# Government College of Engineering, Karad

(An Autonomous Institute of Govt. of Maharashtra)

## Department of Electrical Engineering

## BTech EE Curriculum Structure

## Academic Year: 2023-24

| Institute Vision |
| --- |
| To emerge as a technical Institute of national repute driven by excellence in imparting value based education and innovation in research to face the Global needs of profession. |
| **Institute Mission** |
| To create professionally competent engineers driven with the sense of responsibility towards nature and society. |
| **Department Vision** |
| To produce Electrical Engineers to meet the requirements of Industry with professional, ethical and social responsibility |
| **Department Mission** |
| To impart quality education in Electrical Engineering To upgrade curriculum continuously to meet the industrial requirements To develop ability to research, innovation and entrepreneurship To promote awareness about social and ethical responsibility |

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(PEO): Programme Educational Objectives

| | |
|---|---|
| PEO1 | Student will have a sound foundation of mathematical, scientific and engineering fundamentals necessary to formulate, solve and analyse engineering problems and to prepare them for graduate studies as well as research and innovation. |
| PEO2 | Student will have an excellent academic ambience of collaborative learning which will help them to assimilate difficult theoretical concepts through modelling, simulation, well designed laboratory sessions, industrial training etc by using modern tools. |
| PEO3 | Employability of students will be enhanced by continually upgrading the curricula to satisfy dynamic industry requirements in tune with the state of the art scientific and technological developments and entrepreneurship skills will be inculcated. |
| PEO4 | Students will demonstrate professional, ethical attitude and ability to relate engineering issues to broader environmental and social context through life-long learning. |

**Programme Outcomes (PO):**

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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Program Specific Outcomes (PSO):

| | |
|---|---|
| PSO1 | Design solution for power system problems using appropriate tool and design power apparatus that meet specific needs with appropriate consideration to its social impact. |

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SCHEME OF INSTRUCTION & SYLLABI

Programme: Electrical Engineering

Proposed Scheme of Instructions: First Year B. Tech. in Electrical Engineering

Semester – I(w.e.f. 2023-24)

| Sr. No. | Course Category | Course Code | Course Title | L | T | P | Contact Hrs/Wk | Course Credits | EXAM SCHEME | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | MSE | ISE | ESE | TOTAL |
| 1 | BSC | EE3101 | Engineering Chemistry | 3 | -- | -- | 3 | 3 | 20 | 20 | 60 | 100 |
| 2 | BSC | EE3102 | Linear algebra and Calculus | 3 | 1 | -- | 4 | 4 | 20 | 20 | 60 | 100 |
| 3 | ESC | EE3103 | Basic Electronics Engineering | 3 | -- | -- | 3 | 3 | 20 | 20 | 60 | 100 |
| 4 | ESC | EE3104 | Programming for problem solving | 3 | -- | -- | 3 | 3 | 20 | 20 | 60 | 100 |
| 5 | ESC | EE3105 | Design Thinking | 1 | -- | 2 | 3 | 2 | -- | 50 | -- | 50 |
| 6 | BSC | EE3106 | Engineering Chemistry Lab | -- | -- | 2 | 2 | 1 | - | 50 | - | 50 |
| 7 | ESC | EE3107 | Programming for problem solving Lab | -- | -- | 2 | 2 | 1 | - | 25 | 25 | 50 |
| 8 | HSSM | EE3108 | Professional Communication Skills | 1 | -- | 2 | 3 | 2 | - | 50 | 25 | 75 |
| 9 | VSEC | EE3109 | Electrical Workshop | -- | -- | 2 | 2 | 1 | - | 50 | 25 | 75 |
| 10 | CCA | EE3110 | Yoga | -- | -- | 2 | 2 | 1 | - | 50 | - | 50 |
| 11 | ESC | EE3111 | Basic Electronics Engineering Lab | -- | -- | 2 | 2 | 1 | | 25 | 25 | 50 |
| | | | **Total** | **14** | **1** | **14** | **29** | **22** | **80** | **380** | **340** | **800** |

L- Lecture T-Tutorial P-Practical

MSE- Mid Semester Examination ISE/CA- In Semester Evaluation/Continuous Assessment

ESE- End Semester Examination (For Laboratory End Semester performance)

| Course Category | Basic Science Courses (BSC) | Engineering Science Courses (ESC) | Programme Core Course (PCC) | Programme Elective Course (PEC) | Open Elective other than particular program (OE/MDM) | Vocational and Skill Enhancement Course (VSEC) | Humanities Social Science and Management (HSSM) | Experiential Learning (EL) | Co-curricular And Extracurricular Activities (CCA) |
|---|---|---|---|---|---|---|---|---|---|
| **Credits** | **08** | **10** | - | - | - | 01 | 02 | - | 01 |
| **Cumulative Sum** | **08** | **10** | - | - | - | 01 | 02 | - | 01 |

**PROGRESSIVE TOTAL CREDITS: 00+22 =22**

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SCHEME OF INSTRUCTION & SYLLABI

Programme: Electrical Engineering

Proposed Scheme of Instructions: First Year B. Tech. in Electrical Engineering

Semester – II (w.e.f. 2023-24)

| Sr. No. | Course Category | Course Code | Course Title | L | T | P | Contact Hrs/Wk | Course Credits | EXAM SCHEME | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | MSE | ISE | ESE | TOTAI |
| 1 | BSC | EE3201 | Differential and Integral Calculus | 3 | 1 | -- | 4 | 4 | 20 | 20 | 60 | 100 |
| 2 | BSC | EE3202 | Engineering Physics | 3 | -- | -- | 3 | 3 | 20 | 20 | 60 | 100 |
| 3 | ESC | EE3203 | Engineering Mechanics | 3 | -- | -- | 3 | 3 | 20 | 20 | 60 | 100 |
| 4 | PCC | EE3204 | DC and AC Circuits | 3 | -- | -- | 3 | 3 | 20 | 20 | 60 | 100 |
| 5 | HSSM | EE3205 | Indian Knowledge Systems(MOOC) | - | - | - | - | 2 | - | - | - | 100 |
| 6 | ESC | EE3206 | Computer Aided Design and Drafting Lab | -- | -- | 2 | 2 | 1 | | 50 | - | 50 |
| 7 | BSC | EE3207 | Engineering Physics Lab | - | - | 2 | 2 | 1 | - | 25 | 25 | 50 |
| 8 | PCC | EE3208 | DC and AC Circuits Lab | -- | -- | 2 | 2 | 1 | - | 25 | 25 | 50 |
| 9 | VSEC | EE3209 | Experiential Learning Lab | - | -- | 4 | 4 | 2 | - | 50 | - | 50 |
| 10 | CCA | EE3210 | NCC/NSS/CSP | -- | -- | 2 | 2 | 1 | - | 50 | - | 50 |
| 11 | VSEC | EE3211 | Programming language C++ | - | -- | 2 | 2 | 1 | | 25 | 25 | 50 |
| | | | **Total** | **12** | **1** | **14** | **27** | **22** | **80** | **305** | **315** | **800** |

L- Lecture T-Tutorial P-Practical

MSE- Mid Semester Examination ISE/CA- In Semester Evaluation/Continuous Assessment

ESE- End Semester Examination (For Laboratory End Semester performance)

| Course Category | Basic Science Courses (BSC) | Engineering Science Courses (ESC) | Programme Core Course (PCC) | Programme Elective Course (PEC) | Open Elective other than particular program (OE/MDM) | Vocational and Skill Enhancement Course (VSEC) | Humanities Social Science and Management (HSSM) | Experiential Learning (EL) | Co-curricular And Extracurricular Activities (CCA) |
|---|---|---|---|---|---|---|---|---|---|
| **Credits** | **08** | **04** | **04** | **-** | **-** | **03** | **02** | **-** | **01** |
| **Cumulative Sum** | **16** | **14** | **04** | **-** | **-** | **04** | **04** | **-** | **02** |

PROGRESSIVE TOTAL CREDITS: 22+22 =44

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## Exit Course

| Exit option : Award of UG Certificate in Major with 44 credits and an additional 8 credits from following Exit Courses | | | | |
|---|---|---|---|---|
| **Sr. No** | **Course Code** | **Course Title** | **Mode** | **Credits** |
| 1 | EE-EC-0101 | Building Electrification | Online/offline certification Course or project | 8 |
| | | **OR** | | |
| 2 | EE-EC-0102 | Repairing and maintenance of Electrical Appliances | | 8 |
| | | **OR** | | |
| 3 | EE-EC-0103 | Electrical Panel Design and erection | | 8 |
| | | **OR** | | |
| 4 | EE-EC-0104 | Installation of household and industrial wiring | | 8 |

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SCHEME OF INSTRUCTION & SYLLABI

Programme: Electrical Engineering

Proposed Scheme of Instructions: Second Year B. Tech. in Electrical Engineering

Semester – III (w.e.f. 2024-25)

| Sr. No. | Course Category | Course Code | Course Title | L | T | P | Contact Hrs/Wk | Course Credits | EXAM SCHEME | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | MSE | ISE | ESE | TOTAL |
| 1 | PCC | EE3301 | Signals & Systems | 3 | 1 | - | 4 | 4 | 20 | 20 | 60 | 100 |
| 2 | PCC | EE3302 | DC Machines and Transformer | 3 | -- | -- | 3 | 3 | 20 | 20 | 60 | 100 |
| 3 | PCC | EE3303 | Measurement and Instrumentation | 3 | -- | -- | 3 | 3 | 20 | 20 | 60 | 100 |
| 4 | MDM | ## | Multi-disciplinary Minor – 01 | 2 | -- | -- | 2 | 2 | 20 | 20 | 60 | 100 |
| 5 | OE | $D/O/I | Open Elective -01 | 3 | -- | -- | 3 | 3 | 20/NA/NA | 20/NA/50 | 60/10 0/50 | 100 |
| 6 | HSSM | EE3306 | Universal Human Values | 2 | -- | -- | 2 | 2 | - | 50 | - | 50 |
| 7 | HSSM | EE3307 | Economics for Engineer | 2 | -- | -- | 2 | 2 | - | 50 | - | 50 |
| 8 | PCC | EE3308 | DC Machines and Transformer Lab | -- | -- | 2 | 2 | 1 | - | 50 | 25 | 75 |
| 9 | PCC | EE3309 | Measurement and Instrumentation Lab | -- | -- | 2 | 2 | 1 | -- | 50 | 25 | 75 |
| 10 | OE | $D/O/I | Open Elective -01 Lab | -- | -- | 2 | 2 | 1 | - | 25 | 25 | 50 |
| | | | **Total** | **18** | **1** | **6** | **25** | **22** | **100** | **325** | **375** | **800** |

***Note: Open Elective-01 (OE) can be offered as offline/Online mode (MOOC).**

**Note: $ D/O/I- Any course offered by Department/Online/Institute OE bucket. ##:- Any Course offered from Dept. /Inst. level MDM buckets.**

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MSE- Mid Semester Examination ISE/CA- In Semester Evaluation/Continuous Assessment

ESE- End Semester Examination (For Laboratory End Semester performance)

| Course Category | Basic Science Courses (BSC) | Engineering Science Courses (ESC) | Programme Core Course (PCC) | Programme Elective Course (PEC) | Open Elective other than particular (OE/MDM) | Vocational and Skill Enhancement Course (VSEC) | Humanities Social Science and Management (HSSM) | Experiential Learning (EL) | Co-curricular And Extracurricular Activities (CCA) |
|---|---|---|---|---|---|---|---|---|---|
| **Credits** | -- | - | **12** | - | **06** | - | **04** | - | - |
| **Cumulative Sum** | **16** | **14** | **16** | - | **06** | **04** | **08** | - | **02** |