MTech Course Curriculum

1st Semester

Core Courses (4 Credits)

Code	Course Title	L	T	P	C	Slot	Instructor(s)	
BB 899	Communication skills (PP/NP (*Credits over and above the required minimum of 160)	1	2	0	4*		SN, (SS) + RPat (*), PVB (1 h), SRS, AKun, DPaul	Offered
BB 653	Experimental Techniques in Biomedical Engineering	1	0	2	4		HV*	Offered

Soft Core Courses (Compulsory courses based on background) (12 credits)

Code	Course Title	L	T	P	C	Slot	Instructor(s)	
For Bio background students								
BB 619	Mathematics for Biologists	2	0	1	6		SK	Offered
BB 553	Bioinformatics	1	0	4	6		PB	Offered
For Engg background students								
BB 603	Physiology for engineers	3	0	0	6		NT* + VPS	Offered
OR								
BB 521	Biochemistry and Bioenergetics	2	1	0	6		PVB	Offered
OR								
BB 405	Molecular Biology	2	1	0	6		SN	Offered

OR								
BB 402	Cell Biology	2	1	0	6		SKG	Offered
OR								
BB 553	Bioinformatics	2	1	0	6		PB	Offered

Department Electives (36 credits to be completed over the first two semesters: extra credits may be tagged as additional learning)

FH: runs in First Half of the semester, SH: runs in Second Half of the semester

Code	Course Title	L	T	P	C	Slot	Instructors	
BB 663 (FH)	Medical imaging physics	3	0	0	3		DPaul	Offered
BB 665 (FH)	Biomaterials	3	0	0	3		PT	Offered
BB 679 (SH)	Drug delivery	3	0	0	3		PT	Offered
BB 633 (FH)	Movement Neuroscience	3	0	0	3		NK	Offered
BB 639 (SH)	Nanobiotechnology	3	0	0	3		RS	Offered
BB 627 (SH)	Medical imaging methods	3	0	0	3		HV	Offered
BB 673 (SH)	Medical sensors	3	0	0	3		SM	Offered
BB 601 (SH)	Introduction to bio-nanotechnology	3	0	0	3		–	Not Offered
BB 661 (FH)	Biopotentials I: Cellular Signals	3	0	0	3		RM	Offered

BB 669 (SH)	Signals & systems in Biomedical Engineering	3	0	0	3		–	Not Offered
BB 671 (SH)	Biopotentials II: Clinical Signals	3	0	0	3		–	Not Offered
BB 675 (FH)	Elements of circuits and instrumentation	2	0	2	3		–	Not Offered
BB 677 (SH)	Introduction to biomechanics	3	0	0	3		–	Not Offered
BB 600	Introduction to Biomedical Engineering	3	0	0	6		–	Not Offered
BB 705	Fundamental Concepts in Developmental Biology	3	0	0	6		SN	Offered
BB 706	Fundamental and Practical Aspects of Microscopy	3	0	0	6		–	Not Offered
BB 607	Proteomics Principles and Techniques	2	1	0	6		–	Not Offered
BB 617	Biophysical Chemistry	3	0	0	6		–	Not Offered
BB 651	Virtual instrumentation in BME	1	0	2	4		–	Not Offered
BB 605	Genetics and evolution of biological circuits	2	1	0	6		–	Not Offered
BB 681	Biological Physics at Microscopic Scales	2	1	0	6		AKun	Offered
BB 805	Experimental Techniques-I	3	0	0	6		–	Not Offered
BB 803	Advanced Cellular Electrophysiology	3	0	0	6		–	Not Offfered

BB 501	Advanced Cellular Electrophysiology	3	0	0	6		–	Not Offfered
BB 803	Advanced Cellular Electrophysiology	3	0	0	6		–	Not Offfered
BB 501	Genetics	3	0	0	3		–	Not Offfered
BB 503	Genetic Engineering	2	1	0	6		–	Not Offfered
BB 505	Molecular Immunology	2	1	0	6		–	Not Offfered
BB 507	Molecular Enzymology	2	1	0	6		–	Not Offfered
BB 509	Bioprocess Engineering and Technology	2	1	0	6		–	Not Offfered
BB 511	Emerging Technologies	3	0	0	3		–	Not Offfered
BB 520	Analytical Biochemistry	2	1	0	3		–	Not Offfered
BB 522	Microbiology	2	1	0	3		–	Not Offfered
BB 523	Mathematical and Numerical Methods for Biologists	2	1	0	6		–	Not Offfered
BB 524	Genetic Engineering	3	0	0	3		–	Not Offfered
BB 525	Biological Thermodynamics and Kinetics	2	1	0	3		–	Not Offfered
BB 526	Biomolecular Spectroscopy	2	1	0	3		–	Not Offfered

BB 527	Molecular Enzymology	2	1	0	3		–	Not Offfered
BB 530	Biodesign	3	0	0	6		–	Not Offfered
BB 531	Plant Biotechnology	2	0	4	8		–	Not Offfered
BB 532	Molecular Mycology	3	0	0	6		–	Not Offfered
BB 533	Animal Biotechnology	3	0	0	3		–	Not Offfered
BB 534	Advanced Enzymology	3	0	0	6		–	Not Offfered
BB 535	Environmental Biotechnology	3	0	0	6		–	Not Offfered
BB 537	Virology	3	0	0	6		–	Not Offfered
BB 539	Applied Microbiology Laboratory	0	0	8	4		–	Not Offfered
BB 604	Biomathematics	2	1	0	6		–	Not Offfered
BB 609	Computational Methods in Molecular Biology	3	0	0	6		–	Not Offfered
BB 613	Techniques in Structural Biology	2	0	1	6		–	Not Offfered
BB 631	Topics in Biotechnology I	6	0	0	6		–	Not Offfered

2nd Semester

Core Courses (10 Credits)

Code	Course Title	L	T	P	C	Slot	Instructor(s)	
BB 694	Credit seminar #	0	0	0	4	–	HV + NK	Offered
BB 621	Biostatistics	3	0	0	6	**3**	SSen	Offered

The department process for allotting Credit Seminar and MTP topics to students: **click here**

Institute Elective (6 credits)

Code	Course Title	L	T	P	C
	Institute elective (to be taken either in the 2nd or the 3rd semester)	3	0	0	6

Department Electives (36 credits to be completed over the first two semesters: extra credits may be tagged as additional learning)

FH: runs in First Half of the semester, SH: runs in Second Half of the semester

Code	Course Title	L	T	P	C	Slot	Instructors	
BB 606	Cellular electricity: physics & modeling	3	0	0	6	–		Not Offered
BB 608	Advanced Biomaterials & Regeneration	3	0	0	6	–		Not Offered
BB 610	Biomedical microsystems	3	0	0	6	5	RS	Offered
BB 612	Cell mechanics and mechanobiology	3	0	0	6	1	SSen	Offered
BB 614	Biosensors	3	0	0	6			Not Offered
BB 616	Cellular and tissue engineering	3	0	0	6	7	PT	Offered
BB 624	Microfluidics: physics and applications	3	0	0	6	6	DPaul	Offered

BB 625	Motor Control in Health and Disease	3	0	0	6	8	NK	Offered
BB 626	Modeling Biological Systems and Processes	3	0	0	6	–		Not Offered
BB 629	Applied Immunology	3	0	0	6	–		Not Offered
BB 703	Cancer genetics and Metabolism	3	0	0	6	–		Not Offered
BB704	Diffuse Optical Imaging	3	0	0	6	–		Not Offered
BB 620	Ergonomics	3	0	0	6	–		Not Offered
BB 622	Introduction to medical informatique	3	0	0	6	–		Not Offered
BB 618	Medical instrumentation	3	0	0	6	11	SM	Offered
BB 655	Introduction to Biomedical Optics	3	0	0	6	9	HV	Offered
BB 702 (FH)	Technology in Surgical Reconstruction	3	0	0	3	10	VPS	Offered
BB 628	Molecular Cell Signaling	3	0	0	6	–		Not Offered
BB 630	Industrial Microbiology	3	0	0	6	–		Not Offered
BB 632	Topics in Biotechnology II	3	0	0	6	–		Not Offered
BB 643	NMR in Biological systems	2	0	1	6	–		Not Offered
BB 615	General Virology	3	0	0	6	–	KK	Not Offered

BB 536	cryo-Electron Microscopy	3	0	0	6	6	SK	Offered
BB 642	Protein Crystallography	2	1	0	6	3B+LX	PB	Offered
BB 623	Mechanism of Bacterial Pathogenesis	2	1	0	6	14	AB	Offered
BB 611	Cell Cycle and Epigenetics	3	0	0	6	6	SKG	Offered
BB 806	Principles of Biomolecular interactions and recognition	3	0	0	6	–		Not Offered

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3rd Semester

Institute Elective (6 credits)

Code	Course Title	L	T	P	C
	Institute elective (to be taken either in the 2nd or the 3rd semester)	3	0	0	6

MTP Stage 1- Contact hours: 0; Credits: 44

Code	Course Title	L	T	P	C
BB 797	Project Stage I #	0	0	0	44

The department process for allotting Credit Seminar and MTP topics to students: **click here**

4th Semester

MTP Stage 2- Contact hours: 0; Credits: 48

Code	Course Title	L	T	P	C
BB 798	Project Stage II	0	0	0	48

Course Work and Credit Structure

Course Work and Credits	**Sem. 1**	**Sem. 2**	**Sem. 3**	**Sem. 4**	**Total**
Core course (BB653 Experimental Techniques in Biomedical Engineering- Lab course)	4	–	–	–	4
Core course (BB621 Biostatistics + BB694 Credit Seminar)		10	–	–	10
Soft Core courses (Two compulsory courses based on background)	12-0	0-12	–	–	12
Department Electives	12-18	24-18	–	–	36
Institute Elective	–	0-6	6-0	–	6
Communication (P/NP) (*Credits over and above the required minimum of 160)	4*	–	–	–	4*
Total Course Credits (A)					68
M.Tech. Project Credits (B)	–	–	44	48	92
Total Credits for the Program (A+B)					160