2 | MGT | 23OE2421 | OE-II : Marketing Management |
| 22 | 4 | OE2 | MGT | 23OE2422 | OE-II : Health Care Management |

**Link for Open Electives syllabus: https://ycce.edu/syllabus/**

# IV SEMESTER

## Mandatory Learning Course (MLC)

## MLC2124 : YCAP4