



EXCEL ENGINEERING COLLEGE

(Autonomous)

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

B.E. BIOMEDICAL ENGINEERING REGULATION – 2023 CHIOCE BASED CREDIT SYSTEM I TO VIII SEMESTERS CURRICULUM AND SYLLABI

I SEMESTER									
Code No.	Course	Category	Periods / Week			C	Maximum Marks		
			L	T	P		CA	FE	Total
Theory Course(s)									
23MA102	Matrices and Calculus (Common to All Programmes)	BS	3	1	0	4	40	60	100
23LET07	Heritage of Tamils/தமிழர் மரபு	HSS	1	0	0	1	100	0	100
23BM101	Clinical biochemistry	PC	3	0	0	3	40	60	100
Theory with Practical Course(s)									
23ENE01	Communicative English	HSS	2	0	2	3	50	50	100
23CH101	Chemistry for Electrical Sciences (Common to BME, ECE & EEE)	BS	3	0	2	4	50	50	100
23CS12	Problem Solving using Python	ES	3	0	2	4	50	50	100
Practical Course									
23BM102	Clinical biochemistry Laboratory	PC	0	0	2	1	60	40	100
Mandatory Course									
23MC101	Induction Programme	MC	2 Weeks			0	100	-	100
TOTAL			15	1	8	20	490	310	800

II SEMESTER									
Code No.	Course	Category	Periods / Week			C	Maximum Marks		
			L	T	P		CA	FE	Total
Theory Course (s)									
23MA202	Mathematical Foundations For Engineering (Common to All Programmes)	BS	3	1	0	4	40	60	100
23BM201	Medical Physics	PC	3	0	0	3	40	60	100
23BM202	Human Anatomy and Physiology	PC	3	0	0	3	40	60	100
23LET08	தமிழரும் தொழில்நுட்பமும் Tamil and Technology	HSS	1	0	0	1	100	0	100
Theory with Practical Course (s)									
23LEXXX	Language Electives – II	HSS	2	0	2	3	50	50	100
23PH201	Solid State Physics (Common to BME, ECE & EEE)	BS	3	0	2	4	50	50	100
23ME203	Engineering Graphics	ES	1	0	4	3	50	50	100
Practical Course									
23BM203	Human Physiology Laboratory	PC	0	0	2	1	60	40	100
Mandatory Course									
23MC202	Environmental Sciences	MC	2	0	0	0	100	-	100
Total			18	1	10	22	530	370	900

Language Electives – II

Code No.	Course	Category	Periods / Week			C	Maximum Marks		
			L	T	P		CA	FE	Total
23LEE02	Advanced Communicative English	HSS	2	0	2	3	50	50	100
23LEH03	Hindi	HSS	2	0	2	3	50	50	100
23LEF04	French	HSS	2	0	2	3	50	50	100
23LEG05	German	HSS	2	0	2	3	50	50	100
23LEJ06	Japanese	HSS	2	0	2	3	50	50	100

III SEMESTER									
Code No.	Course	Category	Periods / Week			C	Maximum Marks		
			L	T	P		CA	FE	Total
Theory Course(s)									
23MA302	Probability And Statistics	BS	3	2	0	4	40	60	100
23BM301	Fundamentals of Bioinformatics	PC	3	0	0	3	40	60	100
23BM302	Electronic Device and Circuits	PC	3	0	0	3	40	60	100
23BM303	Signals and Systems for Bioengineers	PC	3	0	0	3	40	60	100
23UH001	Universal Human Values	HSS	3	0	0	3	40	60	100
Theory with Practical Course(s)									
23CS310	Object Oriented Programming And Data Structures	PC	3	0	2	4	50	50	100
Practical Course									
23BM305	Electronic Devices and Circuits Laboratory	PC	0	0	2	1	60	40	100
Mandatory Course									
23MC006	Soft Skills	MC	0	0	2	0	100	-	100
Total			18	2	6	21	410	390	800

IV SEMESTER									
Code No.	Course	Category	Periods / Week			C	Maximum Marks		
			L	T	P		CA	FE	Total
Theory Course(s)									
23MA401	Numerical Methods	BS	3	2	0	4	40	60	100
23BM401	Digital Electronics and Integrated Circuits	PC	3	2	0	4	40	60	100
23BM402	Biosignal processing	PC	3	0	0	3	50	50	100
23BM403	Hospital Management	HSS	3	0	0	3	40	60	100
Theory with Practical Course(s)									
23BM404	Biosensors and Measurements	PC	2	0	2	3	50	50	100
23BM405	Pathology and Microbiology	PC	3	0	2	4	40	60	100
Practical Course									
23BM406	Biosignal processing Laboratory	PC	0	0	2	1	60	40	100
Mandatory Course									
23MC203	Interpersonal Skills	MC	0	0	2	0	100	-	100
23MC004	Constitution of India	MC	2	0	0	0	100	-	100
Total			19	4	8	22	520	380	900

V SEMESTER									
Code No.	Course	Category	Periods / Week			C	Maximum Marks		
			L	T	P		CA	FE	Total
Theory Course(s)									
23BM501	Radiological Equipments	PC	3	2	0	4	40	60	100
23BM502	Biomedical Instrumentation	PC	3	0	0	3	40	60	100
23BM503	Biocontrol System	PC	3	2	0	4	40	60	100
23BMEXX	Professional Elective-I	PE	3	0	0	3	40	60	100
23YYOXX	Open Elective-I	OE	3	0	0	3	40	60	100
Theory with Practical Course(s)									
23BM504	Biomechanics and its practices	PC	3	0	2	4	50	50	100
Practical Course(s)									
23BM505	Biomedical Instrumentation Laboratory	PC	0	0	2	1	60	40	100
Mandatory Course									
23MC005	Yoga and Values for Holistic Development	MC	0	0	2	0	100	-	100
Total			18	4	6	22	410	390	800

VI SEMESTER									
Code No.	Course	Category	Periods / Week			C	Maximum Marks		
			L	T	P		CA	FE	Total
Theory Course(s)									
23BM601	Regulatory Affairs and Medical Ethics	PC	3	0	0	3	40	60	100
23BM602	Biomaterials and Artificial Organs	PC	3	0	0	3	40	60	100
23BM603	Fundamentals of Healthcare Analytics	PC	3	0	0	3	40	60	100
23BMEXX	Professional Elective-II	PE	3	0	0	3	40	60	100
23YYOXX	Open Elective-II	OE	3	0	0	3	40	60	100
Theory with Practical Course									
20BM604	Diagnostic and Therapeutic Equipment	PC	3	0	2	4	40	60	100
Practical Course(s)									
23BM605	Design Thinking and Mini Project	EEC	0	0	4	2	40	60	100
23BM606	Internship	EEC	2 weeks			1	100	0	100
Total			18	0	6	22	380	420	800

VII SEMESTER									
Code No.	Course	Category	Periods / Week			C	Maximum Marks		
			L	T	P		CA	FE	Total
Theory Courses									
23BM701	Economics and Management for Bioengineers	HSS	3	0	0	3	40	60	100
23BM702	Medical Image Processing	PC	3	0	0	3	40	60	100
23BM703	Artificial Intelligence and Machine Learning for Healthcare	PC	3	0	0	3	40	60	100
23BMEXX	Professional Elective-III	PE	3	0	0	3	40	60	100
23BMEXX	Professional Elective-IV	PE	3	0	0	3	40	60	100
23YYOXX	Open Elective-III	OE	3	0	0	3	40	60	100
Practical Course(s)									
23BM704	Medical Image Processing Laboratory	PC	0	0	2	1	60	40	100
23BM705	Hospital Training	EEC	0	0	2	1	100	00	100
23BM706	Design Project	EEC	0	0	4	2	40	60	100
Total			18	0	8	22	440	460	900

VIII SEMESTER									
Code No.	Course	Category	Periods / Week			C	Maximum Marks		
			L	T	P		CA	FE	Total
23BMEXX	Professional Elective-V	PE	3	0	0	3	40	60	100
23BMEXX	Professional Elective-VI	PE	3	0	0	3	40	60	100
23BM801	Major Project	EEC	0	0	16	8	40	60	100
Total			6	0	16	14	120	180	300

PROFESSIONAL ELECTIVES (PE)									
Code No.	Course	Category	Periods / Week			C	Maximum Marks		
			L	T	P		CA	FE	Total
STREAM – 1 BIOMEDICAL SIGNAL AND IMAGE PROCESSING (BSIP)									
23BME01	Physiological Signal Processing	PE	3	0	0	3	40	60	100
23BME02	Biometric Systems	PE	3	0	0	3	40	60	100
23BME03	Computer Vision and Pattern Recognition for Biological applications	PE	3	0	0	3	40	60	100
23BME04	Computational Medicine	PE	3	0	0	3	40	60	100
23BME05	Biostatistics	PE	3	0	0	3	40	60	100
23BME06	Quality Assurance & Medical Device Regulations	PE	3	0	0	3	40	60	100
23BME07	Medical Image Analysis	PE	3	0	0	3	40	60	100
23BME08	Brain Computer Interface and its Applications	PE	3	0	0	3	40	60	100
23BME09	Soft computing and applications	PE	3	0	0	3	40	60	100
23BME10	Deep Learning for Healthcare	PE	3	0	0	3	40	60	100
23BME11	Neuro-Science Engineering	PE	3	0	0	3	40	60	100
23BME12	Biomedical Data Science	PE	3	0	0	3	40	60	100
STREAM – 2 HEALTH CARE SYSTEMS (HCS)									
23BME21	Human Assist Devices	PE	3	0	0	3	40	60	100
23BME22	Robotics in Medicine	PE	3	0	0	3	40	60	100
23BME23	Medical Device Design and Prototyping	PE	3	0	0	3	40	60	100
23BME24	Tele Health Technology	PE	3	0	0	3	40	60	100
23BME25	Wearable Systems	PE	3	0	0	3	40	60	100
23BME26	Body Area Networks	PE	3	0	0	3	40	60	100
23BME27	Health Information Technology	PE	3	0	0	3	40	60	100
23BME28	Data communication and Networking	PE	3	0	0	3	40	60	100
23BME29	Internet of Things in Medicine	PE	3	0	0	3	40	60	100
23BME30	Medical Informatics	PE	3	0	0	3	40	60	100
23BME31	Genomics & Systems Biology	PE	3	0	0	3	40	60	100



23BME32	Computitional Biology	PE	3	0	0	3	40	60	100
STREAM – 3 BIOENGINEERING (BE)									
23BME41	Rehabilitation Engineering	PE	3	0	0	3	40	60	100
23BME42	Translational cell and Tissue Engineering	PE	3	0	0	3	40	60	100
23BME43	Molecular Biology	PE	3	0	0	3	40	60	100
23BME44	Biophotonics	PE	3	0	0	3	40	60	100
23BME45	Genetic Engineering	PE	3	0	0	3	40	60	100
23BME46	Nano Technology and Applications	PE	3	0	0	3	40	60	100
23BME47	Immuno Engineering	PE	3	0	0	3	40	60	100
23BME48	Bio MEMS and Micro fluids	PE	3	0	0	3	40	60	100
23BME49	Lab-on-Chip & Point-of-care Devices	PE	3	0	0	3	40	60	100
23BME50	Physiological Modelling	PE	3	0	0	3	40	60	100
23BME51	Medical Optics	PE	3	0	0	3	40	60	100



OPEN ELECTIVE COURSES (For Other Branches)									
Code No.	Course	Category	Periods / Week			C	Maximum Marks		
			L	T	P		CA	FE	Total
23BMO01	Principles of telemedicine	OE	3	0	0	3	40	60	100
23BMO02	Biosensor and wearable technology	OE	3	0	0	3	40	60	100
23BMO03	R-Program for Bioinformatics	OE	3	0	0	3	40	60	100
23BMO04	Introduction to Biomedical devices	OE	3	0	0	3	40	60	100
23BMO05	Medical nanotechnology	OE	3	0	0	3	40	60	100
23BMO06	Rehabilitation Engineering	OE	3	0	0	3	40	60	100
23BMO07	Medical electronics	OE	3	0	0	3	40	60	100
23BMO08	Biomedical instrumentation	OE	3	0	0	3	40	60	100
23BMO09	Hospital management	OE	3	0	0	3	40	60	100
23BMO10	Basics of Medical informatics	OE	3	0	0	3	40	60	100
23BMO11	Fundamentals of Biochemistry	OE	3	0	0	3	40	60	100
23BMO12	Basics of human anatomy and physiology	OE	3	0	0	3	40	60	100

ONE CREDIT COURSES										
Code No.	Course	Category	Periods / Week				C	Maximum Marks		
			L	T	P	CA		FE	Total	
23BMA01	Scientific Computing for Biologists	EEC	1	0	0	1	100	0	100	
23BMA02	Frontiers in Medical Informatics	EEC	1	0	0	1	100	0	100	
23BMA03	Ultrasound Machine	EEC	1	0	0	1	100	0	100	
23BMA04	IoT for Healthcare Applications	EEC	1	0	0	1	100	0	100	
23BMA05	Ventilator with monitoring equipment	EEC	1	0	0	1	100	0	100	
23BMA06	Human Computer Interaction	EEC	1	0	0	1	100	0	100	
23BMA07	Digital manufacturing for Health Care	EEC	1	0	0	1	100	0	100	

SUMMARY

S.No	Category	CREDITS PER SEMESTER									
		I	II	III	IV	V	VI	VII	VIII	Total Credits (AICTE)	Credits in %
1	HSS	4	4	3	3			3		17 (10-14)	10.3%
2	BS	8	8	4	4			0		24 (22-28)	16.3%
3	ES	4	3	0	0			0		7 (24)	4.8%
4	PC	4	7	14	15	16	13	7		76 (48)	43.3%
5	PE					3	3	6	6	18 (18)	10.9%
6	OE					3	3	3		9	5.4%
7	EEC						3	3	8	14 (12-16)	9%
8	MC	0	0	0						0	0
Total		20	22	21	22	22	22	22	14	165	100%

HSS - Humanities and Social Sciences

BS - Basic Sciences

ES - Engineering Sciences

PC - Professional Core

PE - Professional Electives

OE - Open Electives

EEC - Employability Enhancement Courses

MC - Mandatory Courses (Non-Credit Courses)

CA - Continuous Assessment

FE - Final Examination



Passed in Board of Studies Meeting

CHAIRMAN - BOARD OF STUDIES

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Passed in Board of Studies Meeting


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