



Curriculum and Syllabi

B.Tech. BIOTECHNOLOGY

SEMESTERS I to VIII

Regulations 2025

Programme: B.Tech. BIOTECHNOLOGY

2025 Regulations

(2025-29 Batch Onwards)

Curriculum for Semesters I to VIII

SEMESTER I

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
1	25IP101	Makerspace - Induction Program	-	-	-	-	-	-	-	-	-	0	-	-
Theory Cum Practical Courses														
2	25ES101	Problem Solving Techniques using Python	3	0	2	3	45	0	30	45	120	4	50/50	ES
3	25HS101	English for Communication	3	0	2	3	45	0	30	45	120	4	50/50	HS
4	25ES102	Innovation and Design Thinking	1	0	2	1	15	0	30	15	60	2	100/0	ES
Theory Courses														
5	25MA101	Matrices and Calculus	3	1	0	4	45	15	0	60	120	4	40/60	BS
6	25PH101	Applied Engineering Physics	3	0	0	3	45	0	0	45	90	3	40/60	BS
7	25AC101	Heritage of Tamils	1	0	0	1	15	0	0	15	30	1	100/0	AC
Practical Course														
8	25ES108	Biochemistry Laboratory	0	0	4	0	0	0	60	0	60	2	60/40	ES

SEMESTER II

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Cum Practical Courses														
1	25ES201	Product Design and Development	1	0	2	1	15	0	30	15	60	2	100/0	ES
2	25ES203	Problem Solving Techniques using Java	1	0	4	1	15	0	60	15	90	3	50/50	ES
Theory Courses														
3	25MA201	Numerical Techniques	3	1	0	4	45	15	0	60	120	4	40/60	BS
4	25BS201	Bioorganic Chemistry	3	0	0	3	45	0	0	45	90	3	40/60	BS
5	25BT201	Biomolecules	3	0	0	3	45	0	0	45	90	3	40/60	PC
6	25HS201	Universal Human Values	2	0	0	2	30	0	0	30	60	2	40/60	HS
7	25HS202	Business Communication	3	0	0	3	45	0	0	45	90	3	40/60	HS

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
8	25AC201	Tamils and Technology	1	0	0	1	15	0	0	15	30	1	100/0	AC
9		Foreign Language	2	0	0	2	30	0	0	30	60	2	100/0	HS
10		Value Added Course	1	0	0	1	15	0	0	15	30	1	100/0	VAC*

*Value Added Course is Optional

SEMESTER III

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Cum Practical Courses														
1	25BT301	Cell Biology	3	0	2	3	45	0	30	45	120	4	50/50	PC
2	25BT302	Molecular Genetics	1	0	4	1	15	0	60	15	90	3	50/50	PC
Theory Courses														
3	25MA301	Transform Techniques and Partial Differential Equations	3	1	0	4	45	15	0	60	120	4	40/60	BS
4	25ES302	Artificial Intelligence in Biotechnology	3	0	0	3	45	0	0	45	90	3	40/60	ES
5	25BT303	Basic Industrial Biotechnology	3	0	0	3	45	0	0	45	90	3	40/60	PC
6	25BT304	Microbiology	3	0	0	3	45	0	0	45	90	3	40/60	PC
7	25EEC304	Aptitude and Soft Skills - I	1	0	0	1	15	0	0	15	30	1	100/0	EEC
Practical Courses														
8	25BT305	Microbiology Laboratory	0	0	4	0	0	0	60	0	60	2	60/40	PC
9	25EEC305	Industrial Training - I	-	-	-	-	-	-	-	-	2 Weeks	1	100/0	EEC

SEMESTER IV

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Cum Practical Course														
1	25BT401	Bioprocess Technology	3	0	2	3	45	0	30	45	120	4	50/50	PC
2	25ES403	Instrumental Methods of Analysis	1	0	4	1	15	0	60	15	90	3	50/50	ES
Theory Courses														
3	25MA302	Probability and Statistics	3	1	0	4	45	15	0	60	120	4	40/60	BS
4	25BT402	Immuno Technology	3	0	0	3	45	0	0	45	90	3	40/60	PC
5	25BT403	Biopharmaceutical	3	0	0	3	45	0	0	45	90	3	40/60	PC

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
		Technology												
6		Open Elective I	3	0	0	3	45	0	0	45	90	3	40/60	OE
7		Open Elective II	3	0	0	3	45	0	0	45	90	3	40/60	OE
8	25EEC401	Aptitude and Soft Skills - II	1	0	0	1	15	0	0	15	30	1	100/0	EEC
9	25MC403	History of Science and Technology in India	3	0	0	0	45	0	0	0	45	0	100/0	MC

SEMESTER V

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Cum Practical Courses														
1	25BT501	Genetic Engineering	3	0	2	3	45	0	30	45	120	4	50/50	PC
2	25BT502	Plant Biotechnology	1	0	4	1	15	0	60	15	90	3	50/50	PC
Theory Courses														
3	25ES501	Bioprocess Modelling and Simulation	3	0	0	3	45	0	0	45	90	3	40/60	ES
4		Professional Elective I			0	3			0	45	90	3	40/60	PE
5		Professional Elective II			0	3			0	45	90	3	40/60	PE
6		Open Elective III	3	0	0	3	45	0	0	45	90	3	40/60	OE
Practical Course														
7	25BTP501	Mini Project	0	0	4	0	0	0	60	0	60	2	60/40	EEC
8	25EEC501	Industrial Training - II	-	-	-	-	-	-	-	-	2 Weeks	1	100/0	EEC
For Honours Degree														
1		Honours Elective I			0	3			0	45	90	3	40/60	
2		Honours Elective II			0	3			0	45	90	3	40/60	
For Minor Degree														
1		Minor Elective I									90	3		
2		Minor Elective II									90	3		

SEMESTER VI

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Cum Practical Courses														
1	25BT601	Computational Biology	1	0	4	1	15	0	60	15	90	3	50/50	PC
2	25BT602	Bioseparation Technology	3	0	2	3	45	0	30	45	120	4	50/50	PC
Theory Courses														
3	25BT603	Bioentrepreneurship, Biosafety and Regulatory Affairs	3	0	0	3	45	0	0	45	45	3	40/60	PC

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
4	25HS601	Environmental Science and Engineering	3	0	0	3	45	0	0	45	90	3	40/60	HS
5		Professional Elective III			0	3			0	45	90	3	40/60	PE
6		Professional Elective IV			0	3			0	45	90	3	40/60	PE
7		Open Elective IV	3	0	0	3	45	0	0	45	90	3	40/60	OE
8	25MC601	Well-being with Traditional Practices (Yoga, Ayurveda, Siddha)	3	0	0	0	45	0	0	0	45	0	100/0	MC
For Honours Degree														
1		Honours Elective III			0	3			0	45	90	3	40/60	
2		Honours Elective IV			0	3			0	45	90	3	40/60	
For Minor Degree														
1		Minor Elective III									90	3		
2		Minor Elective IV									90	3		

SEMESTER VII

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Cum Practical Course														
1	25BT701	Enzyme and Protein Engineering	3	0	2	3	45	0	30	45	120	4	50/50	PC
Theory Courses														
2	25BT702	Nanobiotechnology	3	0	0	3	45	0	0	45	90	3	40/60	PC
3	25BT703	Genomics and Proteomics	3	0	0	3	45	0	0	45	90	3	40/60	PC
4		Professional Elective V			0	3			0	45	90	3	40/60	PE
5		Professional Elective VI			0	3			0	45	90	3	40/60	PE
Practical Course														
6	25BTP701	Project Work - I	0	0	4	0	0	0	60	0	60	2	100/0	EEC
For Honours Degree														
1		Honours Elective V			0	3			0	45	90	3	40/60	
2		Honours Elective VI			0	3			0	45	90	3	40/60	
For Minor Degree														
1		Minor Elective V									90	3		
2		Minor Elective VI									90	3		

SEMESTER VIII

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Practical Course														
1	25BTP801	Project Work - II	0	0	20	0	0	0	300	0	300	10	60/40	EEC

TOTAL NO. OF CREDITS: 163

FOREIGN LANGUAGE

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25HS203	German	2	0	0	2	30	0	0	30	60	2	100/0	HS
2	25HS204	Japanese	2	0	0	2	30	0	0	30	60	2	100/0	HS

VALUE ADDED COURSE

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25VAC01	French	1	0	0	1	15	0	0	15	30	1	100/0	VAC
2	25VAC02	Hindi	1	0	0	1	15	0	0	15	30	1	100/0	VAC

PROFESSIONAL ELECTIVE COURSES : VERTICALS

VERTICAL I Bioprocess Technology	VERTICAL II Applied Biotechnology	VERTICAL III Medical Biotechnology	VERTICAL IV Biochemical Engineering	VERTICAL V Animal Biotechnology	VERTICAL VI Computational Biotechnology	VERTICAL VII Quality and Regulatory Affairs	VERTICAL VIII Agro Biotechnology	VERTICAL IX Pharmaceutical Biotechnology
Bioreactor Instrumentation and Control	Biosensors	Human Genetics	Mass Transfer Operations	Fundamentals of Animal Biotechnology	Programming for Bioinformatics Applications	Clinical Trials and Health Care Policies in Biotechnology	Transgenic Technology in Agriculture	Therapeutic Technology
Fermentation Technology	Astrobiology and Astrochemistry	Neuro Biology	Transport Phenomena in Biological System	Animal Health and Nutrition	Fundamentals of Algorithms for Bioinformatics	Biotechnology Products and its Validation	Therapeutic Application of Phytochemicals	Biopharmaceutics
Food Processing and Technology	Stem Cell Technology	Biopharmaceutics and Biosimilars	Bioenergy and Biofuels	Animal Physiology and Metabolism	Molecular Modelling	Quality Assurance and Quality Control in Biotechnology	Biofertilizer and Biopesticides Production	Biopharmaceutics and Pharmacokinetics
Bioreactor Design and Scale-up Process	Biomaterials	Vaccine Technology	Environmental Biotechnology	Animal Cell Culture Technology	Computer-Aided Drug Design	Entrepreneurship and Patent Design	Mushroom Cultivation and Vermicomposting	Pharmaceutical Regulatory Affairs
Process Optimization in Biotechnology	Green Technology	Molecular Therapeutics and Diagnostics	Applied Chemical Reaction Engineering	Advances in Animal Biotechnology	Metabolomics and Genomics Big Data Analytics	Good Manufacturing Practices	Advance Techniques in Agro-Forestry	Novel Drug Delivery Systems
Bioreactor Consideration for Recombinant Products	Tissue Engineering	Biomedical Engineering	Petroleum Biotechnology	Biotechniques in Animal Breeding	Data Mining and Machine Learning Techniques for Bioinformatics	Biosafety and Hazard Management	Plant Tissue Culture and Transformation Techniques	Molecular Pharmaceutics

VERTICAL I : Bioprocess Technology

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25PBT11	Bioreactor Instrumentation and Control	3	0	0	3	45	0	0	45	90	3	40/60	PE
2	25PBT12	Fermentation Technology	3	0	0	3	45	0	0	45	90	3	40/60	PE
3	25PBT13	Food Processing and Technology	3	0	0	3	45	0	0	45	90	3	40/60	PE
4	25PBT14	Bioreactor Design and Scale-up Process	3	0	0	3	45	0	0	45	90	3	40/60	PE
5	25PBT15	Process Optimization in Biotechnology	3	0	0	3	45	0	0	45	90	3	40/60	PE
6	25PBT16	Bioreactor Consideration for Recombinant Products	3	0	0	3	45	0	0	45	90	3	40/60	PE

VERTICAL II : Applied Biotechnology

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25PBT21	Biosensors	3	0	0	3	45	0	0	45	90	3	40/60	PE
2	25PBT22	Astrobiology and Astrochemistry	3	0	0	3	45	0	0	45	90	3	40/60	PE
3	25PBT23	Stem Cell Technology	3	0	0	3	45	0	0	45	90	3	40/60	PE
4	25PBT24	Biomaterials	3	0	0	3	45	0	0	45	90	3	40/60	PE
5	25PBT25	Green Technology	3	0	0	3	45	0	0	45	90	3	40/60	PE
6	25PBT26	Tissue Engineering	3	0	0	3	45	0	0	45	90	3	40/60	PE

VERTICAL III : Medical Biotechnology

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25PBT31	Human Genetics	3	0	0	3	45	0	0	45	90	3	40/60	PE
2	25PBT32	Neuro Biology	3	0	0	3	45	0	0	45	90	3	40/60	PE
3	25PBT33	Biopharmaceuticals and Biosimilars	3	0	0	3	45	0	0	45	90	3	40/60	PE
4	25PBT34	Vaccine Technology	3	0	0	3	45	0	0	45	90	3	40/60	PE
5	25PBT35	Molecular Therapeutics and Diagnostics	3	0	0	3	45	0	0	45	90	3	40/60	PE
6	25PBT36	Biomedical Engineering	3	0	0	3	45	0	0	45	90	3	40/60	PE

VERTICAL IV : Biochemical Engineering

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25PBT41	Mass Transfer Operations	3	0	0	3	45	0	0	45	90	3	40/60	PE
2	25PBT42	Transport Phenomena in Biological System	3	0	0	3	45	0	0	45	90	3	40/60	PE
3	25PBT43	Bioenergy and Biofuels	3	0	0	3	45	0	0	45	90	3	40/60	PE
4	25PBT44	Environmental Biotechnology	3	0	0	3	45	0	0	45	90	3	40/60	PE
5	25PBT45	Applied Chemical Reaction Engineering	3	0	0	3	45	0	0	45	90	3	40/60	PE
6	25PBT46	Petroleum Biotechnology	3	0	0	3	45	0	0	45	90	3	40/60	PE

VERTICAL V : Animal Biotechnology

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25PBT51	Fundamentals of Animal Biotechnology	3	0	0	3	45	0	0	45	90	3	40/60	PE
2	25PBT52	Animal Health and Nutrition	3	0	0	3	45	0	0	45	90	3	40/60	PE
3	25PBT53	Animal Physiology and Metabolism	3	0	0	3	45	0	0	45	90	3	40/60	PE
4	25PBT54	Animal Cell Culture Technology	3	0	0	3	45	0	0	45	90	3	40/60	PE
5	25PBT55	Advances in Animal Biotechnology	3	0	0	3	45	0	0	45	90	3	40/60	PE
6	25PBT56	Biotechniques in Animal Breeding	3	0	0	3	45	0	0	45	90	3	40/60	PE

VERTICAL VI : Computational Biotechnology

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25PBT61	Programming for Bioinformatics Applications	3	0	0	3	45	0	0	45	90	3	40/60	PE
2	25PBT62	Fundamentals of Algorithms for Bioinformatics	3	0	0	3	45	0	0	45	90	3	40/60	PE
3	25PBT63	Molecular Modelling	2	1	0	3	30	15	0	45	90	3	40/60	PE
4	25PBT64	Computer-Aided Drug Design	3	0	0	3	45	0	0	45	90	3	40/60	PE

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
5	25PBT65	Metabolomics and Genomics Big Data Analytics	3	0	0	3	45	0	0	45	90	3	40/60	PE
6	25PBT66	Data Mining and Machine Learning Techniques for Bioinformatics	3	0	0	3	45	0	0	45	90	3	40/60	PE

VERTICAL VII : Quality and Regulatory Affairs

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25PBT71	Clinical Trials and Health Care Policies in Biotechnology	3	0	0	3	45	0	0	45	90	3	40/60	PE
2	25PBT72	Biotechnology Products and its Validation	3	0	0	3	45	0	0	45	90	3	40/60	PE
3	25PBT73	Quality Assurance and Quality Control in Biotechnology	3	0	0	3	45	0	0	45	90	3	40/60	PE
4	25PBT74	Entrepreneurship and Patent Design	3	0	0	3	45	0	0	45	90	3	40/60	PE
5	25PBT75	Good Manufacturing Practices	3	0	0	3	45	0	0	45	90	3	40/60	PE
6	25PBT76	Biosafety and Hazard Management	3	0	0	3	45	0	0	45	90	3	40/60	PE

VERTICAL VIII : Agro Biotechnology

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25PBT81	Transgenic Technology in Agriculture	3	0	0	3	45	0	0	45	90	3	40/60	PE
2	25PBT82	Therapeutic Application of Phytochemicals	3	0	0	3	45	0	0	45	90	3	40/60	PE
3	25PBT83	Biofertilizer and Biopesticides Production	3	0	0	3	45	0	0	45	90	3	40/60	PE
4	25PAG44	Mushroom Cultivation and Vermicomposting	3	0	0	3	45	0	0	45	90	3	40/60	PE
5	25PBT84	Advance Techniques in Agro-Forestry	3	0	0	3	45	0	0	45	90	3	40/60	PE

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
6	25PBT85	Plant Tissue Culture and Transformation Techniques	3	0	0	3	45	0	0	45	90	3	40/60	PE

VERTICAL IX : Pharmaceutical Biotechnology

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25PBT91	Therapeutic Technology	3	0	0	3	45	0	0	45	90	3	40/60	PE
2	25PBT92	Biopharmaceutics	3	0	0	3	45	0	0	45	90	3	40/60	PE
3	25PBT93	Biopharmaceutics and Pharmacokinetics	3	0	0	3	45	0	0	45	90	3	40/60	PE
4	25PBT94	Pharmaceutical Regulatory Affairs	3	0	0	3	45	0	0	45	90	3	40/60	PE
5	25PBT95	Novel Drug Delivery Systems	3	0	0	3	45	0	0	45	90	3	40/60	PE
6	25PBT96	Molecular Pharmaceutics	3	0	0	3	45	0	0	45	90	3	40/60	PE

OPEN ELECTIVES

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25OHS11	Foundation Skills in Integrated Product Development	3	0	0	3	45	0	0	45	90	3	40/60	OE
2	25OHS12	Human Rights	3	0	0	3	45	0	0	45	90	3	40/60	OE
3	25OHS14	Sustainable Management	3	0	0	3	45	0	0	45	90	3	40/60	OE
4	25OHS15	Supply Chain Management	3	0	0	3	45	0	0	45	90	3	40/60	OE
5	25OAG11	Bioenergy and Waste Utilization	3	0	0	3	45	0	0	45	90	3	40/60	OE
6	25OAG12	Agribusiness and Entrepreneurship	3	0	0	3	45	0	0	45	90	3	40/60	OE
7	25OAG13	Precision Agriculture and Smart Farming	3	0	0	3	45	0	0	45	90	3	40/60	OE
8	25OAG14	GIS and Remote Sensing Applications	3	0	0	3	45	0	0	45	90	3	40/60	OE
9	25OAG15	Renewable Energy in Agriculture	3	0	0	3	45	0	0	45	90	3	40/60	OE
10	25OAG16	Post-Harvest Engineering	3	0	0	3	45	0	0	45	90	3	40/60	OE
11	25OIT11	UI & UX Design	3	0	0	3	45	0	0	45	90	3	40/60	OE
12	25OIT12	High Performance Computing	3	0	0	3	45	0	0	45	90	3	40/60	OE
13	25OCY11	Information Security	3	0	0	3	45	0	0	45	90	3	40/60	OE
14	25OCY12	Cyber Physical Systems	3	0	0	3	45	0	0	45	90	3	40/60	OE
15	25OCY13	Information Retrieval System	3	0	0	3	45	0	0	45	90	3	40/60	OE
16	25OAI11	Intelligent Healthcare Solutions	3	0	0	3	45	0	0	45	90	3	40/60	OE
17	25OML12	AI for Precision Agriculture	3	0	0	3	45	0	0	45	90	3	40/60	OE
18	25OCS12	Cloud Web Services	3	0	0	3	45	0	0	45	90	3	40/60	OE
19	25OCS13	Blockchain Technologies	3	0	0	3	45	0	0	45	90	3	40/60	OE
20	25OCS14	Data Mining	3	0	0	3	45	0	0	45	90	3	40/60	OE
21	25OME11	Air Pollution and Control Engineering	3	0	0	3	45	0	0	45	90	3	40/60	OE
22	25OME12	Automotive Systems	3	0	0	3	45	0	0	45	90	3	40/60	OE
23	25OME13	Digital Manufacturing	3	0	0	3	45	0	0	45	90	3	40/60	OE
24	25OME14	Industrial Design and Rapid Prototyping Techniques	3	0	0	3	45	0	0	45	90	3	40/60	OE

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
25	25OME15	Lean Six Sigma	3	0	0	3	45	0	0	45	90	3	40/60	OE
26	25OME16	Low-Cost Automation	3	0	0	3	45	0	0	45	90	3	40/60	OE
27	25OME17	Micro and Precision Engineering	3	0	0	3	45	0	0	45	90	3	40/60	OE
28	25OME18	Plant Layout and Material Handling	3	0	0	3	45	0	0	45	90	3	40/60	OE
29	25OME19	Vehicle Styling and Design	3	0	0	3	45	0	0	45	90	3	40/60	OE
30	25OEC11	Wireless Communication	3	0	0	3	45	0	0	45	90	3	40/60	OE
31	25OEC12	Internet of Things and Applications	3	0	0	3	45	0	0	45	90	3	40/60	OE
32	25OEC13	Embedded Systems	3	0	0	3	45	0	0	45	90	3	40/60	OE
33	25OEC14	Introduction to Quantum Communication	3	0	0	3	45	0	0	45	90	3	40/60	OE
34	25OEC15	Introduction to Quantum Sensing	3	0	0	3	45	0	0	45	90	3	40/60	OE
35	25OEC16	Engineering Foundations of Quantum Technologies	3	0	0	3	45	0	0	45	90	3	40/60	OE
36	25OEC17	Solid State Physics for Quantum Technologies	3	0	0	3	45	0	0	45	90	3	40/60	OE
37	25OEC18	Quantum Optics	3	0	0	3	45	0	0	45	90	3	40/60	OE

VERTICALS FOR MINOR DEGREE (In addition to all the verticals of other programmes)

VERTICAL I Fintech and Block Chain	VERTICAL II Entrepreneurship	VERTICAL III Public Administration	VERTICAL IV Business Data Analytics	VERTICAL V Environment and Sustainability	VERTICAL VI Quantum Technologies
Finance for Managers	Foundations of Entrepreneurship	Principles of Public Administration	Statistics for Management	Sustainable Infrastructure Development	Foundations of Quantum Computing: Physics, Engineering, and Mathematics Computing
Fundamentals of Investment	Team Building and Leadership Management for Business	Public Finance and Budgeting	Business Analytics and Decision-Making	Sustainable Agriculture and Environmental Management	Survey of Quantum Technologies and Applications
Banking, Financial Services and Insurance	Creativity and Innovation in Entrepreneurship	Public Personnel Administration	Human Resource Analytics	Sustainable Bio Materials	Foundations of Quantum Technologies
Introduction to Blockchain and its Applications	Principles of Marketing Management for Business	Administrative Law and Governance	Marketing and Social Media Web Analytics	Materials for Energy Sustainability	Basic Laboratory Course for Quantum Technologies
Fintech Personal Finance and Payments	Human Resource Management for Entrepreneurs	Indian Administrative System	Operation and Supply Chain Analytics	Waste Management and Circular Economy	Introduction to Quantum Computation
Introduction to Fintech	Financing New Business Ventures	Public Policy Administration	Financial Analytics	Environmental Quality Monitoring and Analysis	Introduction to Quantum Materials
		Comparative Public Administration and Development Studies		Integrated Energy Planning for Sustainable Development	
				Energy Efficiency for Sustainable Development	

VERTICAL I : Fintech and Block Chain

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25OMI11	Finance for Managers	3	0	0	3	45	0	0	45	90	3	40/60	OE
2	25OMI12	Fundamentals of Investment	3	0	0	3	45	0	0	45	90	3	40/60	OE
3	25OMI13	Banking, Financial Services and Insurance	3	0	0	3	45	0	0	45	90	3	40/60	OE
4	25OMI14	Introduction to Blockchain and its Applications	3	0	0	3	45	0	0	45	90	3	40/60	OE
5	25OMI15	Fintech Personal Finance and Payments	3	0	0	3	45	0	0	45	90	3	40/60	OE
6	25OMI16	Introduction to Fintech	3	0	0	3	45	0	0	45	90	3	40/60	OE

VERTICAL II : Entrepreneurship

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25OMI21	Foundations of Entrepreneurship	3	0	0	3	45	0	0	45	90	3	40/60	OE
2	25OMI22	Team Building and Leadership Management for Business	3	0	0	3	45	0	0	45	90	3	40/60	OE
3	25OMI23	Creativity and Innovation in Entrepreneurship	3	0	0	3	45	0	0	45	90	3	40/60	OE
4	25OMI24	Principles of Marketing Management for Business	3	0	0	3	45	0	0	45	90	3	40/60	OE
5	25OMI25	Human Resource Management for Entrepreneurs	3	0	0	3	45	0	0	45	90	3	40/60	OE
6	25OMI26	Financing New Business Ventures	3	0	0	3	45	0	0	45	90	3	40/60	OE

VERTICAL III : Public Administration

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25OMI31	Principles of Public Administration	3	0	0	3	45	0	0	45	90	3	40/60	OE
2	25OMI32	Public Finance and Budgeting	3	0	0	3	45	0	0	45	90	3	40/60	OE

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
3	25OMI33	Public Personnel Administration	3	0	0	3	45	0	0	45	90	3	40/60	OE
4	25OMI34	Administrative Law and Governance	3	0	0	3	45	0	0	45	90	3	40/60	OE
5	25OMI35	Indian Administrative System	3	0	0	3	45	0	0	45	90	3	40/60	OE
6	25OMI36	Public Policy Administration	3	0	0	3	45	0	0	45	90	3	40/60	OE
7	25OMI37	Comparative Public Administration and Development Studies	3	0	0	3	45	0	0	45	90	3	40/60	OE

VERTICAL IV : Business Data Analytics

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25OMI41	Statistics for Management	3	0	0	3	45	0	0	45	90	3	40/60	OE
2	25OMI42	Business Analytics and Decision-Making	3	0	0	3	45	0	0	45	90	3	40/60	OE
3	25OMI43	Human Resource Analytics	3	0	0	3	45	0	0	45	90	3	40/60	OE
4	25OMI44	Marketing and Social Media Web Analytics	3	0	0	3	45	0	0	45	90	3	40/60	OE
5	25OMI45	Operation and Supply Chain Analytics	3	0	0	3	45	0	0	45	90	3	40/60	OE
6	25OMI46	Financial Analytics	3	0	0	3	45	0	0	45	90	3	40/60	OE

VERTICAL V : Environment and Sustainability

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25OMI51	Sustainable Infrastructure Development	3	0	0	3	45	0	0	45	90	3	40/60	OE
2	25OMI52	Sustainable Agriculture and Environmental Management	3	0	0	3	45	0	0	45	90	3	40/60	OE
3	25OMI53	Sustainable Bio Materials	3	0	0	3	45	0	0	45	90	3	40/60	OE
4	25OMI54	Materials for Energy Sustainability	3	0	0	3	45	0	0	45	90	3	40/60	OE

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
5	25OMI55	Waste Management and Circular Economy	3	0	0	3	45	0	0	45	90	3	40/60	OE
6	25OMI56	Environmental Quality Monitoring and Analysis	3	0	0	3	45	0	0	45	90	3	40/60	OE
7	25OMI57	Integrated Energy Planning for Sustainable Development	3	0	0	3	45	0	0	45	90	3	40/60	OE
8	25OMI58	Energy Efficiency for Sustainable Development	3	0	0	3	45	0	0	45	90	3	40/60	OE

VERTICAL VI : Quantum Technologies

S. No.	Course Code	Course Title	Hours per week				Hours per sem				Total no. of Hours per semester	Credits	Internal/ External Marks	Course Category
			L	T	P	SL	L	T	P	SL				
Theory Courses														
1	25OMI61	Foundations of Quantum Computing: Physics, Engineering, and Mathematics Computing	3	0	0	3	45	0	0	45	90	3	40/60	OE
2	25OMI62	Survey of Quantum Technologies and Applications	3	0	0	3	45	0	0	45	90	3	40/60	OE
3	25OMI63	Foundations of Quantum Technologies	3	0	0	3	45	0	0	45	90	3	40/60	OE
Practical Course														
4	25OMI64	Basic Laboratory Course for Quantum Technologies	2	0	2	2	30	0	30	30	90	3	50/50	OE
Theory Courses														
5	25OMI65	Introduction to Quantum Computation	3	0	0	3	45	0	0	45	90	3	40/60	OE
6	25OMI66	Introduction to Quantum Materials	3	0	0	3	45	0	0	45	90	3	40/60	OE

SUMMARY

S.No.	COURSE CATEGORY	CREDITS AS PER SEMESTER								TOTAL CREDITS
		I	II	III	IV	V	VI	VII	VIII	
1	HS	4	7				3			14
2	BS	7	7	4	4					22
3	ES	8	5	3	3	3				22
4	PC		3	15	10	7	10	10		55
5	PE					6	6	6		18
6	OE				6	3	3			12
7	EEC			2	1	3		2	10	18
8	AC	1	1							2
9	MC				✓		✓			
TOTAL CREDITS		20	23	24	24	22	22	18	10	163