Jaypee University of Information Technology

M.TECH (Biotechnology) Course Curriculum

M.Tech. Programme

The M.Tech. programme has been designed with the following objectives and goals:

To promote specialized or inter-disciplinary project/ dissertation work of an advanced nature,

To attract the best talent for higher studies and,

To build requisite academic flexibility for a student-centric program in which students can learn at their own pace and which enables interaction with the professional world

The M. Tech. program provides compulsory core courses, elective subjects and intensive project work in the respective area of specialization. Through compulsory core subjects the students acquire a state-of-the-art advanced knowledge. The elective courses provide an opportunity to further specialize in the field depending on his/her interest and future career plans. For project work, students are required to take up problems on a particular topic in the field to focus their study and work. They are required to submit a dissertation/ report at the end of the project work compiling their study. M.Tech. project and dissertation work usually enables students to publish their results. Project work prepares students to take up challenging research and development tasks. Seminars are part of the M.Tech. curriculum for which students collect material on specific current topics and make presentations.

M.Tech. in Biotechnology

The M.Tech in Biotechnology program is designed to offer diverse and extensive aspects of biotechnology and life sciences with strong emphasis on research. It encompasses streams such as Metabolic Engineering, Bioprocess Engineering, Molecular Biology of Infectious Diseases, Microbial Technology, Industrial Enzymes and Protein Engineering; Plant Cell Culture Technologies, Bioremediation, Food Technology & Probiotics, Biosynthetic Pathway Discovery and Gene Function, Genomic, Proteomic and Metabolomic Technologies, etc. Curriculum is enriched to help students to fulfill their research aspirations and current industrial demands. Working along with a blend of Ph.D. students and research fellows involved in intense research enhances the quality of research experience for M.Tech. students.

M.TECH (Biotechnology) Course Curriculum

TWO YEAR M.TECH COURSE CURRICULUM FOR BIOTECHNOLOGY

SEMESTER I (M1)

S.No	Course Code	Course Name	Contact Hours	Credits
1	13M11BT111	Advances in Molecular Cell Biology	3	3
2	13M11BT171	Advances in Molecular Cell Biology Lab	2	1
3	13M11BT115	Research Methodology	3	3
4	13M11BT113	IPR, Biosafety and Bioethics	3	3
5	13M11BT112	Advanced Bioinformatics	3	3
6	13M11BT172	Advanced Bioinformatics Lab	2	1
7	13M11BT114	High Throughput Technologies	3	3
		Total	**19**	**17**

SEMESTER II (M2)

S.No	Course Code	Course Name	Contact Hours	Credits
1	14M11BT211	Industrial Biotechnology	3	3
2	14M17BT271	Industrial Biotechnology Lab	2	1
3	14M11BT212	Immunotechnology	3	3
4	14M17BT272	Immunotechnology Lab	2	1
5	14M11BT214	Bioenterpreunership and Management	2	2
6	14M11BT213	Functional Genomics	3	3
7	14M17BT273	Functional Genomics Lab	2	1
8	14M11BT215	Metabolic Engineering	3	3
		Total	**20**	**17**

TWO YEAR M.TECH COURSE CURRICULUM FOR BIOTECHNOLOGY

SEMESTER III (M3)

S.No	Course Code	Course Name	Contact Hours	Credits
1		DE-I	3	3
2		DE-II	3	3
3		DE-III	3	3
4	14M19BT391	Project-Thesis Part I	24	12
5	14M19BT392	Seminar	2	1
		Total	**35**	**22**

SEMESTER IV (M4)

S.No	Course Code	Course Name	Contact Hours	Credits
1		DE-IV	3	3
2		DE-V	3	3
4	15M19BT 491	Project-Thesis Part II	28	14
		Total	**34**	**20**

LIST OF ELECTIVES

MEDICAL

S.No	Course code	Course Name
1	10B1WBT733	Bioterrorism
2	14M1WBT332	Clinical Diagnostics
3	10I1WBT433	Gene Therapy
4	14B1WBT736	Antibody Engineering Technologies
5	14B1WBT733	Human Pathogens
6	10B13B1839	Pathogen Genomes
7	14B1WBT739	Stem Cells & Regenerative Medicine
8	10B1WBT731	Stem Cells and Healthcare
9	15M1BT432	Translational Genomics
10	1111WBT531	Vaccines
11	10B1WBT419	Cancer Biology
12	08B71BT432	Molecular Aspects of Life Style Diseases
13	14M1WBT333	Vaccine Production

FOOD AND AGRICULTURE

S.No	Course code	Course Name
1	11B1WBT834	Fermented Food Products Technology
2	14M1WBT331	Food Processing & Engineering
3	10B1WBT738	Functional Food Technology
4	15B1WBT841	Industrial Crops & Products
5	10B1WBT735	Industrial Plant Tissue Culture
6	15B1WBT837	Nutritional Security
7	1111WBT433	Plant Biotechnology
8	15B1WBT831	Plant-Microbe Interactions
9	15M1BT431	Traditional Bioprocesses

INDUSTRIAL

S.No	Course code	Course Name
1	14B1WBT731	Bioenergy and Biofuels
2	11B1WBT841	Bioprocess Modelling and Simulation
3	15B1WBT836	Bioprocess Optimization & Upscaling
4	14B1WBT741	Bio-resources & Industrial Products
5	10B1WBT737	Environmental Biotechnology
6	11B1WBT833	Industrial Enzymes
7	11B1WBT836	Manufacturing Processes & QC
8	11B1WBT840	Nano Biotechnology
9	15B1WBT835	Product Manufacturing & Production
10	10B1WBT736	Protein Engineering and Applications
11	14M1WBT334	QC Analysis & Management
12	1011WBT432	Antibody Engineering and Manufacturing Techniques
13	08B71BT435	Bio-energy Technology

OTHERS

S.No	Course code	Course Name
1	11B1WPH834	Biosensors
2	10B1WPH731	Nanoscience & Nanotechnology
3	11B1WBT832	IPR and Bioethics

BIOINFORMATICS

S.No	Course code	Course Name
1	14B1WBI732	Computational Systems Biology
2	15B1WBI832	NGS Data Analysis and Applications
3	14B1WBI733	Clinical Data Management Systems
4	10B13BI732	Microbial Genomics
5	10B13BI736	High Throughput Screening Techniques
6	11B1WBT831	Protein Modelling
7	15B1WBT834	Cancer Biomarkers
8	15B1WBT838	Synthetic Biology
9	11B1WBT837	Clinical Trials and Database Management
10	14B1WBT734	Traditional Foods
11	11B1WBT838	Genetic Counselling
12	10B13BI737	Human Genome & Therapeutics
13	15B1WBT839	Infectious Diseases
14	10B13BI839	Pathogen Genomes
15	10B13BT834	Pharmacogenomics
16	14B1WBT737	Population Genomics
17	10B13BI831	Tool Design in Bioinformatics
18	11B1WBT832	Biosafety, Bioethics, IPR & Patents
19	15B1WPH832	Biophysics of Single Molecules
20	11B1WMA832	Linear programming and Applications
21	15B1WBT832	Chemical Biology
22	10B1WMA731	Optimization Techniques
23	11B2WBT853	Immunoinformatics
24	11B1WPY736	Natural products in Drug Leads