

GUJARAT TECHNOLOGICAL UNIVERSITY

Aeronautical Engineering (01)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Tutorial/ Practical Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2160101	Aerodynamics II	4	0	2	6	70	30	30	20	150	1
2160102	Fundamentals of Jet Propulsion	3	1	0	4	70	30	30	20	150	1
2160109	Theory of Vibration	3	0	2	5	70	30	30	20	150	1
2160104	Basic Control Theory	3	0	2	5	70	30	30	20	150	1
2160106	Avionics	3	0	2	5	70	30	30	20	150	1
2160110	Aviation Meteorology, Navigation and Communication	0	0	2	2	0	0	80	20	100	1
	Department Elective I	2	0	0	2	70	30	0	0	100	1
2160001	Design Engineering - II B	0	0	3	3	0	0	80	20	100	1
	Total	18	1	13	32						

Departmental Elective I:

2160107	Airport and Operations Management
2160108	Aviation Management

Automobile Engineering (02)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Tutorial/ Practical		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2160207	Alternative fuel and power systems	3	0	2	5	70	30	30	20	150	2
2161903	Computer Aided Design	3	0	2	5	70	30	30	20	150	2
2161908	Refrigeration and Air Conditioning	3	0	2	5	70	30	30	20	150	2
2160205	Automobile Chassis and Body Engineering	3	0	0	3	70	30	0	0	100	2
2160208	Automotive computer controlled Systems	3	0	2	5	70	30	30	20	150	2
2161901	Dynamics of Machinery	3	0	2	5	70	30	30	20	150	2
2160001	Design Engineering - II B	0	0	3	3	0	0	80	20	100	2
	Total	18	0	13	31						

Bio-Medical(03)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Tutorial/ Practical Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2160301	Diagnostic Instrumentation	4	0	2	6	70	30	30	20	150	3
2160307	Embedded system Design	4	0	2	6	70	30	30	20	150	3
2160303	Therapeutic Techniques & Instrumentation	4	0	2	6	70	30	30	20	150	3
2160308	Biomechanics	3	2	0	5	70	30	30	20	150	3
	Department Elective - I	3	0	2	5	70	30	30	20	150	3
2160001	Design Engineering - II B	0	0	3	3	0	0	80	20	100	3
	Total	18	2	11	31						

Departmental Elective I:

2160309	Introduction to Tissue Engineering
2160310	Rehabilitation Engineering

Bio-Technology(04)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Tutorial/ Practical Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2160409	Nano-Biotechnology - Department Elective I	3	2	0	5	70	30	30	20	150	4
2160410	Bioinformatics - Department Elective I	3	0	2	5	70	30	30	20	150	4
2160401	Advanced Molecular Biology-II	3	0	0	3	70	30	0	0	100	4
2160407	Instrumentation and Control for Bioengineering	4	0	3	7	70	30	30	20	150	4
2160405	Principles of Process Engineering-III	3	0	3	6	70	30	30	20	150	4
2160408	Agriculture and Food Biotechnology	3	0	3	6	70	30	30	20	150	4
2160001	Design Engineering-II B	0	0	3	3	0	0	80	20	100	4
	Total	19	2	14	35						

Chemical Engineering (05)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2160501	Mass Transfer Operation - II	3	0	3	6	70	30	30	20	150	5
2160503	Process Equipment Design - I	4	0	3	7	70	30	30	20	150	5
2160504	Pollution Control, Safety & Health Management	3	0	0	3	70	30	0	0	100	5
2160506	Chemical Reaction Engineering - I	3	0	3	6	70	30	30	20	150	5
	Department Elective - I	4	0	2	6	70	30	30	20	150	5
2160001	Design Engineering - II B	0	0	3	3	0	0	80	20	100	5
	Total	17	0	14	31						

Departmental Elective I

2160507	Advance Separation Techniques
2160508	Biochemical Engineering
2160509	Biotechnology

Civil Engineering (06)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2160601	Advanced Construction and Equipments	3	1	0	4	70	30	30	20	150	6
2160602	Applied Fluid Mechanics	3	0	2	5	70	30	30	20	150	6
2160603	Railway, Bridge & Tunnel Engineering	3	1	0	4	70	30	30	20	150	6
2160604	Water & Waste Water Engineering	3	0	2	5	70	30	30	20	150	6
2160607	Elementary Structural Design	4	1	0	5	70	30	30	20	150	6
	Departmental Elective - I	3	1	0	4	70	30	30	20	150	6
2160001	Design Engineering - II B	0	0	3	3	0	0	80	20	100	6
	Total	19	4	7	30						

Departmental Elective I:

2160608	Urban Transportation system
2160609	Computational Mechanics

Food Processing & Technology (14)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Tutorial/ Practical Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2161401	Food Process Equipment Design	4	2	0	6	70	30	30	20	150	14
2161403	Food Engineering Operations - II	4	0	2	6	70	30	30	20	150	14
2161406	Food Refrigeration & Air - Conditioning	4	0	2	6	70	30	30	20	150	14
2161409	Bakery and Confectionary Technology	4	0	2	6	70	30	30	20	150	14
	Department Elective-I	4	0	2	6	70	30	30	20	150	14
2160001	Design Engineering - II B	0	0	3	3	0	0	80	20	100	14
	Total	20	2	11	33						

Departmental Elective I:

2161408	Food Fermentation Technology
2161407	Food Plant Utilities & Sanitation

Industrial Engineering (15)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2161501	Materials Management	4	0	2	6	70	30	30	20	150	15
2161502	Product Development & Value Engineering	4	0	2	6	70	30	30	20	150	15
2161503	Finance Management & Cost Control	4	2	0	6	70	30	30	20	150	15
2161504	Metal Cutting & Advanced manufacturing processes	4	0	2	6	70	30	30	20	150	15
	Departmental Elective - I	4	0	2	6	70	30	30	20	150	15
2160001	Design Engineering - II B	0	0	3	3	0	0	80	20	100	15
	Total	20	2	11	33						

Departmental Elective I

2161505	Maintenance & Safety Engg
2161506	Total Productive Maintenance

Information Technology (16)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Tutorial/ Practical		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2160701	Software Engineering	4	0	2	6	70	30	30	20	150	16
2160707	Advanced Java	4	0	2	6	70	30	30	20	150	16
2160708	Web Technology	3	0	2	5	70	30	30	20	150	16
2161603	Data Compression and data Retrieval	3	0	2	5	70	30	30	20	150	16
	Departmental Elective - I	4	0	2	6	70	30	30	20	150	16
2160001	Design Engineering - II B	0	0	3	3	0	0	80	20	100	16
	Total	18	0	13	31						

Departmental Elective I

2161604	Image processing
2160709	Embedded & VLSI Design
2160710	Distributed operating system
2160711	.Net Technology

Instrumentation & Control Engineering (17)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Tutorial/ Practical Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
	Departmental Elective - I	4	0	2	6	70	30	30	20	150	17
2161707	Control System Design	4	0	2	6	70	30	30	20	150	17
2161708	Power Electronics	3	0	2	5	70	30	30	20	150	17
2161704	Analog and Digital communication	3	0	2	5	70	30	30	20	150	17
2161709	Programmable Logic Controller	4	0	2	6	70	30	30	20	150	17
2160001	Design Engineering - II B	0	0	3	3	0	0	80	20	100	17
	Total	18	0	13	31						

Departmental Elective I:

2161711	Environmental Instrumentation
2161712	Bio-Potential Instrumentation

Mechanical Engineering (19)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Tutorial/ Practical Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2161901	Dynamics of Machinery	3	0	2	5	70	30	30	20	150	19
2161902	Internal Combustion Engines	3	0	2	5	70	30	30	20	150	19
2161903	Computer Aided Design	3	0	2	5	70	30	30	20	150	19
2161907	Industrial Engineering	3	0	2	5	70	30	30	20	150	19
2161908	Refrigeration and Airconditioning	3	0	2	5	70	30	30	20	150	19
2161909	Production Technology	3	0	2	5	70	30	30	20	150	19
2160001	Design Engineering - II B	0	0	3	3	0	0	80	20	100	19
	Total	18	0	15	33						

Mechatronics Engineering (20)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2162003	Control of Electric Drives	4	0	2	6	70	30	30	20	150	20
2162004	Hydraulic & Pneumatic Systems	4	0	2	6	70	30	30	20	150	20
2162005	Electro Mechanical Measurements & Instruments	4	0	2	6	70	30	30	20	150	20
2162001	Design of Mechanisms - I	4	0	2	6	70	30	30	20	150	20
	Departmental Elective - I	3	0	2	5	70	30	30	20	150	20
2160001	Design Engineering - II B	0	0	3	3	0	0	80	20	100	20
	Total	19	0	13	32						

Departmental Elective I

2162006	Computer Aided Design for Mechatronics
2162007	Metrology and Product Engineering
2161907	Industrial Engineering

Metallurgy Engineering (21)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2162103	Powder Metallurgy	4	0	2	6	70	30	30	20	150	21
2162106	Foundry Technology	4	0	2	6	70	30	30	20	150	21
2162107	Heat Treatment	4	0	2	6	70	30	30	20	150	21
2162108	Material Degradation and Prevention	4	0	2	6	70	30	30	20	150	21
2162109	Metal Joining Processes	4	0	2	6	70	30	30	20	150	21
2160001	Design Engineering -II B	0	0	3	3	0	0	80	20	100	21
	Total	20	0	13	33						

Mining Engineering (22)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2162202	Underground Metal Mining	4	0	2	6	70	30	30	20	150	22
2162204	Mine Hazards	3	0	2	5	70	30	30	20	150	22
2162205	Mine Surface Environment	4	0	2	6	70	30	30	20	150	22
2162206	Computer Application Mining	2	0	0	2	70	30	0	0	100	22
2162207	Mine Ventilation	3	0	2	5	70	30	30	20	150	22
	Departmental Elective - I	4	0	2	6	70	30	30	20	150	22
2160001	Design Engineering - II B	0	0	3	3	0	0	80	20	100	22
	Total	20	0	13	33						

Departmental Elective I

2162201	Ecology Geology-I
2162208	Minine Electrical Engineering

Production (25)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2162506	Metal Joining Technology	4	0	2	6	70	30	30	20	150	25
2161903	Computer Aided Design	3	0	2	5	70	30	30	20	150	25
2162507	Allied Manufacturing Technique	4	0	2	6	70	30	30	20	150	25
2162508	Metal Forming Technology	4	0	2	6	70	30	30	20	150	25
	Departmental Elective - I	3	1	0	4	70	30	30	20	150	25
2160001	Design Engineering II B	0	0	3	3	0	0	80	20	100	25
	Total	18	1	11	30						

Departmental Elective I:

2162509	Plant Maintenance and Safety Engg.
2162505	Estimating and Costing

Rubber technology (26)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Tutorial/ Practical Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2162601	Rubber Compound & Product Testing	3	0	3	6	70	30	30	20	150	26
2162602	Synthetic Rubbers	3	0	3	6	70	30	30	20	150	26
2162603	Rubber Equipment Design-I	3	0	3	6	70	30	30	20	150	26
2162604	Characterisation of Rubber	3	0	3	6	70	30	30	20	150	26
	Departmental Elective - I	3	0	3	6	70	30	30	20	150	26
2160001	Design Engineering-II B	0	0	3	3	0	0	80	20	100	26
	Total	15	0	18	33						

Departmental Elective I:

2162605	Thermoplastics Elastomers & Polymer Blends
2162606	Corrosion of Polymers & Elastomers

Textile Processing (28)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2162801	Technology of Dyeing - II	3	0	2	5	70	30	30	20	150	28
2162802	Analytical Textile Chemistry -II	3	0	2	5	70	30	30	20	150	28
2162804	Technology of Printing - I	3	0	3	6	70	30	30	20	150	28
2162805	Technology of Finishing - I	3	0	2	5	70	30	30	20	150	28
2162806	Physical Characteristics of textile fibre	3	0	0	3	70	30	0	0	100	28
	Department Elective I	3	0	2	5	70	30	30	20	150	28
2160001	Design Engineering - II B	0	0	3	3	0	0	80	20	100	28
	Total	18	0	14	32						

Departmental Elective I:

2162807	Chemical & Physical Analysis of Textiles
2162808	Manufacturing & Applications of Polymeric Materials

Textile Technology (29)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2162903	Physical Testing-II	3	0	2	5	70	30	30	20	150	29
2162904	Technical Textile-I	3	2	0	5	70	30	30	20	150	29
2162906	Fabric Structure-II	4	0	2	6	70	30	30	20	150	29
2162907	Weaving Technology-III	3	0	2	5	70	30	30	20	150	29
2162908	Modern Yarn Production Technologies	3	0	0	3	70	30	0	0	100	29
	Departmental Elective - I -	3	0	2	5	70	30	30	20	150	29
2160001	Design Engineering - II B	0	0	3	3	0	0	80	20	100	29
	Total	19	2	11	32						

Departmental Elective I:

2162909	Knitting Technology
2162910	Woolen and Worsted Spinning

Information & Communication Technology (32)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2163206	Analog and Digital Communication (ICT)	4	0	2	6	70	30	30	20	150	32
2163201	Operation Research	4	0	2	6	70	30	30	20	150	32
2160708	Web Technology	3	0	2	5	70	30	30	20	150	32
2163203	Engineering Electromagnetics & wave Propagation	4	0	2	6	70	30	30	20	150	32
	Departmental Elective - I	4	0	2	6	70	30	30	20	150	32
2160001	Design Engineering - II B	0	0	3	3	0	0	80	20	100	32
	Total	19	0	13	32						

Departmental Elective I

2161005	Optical Communication
2163204	Telecommunication Engineering
2163205	Advance N/w Protocols

Manufacturing Engineering(34)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2162506	Metal Joining Technology	4	0	2	6	70	30	30	20	150	34
2161903	Computer Aided Design	3	0	2	5	70	30	30	20	150	34
2161907	Industrial Engineering	3	0	2	5	70	30	30	20	150	34
2162508	Metal Forming Technology	4	0	2	6	70	30	30	20	150	34
	Departmental Elective - I	3	1	0	4	70	30	30	20	150	34
2160001	Design Engineering II B	0	0	3	3	0	0	80	20	100	34
	Total	17	1	11	29						

Departmental Elective I

2162509	Plant Maintenance and Safety Engg.
2163407	Plastic Manufacturing Technology

Environmental Science and Technology (35)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Tutorial/ Practical		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2163506	Unit Operations-II	4	0	2	6	70	30	30	20	150	35
2163507	Environmental Management-II	3	1	0	4	70	30	30	20	150	35
2163508	Basics of Thermodynamics & Kinetics	3	1	2	6	70	30	30	20	150	35
2163509	Liquid Effluent Treatment – II	4	0	3	7	70	30	30	20	150	35
2163505	Solid & Hazardous Wastes - Characterization & Treatment	4	0	3	7	70	30	30	20	150	35
2160001	Design Engineering II B	0	0	3	3	0	0	80	20	100	35
Total		18	2	13	33						

Chemical Technology (36)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2163609	Basics of Mass Transfer	3	0	2	5	70	30	30	20	150	36
2163610	Analytical techniques	3	0	2	5	70	30	30	20	150	36
2163611	Chemical Engineering Thermodynamics & Kinetics	3	1	2	6	70	30	30	20	150	36
	Department Elective-V	4	0	3	7	70	30	30	20	150	36
	Department Elective-VI	4	0	3	7	70	30	30	20	150	36
2160001	Design Engineering-II B	0	0	3	3	0	0	80	20	150	36
Total		17	1	15	33						

Departmental Elective V

2163601	Medicinal Chemistry-I
2163602	Compounding & Processing of Plastics & Rubbers
2163603	Refractories-I
2163604	Technology of Pigments

Departmental Elective VI

2163605	Technology of Solid Dosage forms & Medicinal Natural Products
2163606	Compounding & Processing of Plastics & Rubbers-II
2163607	Ceramic Coatings
2163608	Technology of Dyeing

Nano Technology (39)**Semester VI**

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2163901	Coating technology	3	0	2	5	70	30	30	20	150	39
2163902	Nanopolymers and Nano-composites	3	0	2	5	70	30	30	20	150	39
2163903	Nanotechnology and Medicine	3	0	0	3	70	30	0	0	100	39
2163904	Non-conventional energy sources	4	0	0	4	70	30	0	0	100	39
2163905	Microelectronics and VLSI	3	0	2	5	70	30	30	20	150	39
	Departmental Elective I	3	0	2	5	70	30	30	20	150	39
2160001	Design Engineering - II B	0	0	3	3	0	0	80	20	100	39
	Total	19	0	11	30						
	Departmental Elective I										
2163906	Nanomagnetism and NanoFluids										

Civil and Infrastructure (40)**Semester VI**

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2164001	Design of Concrete Structures	3	2	0	5	70	30	30	20	150	40
2164002	Utilities for Civil Infrastructure	3	2	0	5	70	30	30	20	150	40
2164003	Geotechnical Engineering - II	3	0	2	5	70	30	30	20	150	40
2164004	Infrastructure Planning and Appraisal	3	1	0	4	70	30	30	20	150	40
	Departmental Elective - I	3	2	0	5	70	30	30	20	150	40
2164005	Industry Internship-2	0	0	2	2	0	0	80	20	100	40
2160001	Design Engg. II-B	0	0	3	3	0	0	80	20	100	40
	Total	15	7	7	29						

Departmental Elective I		Theory	Tutorial	Practical	Credits
2164006	Advanced Construction Methods & Equipments	3	2	0	5
2164007	Construction Safety and Material Management	3	2	0	5
2164008	Highway Planning & Construction	3	2	0	5
2164009	GIS & Remote Sensing for Infrastructure	3	2	0	5
2164010	Water & Wastewater Treatment Technologies	3	0	2	5

Robotics and Automation (41)

Semester VI

Subject code	Subject name	Teaching Scheme (Hours)			Credits	Theory Marks		Marks		Total Marks	Branch Code
		Theory	Tutorial	Practical		ESE(E)	PA (M)	Viva (V)	PA(I)		
2164101	Automation System Design	3	0	4	7	70	30	30	20	150	41
2164102	Machine Vision System	3	1	0	4	70	30	30	20	150	41
2164103	Modelling and Simulation	3	0	2	5	70	30	30	20	150	41
2164104	Power Electronics and Drives	3	1	0	4	70	30	30	20	150	41
	Departmental Elective - I	3	1	0	4	70	30	30	20	150	41
2160001	Design Engineering II B	0	0	3	3	0	0	80	20	100	41
	Total	15	3	9	27						

Departmental Elective I

2164105	Industrial Robotics and Material Handling Systems
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