



REGULATIONS 2019
FLEXIBLE CHOICE BASED CREDIT SYSTEM
DEPARTMENT OF BIOMEDICAL ENGINEERING
B.E. Biomedical Engineering
CURRICULUM

S.No.	Category	Course Code	Course Title	Contact Hours per Week			Credits	Prerequisite
				L	T	P		
1	HS	19EN101	Communicative English	3	0	2	4	-
2	HS	19EN102	Technical English	3	0	2	4	-
3	HS	19MS151	Principles of Management (#)	3	0	0	3	-
4	HS	19MS152	Total Quality Management (#)	3	0	0	3	-
5	BS	19MA202	Calculus and Laplace Transforms	3	1	0	4	-
6	BS	19MA204	Complex Variables and Ordinary Differential Equations	3	1	0	4	19MA202
7	BS	19MA210	Transforms and Partial Differential Equations	3	1	0	4	19MA202
8	BS	19MA217	Random Processes and Statistics	3	1	0	4	19MA202
9	BS	19PH202	Fundamentals of Engineering Physics	3	0	2	4	-
10	BS	19PH208	Medical Physics	3	0	0	3	-
11	BS	19CY202	Chemistry for Biomedical Engineering	3	0	2	4	-
12	ES	19CS301	Problem Solving and Python Programming	3	0	2	4	-
13	ES	19CS303	Fundamentals of Data Structures using Python	2	0	2	3	-
14	ES	19EE304	Basic Electrical and Instrumentation Engineering (***)	3	0	0	3	-
15	ES	19EE307	Basic Electrical Engineering (#***)	2	0	2	3	-
16	ES	19EC308	Devices and Circuits	3	0	2	4	-
17	ES	19EC301	Electric Circuit Analysis	3	0	2	4	-
18	ES	19EC303	Digital Principles and System Design	3	0	2	4	-
19	ES	19EC306	Analog and Digital Communication	3	0	2	4	-
20	ES	19ME302	Engineering Drawing	2	0	2	3	-
21	PC	19BM401	Biochemistry	3	0	2	4	-
22	PC	19BM402	Biosensors and Transducers	3	0	2	4	-
23	PC	19EC402	Signals and Systems	3	0	0	3	19MA202/ 19MA204
24	PC	19BM412	Anatomy and Human Physiology	3	0	0	3	-
25	PC	19EC405	Linear Integrated Circuits	3	0	2	4	19EC302/ 19EC308
26	PC	19BM404	Pathology and Microbiology	3	0	2	4	-
27	PC	19BM405	Biomedical and Virtual Instrumentation	3	0	2	4	-
28	PC	19EC408	Microprocessor and Microcontroller	3	0	2	4	19EC303
29	PC	19MD402	Bio Control Systems	3	0	0	3	-
30	PC	19BM406	Biomechanics	3	0	0	3	-
31	PC	19BM407	Diagnostic and Interventional Equipment	3	0	2	4	19BM405
32	PC	19BM408	Biomedical Signal Processing	3	0	2	4	19EC402
33	PC	19MD406	Medical Image Processing	3	0	2	4	-
34	PC	19BM409	Pattern Recognition and Neural Networks	3	0	0	3	-
35	PC	19BM410	Bio Materials and Artificial Organs	3	0	0	3	19BM406
36	PC	19BM411	Medical Imaging Systems	3	0	0	3	-
37	PE	19BM501	Medical Assist Devices	3	0	0	3	19MD405/ 19BM407
38	PE	19EC520	Introduction to MEMS and NEMS	3	0	0	3	-
39	PE	19EC414	Embedded Systems	2	0	2	3	19EC408
40	PE	19MD507	Physiological Modeling	3	0	0	3	-
41	PE	19BM505	Virtual Reality:Biomedical Centric Approach	3	0	0	3	-
42	PE	19BM507	Robotics in Medicine	3	0	0	3	-
43	PE	19BM504	Rehabilitation Engineering	3	0	0	3	19BM406
44	PE	19BM502	Biofluids and Dynamics	3	0	0	3	19BM406
45	PE	19BM506	Medical Nanotechnology	3	0	0	3	19BM404

46	PE	19BM510	Ergonomics	3	0	0	3	-
47	PE	19BM508	Tissue Engineering	3	0	0	3	19BM412/ 19BM410
48	PE	19BM509	Lab on Chip	3	0	0	3	19PH202
49	PE	19BM503	Fiber Optics and Lasers in Medicine	3	0	0	3	19PH202
50	PE	19BM511	Biomaterial Characterization	3	0	0	3	19BM410
51	PE	19BM512	Hospital Management	3	0	0	3	19MS151
52	PE	19BM513	Biometric Systems	3	0	0	3	19MD406
53	PE	19BM514	Principles of Telemedicine	3	0	0	3	19EC306
54	PE	19EC502	Speech Processing	3	0	0	3	19EC409/ 19BM408
55	PE	19EC417	Fundamentals of Computer Communication	2	0	2	3	19EC306
56	PE	19MD511	Brain Computer Interface and its Applications	3	0	0	3	-
57	PE	19MD512	Medical Wearable Systems	3	0	0	3	-
58	PE	19BM515	Bioinformatics	3	0	0	3	19BM401
59	PE	19BM516	Neural Engineering	3	0	0	3	19BM409
60	PE	19CS501	Machine Learning	3	0	0	3	19MA211/ 19MA212/ 19MA217/ 19MA218/ 19MA207
61	PE	19CS517	Mobile Computing	3	0	0	3	19CS406/ 19EC417
62	PE	19CS519	Data Science	3	0	0	3	19CS301/ 19CS501
63	PE	19CS520	Big Data Analytics	3	0	0	3	19CS411/ 19CS519
64	PE	19CS524	Deep Learning	3	0	0	3	19CS501
65	PE	19CS526	R Programming	2	0	2	3	19CS301/ 19CS303
66	PE	19CS515	Block Chain Architecture and its Use Cases	3	0	0	3	19CS412/ 19EC506/ 19EC306
67	PE	19CS528	Robotics and its Applications	3	0	0	3	19CS302/ 19EC408
68	PE	19CS529	Quantum Computing	3	0	0	3	19CS301/ 19CS303
69	PE	19CS530	Cyber Security	3	0	0	3	19CS412/ 19EC506/ 19EC306
70	PE	19BM517	Artificial intelligence: A modern Approach	3	0	0	3	19BM409
71	OE	19AG601	Principles of Crop Production	2	0	2	3	-
72	OE	19AG514	Food Packaging Technology	2	0	2	3	-
73	OE	19AG509	Human Engineering and Safety	2	0	2	3	-
74	OE	19AG424	Remote Sensing and GIS Applications	2	0	2	3	-
75	OE	19AG421	Dairy and Food Engineering	2	0	2	3	-
76	OE	19CE510	Integrated Water Resources Management	3	0	0	3	-
77	OE	19CE521	Air Pollution Engineering	3	0	0	3	-
78	OE	19CE525	Traffic Engineering	3	0	0	3	-
79	OE	19CE527	Construction Engineering and Occupational Safety	3	0	0	3	-
80	OE	19CE528	Contract Laws and Regulations	3	0	0	3	-
81	OE	19CS601	Database Management Systems	3	0	0	3	-
82	OE	19CS602	Business Intelligence and its Applications	3	0	0	3	-
83	OE	19CS603	Object Oriented Analysis and Design	3	0	0	3	-
84	OE	19CS516	Software Testing and Quality Assurance	3	0	0	3	-
85	OE	19CS525	Industrial IOT	3	0	0	3	-
86	OE	19EE601	Embedded Based Product Design and Development	3	0	0	3	-
87	OE	19EE602	Electrical Safety	3	0	0	3	-
88	OE	19EE603	Renewable Energy Sources	3	0	0	3	-
89	OE	19EE604	Fundamentals of Electric Power Utilization	3	0	0	3	-
90	OE	19EE605	Industrial Automation and Robotics	3	0	0	3	-
91	OE	19EE606	Solar Photovoltaic Energy	2	0	2	3	-
92	OE	19EC601	Electronic Packaging	3	0	0	3	-
93	OE	19EC602	Introduction to Micro Electro Mechanical Systems	3	0	0	3	-
94	OE	19EC603	Fuzzy Logic Systems and ANN	3	0	0	3	-

95	OE	19EC604	Consumer Electronics	3	0	0	3	-
96	OE	19EC605	Electronic System Design	3	0	0	3	-
97	OE	19EC606	Drones for Agriculture	3	0	0	3	-
98	OE	19EI601	Electrical and Electronic Measurements	3	0	0	3	-
99	OE	19EI602	Instrumentation and Control Systems	3	0	0	3	-
100	OE	19EI504	Environmental Instrumentation	3	0	0	3	-
101	OE	19EI508	SCADA Systems and Applications	3	0	0	3	-
102	OE	19EI511	Telemetry and Tele Control	3	0	0	3	-
103	OE	19BY201	Introduction to Biology	2	0	0	2	-
104	OE	19ME505	Computer Aided Design	2	0	2	3	-
105	OE	19ME511	Automobile Engineering	2	0	2	3	-
106	OE	19ME524	Sustainable and Green Manufacturing	2	0	2	3	-
107	OE	19ME529	Process Planning and Cost Estimation	2	0	2	3	-
108	OE	19ME531	Intellectual Property Rights	2	0	2	3	-
109	OE	19ME601	Mechatronics and Robotics	2	0	2	3	-
110	OE	19ME602	Hydraulic Drives and Controls	2	0	2	3	-
111	OE	19ME533	3D Printing Processes	3	0	2	4	-
112	OE	19MD501	Tele Health Technology	3	0	0	3	-
113	OE	19MD509	Bio MEMS	3	0	0	3	-
114	OE	19MD512	Medical Wearable Systems	3	0	0	3	-
115	OE	19MD601	Biomedical Sensors and Measurements	3	0	0	3	-
116	OE	19MD602	Biomedical Optics	3	0	0	3	-
117	OE	19CH503	Energy Technology	3	0	0	3	-
118	OE	19CH505	Green Technology	3	0	0	3	-
119	OE	19CH511	Food Technology	3	0	0	3	-
120	OE	19CH512	Drugs and Pharmaceutical Technology	3	0	0	3	-
121	OE	19CH516	Corrosion Technology	3	0	0	3	-
122	OE	19IT517	Data Security	3	0	0	3	-
123	OE	19IT518	Game Theory	3	0	0	3	-
124	OE	19IT519	Data Analysis using R Programming	3	0	0	3	-
125	OE	19IT520	Linux Fundamentals	3	0	0	3	-
126	OE	19IT521	Internet Technologies	3	0	0	3	-
127	OE	19IT522	Fundamentals of Databases	3	0	0	3	-
128	OE	19EN601	Creative Writing	2	0	0	2	-
129	OE	19EN602	English through Media	2	0	0	2	-
130	OE	19EN603	Introduction to Design	0	0	4	2	-
131	OE	19EN604	Design Thinking	2	0	0	2	-
132	OE	19EN605	Modern Trends in Physical Education and Sports Sciences	0	0	4	2	-
133	OE	19EN606	Psychology for Professionals	2	0	0	2	-
134	OE	19EN607	Heritage Studies	0	0	4	2	-
135	OE	19EN608	Mime Theatre Art	0	0	4	2	-
136	OE	19EN609	Gender Sensitization	2	0	0	2	-
137	OE	19EN610	French Basic	0	0	4	2	-
138	OE	19EN611	French Advanced	0	0	4	2	19EN610
139	OE	19EN612	German Basic	0	0	4	2	-
140	OE	19EN613	German Advanced	0	0	4	2	19EN612
141	OE	19EN614	Japanese Basic	0	0	4	2	-
142	OE	19EN615	Japanese Advanced	0	0	4	2	19EN614
143	OE	19EN616	Yoga and Meditation	0	0	2	1	-
144	OE	19EN617	Product Design for Future	0	0	4	2	-
145	OE	19EN618	Indian Astronomy and Mathematics	2	0	0	2	-
146	OE	19EN619	Inventions and Discoveries	2	0	0	2	-
147	OE	19EN620	Mandarin	0	0	4	2	-
148	OE	19EN621	Spanish Basic	0	0	4	2	-
149	OE	19EN622	Spanish Advanced	0	0	4	2	19EN621
150	OE	19EN623	Dream, Draw and Create	0	0	4	2	-
151	OE	19MA601	Resource Management Techniques	3	0	0	3	-
152	OE	19MA602	Statistics for Engineers	3	0	0	3	-
153	OE	19BM608	Engineering Mechanics (NPTEL)	0	0	0	2	-
154	OE	19BM609	Mathematical Aspects of Biomedical Electronic System Design (NPTEL)	0	0	0	2	-

155	OE	19EC611	Introduction to Machine Learning (NPTEL)	0	0	0	2	-
156	OE	19EC621	Introduction to Internet of Things (NPTEL)	0	0	0	2	-
157	OE	19EC623	The Joy of Computing using Python (NPTEL)	0	0	0	2	-
158	OE	19BM610	Drug Delivery: Principles and Engineering (NPTEL)	0	0	0	2	-
159	OE	19BM611	Biophotonics (NPTEL)	0	0	0	2	-
160	OE	19BM612	Introduction to Photonics (NPTEL)	0	0	0	2	-
161	OE	19BM613	Fluid Mechanics (NPTEL)	0	0	0	2	-
162	OE	19BM614	Fundamentals of Artificial Intelligence (NPTEL)	0	0	0	2	-
163	OE	19BM615	Physics of Biological System (NPTEL)	0	0	0	2	-
164	EEC	19BM701	Mini Project	0	0	4	2	-
165	EEC	19BM702	Project Work Phase I	0	0	4	2	-
166	EEC	19BM703	Project Work Phase II	0	0	12	6	-
167	EEC	19EY701	Soft Skills	0	0	2	1	-
168	EEC	19EY702	Creative Skills for Communication	0	0	2	1	-
169	EEC	19EY703	System of Numerical and Logical Terminologies	0	0	2	1	-
170	EEC	19EY704	Advanced Quantitative and Logical Reasoning	0	0	2	1	-
171	EEC	19EY705	Employment Enhancement Skills	0	0	2	1	-
172	EEC	19EY706	Company Specific Assessments for Employability	0	0	2	1	-
173	MC	19MC801	Professional Ethics	3	0	0	0	-
174	MC	19MC802	Environmental Science	3	0	0	0	-
175	MC	19MC803	Constitution of India	3	0	0	0	-
176	MC	19MC804	Internship/Entrepreneurship/Consultancy	0	0	0	2	-
177	MC	19MC805	Inplant Training	0	0	0	1	-
178	MC	19MC806	Paper Publication	0	0	0	1	-
179	MC	19MC807	National Service Scheme	0	0	0	0	-
180	MC	19MC808	National Sports Organization	0	0	0	0	-
181	MC	19MC809	Youth Red Cross	0	0	0	0	-

CREDIT SUMMARY				
CATEGORY	REGULAR		LATERAL ENTRY	
	Credits	Credit%	Credits	Credit%
Humanities and Social Science Courses	11	6.7	3	2.38
Basic Science Courses	27	16.46	11	8.73
Engineering Science Courses	29	17.6	15	11.9
Professional Core Courses	57	34.7	57	45.23
Professional Elective Courses	12	7.31	12	9.52
Open Elective Courses	12	7.31	12	9.52
Employability Enhancement Courses	16	9.75	16	12.69
Total	164	100	126	100
Mandatory Courses	4		4	

LEGEND

**	2019 Batch only
***	2020 Batch onwards
#	Any one course to be taken
	Courses exempted for Lateral Entry students