

**BHARATI VIDYAPEETH DEEMED TO BE UNIVERSITY
PUNE**

**REVISED SYLLABUS FOR
MASTER OF SCIENCE IN MEDICAL BIOTECHNOLOGY**

**UNDER
FACULTY OF INTERDISCIPLINARY STUDIES**



**SYLLABUS OF SEM I – SEM IV
AS PER NEP 2020
(CHOICE BASED CREDIT SYSTEM)
From Academic Year
2023-24**

SEMESTER I

Course No. & Description	Title	Credits	IA	Univ. Exam	Total Credits
MMBT-23- 101 Core Course-Theory	Cell Biology and Embryology	2	50	50	20
MMBT-23- 102 Core Course –Theory	Concepts in Molecular Biology	2	50	50	
MMBT -23-103 Core Course –Theory	Medical Biochemistry	2	50	50	
MMBT-23- 104 Core Course –Theory	Medical Microbiology	2	50	50	
MMBT -23-105 Core Course –Theory	Research Methodology 1	2	50	50	
MMBT -23-106 Core Course – Theory	Research Methodology 2	2	50	50	
MMBT-23- 107 Core Course –Practical	Cell Biology and Embryology Lab	1	25	25	
MMBT -23-108 Core Course –Practical	Medical Biochemistry Lab	1	25	25	
MMBT-23- 109 Core Course –Practical	Medical Microbiology Lab	1	25	25	
MMBT -23-110 Core Course –Practical	Molecular Biology Lab	1	25	25	
MMBT -23-111 Elective-I	(Select any1)	2	100	Continuous Assessment	
MMBT -23-112 Elective- II	(Select any1)	2	100		

Elective Course

EC I	EC II
Nano biotechnology	Mathematics for Biologists
Structural Biology and Biophysics	Data Structure and Algorithm
MongoDB	Perl Programming

***Additional credit/s will be awarded to the student who will successfully complete SWAYAM NPTEL Course and receive the certificate.**

SEMESTER II

Course No. & Description	Title	Credits	IA	Univ. Exam	Total Credits
MMBT -23- 201 Core Course –Theory	Analytical Biotechnology	2	50	50	22
MMBT-23- 202 Core Course –Theory	Gene Manipulation Techniques	2	50	50	
MMBT -23- 203 Core Course –Theory	Human Physiology	2	50	50	
MMBT -23- 204 Core Course –Theory	Immunology	2	50	50	
MMBT -23- 205 Core Course –Theory	Cyto-Genetics	2	50	50	
MMBT -23- 206 Core Course - Practical	Analytical Biotechnology Lab	1	25	25	
MMBT-23- 207 Core Course –Practical	Genetic Engineering Lab	1	25	25	
MMBT-23- 208 Core Course –Practical	Immunology Lab	1	25	25	
MMBT -23- 209 Core Course - Practical	Human physiology and Cytogenetic Lab	1	25	25	
MMBT -23- 210 Elective- III	Elective Course (Select One)	2	100	Continuous Assessment	
MMBT-23- 211 Elective- IV	Elective Course (Select One)	2	100	Continuous Assessment	
MMBT-23- 212	On-the-job training/ internship	4	100	Continuous Assessment	

Elective Course:

EC III	EC IV
Molecular Diagnostics	IPR and Bioethics
Basic JAVA	Regenerative Biology
Web Designing	JAVA Script & Angular Programming

***Additional credit/s will be awarded to the student who will successfully complete SWAYAM NPTEL Course and receive the certificate.**

Students May exit after completion of two semesters and will be awarded PG diploma (40 – 44 Credit after 3 year UG Course)

Student must complete on-the-job training/ internship of 4 credits during summer break

SEMESTER III

Course No. & Description	Title	Credits	IA	Univ. Exam	Total Credits
MMBT-23-301 Core Course –Theory	Animal Tissue Culture	2	50	50	20
MMBT-23- 302 Core Course –Theory	Pharmaceutical Biotechnology	2	50	50	
MMBT-23- 303 Core Course –Theory	Stem Cell Biology & Tissue Engineering	2	50	50	
MMBT-23- 304 Core Course –Theory	Genomics and proteomics	2	50	50	
MMBT-23- 305 Core Course – Practical	Animal Tissue Culture & Stem Cell Biology Lab	2	50	50	
MMBT-23- 306 Core Course - Practical	Pharmaceutical Biotechnology Lab	1	25	25	
MMBT-23- 307 Core Course –Practical	Genomics and proteomics Lab	1	25	25	
MMBT-23- 308 EC V	Select any one	2	100	Continuous Assessment	
MMBT-23- 309 EC VI	Select any one	2	100	Continuous Assessment	
MMBT-23 -310 Core Course –Project	Research Project I	4	100	Continuous Assessment	

Elective Course

EC-V	EC-VI
Machine learning	Immunogenetics
Sequence data analysis	Introduction to Artificial intelligence

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SEMESTER IV

Course No. & Description	Title	Credits	IA	Univ. Exam	Total Credits
MMBT-23- 401 Core Course –Theory	Vaccine Technology	2	100	Continuous Assessment	20
MMBT-23- 402 Core Course –Theory	Drug Designing and Development	2	100	Continuous Assessment	
MMBT-23- 403 Core Course –Theory	Clinical Trials and Data Management	2	100	Continuous Assessment	
MMBT-23- 404 Core Course –Theory	Quality assurance and Quality control in Biotechnology	2	100	Continuous Assessment	
MMBT-23- 405 Elective-VII	Selective Any One	2	100	Continuous Assessment	
MMBT-23- 406 Core Course –Project	Research Project II	10	50	50	

Elective-VII
Microbiome data analysis
Toxicology
Power BI