Program Structure

B. Tech Chemical and Biochemical Engineering

Category	**Credits**
Major (Core)	80
Minor Stream / Discipline Electives	30
Multidisciplinary	18
Ability Enhancement Courses (AEC)	6
Skill Enhancement Courses (SEC)	8
Value Added Courses Common for all UG	5
Internship / Field Work	2
Research Project / Dissertation	13
Total	**162**

Semester-1					
Course	**Type**	**L**	**T**	**P**	**C**
Principles of Bioelectronics	Integrated	3	0	1	4
Engineering Chemistry / Applied Physics	Integrated	3	0	1	4
Applied Mathematics for Bioengineering	Theory	3	0	0	3
Engineering Design and Prototyping	Comprehensive	1	0	2	4
Foundations of Biology for Engineers	Theory	3	0	0	3
Physical Education and Yoga	Theory	1	0	0	0
Semester Credits					**18**
Semester-2					
Environmental Impact Analysis	Theory	2	0	0	0
Advanced Applied Mathematics for Bioengineering	Theory	3	0	0	3

Engineering Chemistry / Applied Physics	Integrated	3	0	1	4
Biopython	Integrated	3	0	1	4
Engineering Communication Skills	Theory	2	0	0	2
Cell and Molecular Biology	Integrated	3	0	1	4
Universal Human Values and Professional Ethics	Integrated	2	0	1	3
Semester Credits					**20**
Semester-3					
Fundamentals of Genetic Engineering	Integrated	3	0	1	4
Principles of Biochemistry	Integrated	3	0	1	4
Bioanalytical Techniques and Instrumentation	Theory	3	0	0	3
Microbiology	Integrated	3	0	1	4
Bioinnovation and Entrepreneurship	Theory	1	0	0	1
Professional Elective–1					
Fundamentals of Cancer Biology	Theory	3	0	0	3
AI in Biosciences & Technology	Integrated	2	0	1	3
Food Processing & Preservation	Theory	3	0	0	3
Open Elective–1					
Pharmaceutical Biotechnology	Theory	3	0	0	3
Healthcare Systems	Theory	3	0	0	3
Computational Programming for Bioengineers	Integrated	2	0	1	3
Semester Credits					**22**
Semester-4					
Immunotechnology	Integrated	3	0	1	4
Genetics	Theory	3	0	0	3
Upstream Processing	Integrated	3	0	1	4
Bioinformatics	Integrated	3	0	1	4
Constitution of India	Theory	2	0	0	0

Engineering Economics	Theory	2	0	0	2
Professional Elective–2					
Vaccine Technology	Theory	3	0	0	3
Epidemiology and Global Health	Theory	3	0	0	3
Food Chemistry	Integrated	2	0	1	3
Open Elective–2					
Biopharmaceutics	Theory	3	0	0	3
Healthcare Operations and Quality Management	Theory	3	0	0	3
Biosafety, Bioethics & Regulatory Compliance	Theory	3	0	0	3
Semester Credits					**23**
Semester-5					
Molecular Diagnostics and Therapeutics	Theory	3	0	0	3
Downstream Processing	Integrated	3	0	1	4
Enzyme & Fermentation Technology	Integrated	3	0	1	4
Biomaterial and Tissue Engineering	Theory	3	0	0	3
Summer Training & Minor Project–1	Internship	0	0	1	1
MOOCs Course–1	Theory	2	0	0	2
Professional Elective–3					
Stem Cell & Regenerative Medicine	Theory	3	0	0	3
Marine Biotechnology	Theory	3	0	0	3
Food Microbiology & Safety	Integrated	2	0	1	3
Open Elective–3					
Pharmacology & Toxicology	Theory	3	0	0	3
Health Economics and Policy	Theory	3	0	0	3
Nutrition Science and Functional Foods	Theory	3	0	0	3
Semester Credits					**23**
Semester-6					

Plant Biotechnology	Integrated	3	0	1	4
Intellectual Property Rights and Regulatory Affairs	Theory	2	0	0	2
Drug Discovery & Development	Integrated	3	0	1	4
Animal Biotechnology	Theory	3	0	0	3
Indian Knowledge System	Theory	1	0	0	1
Biostatistics using R	Integrated	3	0	1	4
Professional Elective–4					
Health Informatics	Theory	3	0	0	3
Environmental Biotechnology	Integrated	2	0	1	3
Regulatory Affairs and Quality Control	Theory	3	0	0	3
Open Elective–4					
Clinical Trial Designing	Theory	3	0	0	3
Industrial Biotechnology	Theory	3	0	0	3
Good Manufacturing & Laboratory Practices	Theory	3	0	0	3
Semester Credits					**24**
Semester-7					
Genomics and Proteomics	Theory	3	0	1	4
Biosensors and Nanobiotechnology	Integrated	3	0	1	4
Research Methodology	Theory	2	0	0	2
Prototype Development	Project	0	0	1	1
Summer Training & Minor Project–2	Internship	0	0	1	1
MOOCs Course–2	Theory	2	0	0	2
Professional Elective–5					
Medical Imaging and Diagnostic Techniques	Theory	3	0	0	3
Pharmacogenomics	Theory	3	0	0	3
Food Product Development	Integrated	2	0	1	3
Open Elective–5					

Bioreactor Design and Analysis	Theory	3	0	0	3
Management of Healthcare Organizations	Theory	3	0	0	3
Database Management System for Healthcare	Integrated	2	0	1	3
Semester Credits					**20**
Semester-8					
Project & Dissertation	Project	0	0	12	12
Semester Credits					**12**
TOTAL PROGRAM CREDITS					**162**