VINAYAKA MISSION'S RESEARCH FOUNDATION

(Deemed to be University under section 3 of the UGC Act 1956)

Faculty of Engineering and Technology

REGULATIONS 2021

Programme:

B.E. - BIOMEDICAL ENGINEERING

Full Time (4 Years)

CHOICE BASED CREDIT SYSTEM (CBCS)

CURRICULUM

(Semester I to VIII)

CHAIRPERSON

Dr. D. VINOD KUMAR, B.E., M.E., Ph.D.

Professor & Head - Biomedical Engineering

Vinayaka Mission's Kirupananda Variyar Engg. College

Periya Seeragapadi, Salem - 636 308.

DEPARTMENT OF BIOMEDICAL ENGINEERING

VISION

- To provide a unique multidisciplinary engineering environment in Biomedical Engineering that focuses on producing graduates who apply scientific knowledge and Engineering design principles to contribute the society by developing Biomedical technology need for national health care system.

MISSION

- To create an environment in which students thrive to the best in rational design and implementation of medical device and application.
- To understand local medical problem and developing strategies to tackle these problem to improve human lives.
- To enhance the challenges of health care problems.

PROGRAMME OUTCOMES

Engineering Graduates will be able to:

PO1 - Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 - Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 - 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.

PO4 - 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.

PO5 - Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6 - 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.

PO7 - 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.

PO8 - Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

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PO9 - Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 - 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.

PO11 - 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.

PO12 - 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.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO-1: Analyze, Plan and Design the equipment in multidomains of biomedical engineering.

PSO-2: Hone their professional's expertise in quest for improved career opportunities through sustained learning.

PSO-3: Work with ethical principles and sound managerial skills in the promotion of biomedical engineering infrastructure keeping in mind, patient health, instrument safety and sustainability of the society.

PROGRAM EDUCATIONAL OUTCOMES (PEOs)

PEO-1: Graduates will demonstrate their skills in solving challenges ranging from design, development, problem solving to production support in health care sectors.

PEO-2: Graduates will exhibit leadership, make decisions with social and ethical responsibilities, communicate effectively in multidisciplinary engineering environment.

PEO-3: Graduates will recognize the need for sustaining and expanding their technical competence and engage in learning opportunities throughout the careers.

CHAIRPERSON

VINAYAKA MISSION'S RESEARCH FOUNDATION

(DEEMED TO BE UNIVERSITY), SALEM

DEPARTMENT OF BIOMEDICAL ENGINEERING

MODEL CURRICULUM FOR REGULATION-2021

Credit Requirement for the Course Categories

Sl. No.	Category of Courses	Types of Courses		Suggested Breakup of Credits (min-max)
1.	A. Foundation Courses	Humanities and Social Sciences including Management Courses		9 – 12
2.		Basic Science Courses		18 – 25
3.		Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc.		18 – 24
4.	B. Professional	Core Courses		48 – 54
5.	C. Elective Courses	Professional Electives		12
		Industry Designed/ Industry Supported/ Industry Offered/ Industry Sponsored Courses		6
		Open Electives	Innovation, Entrepreneurship, Skill Development etc.	6 – 9
			Emerging Areas like 3D Printing, Artificial Intelligence, Internet of Things etc.	6 – 9
6.	D. Courses for Presentation of technical Skills related to the specialization	Project Work		8
		Mini Project		3
		Seminar		1
		Internship in Industry or Elsewhere*		3
		Training*		3
7.	**E. Mandatory Courses	IPR, Induction Training, Indian Constitution, Essence of Indian Traditional Knowledge, Employability Enhancement, Value Added Courses, NSS, RRC, YRC, Sports and Games, Student Clubs, Unnat Bharat Abhiyan, Swachh Bharat etc.,		Zero Credit Course (Minimum 2 Courses to be Completed)
			Minimum Credits to be earned	160

* Note : In Category D, Out of 15 Credits minimum Three credits should be earned among any of the following courses – Internship or Training

** The credits earned in category 'E' Courses will not be counted in CGPA calculation for awarding of the degree.

CHAIRPERSON

CURRICULUM

B.E - BIOMEDICAL ENGINEERING

SEMESTER I TO VIII

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B.E. – BIOMEDICAL ENGINEERING – SEMESTER I TO VIII

A. Foundation Courses

Humanities and Social Sciences including Management Courses – Credits (9-12)

SL. NO	COURSE CODDE	COURSE	OFFERING DEPT.	CATEGORY	L	T	P	C	PREREQUISITE
1.	34121H01	TECHNICAL ENGLISH	ENG	FC-HS	3	0	0	3	NIL
2.	34121H01	BUSINESS ENGLISH	ENG	FC-HS	3	0	0	3	NIL
3.	34121H81	ENGLISH LANGUAGE LAB	ENG	FC-HS	0	0	4	2	NIL
4.	34121H82	PROFESSIONAL COMMUNICATION AND PERSONALITY DEVELOPMENT LAB	ENG	FC-HS	0	0	2	1	NIL
5.	34121H03	HOSPITAL ADMINISTRATION AND MANAGEMENT	MANAG	FC-HS	3	0	0	3	NIL
6.	34121H07	MEDICAL ETHICS AND STANDARDS	MANAG	FC-HS	3	0	0	3	NIL
7.	34121H10	QUALITY ASSURANCE AND REGULATORY ASPECTS IN MEDICINE	MANAG	FC-HS	3	0	0	3	NIL
8.	34121H02	TOTAL QUALITY MANAGEMENT	MANAG	FC-HS	3	0	0	3	NIL
9.	34121H83	UNIVERSAL HUMAN VALUES - UNDERSTANDING HARMONY	ENG	FC-HS	3	0	0	3	NIL

Basic Science Courses – Credits (18-25)

1.	34121B03	MATHEMATICS FOR BIOMEDICAL ENGINEERS-I	MATH	FC-BS	2	1	0	3	NIL
2.	34121B08	MATHEMATICS FOR BIOMEDICAL ENGINEERS-II	MATH	FC-BS	2	1	0	3	Mathematics for Biomedical Engineers-I
3.	34121B13	APPLIED STATISTICS FOR BIOMEDICAL ENGINEERS	MATH	FC-BS	2	1	0	3	Mathematics for Biomedical Engineers-I
4.	34121B04	PHYSICAL SCIENCES	PHY & CHEM	FC-BS	4	0	0	4	NIL
5.	35321B01	FUNDAMENTALS OF BIOMEDICAL ENGINEERING	BME	FC-BS	3	0	0	3	NIL
6.	35321B02	BIOLOGY - HUMAN ANATOMY AND PHYSIOLOGY	BME	FC-BS	3	0	0	3	NIL
7.	34121B34	PHYSICS FOR BIOMEDICAL ENGINEERING	PHY	FC-BS	3	0	0	3	Physical Sciences (Part A - Engineering Physics)
8.	34121B29	MEDICAL PHYSICS	PHY	FC-BS	3	0	0	3	Physical Sciences (Part A - Engineering Physics)
9.	34121B22	FUNDAMENTALS OF BIOCHEMISTRY (THEORY AND PRACTICALS)	BTE	FC-BS	3	0	2	4	NIL
10.	34121B81	PHYSICAL SCIENCES LAB	PHY & CHEM	FC-BS	0	0	4	2	NIL
11.	34121B19	ENVIRONMENTAL SCIENCES	CHEM	FC-BS	3	0	0	3	NIL

Engineering Science Courses including Workshop, Drawing, Basics of Electrical/Mechanical/Computer etc Credits – (18-24)									
1.	34621E01	BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING	EEE & ECE	FC-ES	4	0	0	4	NIL
2.	34421E81	ENGINEERING GRAPHICS AND DESIGN	MECH	FC-ES	0	0	6	3	NIL
3.	34421E04	ENGINEERING MECHANICS FOR BIOMEDICAL ENGINEERS	MECH	FC-ES	3	1	0	4	NIL
4.	35021E01	FOUNDATIONS OF COMPUTING AND PROGRAMMING (THEORY AND PRACTICALS)	CSE	FC-ES	2	0	2	3	NIL
5.	35021E02	PYTHON PROGRAMMING (THEORY AND PRACTICALS)	CSE	FC-ES	2	0	2	3	NIL
6.	34621E81	BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING LAB	EEE & ECE	FC-ES	0	0	4	2	NIL
7.	34621E02	ELECTRICAL TECHNOLOGY (THEORY AND PRACTICALS)	EEE	FC-ES	2	0	2	3	Basics of Electrical and Electronics Engineering
8.	34421E83	WORKSHOP PRACTICES	MECH	FC-ES	0	0	4	2	NIL

B.E. – BIOMEDICAL ENGINEERING – SEMESTER I TO VIII

B. Professional

Core Courses – Credits (48-54)

SL. NO	COURSE CODE	COURSE	OFFERING DEPT.	CATEGORY	L	T	P	C	PREREQUISITE
1.	34721C03	SEMICONDUCTOR DEVICES AND CIRCUITS	ECE	CC	3	0	0	3	Basics of Electrical and Electronics Engineering
2.	35321C01	BIOMEDICAL CIRCUITS AND NETWORKS (THEORY AND PRACTICALS)	BME	CC	3	0	2	4	Basics of Electrical and Electronics Engineering
3.	35321C02	BIOMEDICAL SENSORS AND MEASUREMENT DEVICES (THEORY AND PRACTICALS)	BME	CC	3	0	2	4	NIL
4.	34721C15	ANALOG AND DIGITAL INTEGRATED CIRCUITS FOR BIOINSTRUMENTATION (THEORY AND PRACTICALS)	ECE	CC	3	0	2	4	Semiconductor Devices and Circuits
5.	34721C04	SIGNALS AND SYSTEMS	ECE	CC	3	0	0	3	NIL
6.	35321C08	MEDICAL INSTRUMENTATION	BME	CC	3	0	0	3	Biomedical Sensors and Measurement Devices
7.	35321C03	PATHOLOGY AND MICROBIOLOGY (THEORY AND PRACTICALS)	BME	CC	3	0	2	4	NIL
8.	35321C04	BIOCONTROL SYSTEMS	BME	CC	3	0	0	3	Mathematics for Biomedical Engineers-II
9.	34721C19	MICROPROCESSORS AND MICROCONTROLLERS (THEORY AND PRACTICALS)	ECE	CC	3	0	2	4	NIL
10.	35321C07	DIAGNOSTIC AND THERAPEUTIC EQUIPMENT	BME	CC	3	0	0	3	Medical Instrumentation
11.	35321C06	BIOMEDICAL SIGNAL PROCESSING	BME	CC	3	0	0	3	Signals and Systems
12.	35321C05	BIOMEDICAL IMAGE PROCESSING	BME	CC	3	0	0	3	NIL
13.	35321C09	RADIOLOGICAL EQUIPMENT	BME	CC	3	0	0	3	NIL

14.	34721C82	SEMICONDUCTOR DEVICES AND CIRCUITS LAB	ECE	CC	0	0	4	2	NIL
15.	35321C84	MEDICAL INSTRUMENTATION LAB	BME	CC	0	0	4	2	NIL
16.	35321C83	DIAGNOSTIC AND THERAPEUTIC EQUIPMENT LAB	BME	CC	0	0	4	2	NIL
17.	35321C82	BIOMEDICAL SIGNAL AND IMAGE PROCESSING LAB	BME	CC	0	0	4	2	NIL
18.	35321C81	HOSPITAL TRAINING	BME	CC	0	0	4	2	NIL

B.E. – BIOMEDICAL ENGINEERING – SEMESTER I TO VIII

C. Elective Courses

Professional Elective Courses Credits - (12)

SL. NO	COURSE CODE	COURSE	OFFERING DEPT.	CATEGORY	L	T	P	C	PREREQUISITE
1.	35321P09	EMBEDDED SYSTEMS IN MEDICAL DEVICES	BME	EC-PS	3	0	0	3	NIL
2.	35321P03	BIOMATERIAL-CHARACTERIZATION TECHNIQUES	BME	EC-PS	3	0	0	3	NIL
3.	35321P04	BIOMEDICAL NANOTECHNOLOGY	BME	EC-PS	3	0	0	3	NIL
4.	35321P15	NUCLEAR MEDICINE TECHNOLOGY	BME	EC-PS	3	0	0	3	Biology-Human Anatomy and Physiology
5.	35321P10	IOT AND TELEHEALTH TECHNOLOGY	BME	EC-PS	3	0	0	3	NIL
6.	35321P02	APPLIED OPTOELECTRONICS IN MEDICINE	BME	EC-PS	3	0	0	3	NIL
7.	35321P12	MEDICAL RADIATION SAFETY ENGINEERING	BME	EC-PS	3	0	0	3	NIL
8.	35321P17	RADIOTHERAPY EQUIPMENT	BME	EC-PS	3	0	0	3	NIL
9.	35321P13	MEDICAL SIMULATION IN LIFE SUPPORTING DEVICES	BME	EC-PS	3	0	0	3	NIL
10.	35321P11	MEDICAL OPTICS AND LASER APPLICATIONS	BME	EC-PS	3	0	0	3	NIL
11.	35321P05	BIOTELEMETRY	BME	EC-PS	3	0	0	3	NIL
12.	35321P07	DESIGN AND DEVELOPMENT OF MEDICAL DEVICES	BME	EC-PS	3	0	0	3	NIL
13.	35321P18	TELEMEDICINE AND PICTURE ARCHIVAL COMMUNICATION SYSTEM	BME	EC-PS	3	0	0	3	NIL
14.	35321P19	ULTRASOUND PRINCIPLES IN MEDICINE	BME	EC-PS	3	0	0	3	NIL
15.	35321P06	CELL AND TISSUE ENGINEERING	BME	EC-PS	3	0	0	3	NIL
16.	35321P01	APPLIED NEURAL NETWORKS AND FUZZY LOGIC IN MEDICINE	BME	EC-PS	3	0	0	3	NIL
17.	35321P08	ELECTRO PHYSIOLOGY OF HUMAN SYSTEM	BME	EC-PS	3	0	0	3	NIL

18.	35321P16	PHYSIOLOGICAL MODELING	BME	EC-PS	3	0	0	3	NIL
19.	35321P14	MEDICAL TEXTILES FUNDAMENTALS	BME	EC-PS	3	0	0	3	NIL
20.	35321P20	VIRTUAL REALITY IN HEALTHCARE	BME	EC-PS	3	0	0	3	NIL
21.	35321P21	BIOMECHANICS	BME	EC-PS	3	0	0	3	NIL

Industry Offered/Industry Designed Courses- Credits - (6)

SL. NO	COURSE CODE	COURSE	OFFERING INDUSTRY	CATEGORY	L	T	P	C	PREREQUISITE
1.	34121I07	BUSINESS INTELLIGENCE AND ITS APPLICATIONS	INFOSYS	EC-IE	3	0	0	3	NIL
2.	35021I01	LEARNING IT ESSENTIALS BY DOING	INFOSYS	EC-IE	3	0	0	3	NIL
3.	34121I17	MATH MODELLING AND CONTROL SYSTEMS	REYNLAB	EC-IE	3	0	0	3	NIL
4.	34121I25	REAL TIME OPERATING SYSTEMS DESIGN AND PROGRAMMING	ARM	EC-IE	3	0	0	3	NIL
5.	34121I02	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING	ARM	EC-IE	3	0	0	3	NIL
6.	34121I28	TROUBLESHOOTING OF MEDICAL INSTRUMENTS	ATHEENA PANDIAN PVT. LTD	EC-IE	3	0	0	3	NIL

Open Courses – Innovation, Entrepreneurship, Skill Development etc. - Credits (6)

SL. NO	COURSE CODE	COURSE	OFFERING DEPT.	CATEGORY	L	T	P	C	PREREQUISITE
1.	34121O04	INNOVATION, PRODUCT DEVELOPMENT AND COMMERCIALIZATION	MANAG	OE-IE	3	0	0	3	NIL
2.	34121O06	NEW VENTURE PLANNING AND MANAGEMENT	MANAG	OE-IE	3	0	0	3	NIL
3.	34121O07	SOCIAL ENTREPRENEURSHIP	MANAG	OE-IE	3	0	0	3	NIL
4.	34121O01	ENGINEERING STARTUPS AND ENTREPRENEURIAL MANAGEMENT	MANAG	OE-IE	3	0	0	3	NIL
5.	34121O05	LIFE SKILLS	MANAG	OE-IE	3	0	0	3	NIL
6.	34121O02	INTELLECTUAL PROPERTY RIGHTS	MANAG	OE-IE	3	0	0	3	NIL

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Open Courses – Electives from other Technical and /or Emerging Courses Credits (6)									
SL. NO	**COURSE CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1.	34621O01	GREEN POWER GENERATION SYSTEMS	EEE	OE-EA	3	0	0	3	NIL
2.	34621O02	INDUSTRIAL DRIVES AND AUTOMATION	EEE	OE-EA	3	0	0	3	NIL
3.	38121O02	INTRODUCTION TO BIOFUELS	BTE	OE-EA	3	0	0	3	NIL
4.	38121O01	FOOD AND NUTRITION TECHNOLOGY	BTE	OE-EA	3	0	0	3	NIL
5.	34221O01	DISASTER RISK MANAGEMENT	CIVIL	OE-EA	3	0	0	3	NIL
6.	34221O02	MUNICIPAL SOLID WASTE MANAGEMENT	CIVIL	OE-EA	3	0	0	3	NIL
7.	35021O02	FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE	CSE	OE-EA	3	0	0	3	NIL
8.	35021O03	INTRODUCTION TO INTERNET OF THINGS	CSE	OE-EA	3	0	0	3	NIL
9.	35021O01	CYBER SECURITY	CSE	OE-EA	3	0	0	3	NIL
10.	34721O01	DESIGN OF ELECTRONIC EQUIPMENT	ECE	OE-EA	3	0	0	3	NIL
11.	34721O02	INTRODUCTION TO INDUSTRY 4.0 AND INDUSTRIAL INTERNET OF THINGS	ECE	OE-EA	3	0	0	3	NIL
12.	34421O01	3D PRINTING AND ITS APPLICATIONS	MECH	OE-EA	3	0	0	3	NIL
13.	34421O02	INDUSTRIAL ROBOTICS	MECH	OE-EA	3	0	0	3	NIL
14.	36921O01	BIOMOLECULES – STRUCTURE AND FUNCTION	PE	OE-EA	3	0	0	3	NIL
15.	36921O02	PHARMACOGENOMICS	PE	OE-EA	3	0	0	3	NIL

B.E. – BIOMEDICAL ENGINEERING – SEMESTER I TO VIII									
Project work, Seminar and Internship in Industry or elsewhere Credits - (16)									
SL. NO	**COURSE CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1.	35021O01	PROJECT WORK	BME	PI-P	0	0	16	8	NIL
2.	35321M81	MINI PROJECT	BME	PI-M	0	0	6	3	NIL
3.	35321S81	SEMINAR	BME	PI-S	0	0	2	1	NIL
4.	35321T81	INTERNSHIP	BME	PI-I	3 WEEKS			3	NIL
5.	35321T82	TRAINING	BME	PI-T	3 WEEKS			3	NIL

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MANDATORY COURSES (NO CREDITS) (NOT INCLUDED FOR CGPA CALCULATIONS)									
SL. NO	**COURSE CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
1.	34121Z81	YOGA AND MEDITATION	PHED	AC	0	0	2	0	NIL
ANY TWO OF THE FOLLOWING COURSES									
2.	34121Z82	GENDER EQUITY AND LAW	LAW	AC	0	0	2	0	NIL
3.	34121Z81	ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE	GEN	AC	0	0	2	0	NIL
4.	34121Z84	INDIAN CONSTITUTION	LAW	AC	0	0	2	0	NIL
5.	34121Z85	NSS/NCC/RRC/YRC/STUDENT CLUBS/UNNAT BHARAT ABHIYAN/ SWACHH BHARAT	GEN	AC	30 HOURS			0	NIL
6.	34121Z86	SPORTS AND GAMES	PHED	AC	0	0	2	0	NIL

B.E. – BIOMEDICAL ENGINEERING – SEMESTER I TO VIII									
Professional Elective Courses relevant to chosen Specialization / Branch Credits - (12)									
SL. NO	**COURSE CODE**	**COURSE**	**OFFERING DEPT.**	**CATEGORY**	**L**	**T**	**P**	**C**	**PREREQUISITE**
SPECIALISATION – HOSPITAL MANAGEMENT									
1.	35321HM01	HOSPITAL ENGINEERING DESIGN	BME	EC-SE	3	0	0	3	NIL
2.	35321HM02	MEDICAL ETHICS AND INTELLECTUAL PROPERTY RIGHTS	BME	EC-SE	3	0	0	3	NIL
3.	35321HM03	HEALTHCARE INFORMATICS	BME	EC-SE	3	0	0	3	NIL
4.	35321HM04	PATIENT SAFETY AND RISK MANAGEMENT IN HOSPITAL	BME	EC-SE	3	0	0	3	NIL
5.	35321HM05	HOSPITAL WASTE MANAGEMENT	BME	EC-SE	3	0	0	3	NIL
6.	35321HM06	QUALITY CONTROL AND REGULATORY ASPECTS IN MEDICAL DEVICES	BME	EC-SE	3	0	0	3	NIL
7.	35321HM07	HOSPITAL ENGINEERING AND INFORMATION SYSTEMS	BME	EC-SE	3	0	0	3	NIL
8.	35321HM08	HOSPITAL EQUIPMENT SAFETY AND MANAGEMENT	BME	EC-SE	3	0	0	3	NIL
9.	35321HM09	HEALTH TECHNOLOGY MANAGEMENT AND ECONOMICS	BME	EC-SE	3	0	0	3	NIL
10.	35321HM10	HOSPITAL ENGINEERING DESIGN LAB	BME	EC-SE	0	0	4	2	NIL
SPECIALISATION – IMPLANTS AND REHABILITATION ENGINEERING									
1.	35321IRE01	HUMAN ASSIST DEVICES	BME	EC-SE	3	0	0	3	NIL

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2.	35321IRE02	BIOMECHANICS OF HUMAN MOVEMENT	BME	EC-SE	3	0	0	3	NIL
3.	35321IRE03	BIOMATERIALS	BME	EC-SE	3	0	0	3	NIL
4.	35321IRE04	ARTIFICAL ORGANS AND IMPLANTS	BME	EC-SE	3	0	0	3	NIL
5.	35321IRE05	BIO PHOTONICS	BME	EC-SE	3	0	0	3	NIL
6.	35321IRE06	MEMS AND NANOTECHNOLOGY IN MEDICAL APPLICATIONS	BME	EC-SE	3	0	0	3	NIL
7.	35321IRE07	WEARABLE SYSTEMS	BME	EC-SE	3	0	0	3	NIL
8.	35321IRE08	REHABILITATION ENGINEERING	BME	EC-SE	3	0	0	3	NIL
9.	35321IRE09	ROBOTICS AND AUTOMATION	BME	EC-SE	3	0	0	3	NIL
10.	35321IRE10	HUMAN ASSIST DEVICES LAB	BME	EC-SE	0	0	4	2	NIL
SPECIALISATION – CLINICAL ENGINEERING									
1.	35321CE01	QUALITY CONTROL FOR MEDICAL DEVICES	BME	EC-SE	3	0	0	3	NIL
2.	35321CE02	CRITICAL CARE INSTRUMENTS	BME	EC-SE	3	0	0	3	NIL
3.	35321CE03	BIOMEDICAL EQUIPMENT FOR CLINICAL APPLICATIONS	BME	EC-SE	3	0	0	3	NIL
4.	35321CE04	MEDICAL TECHNOLOGY AND ENTREPRENEURSHIP	BME	EC-SE	3	0	0	3	NIL
5.	35321CE05	ACTION PLAN DEVELOPMENT AND INTERVENTION	BME	EC-SE	3	0	0	3	NIL
6.	35321CE06	MEDICAL ETHICS AND HUMAN VALUES	BME	EC-SE	3	0	0	3	NIL
7.	35321CE07	HOME MEDICARE TECHNOLOGY	BME	EC-SE	3	0	0	3	NIL
8.	35321CE08	MEDICAL IMAGING EQUIPMENT	BME	EC-SE	3	0	0	3	NIL
9.	35321CE09	LAB VIEW DESIGN FOR MEDICAL SYSTEM	BME	EC-SE	3	0	0	3	NIL
10.	35321CE10	BIOMEDICAL EQUIPMENT LAB	BME	EC-SE	0	0	4	2	NIL
SPECIALISATION – AI TECHNIQUES FOR MEDICAL IMAGING									
1.	35321AIT01	MEDICAL IMAGING SYSTEMS	BME	EC-SE	3	0	0	3	NIL
2.	35321AIT02	INTRODUCTION TO MEDICAL IMAGE ANALYSIS	BME	EC-SE	3	0	0	3	NIL
3.	35321AIT03	ADVANCED COMPRESSION TECHNIQUES FOR MEDICAL IMAGES	BME	EC-SE	3	0	0	3	NIL
4.	35321AIT04	MACHINE LEARNING AND DEEP LEARNING IN MEDICINE IMAGING	BME	EC-SE	3	0	0	3	NIL
5.	35321AIT05	SOFT COMPUTING TECHNIQUES	BME	EC-SE	3	0	0	3	NIL

CHAIRPERSON
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6.	35321AIT06	NEURAL ENGINEERING	BME	EC-SE	3	0	0	3	NIL
7.	35321AIT07	BRAIN COMPUTER INTERFACE AND ITS APPLICATIONS	BME	EC-SE	3	0	0	3	NIL
8.	35321AIT08	HEALTHCARE BIOMETRIC SYSTEMS	BME	EC-SE	3	0	0	3	NIL
9.	35321AIT09	AI FOR ADVANCED BIOMEDICAL APPLICATION	BME	EC-SE	3	0	0	3	NIL
10.	35321AIT10	MEDICAL IMAGING SYSTEMS LAB	BME	EC-SE	0	0	4	2	NIL

B.E. – BIOMEDICAL ENGINEERING – SEMESTER III TO VIII

Honours & Minor Degree Programme Credits (18 – 20)

SL. NO	COURSE CODE	COURSE	OFFERING DEPT.	CATEGORY	L	T	P	C	PREREQUISITE
MEDICAL DEVICE DESIGN AND DEVELOPMENT									
1.		MEDICAL DEVICE DEVELOPMENT – CONCEPT TO MARKET	BME		3	0	0	3	NIL
2.		SMART BIOSENSORS AND ACTUATORS	BME		3	0	0	3	NIL
3.		EMBEDDED SYSTEM DESIGN AND PROGRAMMING	BME		3	0	2	4	NIL
4.		INTERNET OF MEDICAL THINGS	BME		3	0	0	3	NIL
5.		SMART CLOTHES AND WEARABLE TECHNOLOGY	BME		3	0	0	3	NIL
6.		MEDICAL DEVICES REGULATIONS	BME		3	0	0	3	NIL
7.		RELIABLE DESIGN OF MEDICAL DEVICES	BME		3	0	0	3	NIL
8.		CLINICAL EVALUATION OF MEDICAL DEVICES	BME		3	0	0	3	NIL
ARTIFICIAL INTELLIGENCE IN HEALTHCARE									
1.		NEURAL NETWORKS AND DEEP LEARNING FOR BIOMEDICAL APPLICATIONS	BME		3	0	0	3	NIL
2.		ARTIFICIAL INTELLIGENCE IN MEDICAL IMAGING	BME		3	0	0	3	NIL
3.		BUSINESS APPLICATIONS OF MACHINE LEARNING IN HEALTHCARE	BME		3	0	0	3	NIL
4.		ETHICS AND GOVERNANCE IN HEALTHCARE	BME		3	0	0	3	NIL
5.		ARTIFICIAL INTELLIGENCE IN ELECTRONIC HEALTH RECORDS	BME		3	0	0	3	NIL
6.		MEDICAL ROBOTICS	BME		3	0	0	3	NIL
7.		APPLICATIONS OF DIGITAL HEALTH INTERVENTION	BME		3	0	0	3	NIL
8.		NATURAL LANGUAGE PROCESSING FOR HEALTHCARE	BME		3	0	0	3	NIL

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