SETHU INSTITUTE OF TECHNOLOGY

PULLOOR, KARIAPATTI – 626115

(An Autonomous Institution

Affiliated to Anna University Chennai)

B.E. BIOMEDICAL ENGINEERING

CURRICULUM & SYLLABUS

REGULATIONS 2015

CHOICE BASED CREDIT SYSTEM

(Applicable to candidates admitted in the Academic Year 2016 - 2017)

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Chairman
Board of Studies
Chairperson
Board of Studies
Bio Medical Engineering
Sethu Institute of Technology
Kariapatti - 626 115.

Chairman
Academic Council
CHAIRMAN
ACADEMIC COUNCIL
Sethu Institute of Technology
Pulloor, Kariapatti - 625 115

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REGULATIONS 2015

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PROGRAMME: B.E. BIOMEDICAL ENGINEERING

VISION

To provide high quality technical education and to become a Centre of Excellence in education and research in Biomedical Engineering ensuring quality healthcare services.

MISSION

- Providing quality technical education to enable the students to meet the industrial needs.
- Adapting innovative teaching methodologies to produce competent technocrats.
- Facilitating the students towards employability and entrepreneurship.
- Promoting Industry Institute Interaction to enable new technologies.
- Enriching the student's technical competence in research and development.
- Serving the society by conducting research to improve health care services.

PROGRAMME EDUCATIONAL OBJECTIVES:

Our graduates will

PEO-1: Demonstrate their skills in solving challenges in health care by the knowledge acquired in engineering. **(Technical Competence)**

PEO-2: Exhibit leadership; make decisions with societal and ethical responsibilities effectively in multidisciplinary settings. **(Life-Long Learning)**

PEO-3: Recognize the need for sustaining and expanding their technical competence throughout their careers. **(Professionalism)**

PROGRAMME OUTCOMES:

The graduates of Biomedical Engineering Program will have an ability to:

PO-1: Apply knowledge of basic science, Biomedical, Mathematics and Engineering to solve the solution of complex engineering problems. **(Engineering knowledge)**

PO-2: Identify, formulate and analyze complex problems in the field of biomedical engineering using principles of mathematics, natural, biological and engineering sciences. **(Problem Analysis)**

PO-3: Design components, systems, or processes to meet the medical and health care needs within realistic constraints of economic, safety, cultural, societal, ethical and environmental considerations. **(Design and Development of Solutions)**

PO-4: Use research-based knowledge and research methods including design of medical equipments, analysis and interpretation of medical data, and synthesis of the information to provide valid conclusions. **(Conduct investigations of complex problems)**

PO-5: Use the techniques and skills to develop products such as artificial organs, prostheses medical information system that solve medical and health related problems by combining their knowledge of biology and medicine with engineering principles and practices. **(Modern Engineering Tools)**.

PO-6: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the biomedical engineering practice. **(Engineer and Society)**.

PO-7: Understand the impact of the biomedical engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. **(Environment and sustainability)**

PO-8: Apply ethical principles and commit to professional ethics, responsibilities and norms of the engineering practice. **(Ethics)**

PO-9: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. **(Individual and Team Work)**.

PO-10: 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. **(Communication)**.

PO-11: 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. **(Project Management and Finance)**

PO-12: Recognize the need for, and prepare to engage in independent and life-long learning in the broadest context of technological change and contemporary issues. **(Life-long learning)**

PROGRAMME SPECIFIC OUTCOMES:

PSO-1: Analyze, design and develop the systems to supplement and / or assist human healthcare.

PSO-2: Develop the mathematical model to understand the inter-relation among various Physiological systems.

Estd: 1995

SETHU INSTITUTE OF TECHNOLOGY

Pulloor, Kariapatti - 626 115

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B.E. Degree Programme

CURRICULUM

Regulation 2015

Bachelor of Engineering in Biomedical Engineering

OVERALL COURSE STRUCTURE

Category	Total No. of Courses	Credits	Percentage
Science & Humanities	05	11	7%
Basic Engineering	09	31	18%
Engineering Sciences	4	09	5%
Professional Core	32	76	45%
Professional Elective	6	18	11%
Open Elective	3	9	5%
Project	2	15	9%
TOTAL	63	169	100

COURSE CREDITS - SEMESTER WISE

Branch	I	II	III	IV	V	VI	VII	VIII	TOTAL
BME	22	21	22	22	22	23	17	20	169

Employability Courses
Skill Development Courses
Entrepreneurship Development Courses
Any two or all of the above

REGULATION 2015

B.E BIOMEDICAL ENGINEERING

CURRICULUM

CHOICE BASED CREDIT SYSTEM

SEMESTER I

S.No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	15UEN101	Technical English (Common to ALL)	2	0	0	2
2.	15UMA102	Engineering Mathematics – I (Common to ALL)	3	2	0	4
3.	15UPH103	Engineering Physics (Common to ALL)	3	0	0	3
4.	15UCY105	Applied Chemistry (Common to CSE, ECE, EEE, IT, BME)	3	0	0	3
5.	15UCS107	Computer Programming (Common to ALL)	3	0	0	3
6.	15UME108	Engineering Graphics (Common to ALL)	2	0	4	4
PRACTICAL						
7.	15UCS109	Computer Programming Laboratory (Common to ALL)	0	0	2	1
8.	15UME110	Engineering Practices Laboratory (Common to MECH,EEE,CIVIL, CHEM & BME)	0	0	2	1
9.	15UGS112	Basic Sciences Laboratory – I (Common to ALL)	0	0	2	1
		Total	16	2	10	22
Total Credits : 22						

SEMESTER II

S. No	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	15UEN201	Business English and Presentation Skills (Common to ALL)	3	0	0	3
2.	15UMA202	Engineering Mathematics – II (Common to ALL)	3	2	0	4
3.	15UPH204	Solid State Physics (Common to EEE & BME)	3	0	0	3
4.	15UCY207	Environmental Sciences (Common to ALL)	3	0	0	3
5.	15UBM208	Electrical Circuits Analysis	3	0	0	3
6.	15UBM209	Sensors and Measurement Techniques	3	0	0	3
PRACTICAL						
7.	15UGS210	Basic Sciences Laboratory – II (Common to ALL)	0	0	2	1
8.	15UBM211	Electrical Circuits and Transducer Laboratory	0	0	2	1
		Total	18	2	4	21
Total Credits : 21						

SEMESTER III

S.NO	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	15UMA321	Transforms and Partial Differential Equations (Common to Mech, ECE, EEE, CIVIL,CHEM & BME)	3	2	0	4
2.	15UBM302	Human Anatomy and Physiology	3	0	0	3
3.	15UBM303	Biochemistry	3	0	0	3
4.	15UBM304	Biomedical Instruments	3	0	0	3
5.	15UBM305	Semiconductor Devices and Circuits	3	0	0	3
6.	15UIT327	Object Oriented Programming and Data Structures	3	0	0	3
PRACTICAL						
7.	15UBM307	Semiconductor Devices and Circuits Laboratory	0	0	2	1
8.	15UBM308	Biochemistry Laboratory	0	0	2	1
9.	15UIT328	Object Oriented Programming and Data Structures Laboratory	0	0	2	1
		Total	18	2	6	22
Total Credits : 22						

SEMESTER IV

S.NO	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	15UMA424	Probability and Random Processes (Common to ECE & BME)	3	2	0	4
2.	15UBM401	Analog and Digital Integrated Circuits	3	0	0	3
3.	15UBM403	Medical Physics	3	0	0	3
4.	15UBM404	Principles of Signals and Systems	3	0	0	3
5.	15UBM405	Pathology and Microbiology	3	0	0	3
6.	15UBM406	Diagnostic and Therapeutic Equipments – I	3	0	0	3
7.	15UGS431	Reasoning and Quantitative Aptitude (Common to ALL)	1	0	0	1
PRACTICAL						
8.	15UBM407	Analog and Digital Integrated Circuits Laboratory	0	0	2	1
9.	15UBM408	Pathology and Microbiology Laboratory	0	0	2	1
		Total	19	2	4	22
Total Credits : 22						

SEMESTER V

S.NO	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	15UBM501	Microprocessor and Controller	3	0	0	3
2.	15UBM502	Diagnostic and Therapeutic Equipments – II	3	0	0	3
3.	15UBM503	Bio Control System	3	2	0	4
4.	15UBM504	Principles of Digital Signal Processing	3	0	0	3
5.		Professional Elective – I	3	0	0	3
6.		Professional Elective – II	3	0	0	3
PRACTICAL						
7.	15UBM507	Microprocessor and Controller Laboratory	0	0	2	1
8.	15UBM508	Signal Processing Techniques Laboratory	0	0	2	1
9.	15UBM509	Diagnostic and Therapeutic Equipments Laboratory	0	0	2	1
		Total	18	2	6	22
Total Credits : 22						

SEMESTER VI

S.NO	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	15UBM601	Medical Imaging Equipments	3	0	0	3
2.	15UBM602	Image Processing Techniques	3	0	0	3
3.	15UBM603	Biomechanics	3	0	0	3
4.		Professional Elective – III	3	0	0	3
5.		Professional Elective – IV	3	0	0	3
6.		Open Elective – I	3	0	0	3
PRACTICAL						
7.	15UBM607	Image Processing Techniques Laboratory	0	0	2	1
8.	15UBM608	Technical Project	0	0	6	3
9.	15UGS531	Soft skills and communication Laboratory (Common to MECH, CIVIL, CHEM & BME)	0	0	2	1
		Total	18	0	10	23
Total Credits : 23						

SEMESTER VII

S.NO	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	15UBM701	Hospital Management	3	0	0	3
2.	15UBM702	Human Assist Devices	3	0	0	3
3.	15UBM703	Neural Networks and Pattern Recognition	3	0	0	3
4.		Professional Elective – V	3	0	0	3
5.		Open Elective – II	3	0	0	3
PRACTICAL						
6.	15UBM706	Hospital Training	0	0	2	1
7.	15UBM707	Project Design Laboratory	0	0	2	1
		Total	15	0	4	17
Total Credits : 17						

SEMESTER VIII

S.NO	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1.	15UME801	Professional Ethics (Common to ALL)	2	0	0	2
2.		Professional Elective – VI	3	0	0	3
3.		Open Elective – III	3	0	0	3
PRACTICAL						
4.	15UBM804	Project work	0	0	24	12
		Total	8	0	24	20
Total Credits : 20						

LIST OF ELECTIVES

Course Code	Course Title	L	T	P	C
15UBM901	BioMEMS and Nano Electronics	3	0	0	3
15UBM902	Clinical Engineering	3	0	0	3
15UBM903	Intellectual Property Rights	3	0	0	3
15UBM904	Forensic Science	3	0	0	3
15UBM905	Drug Delivery Systems	3	0	0	3
15UBM906	Nuclear Medicine	3	0	0	3
15UBM907	Medical Radiation Safety Engineering	3	0	0	3
15UBM908	Biomaterials	3	0	0	3
15UBM909	Medical Optics	3	0	0	3
15UBM910	Bio Statistics	3	0	0	3
15UBM911	Communication Engineering	2	0	2	3
15UBM912	Biometric Systems	3	0	0	3
15UBM913	Medical Informatics	3	0	0	3
15UBM914	Telemedicine	3	0	0	3
15UBM915	Rehabilitation Engineering	3	0	0	3
15UBM916	Virtual Instrumentation for Biomedical Engineers	2	0	2	3
15UBM917	Embedded Systems in Medicine	3	0	0	3
15UBM918	Brain Computer Interface	3	0	0	3
15UBM919	Neuroscience	3	0	0	3
15UBM920	Cancer Biology	3	0	0	3
15UBM921	Robotics and Automation in medicine	3	0	0	3
15UBM922	Bio-Dynamics	3	0	0	3
15UBM923	Orthopedic mechanics	3	0	0	3
15UBM924	Physiological Modeling	2	0	2	3

LIST OF OPEN ELECTIVES

S. No	Course Code	Course Title	L	T	P	C
1	15UBM951	Biomedical Instrumentation Systems	3	0	0	3
2	15UBM952	Computer Applications in Medicine	3	0	0	3
3	15UBM953	Forensic Science in Health Care	3	0	0	3
4	15UBM954	Nuclear Medicine	3	0	0	3

LIST OF ONE CREDIT COURSES

S. No	Course Code	Course Title	L	T	P	C
1	15UBM861	Introduction to MATLAB	0	0	2	1
2	15UBM862	LabView for Medical Applications	0	0	2	1
3	15UBM863	Virtual Learning of Anatomy and Physiology	0	0	2	1
4	15UBM864	DICOM Introduction and Interpretation	0	0	2	1
5	15UBM865	Medical Coding	0	0	2	1
6	15UBM866	Multi Medical Equipments Operating Skills Laboratory	0	0	2	1
7	15UBM867	Medical Science	0	0	2	1
8	15UBM868	3D Printing applicable to Medical Field	0	0	2	1

LIST OF INTER DISICIPLINARY COURSES

S. No	Course Code	Course Title	L	T	P	C
1	15UGM951	Electrical Hazards and Safety In Hospitals	3	0	0	3
2	15UGM952	Biofluid Mechanics	3	0	0	3
3	15UGM953	Big Data and IOT in Medical Applications	3	0	0	3