

ACADEMIC CURRICULA

POST GRADUATE DEGREE PROGRAMMES

Master of Technology

(Choice Based Flexible Credit System)

Regulations 2021

Volume – 21 Curriculum



SRM

INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

(Deemed to be University u/s 3 of UGC Act, 1956)

Kattankulathur, Chengalpattu District 603203,

Tamil Nadu, India

5. M.Tech in Biomedical Engineering

5. (a) Department Vision Statement

Stmnt - 1	<i>Implement science and Engineering principles in the broad area of medical Instrumentation</i>
Stmnt - 2	<i>Improve health care delivery to humans in association with physicians and surgeons</i>
Stmnt - 3	<i>Translate Biomedical Engineering research to applications that will advance and improve health care.</i>

5. (b) Department Mission Statement

Stmnt - 1	<i>Build on a strong foundation in Basic science and Engineering and educate the students in diverse filed of Biomedical Engineering</i>
Stmnt - 2	<i>Work towards state of art Biomedical Engineering research and development through an interdisciplinary curriculum.</i>
Stmnt - 3	<i>Apply knowledge about design in development of enabling technologies for improvement of human health</i>
Stmnt - 4	<i>Promote Biomedical Engineering research with ethics in the development of novel and innovative technologies.</i>
Stmnt - 5	<i>Achieve academic excellence and stay research driven to match national and international standards.</i>

5. (c) Program Education Objectives (PEO)

PEO - 1	<i>To apply quantitative, qualitative, analytic and critical thinking skills to solve engineering problems.</i>
PEO - 2	<i>To meet the expectations of the employers in the biomedical engineering domain.</i>
PEO - 3	<i>To inculcate insight knowledge to improve quality research development in health care domain</i>
PEO - 4	<i>To foster device development and promote Entrepreneurship skills.</i>
PEO - 5	<i>To provide self-directed learning to accomplish technical competence in the medical field.</i>

5. (d) Consistency of PEO's with Mission of the Department

	Mission Stmnt. - 1	Mission Stmnt. - 2	Mission Stmnt. - 3	Mission Stmnt. - 4	Mission Stmnt. - 5
PEO - 1	2	2	3	2	1
PEO - 2	2	2	3	2	3
PEO - 3	2	3	2	2	3
PEO - 4	2	3	3	2	2
PEO - 5	2	2	2	2	3

5. (e) PO – Program Outcomes

PO - 1	<i>An ability to independently carry out research /investigation and development work to solve practical problems.</i>
PO - 2	<i>An ability to write and present a substantial technical report/document.</i>
PO - 3	<i>Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.</i>

5. (f) Consistency of PEO's with Program Outcomes (PO)

	Program Outcomes (PO)		
	1	2	3
PEO - 1	2	3	3
PEO - 2	2	2	3
PEO - 3	2	3	3
PEO - 4	2	1	1
PEO - 5	1	2	2

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

5. (g) Programme Structure: M.Tech in Biomedical Engineering

Professional Core Courses (C)							Professional Elective Courses (E) (7 Course only)						
Course Code	Course Title	Hours/Week			C		Course Code	Course Title	Hours/Week			C	
		L	T	P					L	T	P		
21BMC501T	Human Anatomy and Physiology	3	0	0	3		21BME601T	Advanced Medical Imaging Systems	2	1	0	3	
21BMC502J ²	Advanced Biomedical Instrumentation	3	0	2	4		21BME603T	Biomedical Optics	3	0	0		
21BMC503J	Advanced Biomaterials	3	0	2	4		21BME602T	Biomechanics and Finite Element Analysis	3	0	0	3	
21BMC504J	Biomedical Signal Analysis	3	0	2	4		21BME607T	Tissue Engineering and Regenerative Medicine	3	0	0		
21BMC505J	Techniques in Medical Image Analysis	3	0	2	4		21BME614T	Human Machine Interface	3	0	0	3	
21IPC501J ²	Research Methodology	2	1	2	4		21BME616T ³	Hospital Management System	3	0	0		
21BMC601T ¹	Case Studies	3	0	0	3		21BME609T	Artificial Neural Networks and Genetic Algorithms	3	0	0	3	
Total Credits						26	21BME613T	Biometrics and Biomimetics	3	0	0		
							21BME610T	Neuroengineering	3	0	0	3	
							21BME606T	Kinesiology and Ergonomics	3	0	0		
							21BME612T	Intelligent Healthcare using Machine Learning and Deep Learning Techniques	3	0	0		
							21BME605T	Biomedical Sensors and Applications	3	0	0	3	
							21BME608T	Rehabilitation Engineering and Assistive Technology	3	0	0		
							21BME600T ¹	Journal Publication	0	0	0		
							21BME604T	Troubleshooting and Regulatory Affairs in Medicine	3	0	0	3	
							21BME611T	BioMEMS and Bio microfluidics	3	0	0		
							21BME615T	Medical Robotics and Automation	3	0	0		
							Total Credits						21
							Open Elective Courses (O)						
Course Code	Course Title	Hours/Week			C		Course Code	Course Title	Hours/Week			C	
		L	T	P					L	T	P		
21BMC502J ²	Advanced Biomedical Instrumentation	3	0	2	4				3	0	0	3	
21IPC501J ²	Research Methodology	2	1	2	4		Total Credits ³						3
							100% assessment by the Department ⁽¹⁾						
Course Code	Course Title	Hours/Week			C		Course Code	Course Title	Hours/Week			C	
		L	T	P					L	T	P		
21BME616T ³	Hospital Management System	3	0	0	3		21BMC601T ¹	Case Studies	3	0	0	3	
							21BME600T ¹	Journal Publication	0	0	0	3	

All elective courses may be studied under MOOC platform

¹ 100% assessment by the Department

² Assessment by Open Book Examination

³ Course Delivery through online mode

5. (h) Implementation Plan: M.Tech in Biomedical Engineering

Semester - I						Semester - II					
Code	Course Title	Hours/Week				Code	Course Title	Hours/Week			
		L	T	P	C			L	T	P	C
21BMC501T	Human Anatomy and Physiology	3	0	0	3	21BMC504J	Biomedical Signal Analysis	3	0	2	4
21BMC502J ²	Advanced Biomedical Instrumentation	3	0	2	4	21BMC505J	Techniques in Medical Image Analysis	3	0	2	4
21BMC503J	Advanced Biomaterials	3	0	2	4	21BME602T	Biomechanics and Finite Element Analysis	3	0	0	3
21IPC501J ²	Research Methodology	2	1	2	4	21BME607T	Tissue Engineering and Regenerative Medicine	3	0	0	
21BME601T	Advanced Medical Imaging Systems	2	1	0	3	21BME614T	Human Machine Interface	3	0	0	3
21BME603T	Biomedical Optics	3	0	0		21BME616T ³	Hospital Management System	3	0	0	
Total Credits					18	21BME609T	Artificial Neural Networks and Genetic Algorithms	3	0	0	3
						21BME613T	Biometrics and Biomimetics	3	0	0	
						Total Credits					17
Semester - III						Semester - IV					
Code	Course Title	Hours/Week				Code	Course Title	Hours/Week			
		L	T	P	C			L	T	P	C
	Open Elective	3	0	0	3	21BMP501L	Specialization Project (OR)	0	0	40	20
21BME610T	Neuroengineering	3	0	0	3	21BMP502L	Specialization Project	0	0	30	15
21BME606T	Kinesiology and Ergonomics	3	0	0		21BMP503L	Domain Internship	0	0	10	5
21BME612T	Intelligent healthcare using Machine Learning and Deep Learning Techniques	3	0	0	3	Total Credits					20
21BME605T	Biomedical Sensors and Applications	3	0	0							
21BME608T	Rehabilitation Engineering and Assistive Technology	3	0	0	3						
21BME600T ¹	Journal Publication	0	0	0							
21BME604T	Troubleshooting and Regulatory Affairs in Medicine	3	0	0	3						
21BME611T	BioMEMS and Bio microfluidics	3	0	0							
21BME615T	Medical Robotics and Automation	3	0	0	3						
21BMC601T ¹	Case Studies	3	0	0							
Total Credits					15						

Students must register either 21BMP501L or 21BMP502L and 21BMP503L both in fourth semester

5. (i) Program Articulation Matrix: M.Tech in Biomedical Engineering

Course Code	Course Name	Programme Outcomes		
		1	2	3
21BMC501T	Human Anatomy and Physiology	1	1	1
21BMC502J	Advanced Biomedical Instrumentation	3	-	2
21BMC503J	Advanced Biomaterials	1	-	1
21BMC504J	Biomedical Signal Analysis	2	1	2
21BMC505J	Techniques in Medical Image Analysis	1	1	2
21BMC601T	Case Studies			
21BME601T	Advanced Medical Imaging Systems	2	2	2
21BME602T	Biomechanics and Finite Element Analysis	2	1	1
21BME603T	Biomedical Optics	2	2	2
21BME604T	Troubleshooting and Regulatory Affairs in Medicine	1	-	-
21BME605T	Biomedical Sensors and Applications	2	2	2
21BME606T	Kinesiology and Ergonomics	2	1	1
21BME607T	Tissue Engineering and Regenerative medicine	1	1	-
21BME608T	Rehabilitation Engineering and Assistive Technology	2	1	1
21BME609T	Artificial Neural Networks and Genetic Algorithms	1	1	2
21BME610T	Neuroengineering	2	2	2
21BME611T	BioMEMS and Bio microfluidics	1	1	1
21BME612T	Intelligent healthcare using Machine learning and Deep learning techniques	2	1	1
21BME613T	Biometrics and Biomimetics	1	1	1
21BME614T	Human Machine Interface	1	-	1
21BME615T	Medical Robotics and Automation	2	1	1
21BME616T	Hospital Management System	1	-	1
21BME600T	Journal Publication			
21IPC501J	Research Methodology	3	2.6	
	Open Elective			
21BMP501L	Specialization Project			
21BMP502L	Specialization Project			
21BMP503L	Domain Internship			
Program Average				

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation



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