# EXCEL ENGINEERING COLLEGE

## (Autonomous)

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Accredited by NBA (AERO, CSE, MECH, ECE), NAAC with "A+" and Recognised by UGC (2f &12B)
KOMARAPALAYAM - 637303

## DEPARTMENT OF BIOMEDICAL ENGINEERING

**1.1.1** Curricula developed and implemented have relevance to the local, national, regional, and global developmental needs, which are reflected in Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the various Programmes offered by the Institution:

| Course code and name | Classification / Mapping of Course with their societal needs | | | |
|---|---|---|---|---|
| | Local needs | Regional Needs | National Needs | Global Needs |
| **B.E BME Regulation 2017** | | | | |
| BM8076-Electrical Safety and Quality Assurance | ✓ | ✓ | | |
| BM8006-Ergonomics | ✓ | | | |
| BM8075-Brain-Computer Interface and its Applications | | | ✓ | ✓ |
| EC8791-Embedded and Real-time Systems | ✓ | ✓ | | |
| GE8073-Fundamentals of Nanoscience | | ✓ | | |
| BM8079-Virtual Reality and Augmented Reality | | | ✓ | ✓ |
| BM8077-Hospital Waste Management | ✓ | ✓ | | |
| GE8076-Professional Ethics in Engineering | | | ✓ | ✓ |
| BM8005-Neural Engineering | ✓ | ✓ | | |
| BM8073-Biometric Systems | ✓ | ✓ | | |
| BM8811-Project work | ✓ | ✓ | | |
| BM8701-Diagnostic and Therapeutic Equipment - II | ✓ | ✓ | | |
| EC8093-Digital Image Processing | ✓ | ✓ | | |
| BM8702-Radiological Equipment's | ✓ | ✓ | | |
| BM8703-Rehabilitation Engineering | ✓ | ✓ | | |
| MD8752-Physiological Modeling | ✓ | ✓ | | |
| BM8004-Robotics in Medicine | | | ✓ | ✓ |
| CS8081-Internet of Things | | ✓ | ✓ | |
| BM8078-Soft Computing Techniques | ✓ | ✓ | | |
| GE8072-Foundation Skills in Integrated Product Development | ✓ | ✓ | | |
| GE8071-Disaster Management | | | ✓ | ✓ |

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| | | | | |
|---|---|---|---|---|
| MD8751 -Hospital Training | ✓ | ✓ | | |
| B.E BME Regulation 2020 | | | | |
| 20BM601 – Medical Regulatory Affairs and Ethics | ✓ | ✓ | | |
| 20BM602 – Biomaterials and Artificial Organs | ✓ | ✓ | | |
| 20BM603 – Biomechanics | | | ✓ | ✓ |
| 20BM604 – Diagnostic and Therapeutic Equipment | ✓ | ✓ | | |
| 20BM605 – Mini Project | ✓ | ✓ | | |
| 20BM606 – Internship | ✓ | ✓ | | |
| 20BME01 – Physiological Signal Processing | | ✓ | ✓ | |
| 20BME02 - Biometric Systems | | ✓ | ✓ | |
| 20BME03 - Computer Vision and Pattern Recognition for Biological applications | | ✓ | ✓ | |
| 20BME04 - Speech Processing | | ✓ | ✓ | |
| 20BME05 – Biostatistics | | ✓ | ✓ | |
| 20BME06 - Quality Assurance & Medical Device Regulations | ✓ | ✓ | | |
| 20BME07 - Medical Image Analysis | ✓ | ✓ | | |
| 20BME08 - Brain Computer Interface and its Applications | ✓ | ✓ | | |
| 20BME09 - Soft computing and applications | | ✓ | ✓ | |
| 20BME10 - Deep Learning for Heathcare | ✓ | ✓ | | |
| 20BME11 - Machine Learning for Healthcare | ✓ | ✓ | | |
| 20BME12 - Neuro-Science Engineering | ✓ | ✓ | | |
| 20BME13 - Real Time Embedded Systems | | ✓ | ✓ | |
| 20BME21 - Human Assist Devices | | ✓ | ✓ | |
| 20BME22 - Robotics in Medicine | | ✓ | ✓ | |
| 20BME23 - Medical Device Design and Prototyping | | ✓ | ✓ | |

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| Course | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 20BME24 - Hospital Information System | ✓ | ✓ | ✓ | ✓ |
| 20BME25 - TeleHealth Technology | | | ✓ | ✓ |
| 20BME26 - Wearable Systems | ✓ | | ✓ | ✓ |
| 20BME27 - Body Area Networks | | ✓ | ✓ | ✓ |
| 20BME28 - Health Information Technology | ✓ | | ✓ | ✓ |
| 20BME29 - Data communication and Networking | | | ✓ | ✓ |
| 20BME30 - Internet of Things in Medicine | ✓ | | ✓ | ✓ |
| 20BME31 - Biomedical Data Science | ✓ | ✓ | ✓ | ✓ |
| 20BME32 - Medical Informatics | ✓ | | ✓ | |
| 20BME33 - Medical Ethics and Standards | | ✓ | ✓ | ✓ |
| 20BME34 - BioInformatics and Drug Design | | | ✓ | ✓ |
| 20BME41 - Rehabilitation Engineering | ✓ | | ✓ | ✓ |
| 20BME42 - Principles of Tissue Engineering | | ✓ | ✓ | ✓ |
| 20BME43 - Molecular Biology | | | ✓ | ✓ |
| 20BME44 – Biophotonics | | | ✓ | ✓ |
| 20BME45 - Genetic Engineering | | | ✓ | ✓ |
| 20BME46 - Nano Technology and Applications | | | ✓ | ✓ |
| 20BME47 - Tissue Engineering and Artificial Organs | | | ✓ | ✓ |
| 20BME48 - Bio-MEMS | | | ✓ | ✓ |
| 20BME49 - Lab-on-Chip & Point-of-care Devices | | | ✓ | ✓ |
| 20BME50 - Physiological Modelling | ✓ | | ✓ | ✓ |
| 20BME51 - Virtual Instrumentation | | | ✓ | ✓ |
| 20BME52 - Medical Optics | ✓ | ✓ | | |
| 20BMO01 - Principles of Telemedicine | ✓ | | ✓ | ✓ |
| 20BMO02 - Biosensor and wearable technology | ✓ | ✓ | ✓ | ✓ |

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| | | | | |
|---|---|---|---|---|
| 20BMO03 - Bioinformatics with soft computing tools | | | ✓ | ✓ |
| 20BMO04 - Healthcare Data Analytics | ✓ | ✓ | | ✓ |
| 20BMO05 - Medical nanotechnology | ✓ | ✓ | ✓ | ✓ |
| 20BMO06 - Rehabilitation Engineering | ✓ | ✓ | ✓ | ✓ |
| 20BMO07 - Medical electronics | ✓ | ✓ | ✓ | ✓ |
| 20BMO08 - Biomedical instrumentation | ✓ | ✓ | ✓ | ✓ |
| 20BMO09 - Hospital management | ✓ | ✓ | ✓ | ✓ |
| 20BMO10 - Basics of Medical Informatics | | | ✓ | ✓ |
| 20BMO11 - Biochemistry for Lab-on-chip | | | ✓ | ✓ |
| 20BMO12 - Biology for Engineers | | ✓ | ✓ | ✓ |
| 20BMA01 - Scientific Computing for Biologists | ✓ | ✓ | ✓ | ✓ |
| 20BMA02 - Frontiers in Medical Informatics | ✓ | ✓ | ✓ | ✓ |
| 20BMA03 - Medical Imaging Equipment's | | ✓ | ✓ | ✓ |
| 20BMA04 - IoT for Healthcare Applications | ✓ | | ✓ | ✓ |
| 20BMA05 - Electronic Design Automation Tools for Medical Devices | ✓ | ✓ | ✓ | ✓ |
| 20BMA06 - Ventilator with monitoring equipment for Critical Care | ✓ | ✓ | ✓ | ✓ |
| 20BMA07 - Human Computer Interaction | ✓ | ✓ | ✓ | ✓ |
| 20BMA08 - 3D Printing/Modeling for Health Care | | ✓ | ✓ | ✓ |
| 20BM501 - Biocontrol system | ✓ | ✓ | ✓ | ✓ |
| 20BM502 - Biomedical Instrumentation | ✓ | ✓ | ✓ | ✓ |
| 20BM503 - Biosignal Processing | ✓ | ✓ | ✓ | ✓ |
| 20BM504 - Radiological Equipment's | ✓ | ✓ | ✓ | ✓ |

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| Subject | | | | |
|---|---|---|---|---|
| 20BM507 - Biomedical Instrumentation Laboratory | ✓ | ✓ | ✓ | ✓ |
| 20BM508 - Biosignal Processing Laboratory | ✓ | ✓ | ✓ | ✓ |
| 20MA402 - Probability and Stochastic Process | ✓ | ✓ | | |
| 20BM401 - Digital Electronics | ✓ | ✓ | | |
| 20BM402 - Medical and Radiation Physics | ✓ | ✓ | | |
| 20BM403 - Healthcare Data Analytics | | ✓ | ✓ | |
| 20BM404 - Pathology and Microbiology | | ✓ | ✓ | |
| 20CS407 - Data Structure using Object Oriented Programming | ✓ | ✓ | | |
| 20MC401 - Soft Skills | | | ✓ | ✓ |
| 20MA302 - Partial Differential Equation and Linear Algebra | ✓ | ✓ | | |
| 20BM301 - Signals and Systems for Bioengineers | ✓ | ✓ | | |
| 20BM302 - Circuit Theory | ✓ | ✓ | | |
| 20BM303 - Electronic Device and Circuits | ✓ | ✓ | | |
| 20BM304 - Biosensors and Measurements | ✓ | ✓ | | |
| 20BM305 - Human Anatomy and Physiology | ✓ | ✓ | | |
| 20BM306 - Electronic Devices and Circuits Laboratory | ✓ | ✓ | | |
| 20MC301 - Environmental Sciences | | ✓ | ✓ | |
| 20MA201 - Mathematics – II for Electrical Sciences | ✓ | ✓ | | |
| 20BM201 - Biochemistry | ✓ | ✓ | | |
| 20ENE02 - Advanced Communicative English | | | ✓ | ✓ |
| 20ENE03 - Hindi | | ✓ | ✓ | |
| 20ENE04 - French | | | ✓ | ✓ |

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| | | | | |
|---|---|---|---|---|
| 20ENE05- German | | | ✓ | ✓ |
| 20CH202- Chemistry for Electrical Sciences | ✓ | ✓ | | |
| 20ME203- Engineering Graphics | ✓ | ✓ | | |
| 20BM202- Biochemistry Laboratory | ✓ | ✓ | | |
| 20MC202- Interpersonal Skills | | ✓ | ✓ | |
| 20MA101- Mathematics – I for Electrical Sciences | ✓ | ✓ | | |
| 20BM101- Basics of Electrical and Biomedical Engineering | ✓ | ✓ | | |
| 20ENE01- Communicative English | ✓ | ✓ | | |
| 20ENE02- Advanced Communicative English | | ✓ | ✓ | |
| 20PH102- Physics for Electrical Sciences | ✓ | ✓ | | |
| 20CS102- Problem Solving using Python | | ✓ | ✓ | |
| 20BM102- Biomedical Engineering Practices Laboratory | ✓ | ✓ | | |
| 20MC101- Induction Programme | ✓ | ✓ | | |

| | Prepared by | Reviewed by | Approved By |
|---|---|---|---|
| SIGN | | | |
| NAME | *A. S* | *signature* | *signature* |