

CURRICULUM STRUCTURE FOR BIOCHEMICAL- BIOTECHNOLOGY ENGINEERING PROGRAMME

Total credit hours required: 139

SEMESTER III (17.5 c.h.)

Course Code	Course Title	Credit hours	Pre-requisites	Co-requisites
BTEN 2181	Biotechnology Engineering Lab I	1		BTEN 2210 BTEN 2211
BTEN 2210	Introductory Microbiology	2		BTEN 2181
BTEN 2211	Organic Chemistry for Biological Engineering	2		BTE 2181
BTEN 2312	Thermodynamics	3	MATH 1320	
MATH 2310	Differential Equations	3	MATH 1320	
MATR 2381	Materials Science and Engineering	3	MANU 1202	
UNGS 2030	Islam, Knowledge and Civilization	3		
CC XXXX	Co-curriculum	0.5		

SEMESTER IV (16.5 c.h.)

Course Codes	Course Title	Credit Hours	Pre-Requisites	Co-Requisites
BTEN 2182	Biotechnology Engineering Lab II	1	BTEN 2312	MECH 2340
BTEN 2313	Principles of Mass and Energy Balance	3	MATH 1320	
BTEN 2314	Biochemical Engineering Fundamentals	3	BTEN 2210 BTEN 2312	
BTEN 2315	Biochemistry	3	BTEN 2211	
MECH 2340	Fluid Mechanics	3	MATH 2310	BTEN 2182
MATH 2330	Computational Methods & Statistics	3	MATH 2310	
CC XXXX	Co-curriculum	0.5		

SEMESTER V (16.5 c.h.)

Course Codes	Course Title	Credit Hours	Pre-Requisites	Co-Requisites
BTEN 3183	Biotechnology Engineering Lab III	1	BTEN 2182	BTEN 3318
BTEN 3317	Reaction Engineering	3	BTEN 2313	
BTEN 3318	Molecular Biology & Genetic Engineering	3	BTEN 2210	
BTEN 3319	Separation Processes I	3	BTEN 2312	
MANU 3314	Project and Operation Management	3	MATH 2330	
UNGS 2040	Ethics and Fiqh for Everyday Life	3	UNGS 2030	
CC XXXX	Co-curriculum	0.5		

SEMESTER VI (16.5 c.h.)

Course Codes	Course Title	Credit Hours	Pre-Requisites	Co-Requisites
BTEN 3292	Process Plant Design & Safety	2	BTEN 2314 BTEN 3319	
BTEN 3100	Seminar	1		
BTEN 3184	Biotechnology Engineering Lab IV	1	BTEN 2314 BTEN 3183	BTEN 3316
BTEN 3222	Separation Processes II	3	BTEN 3319	
BTEN 3316	Environmental Engineering	3	BTEN 2210	
BTEN 3320	Heat and Mass Transfer	3	MATH 2310 MECH 2340	
MANU 3318	Engineering Economics and Management	3	MANU 3314	
CC XXXX	Co-curriculum	0.5		

INDUSTRIAL TRAINING (5 c.h.)

Course Codes	Course Title	Credit Hours	Pre-Requisites
EITR 3521	Engineering Industrial Training	5	Third year completion

SEMESTER VII (17 c.h.)

Course Codes	Course Title	Credit Hours	Pre-Requisites	Co-Requisites
BTEN 4300	Integrated Design Project	3	BTEN 3292	
BTEN 4398	Final Year Project I	3	BTEN 2314 BTEN 3319 BTEN 3320	
BTEN 4321	Bioprocess Control & Instrumentation	3	MATH 2310	
BTEN 4323	Cell and Tissue Engineering	3	BTEN 3318	
MANU 4211	Technology Entrepreneurship	2	MANU 3318	
UNGS 2090	Ethics and Fiqh for Everyday Life	3	UNGS 2040	

SEMESTER VIII (18 c.h.)

Course Codes	Course Title	Credit Hours	Pre-Requisites	Co-Requisites
BTEN 4300	Integrated Design Project	3	BTEN 3292	BTEN 4300
BTEN 4398	Final Year Project I	3	BTEN 2314 BTEN 3319 BTEN 3320	BTEN 4398
BTEN 4321	Bioprocess Control & Instrumentation	3	MATH 2310	BTEN 4321
BTEN 4323	Cell and Tissue Engineering	3	BTEN 3318	BTEN 4323
MANU 4211	Technology Entrepreneurship	2	MANU 3318	MANU 4211
UNGS 2090	Ethics and Fiqh for Everyday Life	3	UNGS 2040	UNGS 2090

LIST OF ELECTIVE COURSES FOR BIOCHEMICAL-BIOTECHNOLOGY ENGINEERING

Elective courses are to be selected based on four main streams, namely *Bioenvironmental Engineering*, *Bio-molecular Engineering*, *Bioprocess Engineering* and *Nanotechnology*. Students are required to take at least two electives from the same stream.

BIOENVIRONMENTAL ENGINEERING

Course Code	Course Title	Credit Hours	Pre-requisites	Co-requisites
BTEN 4350	Solid Waste Engineering	3	BTEN 3316	
BTEN 4351	Biomass Energy	3	BTEN 3316	
BTEN 4352	Water Treatment Plant Design	3	BTEN 3316	
BTEN 4353	Environmental Biotechnology	3	BTEN 3316	
BTEN 4354	Wastewater Engineering	3	BTEN 3316	

BIOPROCESS ENGINEERING

Course Code	Course Title	Credit Hours	Pre-requisites	Co-requisites
BTEN 4360	Food Process Engineering	3	BTEN 3319	
BTEN 4361	Biopharmaceutical Manufacturing	3	BTEN 3319	
BTEN 4362	Bioprocess Facility Design and Regulatory	3	BTEN 3319	
BTEN 4363	Engineering Aspect of Animal and Plant Cell Culture	3	BTEN 4323	

BIOMOLECULAR ENGINEERING

Course Code	Course Title	Credit Hours	Pre-requisites	Co-requisites
BTEN 4370	Bioinformatics	3	BTEN 3318	
BTEN 4371	Molecular Farming	3	BTEN 3318	
BTEN 4372	Computer Simulation in Bioreactor System	3	BTEN 3317	
BTEN 4373	Artificial Tissue Engineering	3	BTEN 4323	

NANOTECHNOLOGY

Course Code	Course Title	Credit Hours	Pre-requisites	Co-requisites
BTEN 4376	Carbon Nanomaterials and Applications	3	BTEN 3319	
BTEN 4377	Membrane Technology	3	BTEN 3319	
BTEN 4378	Bionanotechnology	3	BTEN 3319	
BTEN 4379	Colloidal and Interfacial Science and Technology	3	BTEN 3319	