

**Non-Credit Compulsory**

<b>Course Code</b>	<b>Course Title</b>
BTEC 591	Seminars in Biotechnology-I
BTEC 592	Seminars in Biotechnology-II
BTEC 593	Research and Publication Ethics
BTEC 598	Thesis Project
BTEC 599	Thesis Study
BTEC 691	Seminars in Biotechnology-I
BTEC 692	Seminars in biotechnology-II
BTEC 693	Scientific Research and Publication Ethics and Methodology
BTEC 699	Thesis Study

**Elective Compulsory Biotechnology**

<b>Course Code</b>	<b>Course Title</b>
BSB 511	Fundamentals of Bioinformatics
BSB 513	Fundamentals of System Biology
BSB 615	Biostatistics
BTEC 501	Fundamentals of Biotechnology
BTEC 502	Molecular Biotechnology and Gene Regulation
BTEC 503	Introduction to Biomaterials
BTEC 504	Advanced Plant Physiology
BTEC 505	Advanced Biochemistry
BTEC 564	Protein Biotechnology
BTEC 601	Advanced Biotechnology
BTEC 602	Agricultural Biotechnology and Global Food Security
BTEC 603	Principles of Synthetic Biology and Biotechnology
CHEM 660	Molecular Modelling I
CSE 604	Mathematical Modeling
MBG 521	Advanced Molecular Plant Physiology
MBG 524	Computer Programing in Biology
MBG 621	Prokaryotic Gene Expression
MBG 643	Gene and Protein Engineering
MBG 645	Plant Biotechnology
MSE 618	Structural Properties of Biomaterials
NANO 511	Fundamentals of Nanoscience and Nanotechnology
NANO 618	Nanobiotechnology

**Elective Compulsory Bioentrepreneurship**

<b>Course Code</b>	<b>Course Title</b>
BTEC 521	Entrepreneurship in Biotechnology
BTEC 523	Biotechnology Management
BTEC 526	Intellectual Property, Patent and Licensing in Biotechnology
BTEC 621	Change Management in Biotechnology
BTEC 622	Marketing in Biotechnology
BTEC 623	Technology Transfer and Commercialization
BTEC 624	Finance and Strategic Planning in Biotechnology
BTEC 625	Engineering Applications in Pharmaceutical Biotechnology
GIR 501	Basic Concepts of Entrepreneurship
GIR 512	New Product and Technology Development
NANO 517	Project Management and Entrepreneurship
SSTR 659	Strategic Entrepreneurship
SSTR 662	R&D Management

**Area Elective Courses**

**a) Medical Biotechnology**

<b>Course Code</b>	<b>Course Title</b>
BTEC 541	Fundamentals of Medical Biotechnology
BTEC 542	Pharmaceutical Biotechnology and Drug Discovery
BTEC 543	Introduction to Biomedical Engineering
BTEC 551	Genome Editing Strategies
BTEC 552	Biomaterials in Biotechnology and Tissue Engineering
BTEC 553	Gene and Stem Cell Therapies in Medical Biotechnology
BTEC 641	Advanced Topics in Biomedical Engineering
BTEC 642	Fundamental and Molecular Diagnosticstals of Medical Biotechnology
BTEC 643	Molecular Pharmacology
BTEC 651	Regenerative Medicine
BTEC 652	Forensic Technologies
BTEC 653	Personalized Medicine
CED 542	BioMEMS - Fabrication and Applications
CHEM 550	Properties And Applications Of Polymers
CHEM 775	Molecular Diagnostics and Biosensor Technologies
CSE 763	Human Computer Interface
PHYS 530	Physics and Technology of Semiconductor Optoelectronic Detectors
MSE 520	Structure And Properties Of Polymers
MBG 622	Eukaryotic Gene Expression
MBG 623	Viral Genetics and Gene Therapy
MBG 630	Molecular and Cellular Immunology
MBG 632	Cancer Molecular Genetics
MBG 638	Stem Cell Biology
MBG 640	Advanced Neurobiology

**b) Industrial Biotechnology**

<b>Course Code</b>	<b>Course Title</b>
BSB 516	Bioreaction Engineering
BTEC 561	Bioremediation
BTEC 562	Bioprocess Engineering
BTEC 563	Enzyme Engineering
BTEC 565	Microorganisms in Industrial Biotechnology
BTEC 661	Biochemical Engineering
BTEC 662	Modern Applications of Food Biotechnology
BTEC 663	Biofuels
BTEC 664	Upstream and Downstream Processing in Biotechnology
BTEC 665	Principles of Fermentation Technology
CED 519	Biopolimer I
CED 520	Special Topics In Food Technology-1
CED 527	Planning And Optimization Methods in Industrial Experimentation
CED 613	Advanced Topics in Chemical Reactor Design
CED 618	Bioenergy Systems
CED 619	Food Preservation Engineering
CHEM 670	Industrial Biocatalysis and Bioconversion
CHEM 671	Immobilized Enzyme Methods
ENVE 517	Environmental Biotechnology
ENVE 617	Environmental Toxicology
ENVE 625	Biomass and Waste Technologies

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MBG 511	Bacterial Physiology
MBG 543	Marine Biotechnology
MBG 673	Industrial microbiology
MBG 676	Food microbiology and biotechnology
MBG 677	Microbial decomposition
NANO 617	Industrial Applications of Nanotechnology

### c) Plant Biotechnology

#### Course Code Course Title

BTEC 571	Seed Biology, Quality and Technologies
BTEC 572	Genetically Modified Plants
BTEC 573	Soilless Agriculture Technologies
BTEC 574	Advanced Plant Nutrition: Mineral and Organic Fertilizers and Growth Stimulants
BTEC 575	Plant Genomics
BTEC 576	Plant Tissue Culture and Micropropagation
BTEC 671	Plant Abiotic Stress Physiology and Tolerance
BTEC 672	Biofortification and Human Health: Agronomic, Genetic and Biotechnological Approaches
BTEC 673	Agrochemicals, Environment and Human Health
BTEC 674	Phytohormones and Applications in Crop Production
BTEC 675	Organic Crop Production Technologies
MBG 676	Food microbiology and biotechnology
MBG 523	Advanced Molecular Plant Nutrition
MBG 661	Plant Molecular Genetics
MBG 665	Molecular Plant Breeding
MBG 667	Plant Metabolic Engineering

### d) Synthetic and System Biotechnology

#### Course Code Course Title

BSB 521	Cell Fate and Epigenetics from a Systems Biology perspective
BSB 611	Foundations of Mathematical Modelling in Biology
BSB 612	Systems Neuroscience
BSB 613	Advanced Systems Biology
BSB 617	Systems Biology of Host-Pathogen Interactions
BTEC 581	Synthetic Biology and Biotechnology
BTEC 582	Tools in High Throughput Analyses
BTEC 584	Signaling and Information Processing in Biological Systems
BTEC 681	Current Topics in Synthetic Biology
BTEC 682	Metabolic and Cellular Engineering
BTEC 683	Tools for Synthetic and Systems Biotechnology
BTEC 684	Gene Mining and Metagenomics
CED 538	Systems Bioengineering
CED 541	Infections in Bioengineering
CED 612	Applied Advanced Mathematics in Chemical Engineering
CSE 606	Computation with Artificial Neural Networks
CSE 611	Big Data Analytics
ELEC 672	Numerical Analysis for Simulation and Modeling
MATH 677	Non-linear Analysis for Dynamic Systems
MBG 522	Bioinformatics
MBG 524	Computer Programming in Biology