



ADITYA ENGINEERING COLLEGE

An Autonomous Institution

Approved by AICTE • Permanently Affiliated to JNTUK • Accredited by NAAC with 'A' Grade

Recognised by UGC under sections 2(f) and 12(B) of UGC Act, 1956

Aditya Nagar, ADB Road, Surampalem - 533437, Near Kakinada, E.G.Dt., Ph:99498 76662

1.2.2 Elective Course highlight in the Program Structure during the academic year 2021-22.

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PROGRAM STRUCTURE

I SEMESTER

Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201HS1T01	Communicative English	HSMC	Theory	3	0	0	3	3
201BS1T01	Differential equations and Linear algebra	BSC	Theory	3	0	0	3	3
201BS1T02	Engineering Physics	BSC	Theory	3	0	0	3	3
201ES1T01	Building Materials & Construction	ESC	Theory	3	0	0	3	3
201ES1T05	Engineering Graphics	ESC	Theory	1	0	4	5	3
201HS1L01	Communicative English Lab	HSMC	Lab	0	0	3	3	1.5
201BS1L01	Engineering Physics Lab	BSC	Lab	0	0	3	3	1.5
201ES1L01	Engineering Workshop	ESC	Lab	0	0	3	3	1.5
201MC1T01	Environmental Science	MC	Theory	2	0	0	2	0
TOTAL				15	0	13	28	19.5

II SEMESTER

Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS2T05	Partial Differential Equations and Vector Calculus	BSC	Theory	3	0	0	3	3
201BS2T08	Chemistry of Materials	BSC	Theory	3	0	0	3	3
201ES2T06	Engineering Mechanics	ESC	Theory	3	0	0	3	3
201ES2T08	Programming for Problem Solving Using C	ESC	Theory	3	0	0	3	3
201ES2T12	Surveying	ESC	Theory	3	0	0	3	3
201ES2L05	Surveying field Work	ESC	Lab	0	0	3	3	1.5
201BS2L05	Engineering Chemistry Lab	BSC	Lab	0	0	3	3	1.5
201ES2L10	Programming for Problem Solving Using C Lab	ESC	Lab	0	0	3	3	1.5
201MC2L01	Professional Communications skills Lab	MC	Lab	0	0	3	3	0
201MC2T02	Constitution of India	MC	Theory	2	0	0	2	0
TOTAL				17	0	12	29	19.5

III SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS3T12	Integral Transforms and Applications of Partial Differential Equations	BSC	Theory	3	0	0	3	3
201CE3T01	Strength of Materials-I	PCC	Theory	3	0	0	3	3
201CE3T02	Fluid Mechanics	PCC	Theory	3	0	0	3	3
201CE3T03	Structural Analysis	PCC	Theory	3	0	0	3	3
201CE3T04	Concrete Technology	PCC	Theory	3	0	0	3	3
201CE3L01	Building Planning and Drawing Lab	PCC	Lab	0	0	3	3	1.5
201CE3L02	Concrete Technology Lab	PCC	Lab	0	0	3	3	1.5
201CE3L03	Strength of Materials Lab	PCC	Lab	0	0	3	3	1.5
201SC3L01	Skill Oriented Course-I Computer Aided Drafting Lab	SC	Lab	0	0	4	4	2
201MC3T03	Biology for Engineers	MC	Theory	2	0	0	2	0
TOTAL				17	0	13	30	21.5
IV SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS4T15	Numerical Methods and Statistical Techniques	BSC	Theory	3	0	0	3	3
201CE4T05	Engineering Geology	PCC	Theory	3	0	0	3	3
201CE4T06	Strength of Materials-II	PCC	Theory	3	0	0	3	3
201CE4T07	Hydraulics and Hydraulic Machinery	PCC	Theory	3	0	0	3	3
201HS4T02	Management Science	HSMC	Theory	3	0	0	3	3
201CE4T08	Soil Mechanics	PCC	Theory	3	0	0	3	3
201CE4L04	Engineering Geology Lab	PCC	Lab	0	0	3	3	1.5
201CE4L05	Fluid Mechanics and Hydraulic Machinery	PCC	Lab	0	0	3	3	1.5
201SC4L13	Skill Oriented Course-II 3D Modeling using Revit	SC	Lab	0	0	4	4	2
201MC4T04	Essence of Indian Traditional Knowledge	MC	Theory	2	0	0	2	0
TOTAL				20	0	10	30	24

BSC: Basic Sciences Courses; HSMC: Humanities and Social Sciences including Management Courses; ESC: Engineering Sciences Courses; PCC: Professional Core Courses; SC: Skill Oriented Course; PEC: Professional Elective Courses; OEC: Open Elective Courses; MC: Mandatory Courses; PROJ: Project.


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V SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191CE5T09	Irrigation & water resource Engineering	PCC	2	0	0	2	2
191CE5T10	Engineering geology	PCC	2	0	0	2	2
191CE5T11	Design & drawing of Reinforced concrete structures	PCC	2	1	0	3	3
191CE5T12	Geotechnical engineering	PCC	3	0	0	3	3
----	Professional elective -I	PEC	3	0	0	3	3
----	Open elective -I	OEC	3	0	0	3	3
191CE5L05	Engineering geology lab	PCC	0	0	3	3	1.5
191CE5L06	Geotechnical engineering lab	PCC	0	0	3	3	1.5
191HS5T06	Employability Skills - III	HSMC	0	0	2	2	1
191PR5P02	Socially Relevant Project	PROJ	0	0	2	2	1
191MC5A07	Survey camp	MC	0	0	2	2	0
191MC5A08	Intellectual Property Rights and Patents	MC	2	0	0	2	0
TOTAL			15	1	12	28	21

VI SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191CE6T13	Design & drawing of steel Structures	PCC	2	1	0	3	3
191CE6T14	Highway engineering	PCC	2	0	0	2	2
191CE6T15	Foundation engineering	PCC	2	0	0	2	2
----	Profession elective -II	PEC	3	0	0	3	3
----	Profession elective -III	PEC	3	0	0	3	3
----	Open elective -II	OEC	3	0	0	3	3
191CE6L07	Transportation engineering lab	PCC	0	0	3	3	1.5
191CE6L08	Computer aided design lab	PCC	0	0	3	3	1.5
191CE6L09	Irrigation design & drawing	PCC	0	0	3	3	1.5
191HS6T07	Employability skills - IV	HSMC	0	0	2	2	1
191MC6A09	Professional Ethics and Human Values	MC	2	0	0	2	0
TOTAL			15	1	11	27	21.5

VII SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191CE7T16	Environmental Engineering	PCC	2	0	0	2	2
191CE7T17	Pre stressed concrete	PCC	3	0	0	3	3
191CE7T18	Estimation, specification & Contracts	PCC	3	0	0	3	3
----	Profession Elective - IV	PEC	3	0	0	3	3
----	Profession Elective - V	PEC	3	0	0	3	3
----	Open Elective - III	OEC	3	0	0	3	3
191CE7P03	Internship	PROJ	0	0	4	4	2
191CE7P03	Environmental Engineering Lab	PCC	0	0	3	3	1.5

Open Elective - I (V Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE5001	Basic Concrete Technology	CE, EEE	CE
2	191EE5001	Electrical Safety	EEE	EEE
3	191EE5002	Electrical Materials	EEE	EEE
4	191EE5003	Basic Electrical Measurements	EEE, ECE	EEE
5	191EE5003	Renewable Energy Sources	CE, EEE, ME, Ag. E	ME
6	191ME5002	Fundamentals of Mechanical Engineering	ME	ME
7	191ME5003	Supply Chain Management	ME	ME
8	191ME5004	3D Printing	ME	ME
9	191ME5005	Entrepreneurship Development and Incubation		ME
10	191EC5001	Signals & Systems	EEE, ECE	ECE
11	191EC5002	Digital Electronics and Logic Design	EEE, ECE, CSE, IT	ECE
12	191EC5003	Semi conductor devices	EEE, ECE	ECE
13	191CS5001	Data Structures	EEE, ECE, CSE, IT	CSE
14	191CS5002	Object Oriented Programming through C++	CSE, IT	CSE
15	191CS5003	Java Programming	CSE, IT	CSE
16	191CS5004	R Programming		CSE
17	191IT5001	Data Base Management Systems	CSE, IT	IT
18	191IT5002	Computer Graphics	CSE, IT	IT
19	191MI5001	Overview of Mining	Min.E	Min.E
20	191PT5001	Process Intensification in Petroleum Industry	PT	PT
21	191PT5002	Fundamentals of Petroleum Industry	PT	PT
22	191AG5001	Basic Crop Production Practices	Ag.E	Ag.E


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Open Elective - II (VI Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE6O02	Disaster Management		CE
2	191EE6O04	Energy Audit and Conservation Management	EEE	EEE
3	191EE6O05	Non-Conventional Energy resources	EEE	EEE
4	191EE6O06	Instrumentation	EEE, ECE, Ag. E	EEE
5	191ME6O06	Solar Energy Utilisation	ME, Ag. E	ME
6	191ME6O07	Basic Thermodynamics and Heat Transfer	EEE, ME, PT, Ag.E, Min.E	ME
7	191ME6O08	Introduction to Hydraulics and Pneumatics	CE, ME, PT	ME
8	191ME6O09	3D Printing	ME	ME
9	191ME6O10	Robotics	ME	ME
10	191ME6O11	Management Science	CE, CSE, IT, PT, Min. E	ME
11	191ME6O12	Entrepreneurship Development and Incubation		ME
12	191EC6O04	Biomedical Instrumentation		ECE
13	191EC6O05	ECAD Tools	ECE	ECE
14	191CS6O05	Python Programming	EEE, CSE, IT	CSE
15	191CS6O06	Operating Systems	CSE, IT	CSE
16	191CS6O07	Web Technologies	CSE, IT	CSE
17	191CS6O08	Cyber Security	CSE, IT	CSE
18	191CS6O09	AR / VR		CSE
19	191IT6O03	Computer Organization	CSE, IT	IT
20	191IT6O04	AI Tools & Techniques	CSE, IT	IT
21	191IT6O05	Robotic Process Automation	Ag.E	IT
22	191MI6O02	Industrial Safety Practices		Min.E
23	191MI6O03	Electrical Equipment's in Mines		Min.E
24	191PT6O03	Unconventional Hydrocarbon Resources	PT	PT
25	191PT6O04	Asset Management		PT
26	191AG6O02	Weather forecast in Agriculture		Ag.E
27	191AG6O03	Bio-energy systems design and applications		Ag.E

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191CE7P04	Project Part -I	PROJ	0	0	4	4	2
TOTAL			17	0	11	28	22.5

VIII SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
----	Profession Elective -VI	PEC	3	0	0	3	3
----	Open Elective -IV	OEC	3	0	0	3	3
191CE8P05	Project Part -II	PROJ	0	0	14	14	7
TOTAL			6	0	14	20	13

BSC: Basic Sciences Courses; HSMC: Humanities and Social Sciences including Management Courses; ESC: Engineering Sciences Courses; PCC: Professional Core Courses; PEC: Professional Elective Courses; OEC: Open Elective Courses; SSC: Self Study Course; MC: Mandatory Courses; PROJ: Project.

S. No	Track title/sub specialization	Professional Elective-I	Professional Elective-II	Professional Elective-III	Professional Elective-IV	Professional Elective-V	Professional Elective-VI
1	Structural engineering	Construction Technology & Management 191CE5E02	Repair and Rehabilitation of Structures 191CE6E10	Finite Element Methods 191CE6E13	Design of Tall Buildings 191CE7E17	Advanced Structural Analysis 191CE7E21	Sustainable Materials and Green Buildings 191CE8E30
2	Geotechnical engineering	Subsurface Investigation and Instrumentation 191CE5E04	Ground Improvement Techniques 191CE6E07	Expansive Soils 191CE6E12	Advanced Foundation Engineering 191CE7E16	Geo-techniques for Design of Underground Structures 191CE7E22	Geo-synthetics and Reinforced soil structures 191CE8E27
3	Transportation engineering	Airport Planning and Design 191CE5E01	Railway Engineering 191CE6E09	Docks and Harbour Engineering 191CE6E11	Traffic Engineering 191CE7E20	Traffic Analysis 191CE7E25	Infrastructure planning and Management 191CE8E28
4	Hydrology	Urban Hydrology 191CE5E05	Hydropower Development 191CE6E08	Water Resources System Analysis 191CE6E15	Sustainable Water Resources Development 191CE7E19	River Basin Management 191CE7E24	Subsurface exploration importance and techniques involved 191CE8E29
5	Environmental engineering	Environmental Pollution and Control 191CE5E03	Air Pollution Engineering 191CE6E06	Industrial Waste & Waste-Water Engineering 191CE6E14	Environmental Impact Assessment 191CE7E18	Remote Sensing and GIS 191CE7E23	Environmental Remediation of Contaminated Sites 191CE8E26


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VII SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
171CE7T18	Geotechnical Engineering - II	PC	3	1	0	4	3
171CE7T19	Environmental Engineering	PC	3	1	0	4	3
171CE7T20	Remote Sensing and GIS Applications	PC	3	1	0	4	3
171CE7T21	Estimation, Specifications and Contracts	PC	3	1	0	4	3
---	Professional Elective – IV	PE	3	1	0	4	3
---	Professional Elective – V	PE	3	1	0	4	3
171CE7L08	Environmental Engineering Lab	PC	0	0	3	3	2
171CE7L09	GIS And Computer Aided Design (CAD) Lab	PC	0	0	3	3	2
171CE7P01	Industry Oriented (Internship) Minor Project	PR	0	0	0	0	1
TOTAL			18	6	6	30	23

VIII SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
---	Professional Elective – VI	PE	3	1	0	4	3
---	Open Elective	OE	3	1	0	4	3
171CE8P02	Major Project	PR	0	0	0	0	14
TOTAL			6	2	0	8	20


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Professional Elective – I (V Semester)

S.No	Course Code	Name of the Course
1	171CE5E01	Construction Technology and Management
2	171CE5E02	Urban Hydrology
3	171CE5E03	Traffic Engineering

Professional Elective – II (VI Semester)

S.No	Course Code	Name of the Course
1	171CE6E04	Ground Water Development
2	171CE6E05	Pavement Analysis and Design
3	171CE6E06	Repair and Rehabilitation of Structures

Professional Elective – III (VI Semester)

S.No	Course Code	Name of the Course
1	171CE6E07	Ground Improvement Techniques
2	171CE6E08	Finite Element Methods
3	171CE6E09	Earthquake Resistant Design

Professional Elective – IV (VII Semester)

S.No	Course Code	Name of the Course
1	171CE7E10	Advanced Structural Engineering
2	171CE7E11	Watershed Management
3	171CE7E12	Design of Tall Buildings

Professional Elective – V (VII Semester)

S.No	Course Code	Name of the Course
1	171CE7E13	Bridge Engineering
2	171CE7E14	Environmental Impact Assessment and Management
3	171CE7E15	Water Resources Systems Planning

Professional Elective – VI (VIII Semester)

S.No	Course Code	Name of the Course
1	171CE8E16	Urban Transportation Planning Engineering
2	171CE8E17	Soil Dynamics and Foundations
3	171CE8E18	Solid And Hazardous Waste Management
4	171CE8E19	Air Pollution and Control

Open Elective (VIII Semester)

S.No	Course Code	Name of the Course
1	171CE8O01	Electronic Instrumentation
2	171CE8O02	Database Management Systems
3	171CE8O03	Alternative Energy Sources
4	171CE8O04	Waste Water Management
5	171CE8O05	Fundamentals of Liquefied Natural Gas
6	171CE8O06	Green Fuel Technologies
7	171CE8O07	Green Engineering Systems

PROGRAM STRUCTURE								
I SEMESTER								
Course Code	Course Title	Course Title	Course Type	Total Number of Contact Hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201HS1T01	Communicative English	HS C	Theory	3	0	0	3	3
201BS1T01	Differential equations and Linear algebra	BS C	Theory	3	0	0	3	3
201BS1T03	Applied Physics	BS C	Theory	3	0	0	3	3
201ES1T02	Programming for Problem Solving using C	ESC	Theory	3	0	0	3	3
201ES1I01	Engineering Graphics and Design	ESC	Integrated	2	0	2	4	3
201HS1L01	Communicative English Lab	HS C	Lab	0	0	3	3	1.5
201BS1L02	Applied Physics Lab	BS C	Lab	0	0	3	3	1.5
201ES1L02	Programming for Problem Solving using C Lab	ESC	Lab	0	0	3	3	1.5
201MC1T01	Environmental Science	MC	Theory	2	0	0	2	0
TOTAL				16	0	11	27	19.5
II SEMESTER								
Course Code	Course Title	Course Title	Course Type	Total Number of Contact Hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS2T05	Partial Differential Equations and Vector Calculus	BSC	Theory	3	0	0	3	3
201BS2T06	Transform Techniques	BSC	Theory	3	0	0	3	3
201ES2T07	Data Structures through C	ESC	Theory	3	0	0	3	3
201ES2T09	Basic Electrical Circuits	ESC	Theory	3	0	0	3	3
201ES2T13	Basic Civil and Mechanical Engineering	ESC	Theory	3	0	0	3	3
201ES2L06	Data Structures through C Lab	ESC	Lab	0	0	3	3	1.5
201ES2L09	Electrical Engineering Workshop	ESC	Lab	0	0	3	3	1.5
201ES2L11	Basic Civil and Mechanical Engineering Lab	ESC	Lab	0	0	3	3	1.5
201MC2L01	Professional Communications Skills Lab	MC	Lab	0	0	3	3	0
201MC2T02	Constitution of India	MC	Theory	2	0	0	2	0
TOTAL				17	0	12	29	19.5

III SEMESTER

Course Code	Course Title	Course Title	Course Type	Total Number of Contact Hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS3T11	Numerical methods & Complex Variables	BSC	Theory	3	0	0	3	3
201EE3T01	Analog Electronic Circuits	PCC	Theory	3	0	0	3	3
201EE3T02	Electrical Circuit Analysis	PCC	Theory	3	0	0	3	3
201EE3T03	DC Machines and transformers	PCC	Theory	3	0	0	3	3
201EE3T04	Electromagnetic Fields	PCC	Theory	3	0	0	3	3
201EE3L01	DC machines and transformers Lab	PCC	Lab	0	0	3	3	1.5
201EE3L02	Electrical Circuits Lab	PCC	Lab	0	0	3	3	1.5
201EE3L03	Analog Electronic Circuits Lab	PCC	Lab	0	0	3	3	1.5
201SC3L02	Design of Electrical Circuits using Engineering Software Tools	SC	Lab	0	0	4	4	2
201MC3T03	Biology For Engineers	MC	Theory	2	0	0	0	0
Total				18		0	13	21.5

IV SEMESTER

Course Code	Course Title	Course Title	Course Type	Total Number of Contact Hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201EE4T05	Electrical Power Generation and Distribution Systems	PCC	Theory	3	0	0	3	3
201EE4T06	Digital Electronics	PCC	Theory	3	0	0	3	3
201EE4T07	Induction and Synchronous Machines	PCC	Theory	3	0	0	3	3
201HS4T03	Managerial Economics and Financial Analysis	HSC	Theory	3	0	0	3	3
201ES4T18	Python Programming	ESC	Theory	3	0	0	3	3
201ES4L15	Python Programming Lab	ESC	Lab	0	0	3	3	1.5
201EE4L04	Induction and Synchronous Machines Lab	PCC	Lab	0	0	3	3	1.5
201EE4L05	Digital Electronics lab	PCC	Lab	0	0	3	3	1.5
201SC4L14	IoT Applications of Electrical Engineering	SC	Lab	0	0	4	4	2
201MC4T04	Essence of Indian Traditional Knowledge	MC	Theory	2	0	0	0	0
TOTAL				18	0	13	27	21.5
Internship 2 months (Mandatory) during summer vacation								
Honor/Minor course (the hours distribution can be 3-0-2 or 3-1-0 also)				4	0	0	4	4

V SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191EE5T10	Power Systems –II	PCC	3	0	0	3	3
191EE5T11	Power Electronics	PCC	3	0	0	3	3
191EE5T12	Electrical Measurements and Instrumentation	PCC	3	0	0	3	3
191HS5T05	Managerial Economics and Financial Analysis	HSC	3	0	0	3	3
----	Professional Elective-I	PEC	3	0	0	3	3
----	Open Elective-I	OEC	3	0	0	3	3
191EE5L04	Electrical Machines-II Lab	PCC	0	0	3	3	1.5
191EE5L05	Control Systems Lab	PCC	0	0	3	3	1.5
191HS5T06	Employability Skills -III	HSMC	0	0	2	2	1
191PR5P02	Socially Relevant Project	PROJ	0	0	2	2	1
191MC5A08	Intellectual Property Rights and Patents	MC	2	0	0	2	0
TOTAL			18	0	10	28	23

VI SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191EE6T13	Microprocessor & Interfacing	PCC	3	0	0	3	3
191EE6T14	Power System Analysis	PCC	3	0	0	3	3
191EE6T15	Power Converter Drives	PCC	3	0	0	3	3
----	Professional Elective -II	PEC	3	0	0	3	3
----	Professional Elective -III	PEC	3	0	0	3	3
----	Open Elective -II	OEC	3	0	0	3	3
191EE6L06	Electrical Measurements & Instrumentation Lab	PCC	0	0	3	3	1.5
191EE6L07	Power Electronics Lab	PCC	0	0	3	3	1.5
191HS6T07	Employability Skills -IV	HSMC	0	0	2	2	1
191MC6A09	Professional Ethics and Human Values	MC	2	0	0	2	0
TOTAL			18	0	8	26	22


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Electrical & Electronics Engineering—Tracks and Courses

Tracks	Professional Elective-I	Professional Elective-II	Professional Elective-III	Professional Elective-IV	Professional Elective-V	Professional Elective-VI
Power Systems	Renewable energy systems 191EE5E03	Electrical Distribution Systems 191EE6E07	High Voltage Transmission 191EE6E11	Smart Micro Grid 191EE7E15	Power Quality & FACTS 191EE7E18	Machine Learning for Engineering and Science Applications 191EE8E20
Power Electronics	Electrical Machine Modeling and Analysis 191EE5E02	Advanced Power Electronics Converters 191EE6E05	Switched mode power Converters 191EE6E12	Electrical and Hybrid Vehicles 191EE7E13	Power Quality & FACTS 191EE7E18	Digital Signal Processing 191EE8E19
Control Systems	Advanced Control Systems 191EE5E01	Digital Control Systems 191EE6E06	Control Systems Design 191EE6E09	Smart Micro Grid 191EE7E15	Microcontroller and Applications 191EE7E17	Neural Networks for Signal Processing 191EE8E04
Energy Systems & Instrumentation	Renewable energy systems 191EE5E03	Energy Audit, Conservation & Management 191EE6E08	Electrical Safety 191EE6E10	PLC & Applications 191EE7E14	Energy storage systems 191EE7E16	Machine Learning for Engineering and Science Applications 191EE8E20


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Open Elective - I (V Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE5001	Basic Concrete Technology	CE, EEE	CE
2	191EE5001	Electrical Safety	EEE	EEE
3	191EE5002	Electrical Materials	EEE	EEE
4	191EE5003	Basic Electrical Measurements	EEE, ECE	EEE
5	191ME5001	Renewable Energy Sources	CE, EEE, ME, Ag. E	ME
6	191ME5002	Fundamentals of Mechanical Engineering	ME	ME
7	191ME5003	Supply Chain Management	ME	ME
8	191ME5004	3D Printing	ME	ME
9	191ME5005	Entrepreneurship Development and Incubation		ME
10	191EC5001	Signals & Systems	EEE, ECE	ECE
11	191EC5002	Digital Electronics and Logic Design	EEE, ECE, CSE, IT	ECE
12	191EC5003	Semi-Conductor Devices	EEE, ECE	ECE
13	191CS5001	Data Structures	EEE, ECE, CSE, IT	CSE
14	191CS5002	Object Oriented Programming through C++	CSE, IT	CSE
15	191CS5003	Java Programming	CSE, IT	CSE
16	191CS5004	R Programming		CSE
17	191IT5001	Data Base Management Systems	CSE, IT	IT
18	191IT5002	Computer Graphics	CSE, IT	IT
19	191MI5001	Overview of Mining	Min.E	Min.E
20	191PT5001	Process Intensification in Petroleum Industry	PT	PT
21	191PT5002	Fundamentals of Petroleum Industry	PT	PT
22	191AG5001	Basic Crop Production Practices	Ag.E	Ag.E


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Open Elective - II (VI Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE6O02	Disaster Management		CE
2	191EE6O04	Energy Audit and Conservation Management	EEE	EEE
3	191EE6O05	Non Conventional Energy resources	EEE	EEE
4	191EE6O06	Instrumentation	EEE, ECE, Ag. E	EEE
5	191ME6O06	Solar Energy Utilisation	ME, Ag. E	ME
6	191ME6O07	Basic Thermodynamics and Heat Transfer	EEE, ME, PT, Ag.E, Min.E	ME
7	191ME6O08	Introduction to Hydraulics and Pneumatics	CE, ME, PT	ME
8	191ME6O09	3D Printing	ME	ME
9	191ME6O10	Robotics	ME	ME
10	191ME6O11	Management Science	CE, CSE, IT, PT, Min. E	ME
11	191ME6O12	Entrepreneurship Development and Incubation		ME
12	191EC6O04	Biomedical Instrumentation		ECE
13	191EC6O05	ECAD Tools	ECE	ECE
14	191CS6O05	Python Programming	EEE, CSE, IT	CSE
15	191CS6O06	Operating Systems	CSE, IT	CSE
16	191CS6O07	Web Technologies	CSE, IT	CSE
17	191CS6O08	Cyber Security	CSE, IT	CSE
18	191CS6O09	AR / VR		CSE
19	191IT6O03	Computer Organization	CSE, IT	IT
20	191IT6O04	AI Tools & Techniques	CSE, IT	IT
21	191IT6O05	Robotic Process Automation	Ag.E	IT
22	191MI6O02	Industrial Safety Practices		Min.E
23	191MI6O03	Electrical Equipment's in Mines		Min.E
24	191PT6O03	Unconventional Hydrocarbon Resources	PT	PT
25	191PT6O04	Asset Management		PT
26	191AG6O02	Weather forecast in Agriculture		Ag.E
27	191AG6O03	Bio-energy systems design and applications		Ag.E


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VII SEMESTER

Course Code	Name of the Course	Category	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
171EE7T18	Utilization of Electrical Energy	PC	3	1	0	4	3
171EE7T19	Linear and Digital IC Applications	PC	3	1	0	4	3
171EE7T20	Power System Operation and Control	PC	3	1	0	4	3
171EE7T21	Switch Gear and Protection	PC	3	1	0	4	3
---	Professional Elective - IV	PE	3	1	0	4	3
---	Professional Elective - V	PE	3	1	0	4	3
171EE7L09	Power Systems Simulation Lab	PC	0	0	3	3	2
171EE7L10	Micro Processor and Micro Controllers Lab	PC	0	0	3	3	2
171EE7P01	Industry Oriented (Internship) Minor Project	PR	0	0	0	0	1
TOTAL			18	6	6	30	23

VIII SEMESTER

Course Code	Name of the Course	Category	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
---	Professional Elective - VI	PE	3	1	0	4	3
---	Open Elective	OE	3	1	0	4	3
171EE8P02	Major Project	PR	0	0	0	0	14
TOTAL			6	2	0	8	20

BS: Basic Sciences; HSS: Humanities and Social Sciences; ES: Engineering Sciences; PC: Professional Core; PE: Professional Elective; OE: Open Elective; SS: Self Study Course; PR: Project.


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Professional Elective - I (V Semester)

S.No	Course Code	Name of the Course
1	171EE5E01	Renewable Energy Sources
2	171EE5E02	Modeling and Analysis of Electrical Machines
3	171EE5E03	Electrical Safety

Professional Elective – II (VI Semester)

S.No	Course Code	Name of the Course
1	171EE6E04	Computer Architecture
2	171EE6E05	Electrical Distribution Systems
3	171EE6E06	Distributed Generation and Microgrid

Professional Elective – III (VI Semester)

S.No	Course Code	Name of the Course
1	171EE6E07	Advanced Control Systems
2	171EE6E08	PLC and Applications
3	171EE6E09	Instrumentation
4	171EE6E10	OOPs through JAVA

Professional Elective – IV (VII Semester)

S.No	Course Code	Name of the Course
1	171EE7E11	Optimization Techniques
2	171EE7E12	Digital Signal Processing
3	171EE7E13	Special Electrical Machines

Professional Elective – V (VII Semester)

S.No	Course Code	Name of the Course
1	171EE7E14	High Voltage Engineering
2	171EE7E15	Electric Power Quality
3	171EE7E16	EHVAC Transmission

Professional Elective – VI (VIII Semester)

S.No	Course Code	Name of the Course
1	171EE8E17	HVDC Transmission
2	171EE8E18	Flexible AC Transmission Systems
3	171EE8E19	Power System Reforms
4	171EE8E20	Digital Control Systems

Open Elective (VIII Semester)

S.No	CourseCode	Name of the Course
1	171EE8O01	Energy Audit, Conservation and Management
2	171EE8O02	VLSI Design
3	171EE8O03	Unix and Shell Programming
4	171EE8O04	Neural Networks And Fuzzy Logic
5	171EE8O05	Robotics
6	171EE8O06	Vehicular Electric Power Systems
7	171EE8O07	Internet of Things
8	171EE8O08	Cyber Security

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PROGRAM STRUCTURE								
I SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201HS1T01	Communicative English	HSMC	Theory	3	0	0	3	3
201BS1T01	Differential equations and Linear algebra	BSC	Theory	3	0	0	3	3
201BS1T02	Engineering Physics	BSC	Theory	3	0	0	3	3
201ES1T03	Essential Electrical and Electronics Engineering	ESC	Theory	3	0	0	3	3
201ES1T05	Engineering Graphics	ESC	Theory	1	0	4	5	3
201HS1L01	Communicative English Lab	HSMC	Lab	0	0	3	3	1.5
201BS1L01	Engineering Physics Lab	BSC	Lab	0	0	3	3	1.5
201ES1L03	Essential Electrical and Electronics Engineering Lab	ESC	Lab	0	0	3	3	1.5
201MC1T01	Environmental Science	MC	Theory	2	0	0	2	0
TOTAL				15	0	13	28	19.5
II SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS2T05	Partial Differential Equations and Vector Calculus	BSC	Theory	3	0	0	3	3
201BS2T08	Chemistry of Materials	BSC	Theory	3	0	0	3	3
201ES2T06	Engineering Mechanics	ESC	Theory	3	0	0	3	3
201ES2T08	Programming for Problem Solving Using C	ESC	Theory	3	0	0	3	3
201ES2L07	Engineering Workshop	ESC	Lab	0	0	3	3	1.5
201ES2L12	Computer Aided Drafting Lab	ESC	Lab	0	0	3	3	1.5
201HS2L02	Professional Communications Skills Lab	HSMC	Lab	0	0	3	3	1.5
201BS2L05	Engineering Chemistry Lab	BSC	Lab	0	0	3	3	1.5
201ES2L10	Programming for Problem Solving Using C Lab	ESC	Lab	0	0	3	3	1.5
201MC2T02	Constitution of India	MC	Theory	2	0	0	2	0
TOTAL				14	0	15	29	19.5



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III SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS3T12	Integral Transforms And Applications Of Partial Differential Equations	BSC	Theory	3	0	0	3	3
201ME3T01	Production Technology	PCC	Theory	3	0	0	3	3
201ME3T02	Fluid Mechanics & Hydraulic Machines	PCC	Theory	3	0	0	3	3
201ES3T15	Thermodynamics	ESC	Theory	3	0	0	3	3
201ES3T16	Metallurgy & Material Science	ESC	Theory	3	0	0	3	3
201ME3L01	Computer Aided Machine Drawing Lab	PCC	Lab	0	0	3	3	1.5
201ME3L02	Production Technology Lab	PCC	Lab	0	0	3	3	1.5
201ME3L03	Fluid Mechanics & Hydraulic Machines Lab	PCC	Lab	0	0	3	3	1.5
201SC3L03	Skill Oriented Course-I	SC	Lab	0	0	4	4	2
	Java Programming Lab							
201MC3T03	Biology for Engineers	MC	Theory	2	0	0	2	0
TOTAL				17	0	13	30	21.5

IV SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS4T15	Numerical methods & Statistical Techniques	BSC	Theory	3	0	0	3	3
201HS4T04	Industrial Engineering and Management	HSMC	Theory	3	0	0	3	3
201ME4T03	Mechanics of Solids	PCC	Theory	3	0	0	3	3
201ME4T04	Theory of Machines-I	PCC	Theory	3	0	0	3	3
201ME4T05	Thermal Engineering-I	PCC	Theory	3	0	0	3	3
201ME4L04	Theory of Machines Lab	PCC	Lab	0	0	3	3	1.5
201ME4L05	Mechanics of Solids & Metallurgy Lab	PCC	Lab	0	0	3	3	1.5
201ME4L06	Thermal Engineering Lab	PCC	Lab	0	0	3	3	1.5
201SC4L15	Skill Oriented Course-II	SC	Lab	0	0	4	4	2
	Python Programming Lab							
201MC4T04	Essence of Indian Traditional Knowledge	MC	Theory	2	0	0	2	0
TOTAL				17	0	13	30	21.5



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V SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191ME5T09	Dynamics of Machinery	PCC	3	0	0	3	3
191ME5T10	Design of Machine Members-I	PCC	3	0	0	3	3
191ME5T11	Thermal Engineering-II	PCC	3	0	0	3	3
----	PE-I	PEC	3	0	0	3	3
----	OE-I	OEC	3	0	0	3	3
191ME5L05	Metrology/ ICS lab	PCC	0	0	3	3	1.5
191ME5L06	Theory of Machines Lab	PCC	0	0	3	3	1.5
191ME5L07	Thermal Engineering Lab	PCC	0	0	3	3	1.5
191HS5T06	Employability Skills – III	HSMC	0	0	2	2	1
191PR5P02	Socially Relevant Project	PROJ	0	0	0	0	1
191MC5A08	Intellectual Property Rights and Patents	MC	2	0	0	2	0
TOTAL			15	0	11	26	21.5

VI SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191ME6T12	Heat Transfer	PCC	3	0	0	3	3
191ME6T13	Design of Machine Members-II	PCC	3	0	0	3	3
191ME6T14	Metal cutting and Machine Tools	PCC	3	0	0	3	3
----	PE-II	PEC	3	0	0	3	3
----	PE-III	PEC	3	0	0	3	3
----	OE-II	OEC	3	0	0	3	3
191ME6L08	Metal Cutting and Machine Tools Lab	PCC	0	0	3	3	1.5
191ME6L09	Heat Transfer Lab	PCC	0	0	3	3	1.5
191HS6T07	Employability Skills – IV	HSMC	0	0	2	2	1
191MC6A09	Professional Ethics and Human Values	MC	2	0	0	2	0
TOTAL			18	0	8	26	22

VII SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191ME7T15	Operations Research	PCC	3	0	0	3	3
191ME7T16	Finite Element Methods	PCC	3	0	0	3	3
----	PE-IV	PEC	3	0	0	3	3
----	PE-V	PEC	3	0	0	3	3
----	OE-III	OEC	3	0	0	3	3
191ME7P03	Internship	PROJ	0	0	0	0	2
191ME7L10	CAM/ Mechatronics Lab	PCC	0	0	3	3	1.5
191ME7L11	CAD/ CFD lab	PCC	0	0	4	4	2
191ME7P04	Project Part I	PROJ	0	0	0	0	2
TOTAL			15	0	7	22	22.5

VIII SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
----	PE-VI (MOOCs)	PEC	3	0	0	3	3
----	OE-IV (MOOCs)	OEC	3	0	0	3	3
191ME8P05	Project Part 2	PROJ	0	0	0	0	7
TOTAL			6	0	0	6	13

BSC: Basic Sciences Courses; HSMC: Humanities and Social Sciences including Management Courses; ESC: Engineering Sciences Courses; PCC: Professional Core Courses; PEC: Professional Elective Courses; OEC: Open Elective Courses; SSC: Self Study Course; MC: Mandatory Courses; PROJ: Project.

PROFESSIONAL ELECTIVES

Professional Elective – I			Professional Elective – II		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	191ME5E01	Automobile Engineering	1	191ME6E07	Industrial Engineering & Management
2	191ME5E02	Composite Materials	2	191ME6E08	Mechatronics
3	191ME5E03	Fluid Engineering	3	191ME6E09	Non Destructive Evaluation
4	191ME5E04	Mechanical Vibrations	4	191ME6E10	Refrigeration and Air Conditioning
5	191ME5E05	Metrology & Instrumentation	5	191ME6E11	Robotics
6	191ME5E06	Organizational Behavior			
Professional Elective – III			Professional Elective – IV		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	191ME6E12	Additive Manufacturing	1	191ME7E17	Advanced Automobile Engineering
2	191ME6E13	Alternative Fuels	2	191ME7E18	Advanced Fluid Mechanics
3	191ME6E14	Design for Manufacturing	3	191ME7E19	Computational Fluid Dynamics
4	191ME6E15	Green Engineering Systems	4	191ME7E20	Nano materials & Technology
5	191ME6E16	Lean Manufacturing	5	191ME7E21	Power Plant Engineering
Professional Elective – V			Professional Elective – VI		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	191ME7E22	CAD/ CAM	1	191ME8E27	Advanced Materials
2	191ME7E23	Condition Monitoring	2	191ME8E28	Manufacturing Methods in Precision Engineering
3	191ME7E24	Product Design and Development	3	191ME8E29	Production Planning and Control
4	191ME7E25	Flexible Manufacturing Systems	4	191ME8E30	Thermal Equipment Design
5	191ME7E26	Gas Dynamics	5	191ME8E31	Total Quality Management



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OPEN ELECTIVE - I (V Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE5O01	Basic Concrete Technology	CE, EEE	CE
2	191EE5O01	Electrical Safety	EEE	EEE
3	191EE5O02	Electrical Materials	EEE	EEE
4	191EE5O03	Basic Electrical Measurements	EEE, ECE	EEE
5	191ME5O01	Renewable Energy Sources	CE, EEE, ME, Ag. E	ME
6	191ME5O02	Fundamentals of Mechanical Engineering	ME	ME
7	191ME5O03	Supply Chain Management	ME	ME
8	191ME5O04	3D Printing	ME	ME
9	191ME5O05	Entrepreneurship Development and Incubation		ME
10	191EC5O01	Signals & Systems	EEE, ECE	ECE
11	191EC5O02	Digital Electronics and Logic Design	EEE, ECE, CSE, IT	ECE
12	191EC5O03	Semi conductor devices	EEE, ECE	ECE
13	191CS5O01	Data Structures	EEE, ECE, CSE, IT	CSE
14	191CS5O02	Object Oriented Programming through C++	CSE, IT	CSE
15	191CS5O03	Java Programming	CSE, IT	CSE
16	191CS5O04	R Programming		CSE
17	191IT5O01	Database Management Systems	CSE, IT	IT
18	191IT5O02	Computer Graphics	CSE, IT	IT
19	191MI5O01	Overview of Mining	Min.E	Min.E
20	191PT5O01	Process Intensification in Petroleum Industry	PT	PT
21	191PT5O02	Fundamentals of Petroleum Industry	PT	PT
22	191AG5O01	Basic Crop Production Practices	Ag.E	Ag.E



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OPEN ELECTIVE - II (VI Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE6O02	Disaster Management		CE
2	191EE6O04	Energy Audit and Conservation Management	EEE	EEE
3	191EE6O05	Non Conventional Energy resources	EEE	EEE
4	191EE6O06	Instrumentation	EEE, ECE, Ag. E	EEE
5	191ME6O06	Solar Energy Utilisation	ME, Ag. E	ME
6	191ME6O07	Basic Thermodynamics and Heat Transfer	EEE, ME, PT, Ag.E, Min.E	ME
7	191ME6O08	Introduction to Hydraulics and Pneumatics	CE, ME, PT	ME
8	191ME6O09	3D Printing	ME	ME
9	191ME6O10	Robotics	ME	ME
10	191ME6O09	Management Science	CE, CSE, IT, PT, Min. E	ME
11	191ME6O12	Entrepreneurship Development and Incubation		ME
12	191EC6O04	Biomedical Instrumentation		ECE
13	191EC6O05	ECAD Tools	ECE	ECE
14	191CS6O05	Python Programming	EEE, CSE, IT	CSE
15	191CS6O06	Operating Systems	CSE, IT	CSE
16	191CS6O07	Web Technologies	CSE, IT	CSE
17	191CS6O08	Cyber Security	CSE, IT	CSE
18	191CS6O09	AR / VR		CSE
19	191IT6O03	Computer Organization	CSE, IT	IT
20	191IT6O04	AI Tools & Techniques	CSE, IT	IT
21	191IT6O05	Robotic Process Automation		IT
22	191MI6O02	Industrial Safety Practices	Ag.E	Min.E
23	191MI6O03	Electrical Equipment's in Mines		Min.E
24	191PT6O03	Unconventional Hydrocarbon Resources	PT	PT
25	191PT6O04	Asset Management		PT
26	191AG6O02	Weather forecast in Agriculture		Ag.E
27	191AG6O03	Bio-energy systems design and applications		Ag.E



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VII SEMESTER

Course Code	Course Title	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
171ME7T16	CAD / CAM	PC	3	1	---	4	3
171ME7T17	Mechatronics	PC	3	1	---	4	3
171ME7T18	Finite Element Methods	PC	3	1	---	4	3
171ME7T19	Power Plant Engineering	PC	3	1	---	4	3
---	Professional Elective - IV	PE	3	1	---	4	3
---	Professional Elective - V	PE	3	1	---	4	3
171ME7L07	CAD / CFD Lab	PC	---	---	3	3	2
171ME7L08	CAM / Mechatronics Lab	PC	---	---	3	3	2
171ME7P01	Industry Oriented (Internship) Minor Project	PR	---	---	---	---	1
TOTAL			18	6	6	30	23

VIII SEMESTER

Course Code	Course Title	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
---	Professional Elective - VI	PE	3	1	---	4	3
---	Open Elective	OE	3	1	---	4	3
171ME8P02	Major Project	PR	---	---	---	---	14
TOTAL			6	2	---	8	20



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Professional Elective – I (V Semester)

S.No	Course Code	Name of the Course
1	171ME5E01	Automobile Engineering
2	171ME5E02	Mechanical Vibrations
3	171ME5E03	Additive Manufacturing

Professional Elective – II (VI Semester)

S.No	Course Code	Name of the Course
1	171ME6E04	Robotics
2	171ME6E05	Design for Manufacturing
3	171ME6E06	Non Destructive Evaluation

Professional Elective – III (VI Semester)

S.No	Course Code	Name of the Course
1	171ME6E07	Unconventional Machining Processes
2	171ME6E08	Industrial Hydraulics and Pneumatics
3	171ME6E09	Quality and Reliability Engineering

Professional Elective – IV (VII Semester)

S.No	Course Code	Name of the Course
1	171ME7E10	Computational Fluid Dynamics
2	171ME7E11	Green Engineering Systems
3	171ME7E12	Nano Materials and Technology

Professional Elective – V (VII Semester)

S.No	Course Code	Name of the Course
1	171ME7E13	Gas Dynamics
2	171ME7E14	Condition Monitoring
3	171ME7E15	Flexible Manufacturing Systems

Professional Elective – VI (VIII Semester)

S.No	Course Code	Name of the Course
1	171ME8E16	Production Planning and Control
2	171ME8E17	Advanced Materials
3	171ME8E18	Thermal Equipment Design

Open Elective (VIII Semester)

S.No	Course Code	Name of the Course
1	171ME8O01	Java Programming
2	171ME8O02	Electrical Safety Management
3	171EE8O04	Neural Networks And Fuzzy Logic
4	171CE8O02	Database Management Systems
5	171ME8O03	Entrepreneur Resource Planning
6	171ME8O04	Computer Graphics



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PROGRAM STRUCTURE

I SEMESTER

Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201HS1T01	Communicative English	HSMC	Theory	3	0	0	3	3
201BS1T01	Differential Equations and Linear Algebra	BSC	Theory	3	0	0	3	3
201BS1T04	Engineering Chemistry	BSC	Theory	3	0	0	3	3
201ES1T02	Programming for Problem Solving using C	ESC	Theory	3	0	0	3	3
201ES1I01	Engineering Graphics and Design	ESC	Integrated	2	0	2	4	3
201HS1L01	Communicative English Lab	HSMC	Lab	0	0	3	3	1.5
201BS1L03	Engineering Chemistry Lab	BSC	Lab	0	0	3	3	1.5
201ES1L02	Programming for Problem Solving using C Lab	ESC	Lab	0	0	3	3	1.5
201MC1T01	Environmental Science	MC	Theory	2	0	0	2	0
TOTAL				16	0	11	27	19.5

II SEMESTER

Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS2T06	Transform Techniques	BSC	Theory	3	0	0	3	3
201BS2T09	Applied Physics	BSC	Theory	3	0	0	3	3
201ES2I03	Object Oriented Programming through JAVA	ESC	Integrated	2	0	2	4	3
201ES2T10	Basic Electrical Engineering	ESC	Theory	3	0	0	3	3
201ES2T14	Network Analysis	ESC	Theory	3	0	0	3	3
201ES2L08	Electronics Engineering Workshop	ESC	Lab	0	0	3	3	1.5
201BS2L04	Applied Physics Lab	BSC	Lab	0	0	3	3	1.5
201ES2L13	Basic Electrical Engineering Lab	ESC	Lab	0	0	3	3	1.5
201MC2L01	Professional Communication Skills Lab	MC	Lab	0	0	3	3	0
201MC2T02	Constitution of India	MC	Theory	2	0	0	2	0
TOTAL				16	0	16	0	19.5

III SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS3T10	Numerical Methods & Vector Calculus	BSC	Theory	3	0	0	3	3
201EC3T01	Electronic Devices and Circuits	PCC	Theory	3	0	0	3	3
201EC3T02	Signals and Systems	PCC	Theory	3	0	0	3	3
201EC3T03	Digital Electronics and Logic Design	PCC	Theory	3	0	0	3	3
201EC3T04	Random Variables and Stochastic Processes	PCC	Theory	3	0	0	3	3
201EC3L01	Electronic Devices and Circuits Lab	PCC	Lab	0	0	3	3	1.5
201EC3L02	Signals and Systems Lab	PCC	Lab	0	0	3	3	1.5
201EC3L03	Digital Electronics and Logic Design Lab	PCC	Lab	0	0	3	3	1.5
201SC3L04	Skill Oriented Course - I Python Programming	SC	Lab	0	0	4	4	2
201MC3T03	Biology for Engineers	MC	Theory	2	0	0	2	0
TOTAL				17	0	13	30	21.5
IV SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201ES4T19	Linear Control Systems	ESC	Theory	3	0	0	3	3
201EC4T05	Electronic Circuit Analysis	PCC	Theory	3	0	0	3	3
201EC4T06	Integrated Circuits and Applications	PCC	Theory	3	0	0	3	3
201EC4T07	Analog Communications	PCC	Theory	3	0	0	3	3
201HS4T03	Managerial Economics and Financial Analysis	HSMC	Theory	3	0	0	3	3
201EC4L04	Electronic Circuit Analysis Lab	PCC	Lab	0	0	3	3	1.5
201EC4L05	Integrated Circuits and Applications Lab	PCC	Lab	0	0	3	3	1.5
201EC4L06	Analog Communications Lab	PCC	Lab	0	0	3	3	1.5
201SC4L16 201SC4L17	Skill Oriented Course-II a) PCB Designing b) Applications of Python Programming	SC	Lab	0	0	4	4	2
201MC4T04	Essence of Indian Traditional Knowledge	MC	Theory	2	0	0	2	0
TOTAL				17	0	13	30	21.5

BSC: Basic Sciences Courses; HSMC: Humanities and Social Sciences including Management Courses; ESC: Engineering Sciences Courses; PCC: Professional Core Courses; SC: Skill Oriented Course; PEC: Professional Elective Courses; OEC: Open Elective Courses; MC: Mandatory Courses; PROJ: Project.

V SEMESTER

Course Code	Course Title	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
191EC5T08	Integrated Circuits and applications	PCC	3	0	0	3	3
191EC5T09	Digital Communications	PCC	3	0	0	3	3
191EC5T10	Antennas and Wave Propagation	PCC	3	0	0	3	3
191EC5T11	Computer Networks	PCC	2	0	0	2	2
----	Professional Elective-I	PEC	3	0	0	3	3
----	Open Elective -I	OEC	3	0	0	3	3
191EC5L05	Integrated Circuits and applications Lab	PCC	0	0	3	3	1.5
191EC5L06	Digital Communications Lab	PCC	0	0	2	2	1
191HS5T06	Employability Skills – III	HSMC	0	0	2	2	1
191PR5P02	Socially Relevant Project	PROJ	0	0	2	2	1
191MC5A08	Intellectual Property Rights and Patents	MC	2	0	0	2	0
TOTAL			17	0	9	26	21.5

VI SEMESTER

Course Code	Course Title	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
191EC6T12	Internet of Things	PCC	3	0	0	3	3
191EC6T13	VLSI Design	PCC	3	0	0	3	3
191EC6T14	Digital Signal Processing	PCC	3	0	0	3	3
----	Professional Elective -II	PEC	3	0	0	3	3
----	Professional Elective -III	PEC	3	0	0	3	3
----	Open Elective-II	OEC	3	0	0	3	3
191EC6L08	VLSI Lab	PCC	0	0	3	3	1.5
191EC6L07	Internet of Things Lab	PCC	0	0	3	3	1.5
191HS6T07	Employability Skills – IV	HSMC	0	0	2	2	1
191MC6A09	Professional Ethics and Human Values	MC	2	0	0	2	0
TOTAL			18	0	8	26	22

VII SEMESTER

Course Code	Course Title	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
191EC7T15	Microwave and Optical Communications	PCC	3	0	0	3	3
191EC7T16	Digital Image and Video Processing	PCC	3	0	0	3	3
----	Professional Elective -IV	PEC	3	0	0	3	3
----	Professional Elective -V	PEC	3	0	0	3	3
----	Open Elective -III	OEC	3	0	0	3	3
191EC7P03	Internship	PROJ	0	0	4	4	2
191EC7L09	Digital Signal and Image Processing Lab	PCC	0	0	3	3	1.5

191EC7L10	Microwave and Optical Communications Lab	PCC	0	0	3	3	1.5
191EC7P04	Project Part 1	PROJ	0	0	4	4	2
TOTAL			15	0	14	29	22

VIII**SEMESTER**

Course Code	Course Title	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
----	Professional Elective-VI (MOOCs)	PEC	-	-	-	-	3
----	Open Elective -IV (MOOCs)	OEC	-	-	-	-	3
191EC8P05	Project Part 2	PROJ	0	0	14	14	7
TOTAL			0	0	14	14	13

BSC: Basic Sciences Courses; HSMC: Humanities and Social Sciences including Management Courses; ESC: Engineering Sciences Courses; PCC: Professional Core Courses; PEC: Professional Elective Courses; OEC: Open Elective Courses; SSC: Self Study Course; MC: Mandatory Courses; PROJ: Project.

Courses to be offered as Professional Electives by ECE Department by Specialization

Track Title / Specialization	PEC-I (V Semester)	PEC-II (VI Semester)	PEC-III (VI Semester)	PEC-IV (VII Semester)	PEC-V (VII Semester)
Microwave & Communication Systems	Electromagnetic Interference & Compatibility 191EC5E03	Information Theory and Coding 191EC6E07	Radar Systems 191EC6E11	Satellite Communications 191EC7E16	Cellular and Mobile Communications 191EC7E17
Embedded Systems	Computer System Architecture 191EC5E01	Embedded Systems 191EC6E06	Embedded C 191EC6E10	Real Time Operating Systems 191EC7E15	SoC Architectures 191EC7E20
VLSI	Digital System Design-I 191EC5E02	Digital System Design-II 191EC6E05	Design for Testability 191EC6E09	CMOS Digital IC Design 191EC7E13	Low Power VLSI Design 191EC7E18
Signal Processing	Python Programming 191EC5E04	Soft Computing Techniques 191EC6E08	Signal Transform Techniques 191EC6E12	Digital Signal Processors & Architectures 191EC7E14	Pattern Recognition 191EC7E19

Professional Elective – VI (VIII Semester) (MOOCs)

S. No	Track Title / Specialization	Name of the Course
1.	Microwave & Communication Systems	Wireless Communications 191EC8E24
2.	Embedded Systems	Sensors and Actuators 191EC8E23
3.	VLSI	Micro Electronic Devices to Circuits 191EC8E22
4.	Signal Processing	Introduction to Computer Vision 191EC8E21

OPEN ELECTIVE - I (V Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE5O01	Basic Concrete Technology	CE, EEE	CE
2	191EE5O01	Electrical Safety	EEE	EEE
3	191EE5O02	Electrical Materials	EEE	EEE
4	191EE5O03	Basic Electrical Measurements	EEE, ECE	EEE
5	191EE5O03	Renewable Energy Sources	CE, EEE, ME, Ag. E	ME
6	191ME5O02	Fundamentals of Mechanical Engineering	ME	ME
7	191ME5O03	Supply Chain Management	ME	ME
8	191ME5O04	3D Printing	ME	ME
9	191ME5O05	Entrepreneurship Development and Incubation		ME
10	191EC5O01	Signals & Systems	EEE, ECE	ECE
11	191EC5O02	Digital Electronics and Logic Design	EEE, ECE, CSE, IT	ECE
12	191EC5O03	Semi conductor devices	EEE, ECE	ECE
13	191CS5O01	Data Structures	EEE, ECE, CSE, IT	CSE
14	191CS5O02	Object Oriented Programming through C++	CSE, IT	CSE
15	191CS5O03	Java Programming	CSE, IT	CSE
16	191CS5O04	R Programming		CSE
17	191IT5O01	Data Base Management Systems	CSE, IT	IT
18	191IT5O02	Computer Graphics	CSE, IT	IT
19	191MI5O01	Overview of Mining	Min.E	Min.E
20	191PT5O01	Process Intensification in Petroleum Industry	PT	PT
21	191PT5O02	Fundamentals of Petroleum Industry	PT	PT
22	191AG5O01	Basic Crop Production Practices	Ag.E	Ag.E

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OPEN ELECTIVE - II (VI Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE6O02	Disaster Management		CE
2	191EE6O04	Energy Audit and Conservation Management	EEE	EEE
3	191EE6O05	Non Conventional Energy resources	EEE	EEE
4	191EE6O06	Instrumentation	EEE, ECE, Ag. E	EEE
5	191ME6O06	Solar Energy Utilisation	ME, Ag. E	ME
6	191ME6O07	Basic Thermodynamics and Heat Transfer	EEE, ME, PT, Ag.E, Min.E	ME
7	191ME6O08	Introduction to Hydraulics and Pneumatics	CE, ME, PT	ME
8	191ME6O09	3D Printing	ME	ME
9	191ME6O10	Robotics	ME	ME
10	191ME6O11	Management Science	CE, CSE, IT, PT, Min. E	ME
11	191ME6O12	Entrepreneurship Development and Incubation		ME
12	191EC6O04	Biomedical Instrumentation		ECE
13	191EC6O05	ECAD Tools	ECE	ECE
14	191CS6O05	Python Programming	EEE, CSE, IT	CSE
15	191CS6O06	Operating Systems	CSE, IT	CSE
16	191CS6O07	Web Technologies	CSE, IT	CSE
17	191CS6O08	Cyber Security	CSE, IT	CSE
18	191CS6O09	AR / VR		CSE
19	191IT6O03	Computer Organization	CSE, IT	IT
20	191IT6O04	AI Tools & Techniques	CSE, IT	IT
21	191IT6O05	Robotic Process Automation	Ag.E	IT
22	191MI6O02	Industrial Safety Practices		Min.E
23	191MI6O03	Electrical Equipment's in Mines		Min.E
24	191PT6O03	Unconventional Hydrocarbon Resources	PT	PT
25	191PT6O04	Asset Management		PT
26	191AG6O02	Weather forecast in Agriculture		Ag.E
27	191AG6O03	Bio-energy systems design and applications		Ag.E



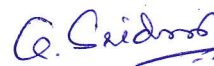
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VII SEMESTER

Course Code	Course Title	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
171EC7T16	Microwave Engineering	PC	3	1	0	4	3
171EC7T17	Digital Image Processing	PC	3	1	0	4	3
171EC7T18	Electronic Measurements And Instrumentation	PC	3	1	0	4	3
171EC7T19	Optical Communications	PC	3	1	0	4	3
---	Professional Elective – IV	PE	3	1	0	4	3
---	Professional Elective – V	PE	3	1	0	4	3
171EC7L10	Microwave Engineering and Optical Communications Lab	PC	0	0	3	3	2
171EC7L11	Digital Signal and Image Processing Lab	PC	0	0	3	3	2
171EC7P01	Industry Oriented (Internship) Minor Project	PR	0	0	0	0	2
Total			18	6	6	30	24

VIII SEMESTER

Course Code	Course Title	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
---	Professional Elective – VI	PE	3	1	0	4	3
---	Open Elective	OE	3	1	0	4	3
171EC8P02	Major Project	PR	0	0	0	0	14
Total			6	2	0	8	20



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Professional Elective – I (V Semester)

S.No	Course Code	Name of the Course
1	171EC5E01	Computer Architecture and Organization
2	171EC5E02	OOPS through JAVA
3	171EC5E03	Electronic Switching Systems

Professional Elective – II (VI Semester)

S.No	Course Code	Name of the Course
1	171EC6E04	CPLD and FPGA Architectures
2	171EC6E05	Operating Systems
3	171EC6E06	Computer Networks

Professional Elective – III (VI Semester)

S.No	Course Code	Name of the Course
1	171EC6E07	Digital Design Through Verilog
2	171EC6E08	Biomedical Engineering
3	171EC6E09	Information Theory and Coding

Professional Elective – IV (VII Semester)

S.No	Course Code	Name of the Course
1	171EC7E10	Digital Signal Processors
2	171EC7E11	Embedded Systems
3	171EC7E12	Cellular and Mobile Communications

Professional Elective – V (VII Semester)

S.No	Course Code	Name of the Course
1	171EC7E13	Analog IC Design
2	171EC7E14	Cryptography and Network Security
3	171EC7E15	Radar Systems

Professional Elective – VI (VIII Semester)

S.No	Course Code	Name of the Course
1	171EC8E16	Mixed Signal IC Design
2	171EC8E17	Wireless Sensors and Networks
3	171EC8E18	Satellite Communications

Open Elective (VIII Semester)

S.No	CourseCode	Name of the Course
1	171EC8O01	Basic Concrete Technology
2	171CE8O04	Waste Water Management
3	171EE8O05	Robotics
4	171EC8O02	Disaster Management
5	171EE8O07	Internet of Things
6	171EC8O03	Neural Networks
7	171CE8O03	Alternative Energy Sources
8	171CE8O02	Database Management Systems
9	171EC8O04	Web Technologies
10	171CE8O06	Green Fuel Technologies

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PROGRAM STRUCTURE**I SEMESTER**

Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201HS1T01	Communicative English	HSMC	Theory	3	0	0	3	3
201BS1T01	Differential Equations and Linear algebra	BSC	Theory	3	0	0	3	3
201BS1T04	Engineering Chemistry	BSC	Theory	3	0	0	3	3
201ES1T02	Programming for Problem Solving using C	ESC	Theory	3	0	0	3	3
201ES1I02	Computer Engineering Workshop	ESC	Integrated	2	0	2	4	3
201HS1L01	Communicative English Lab	HSMC	Lab	0	0	3	3	1.5
201BS1L03	Engineering Chemistry Lab	BSC	Lab	0	0	3	3	1.5
201ES1L02	Programming for Problem Solving using C Lab	ESC	Lab	0	0	3	3	1.5
201MC1T01	Environmental Science	MC	Theory	2	0	0	2	0
TOTAL				16	0	11	27	19.5

II SEMESTER

Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS2T07	Numerical Methods and Complex Variables	BSC	Theory	3	0	0	3	3
201BS2T09	Applied Physics	BSC	Theory	3	0	0	3	3
201ES2T11	Computer Organization	ESC	Theory	3	0	0	3	3
201ES2T04	Python Programming	ESC	Theory	3	0	0	3	3
201ES2T07	Data Structures through C	ESC	Theory	3	0	0	3	3
201BS2L04	Applied Physics Lab	BSC	Lab	0	0	3	3	1.5
201ES2L06	Data Structures through C Lab	ESC	Lab	0	0	3	3	1.5
201ES2L14	Python Programming Lab	ESC	Lab	0	0	3	3	1.5
201MC2L01	Professional Communication Skills Lab	MC	Lab	0	0	3	3	0
201MC2T02	Constitution of India	MC	Theory	2	0	0	2	0
TOTAL				15	0	16	31	19.5

III SEMESTER

Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201CS3T01	Advanced Data Structures	PCC	Theory	3	0	0	3	3
201CS3T02	Object Oriented Programming through C++	PCC	Theory	3	0	0	3	3
201CS3T03	Operating Systems	PCC	Theory	3	0	0	3	3
201CS3T04	Software Engineering	PCC	Theory	3	0	0	3	3
201BS3T13	Discrete Mathematics	BSC	Theory	3	0	0	3	3
201CS3L01	Object Oriented Programming through C++ Lab	PCC	Lab	0	0	3	3	1.5
201CS3L02	Operating Systems Lab	PCC	Lab	0	0	3	3	1.5
201CS3L03	Unix and Shell Programming Lab	PCC	Lab	0	0	3	3	1.5
201SC3E05 201SC3L06	Skill Oriented Course-I Applications of python-numpy Web Application Development using Full Stack Frontend Development-Module-I	SC	Lab	0	0	4	4	2
201MC3T03	Biology for Engineers	MC	Theory	2	0	0	0	0
TOTAL				17	0	13	28	21.5

IV SEMESTER

Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS4T16	Probability and statistics	BSC	Theory	3	0	0	3	3
201CS4T05	Formal Languages and Automata Theory	PCC	Theory	3	0	0	3	3
201CS4T06	Database Management Systems	PCC	Theory	3	0	0	3	3
201CS4T07	Java programming	PCC	Theory	3	0	0	3	3
201HS4T03	Managerial Economics and Financial Analysis	HSMC	Theory	3	0	0	3	3
201CS4L04	Database Management Systems Lab	PCC	Lab	0	0	3	3	1.5
201CS4L05	Java Programming Lab	PCC	Lab	0	0	3	3	1.5
201CS4L06	R Programming Lab	PCC	Lab	0	0	3	3	1.5
201SC4L18 201SC4L19	Skill Oriented Course-II Applications of python-pandas Web Application Development using Full Stack Frontend Development-Module-II	SC	Lab	0	0	4	4	2
201MC4T04	Essence of Indian Traditional Knowledge	MC	Theory	2	0	0	0	0
TOTAL				17	0	13	28	21.5
Honors/Minor courses				3	1	0	4	4

V SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191CS5T08	Compiler Design	PCC	3	0	0	3	3
191CS5T09	Computer Networks	PCC	3	0	0	3	3
191CS5T10	Database Management Systems	PCC	3	0	0	3	3
191CS5T11	Operating Systems	PCC	3	0	0	3	3
----	Professional Elective -I	PEC	3	0	0	3	3
----	Open Elective -I	OEC	3	0	0	3	3
191CS5L04	Operating Systems and Computer Networks Lab	PCC	0	0	3	3	1.5
191CS5L05	Database Management Systems Lab	PCC	0	0	2	2	1
191HS5T06	Employability Skills - III	HSMC	0	0	2	2	1
191PR5P02	Socially Relevant Project	PROJ	0	0	2	2	1
191MC5A08	Intellectual Property Rights and Patents	MC	2	0	0	2	0
TOTAL			20	0	9	29	22.5

VI SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191CS6T12	Data Ware Housing and Data Mining	PCC	3	0	0	3	3
191CS6T13	Object Oriented Analysis and Design	PCC	3	0	0	3	3
191CS6T14	Web Technologies	PCC	3	0	0	3	3
----	Professional Elective-II	PEC	3	0	0	3	3
----	Professional Elective-III	PEC	3	0	0	3	3
----	Open Elective-II	OEC	3	0	0	3	3
191CS6L06	Data Mining and Object Oriented Analysis and Design Lab	PCC	0	0	3	3	1.5
191CS6L07	Web Technologies Lab	PCC	0	0	3	3	1.5
191HS6T07	Employability Skills - IV	HSMC	0	0	2	2	1
191MC6A09	Professional Ethics and Human Values	MC	2	0	0	2	0
TOTAL			20	0	8	28	22

PROFESSIONAL ELECTIVES

Professional Elective – I (V Semester)			Professional Elective – II (VI Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	191CS5E04	Functional and Logic Programming	1	191CS6E09	Scripting languages
2	191CS5E01	Advanced Computer Architecture	2	191CS6E06	Advanced Operating Systems
3	191CS5E02	Artificial Intelligence	3	191CS6E08	Machine Learning
4	191CS5E05	Software Requirement and Estimation	4	191CS6E10	Software Testing Methodologies
5	191CS5E03	Computer Graphics	5	191CS6E07	Image Processing
Professional Elective – III (VI Semester)			Professional Elective – IV (VII Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	191CS6E11	C# .Net	1	191CS7E19	Middleware Technologies
2	191CS6E13	Distributed Systems	2	191CS7E17	Embedded Systems
3	191CS6E14	Natural Language Processing	3	191CS7E16	Data Analytics
4	191CS6E15	Software Quality Assurance	4	191CS7E20	Software Configuration Management
5	191CS6E12	Cloud Computing	5	191CS7E18	Human Computer Interaction
Professional Elective – V (VII Semester)			Professional Elective – VI (VIII Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	191CS7E22	Design Patterns	1	191CS8E26	Block chain Architecture Design and Use cases
2	191CS7E23	Fault Tolerant Computing	2	191CS8E29	Real Time Operating Systems
3	191CS7E24	No SQL databases	3	191CS8E28	Deep Learning
4	191CS7E21	Agile Methodologies (Using Devops)	4	191CS8E30	Software Project Management
5	191CS7E25	Parallel Computing	5	191CS8E27	Cyber Security

PROFESSIONAL ELECTIVE

Track		Professional Elective I	Professional Elective II	Professional Elective III	Professional Elective IV	Professional Elective V	Professional Elective VI
Track 1	Programming languages	Functional and Logic Programming	Scripting languages	C# .Net	Middleware Technologies	Design Patterns	Block chain Architecture Design and Use cases
Track 2	Systems	Advanced Computer Architecture	Advance Operating Systems	Distributed Systems	Embedded Systems	Fault Tolerant Computing	Real Time Operating Systems
Track 3	Data Science and Machine Intelligence	Artificial Intelligence	Machine Learning	Natural Language Processing	Data Analytics	No SQL databases	Deep Learning
Track 4	Software Systems Engineering	Software Requirement and Estimation	Software Testing Methodologies	Software Quality Assurance	Software Configuration Management	Agile Methodologies (Using Devops)	Software Project Management
Track 5	Applications/ Generic	Computer Graphics	Image Processing	Cloud Computing	Human Computer Interaction	Parallel Computing	Cyber Security

OPEN ELECTIVE - I (V Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE5001	Basic Concrete Technology	CE, EEE	CE
2	191EE5001	Electrical Safety	EEE	EEE
3	191EE5002	Electrical Materials	EEE	EEE
4	191EE5003	Basic Electrical Measurements	EEE, ECE	EEE
5	191ME5001	Renewable Energy Sources	CE, EEE, ME, Ag. E	ME
6	191ME5002	Fundamentals of Mechanical Engineering	ME	ME
7	191ME5003	Supply Chain Management	ME	ME
8	191ME5004	3D Printing	ME	ME
9	191ME5005	Entrepreneurship Development and Incubation		ME
10	191EC5001	Signals & Systems	EEE, ECE	ECE
11	191EC5002	Digital Electronics and Logic Design	EEE, ECE, CSE, IT	ECE
12	191EC5003	Semi conductor devices	EEE, ECE	ECE
13	191CS5001	Data Structures	EEE, ECE, CSE, IT	CSE
14	191CS5002	Object Oriented Programming through C++	CSE, IT	CSE
15	191CS5003	Java Programming	CSE, IT	CSE
16	191CS5004	R Programming		CSE
17	191IT5001	Data Base Management Systems	CSE, IT	IT
18	191IT5002	Computer Graphics	CSE, IT	IT
19	191MI5001	Overview of Mining	Min.E	Min.E
20	191PT5001	Process Intensification in Petroleum Industry	PT	PT
21	191PT5002	Fundamentals of Petroleum Industry	PT	PT
22	191AG5001	Basic Crop Production Practices	Ag.E	Ag.E

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OPEN ELECTIVE - II (VI Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE6O02	Disaster Management		CE
2	191EE6O04	Energy Audit and Conservation Management	EEE	EEE
3	191EE6O05	Non Conventional Energy resources	EEE	EEE
4	191EE6O06	Instrumentation	EEE, ECE, Ag. E	EEE
5	191ME6O06	Solar Energy Utilisation	ME, Ag. E	ME
6	191ME6O07	Basic Thermodynamics and Heat Transfer	EEE, ME, PT, Ag.E, Min.E	ME
7	191ME6O08	Introduction to Hydraulics and Pneumatics	CE, ME, PT	ME
8	191ME6O09	3D Printing	ME	ME
9	191ME6O06	Robotics	ME	ME
10	191ME6O11	Management Science	CE, CSE, IT, PT, Min. E	ME
11	191ME6O12	Entrepreneurship Development and Incubation		ME
12	191ME6O07	Biomedical Instrumentation		ECE
13	191ME6O08	ECAD Tools	ECE	ECE
14	191CS6O05	Python Programming	EEE, CSE, IT	CSE
15	191CS6O06	Operating Systems	CSE, IT	CSE
16	191CS6O07	Web Technologies	CSE, IT	CSE
17	191CS6O08	Cyber Security	CSE, IT	CSE
18	191CS6O09	AR / VR		CSE
19	191IT6O03	Computer Organization	CSE, IT	IT
20	191IT6O04	AI Tools & Techniques	CSE, IT	IT
21	191IT6O05	Robotic Process Automation	Ag.E	IT
22	191MI6O02	Industrial Safety Practices		Min.E
23	191MI6O03	Electrical Equipment's in Mines		Min.E
24	191PT6O03	Unconventional Hydrocarbon Resources	PT	PT
25	191PT6O04	Asset Management		PT
26	191AG6O02	Weather forecast in Agriculture		Ag.E
27	191AG6O03	Bio-energy systems design and applications		Ag.E

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VII SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
171CS7T18	Cryptography and Network Security	PC	3	1	---	4	3
171CS7T19	UML and Design Patterns	PC	3	1	---	4	3
171CS7T20	Cloud Computing	PC	3	1	---	4	3
171HS7T05	Management Science	HSS	3	1	---	4	3
---	Professional Elective - IV	PE	3	1	---	4	3
---	Professional Elective - V	PE	3	1	---	4	3
171CS7L12	UML and Design Patterns Lab	PC	---	---	3	3	2
171CS7L13	Big Data Analytics Lab	PC	---	---	3	3	2
171CS7P01	Industry Oriented (Internship) Minor Project	PR	---	---	---	-	1
TOTAL			18	6	6	30	23

VIII SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
---	Professional Elective - VI	PE	3	1	---	4	3
---	Open Elective	OE	3	1	---	4	3
171CS8P02	Project Work	PR	----	----	---	--	14
TOTAL			6	2	0	8	20

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Professional Elective – I (V Semester)

S.No	Course Code	Name of the Course
1	171CS5E01	Unix and Shell Programming
2	171CS5E02	Advanced Computer Architecture
3	171CS5E03	Computer Graphics
4	171CS5E04	Software Testing Methodologies

Professional Elective – II (VI Semester)

S.No	Course Code	Name of the Course
1	171CS6E05	Software Quality Assurance
2	171CS6E06	Bio Informatics
3	171CS6E07	Human Computer Interaction
4	171CS6E08	Social Networks and Semantic Web

Professional Elective – III (VI Semester)

S.No	Course Code	Name of the Course
1	171CS6E09	Pattern Recognition
2	171CS6E10	Parallel Computing
3	171CS6E11	Storage Area Networks
4	171CS6E12	E - Commerce

Professional Elective – IV (VII Semester)

S.No	Course Code	Name of the Course
1	171CS7E13	Software Project Management
2	171CS5E14	Big Data Analytics
3	171CS7E15	Image Processing
4	171CS7E16	Cyber Laws

Professional Elective – V (VII Semester)

S.No	Course Code	Name of the Course
1	171CS7E17	Middleware Technologies
2	171CS7E18	Artificial Intelligence and Machine Learning
3	171CS7E19	Information Retrieval Systems
4	171CS7E20	Mobile Computing

Professional Elective – VI (VIII Semester)

S.No	Course Code	Name of the Course
1	171CS8E21	Agile Methodologies
2	171CS8E22	Cyber Security
3	171CS8E23	Distributed Databases
4	171CS8E24	Distributed Systems

Open Elective (VIII Semester)

S.No	Course Code	Name of the Course
1	171CS8O01	Microprocessor and Multi Core Systems
2	171CS8O02	Embedded Systems
3	171CS8O03	Soft Computing
4	171EE8O05	Robotics
5	171CS8O04	Operations Research
6	171CS8O05	Optical Communications
7	171EE8O07	Internet of Things
8	171EC8O02	Disaster Management
9	171CS8O06	Renewable Energy sources
10	171CS8O07	Nano Technology and its Applications

PROGRAM STRUCTURE**I SEMESTER**

Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201HS1T01	Communicative English	HSMC	Theory	3	0	0	3	3
201BS1T01	Differential Equations and Linear algebra	BSC	Theory	3	0	0	3	3
201BS1T04	Engineering Chemistry	BSC	Theory	3	0	0	3	3
201ES1T02	Programming for Problem Solving using C	ESC	Theory	3	0	0	3	3
201ES1I02	Computer Engineering Workshop	ESC	Integrated	2	0	2	4	3
201HS1L01	Communicative English Lab	HSMC	Lab	0	0	3	3	1.5
201BS1L03	Engineering Chemistry Lab	BSC	Lab	0	0	3	3	1.5
201ES1L02	Programming for Problem Solving using C Lab	ESC	Lab	0	0	3	3	1.5
201MC1T01	Environmental Science	MC	Theory	2	0	0	2	0
TOTAL				16	0	11	27	19.5

II SEMESTER

Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS2T07	Numerical Methods and Complex Variables	BSC	Theory	3	0	0	3	3
201BS2T09	Applied Physics	BSC	Theory	3	0	0	3	3
201ES2T11	Computer Organization	ESC	Theory	3	0	0	3	3
201ES2T04	Python Programming	ESC	Theory	3	0	0	3	3
201ES2T07	Data Structures through C	ESC	Theory	3	0	0	3	3
201BS2L04	Applied Physics Lab	BSC	Lab	0	0	3	3	1.5
201ES2L06	Data Structures through C Lab	ESC	Lab	0	0	3	3	1.5
201ES2L14	Python Programming Lab	ESC	Lab	0	0	3	3	1.5
201MC2L01	Professional Communication Skills Lab	MC	Lab	0	0	3	3	0
201MC2T02	Constitution of India	MC	Theory	2	0	0	2	0
TOTAL				17	0	12	29	19.5

III SEMESTER

Course code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
201CS3T01	Advanced data structures	PCC	3	0	0	3	3
201CS3T02	Object Oriented Programming through C++	PCC	3	0	0	3	3
201CS3T03	Operating Systems	PCC	3	0	0	3	3
201CS3T04	Software Engineering	PCC	3	0	0	3	3
201BS3T13	Discrete Mathematics	BSC	3	0	0	3	3
201CS3L01	Object Oriented Programming through C++ Lab	PCC	0	0	3	3	1.5
201CS3L02	Operating Systems Lab	PCC	0	0	3	3	1.5
201CS3L03	Unix and Shell Programming Lab	PCC	0	0	3	3	1.5
201SC3L05	Skill Oriented Course-I	SC	0	0	4	4	2
	1. Applications of Python - numpy						
201SC3L06	2. Web application development using full stack frontend development - Module -I						
201MC3T03	Biology for Engineers	MC	2	0	0	0	0
TOTAL			17	0	13	28	21.5

IV SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
201BS4T16	Probability and statistics	BSC	3	0	0	3	3
201CS4T05	Formal Languages and Automata Theory	PCC	3	0	0	3	3
201CS4T06	Database Management Systems	PCC	3	0	0	3	3
201CS4T07	Java programming	PCC	3	0	0	3	3
201HS4T03	Managerial Economics and Financial Analysis	HSMC	3	0	0	3	3
201CS4L04	Database Management Systems Lab	PCC	0	0	3	3	1.5
201CS4L05	Java Programming Lab	PCC	0	0	3	3	1.5
201CS4L06	R Programming Lab	PCC	0	0	3	3	1.5
201SC4L18 201SC4L19	Skill Oriented Course-II	SC	0	0	4	4	2
	1. Applications of python-pandas						
	2. Web application development using full stack frontend development -Module-II						
201MC4T04	Essence of Indian Traditional Knowledge	MC	2	0	0	0	0
TOTAL			17	0	13	28	21.5

V SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191CS5T08	Compiler Design	PCC	3	0	0	3	3
191CS5T09	Computer Networks	PCC	3	0	0	3	3
191CS5T10	Database Management Systems	PCC	3	0	0	3	3
191CS5T11	Operating Systems	PCC	3	0	0	3	3
----	Professional Elective -I	PEC	3	0	0	3	3
----	Open Elective -I	OEC	3	0	0	3	3
191CS5L04	Operating Systems and Computer Networks Lab	PCC	0	0	3	3	1.5
191CS5L05	Database Management Systems Lab	PCC	0	0	2	2	1
191HS5T06	Employability Skills - III	HSMC	0	0	2	2	1
191PR5P02	Socially Relevant Project	PROJ	0	0	0	0	1
191MC5A08	Intellectual Property Rights and	MC	2	0	0	2	0

VI SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191CS6T12	Data Ware Housing and Data Mining	PCC	3	0	0	3	3
191CS6T13	Object Oriented Analysis of Design	PCC	3	0	0	3	3
191CS6T14	Web Technologies	PCC	3	0	0	3	3
----	Professional Elective II	PEC	3	0	0	3	3
----	Professional Elective III	PEC	3	0	0	3	3
----	Open Elective II	OEC	3	0	0	3	3
191CS6L06	Data Mining and Object Oriented Analysis of Design Lab	PCC	0	0	3	3	1.5
191CS6L07	Web Technologies Lab	PCC	0	0	3	3	1.5
191HS6T07	Employability Skills - IV	HSMC	0	0	2	2	1
191MC6A09	Professional Ethics and Human Values	MC	2	0	0	2	0
TOTAL			18	0	8	26	22


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VII SEMESTER

Course Code	Course Title	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
171CS7T18	Cryptography and Network Security	PC	3	1	---	4	3
171IT7T05	Big Data Analytics	PC	3	1	---	4	3
171CS7T20	Cloud Computing	PC	3	1	---	4	3
171IT7T06	Mobile Computing	PC	3	1	---	4	3
---	Professional Elective – IV	PE	3	1	---	4	3
---	Professional Elective – V	PE	3	1	---	4	3
171IT7L04	Mobile Computing Lab	PC	---	---	3	3	2
171CS7L13	Big Data Analytics Lab	PC	---	---	3	3	2
171IT7P01	Industry Oriented (Internship) Minor Project	PR	---	---	---	0	1
Total			18	6	6	30	23

VIII SEMESTER

Course Code	Course Title	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
---	Professional Elective – VI	PE	3	1	---	4	3
---	Open Elective	OE	3	1	---	4	3
171IT8P02	Major Project	PR	---	---	---	0	14
Total			6	2	0	8	20


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PROFESSIONAL ELECTIVES

Professional Elective – I (V Semester)			Professional Elective – II (VI Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	191CS5E04	Functional and Logic Programming	1	191CS6E09	Scripting languages
2	191CS5E01	Advanced Computer Architecture	2	191CS6E06	Advanced Operating Systems
3	191CS5E02	Artificial Intelligence	3	191CS6E08	Machine Learning
4	191CS5E05	Software Requirement and Estimation	4	191CS6E10	Software Testing Methodologies
5	191CS5E03	Computer Graphics	5	191CS6E07	Image Processing
Professional Elective – III (VI Semester)			Professional Elective – IV (VII Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	191CS6E11	C# .Net	1	191CS7E19	Middleware Technologies
2	191CS6E13	Distributed Systems	2	191CS7E17	Embedded Systems
3	191CS6E14	Natural Language Processing	3	191CS7E16	Data Analytics
4	191CS6E15	Software Quality Assurance	4	191CS7E20	Software Configuration Management
5	191CS6E12	Cloud Computing	5	191CS7E18	Human Computer Interaction
Professional Elective – V (VII Semester)			Professional Elective – VI (VIII Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	191CS7E22	Design Patterns	1	191CS8E26	Block chain Architecture Design and Use cases
2	191CS7E23	Fault Tolerant Computing	2	191CS8E29	Real Time Operating Systems
3	191CS7E24	No SQL databases	3	191CS8E28	Deep Learning
4	191CS7E21	Agile Methodologies (Using Devops)	4	191CS8E30	Software Project Management
5	191CS7E25	Parallel Computing	5	191CS8E27	Cyber Security

PROFESSIONAL ELECTIVE

Track		Professional Elective I	Professional Elective II	Professional Elective III	Professional Elective IV	Professional Elective V	Professional Elective VI
Track 1	Programming languages	Functional and Logic Programming	Scripting languages	C# .Net	Middleware Technologies	Design Patterns	Block chain Architecture Design and Use cases
Track 2	Systems	Advanced Computer Architecture	Advance Operating Systems	Distributed Systems	Embedded Systems	Fault Tolerant Computing	Real Time Operating Systems
Track 3	Data Science and Machine Intelligence	Artificial Intelligence	Machine Learning	Natural Language Processing	Data Analytics	No SQL databases	Deep Learning
Track 4	Software Systems Engineering	Software Requirement and Estimation	Software Testing Methodologies	Software Quality Assurance	Software Configuration Management	Agile Methodologies (Using Devops)	Software Project Management
Track 5	Applications/ Generic	Computer Graphics	Image Processing	Cloud Computing	Human Computer Interaction	Parallel Computing	Cyber Security

OPEN ELECTIVE - I (V Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE5O01	Basic Concrete Technology	CE, EEE	CE
2	191EE5O01	Electrical Safety	EEE	EEE
3	191EE5O02	Electrical Materials	EEE	EEE
4	191EE5O03	Basic Electrical Measurements	EEE, ECE	EEE
5	191ME5O01	Renewable Energy Sources	CE, EEE, ME, Ag. E	ME
6	191ME5O02	Fundamentals of Mechanical Engineering	ME	ME
7	191ME5O03	Supply Chain Management	ME	ME
8	191ME5O04	3D Printing	ME	ME
9	191ME5O05	Entrepreneurship Development and Incubation		ME
10	191EC5O01	Signals & Systems	EEE, ECE	ECE
11	191EC5O02	Digital Electronics and Logic Design	EEE, ECE, CSE, IT	ECE
12	191EC5O03	Semi conductor devices	EEE, ECE	ECE
13	191CS5O01	Data Structures	EEE, ECE, CSE, IT	CSE
14	191CS5O02	Object Oriented Programming through C++	CSE, IT	CSE
15	191CS5O03	Java Programming	CSE, IT	CSE
16	191CS5O04	R Programming		CSE
17	191IT5O01	Data Base Management Systems	CSE, IT	IT
18	191IT5O02	Computer Graphics	CSE, IT	IT
19	191MI5O01	Overview of Mining	Min.E	Min.E
20	191PT5O01	Process Intensification in Petroleum Industry	PT	PT
21	191PT5O02	Fundamentals of Petroleum Industry	PT	PT
22	191AG5O01	Basic Crop Production Practices	Ag.E	Ag.E

OPEN ELECTIVE - II (VI Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE6O02	Disaster Management		CE
2	191EE6O04	Energy Audit and Conservation Management	EEE	EEE
3	191EE6O05	Non Conventional Energy resources	EEE	EEE
4	191EE6O06	Instrumentation	EEE, ECE, Ag. E	EEE
5	191ME6O06	Solar Energy Utilisation	ME, Ag. E	ME
6	191ME6O07	Basic Thermodynamics and Heat Transfer	EEE, ME, PT, Ag.E, Min.E	ME
7	191ME6O08	Introduction to Hydraulics and Pneumatics	CE, ME, PT	ME
8	191ME6O09	3D Printing	ME	ME
9	191ME6O10	Robotics	ME	ME
10	191ME6O11	Management Science	CE, CSE, IT, PT, Min. E	ME
11	191ME6O12	Entrepreneurship Development and Incubation		ME
12	191ME6O07	Biomedical Instrumentation		ECE
13	191ME6O08	ECAD Tools	ECE	ECE
14	191CS6O05	Python Programming	EEE, CSE, IT	CSE
15	191CS6O06	Operating Systems	CSE, IT	CSE
16	191CS6O07	Web Technologies	CSE, IT	CSE
17	191CS6O08	Cyber Security	CSE, IT	CSE
18	191CS6O09	AR / VR		CSE
19	191IT6O03	Computer Organization	CSE, IT	IT
20	191IT6O04	AI Tools & Techniques	CSE, IT	IT
21	191IT6O05	Robotic Process Automation	Ag.E	IT
22	191MI6O02	Industrial Safety Practices		Min.E
23	191MI6O03	Electrical Equipment's in Mines		Min.E
24	191PT6O03	Unconventional Hydrocarbon Resources	PT	PT
25	191PT6O04	Asset Management		PT
26	191AG6O02	Weather forecast in Agriculture		Ag.E
27	191AG6O03	Bio-energy systems design and applications		Ag.E

OPEN ELECTIVE - III (VII Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE7O03	Waste Water Management	CE	CE
2	191EE7O07	Electrical and Hybrid Vehicles	EEE	EEE
3	191EE7O08	Special Electrical Machines	EEE	EEE
4	191EE7O09	Industrial Electrical Systems	EEE	EEE
5	191ME7O13	Optimization techniques		ME
6	191ME7O14	Energy Conservation		ME
7	191ME7O15	Introduction to Material Handling Systems		ME
8	191ME7O16	Robotics	ME	ME
9	191ME7O17	Entrepreneurship Development and Incubation		ME
10	191EC7O06	Overview of Digital Signal Processing	EEE, ECE	ECE
11	191EC7O07	Basics of VLSI Design	ECE	ECE
12	191EC7O08	Micro Electro Mechanical Systems		ECE
13	191EC7O09	Image Processing	ECE, CSE, IT	ECE
14	191CS7O10	Big Data Analytics	CSE, IT	CSE
15	191CS7O11	Mobile Application Development	CSE, IT	CSE
16	191CS7O12	Data Science	CSE, IT	CSE
17	191IT7O06	Machine Learning	CSE, IT	IT
18	191IT7O07	Quantum Computing		IT
19	191IT7O08	Block Chain Technologies	CSE, IT	IT
20	191MI7O04	Communication System in Mines		Min.E
21	191MI7O05	Drilling & Blasting	Min.E	Min.E
22	191PT7O05	Introduction to Earth Sciences	CE, PT, Min. E	PT
23	191PT7O06	Basic Concepts in Petroleum Drilling and Completions	PT	PT
24	191AG7O04	Greenhouse Technology	Ag.E	Ag.E
25	191AG7O05	Floods and Control Measures	CE	Ag.E

OPEN ELECTIVE – IV (VIII Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE8O04	Integrated Waste Management for a Smart City		CE
2	191EE8O10	Fundamentals of Electrical Engineering	EEE, ECE	EEE
3	191EE8O11	Basic Electrical Circuits	EEE, ECE	EEE
4	191EE8O12	Electrical Machines	EEE	EEE
5	191EE8O13	Power Electronics	EEE	EEE
6	191EE8O14	Non-Conventional Energy Sources	CE, EEE, ME	EEE
7	191ME8O18	Fabrication processes	ME	ME
8	191ME8O19	Smart Materials		ME
9	191EC8O10	Micro Electro Mechanical Systems		ECE
10	191EC8O11	Basic Electronic Circuits	EEE & ECE	ECE
11	191EC8O12	Principles of Communications	ECE	ECE
12	191EC8O13	Electronic Instrumentation	EEE & ECE	ECE
13	191EC8O14	Digital Image Processing	ECE, CSE, IT	ECE
14	191CS8O13	Cyber Security	CSE, IT	CSE
15	191CS8O14	Data Science	CSE, IT	CSE
16	191IT8O12	Game Programming		IT
17	191IT8O11	Cloud Computing	CSE,IT	CSE
18	191CS8O16	AR / VR		CSE
19	191IT8O09	Deep learning	CSE, IT	IT
20	191IT8O10	Block Chain Technologies	CSE, IT	IT
21	191PT8O07	Chemical Process Safety		PT
22	191PT8O08	Mechanical Unit Operations		PT
23	191AG8O06	Applications of RS and GIS in Land and Water Resources Management	CE	Ag.E
24	191AG8O07	Plastic Applications in Agriculture		Ag.E

Professional Elective – I (V Semester)

S.No	Course Code	Name of the Course
1	171IT5E01	Artificial Intelligence
2	171CS5E02	Advanced Computer Architecture
3	171CS5E03	Computer Graphics
4	171CS5E04	Software Testing Methodologies

Professional Elective – II (VI Semester)

S.No	Course Code	Name of the Course
1	171CS6E05	Software Quality Assurance
2	171IT6E02	Neural Networks
3	171CS6E08	Social Networks and Semantic Web
4	171IT6E03	Design and Analysis of Algorithms

Professional Elective – III (VI Semester)

S.No	Course Code	Name of the Course
1	171IT6E04	Advanced Computer Networks
2	171CS6E10	Parallel Computing
3	171IT6E05	Multimedia Programming
4	171CS6E12	E - Commerce

Professional Elective – IV (VII Semester)

S.No	Course Code	Name of the Course
1	171CS7E13	Software Project Management
2	171IT7E06	Machine Learning
3	171CS7E15	Image Processing
4	171CS7E16	Cyber Laws

Professional Elective – V (VII Semester)

S.No	Course Code	Name of the Course
1	171CS7E19	Information Retrieval Systems
2	171IT7E07	Human Computer Interaction
3	171IT7E08	Distributed Systems
4	171IT7E09	Decision Support System

Professional Elective – VI (VIII Semester)

S.No	Course Code	Name of the Course
1	171CS8E21	Agile Methodologies
2	171CS8E22	Cyber Security
3	171CS8E23	Distributed Databases
4	171IT8E10	Pattern Recognition

Open Elective (VIII Semester)

S.No	CourseCode	Name of the Course
1	171IT8O01	Management Information System
2	171CS8O01	Microprocessor and Multi Core Systems
3	171CS8O02	Embedded Systems
4	171IT8O02	Computer Vision
5	171EE8O05	Robotics
6	171CS8O04	Operations Research
7	171CS8O05	Optical Communications
8	171EE8O07	Internet of Things
9	171EC8O02	Disaster Management
10	171CS8O07	Nano Technology and its Applications

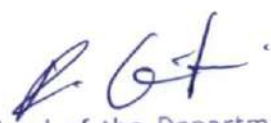
PROGRAM STRUCTURE

I SEMESTER

Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201HS1T01	Communicative English	HSMC	Theory	3	0	0	3	3
201BS1T01	Differential equations and Linear algebra	BSC	Theory	3	0	0	3	3
201BS1T02	Engineering Physics	BSC	Theory	3	0	0	3	3
201ES1T03	Essential Electrical and Electronics Engineering	ESC	Theory	3	0	0	3	3
201ES1T05	Engineering Graphics	ESC	Theory	1	0	4	5	3
201HS1L01	Communicative English Lab	HSMC	Lab	0	0	3	3	1.5
201BS1L01	Engineering Physics Lab	BSC	Lab	0	0	3	3	1.5
201ES1L03	Essential Electrical and Electronics Engineering Lab	ESC	Lab	0	0	3	3	1.5
201MC1T01	Environmental Science	MC	Theory	2	0	0	2	0
TOTAL				15	0	13	28	19.5

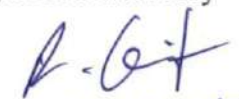
II SEMESTER

Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS2T05	Partial Differential Equations and Vector Calculus	BSC	Theory	3	0	0	3	3
201BS2T08	Chemistry of Materials	BSC	Theory	3	0	0	3	3
201ES2T06	Engineering Mechanics	ESC	Theory	3	0	0	3	3
201ES2T08	Programming for Problem Solving Using C	ESC	Theory	3	0	0	3	3
201ES2L07	Engineering Workshop	ESC	Lab	0	0	3	3	1.5
201ES2L12	Computer Aided Drafting Lab	ESC	Lab	0	0	3	3	1.5
201HS2L02	Professional Communications Skills Lab	HSMC	Lab	0	0	3	3	1.5
201BS2L05	Engineering Chemistry Lab	BSC	Lab	0	0	3	3	1.5
201ES2L10	Programming for Problem Solving Using C Lab	ESC	Lab	0	0	3	3	1.5
201MC2T02	Constitution of India	MC	Theory	2	0	0	2	0
TOTAL				14	0	15	29	19.5


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III SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS3T14	Numerical Methods and Integral Transforms	BSC	Theory	3	0	0	3	3
201PT3T01	Principles of Geology for Petroleum Engineers	PCC	Theory	3	0	0	3	3
201PT3T02	Material and Energy Balance	PCC	Theory	3	0	0	3	3
201PT3T03	Petroleum Exploration	PCC	Theory	3	0	0	3	3
201PT3T04	Fluid Mechanics for Petroleum Engineers	PCC	Theory	3	0	0	3	3
201PT3L01	Principles of Geology for Petroleum Engineers lab	PCC	Lab	0	0	3	3	1.5
201PT3L02	Fluid Mechanics for Petroleum Engineers Lab	PCC	Lab	0	0	3	3	1.5
201PT3L03	Mathematical Methods Lab	PCC	Lab	0	0	3	3	1.5
201SC3L10	Skill oriented course -I	SC	Proj	0	0	4	4	2
	Industry Exploration Project							
201MC3T03	Biology For Engineers	MC	Theory	2	0	0	2	0
TOTAL				17	0	13	30	21.5
IV SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201ES4T20	Mechanical and Materials Science and Engineering	ESC	Theory	3	0	0	3	3
201BS4T17	Complex Variables and Statistical Methods	BSC	Theory	3	0	0	3	3
201PT4T05	Petroleum Geology	PCC	Theory	3	0	0	3	3
201PT4T06	Heat Transfer Operations	PCC	Theory	3	0	0	3	3
201HS4T06	Management and Organizational Behavior	HSMC	Theory	3	0	0	3	3
201ES4L16	Mechanical and Materials Science and Engineering Lab	ESC	Lab	0	0	3	3	1.5
201PT4L04	Heat Transfer Operations Lab	PCC	Lab	0	0	3	3	1.5
201PT4L05	Petroleum Geology Lab	PCC	Lab	0	0	3	3	1.5
201SC4L21	Skill oriented course-II	SC	Proj	0	0	4	4	2
	Python Programming							
201MC4T04	Essence of Indian Traditional Knowledge	MC	Theory	2	0	0	2	0
TOTAL				17	0	13	30	21.5
Internship 2 months (Mandatory) during summer vacation								

BSC: Basic Sciences Courses; HSMC: Humanities and Social Sciences including Management Courses; ESC: Engineering Sciences Courses; PCC: Professional Core Courses; SC: Skill Oriented Course; PEC: Professional Elective Courses; OEC: Open Elective Courses; MC: Mandatory Courses; PROJ: Project.

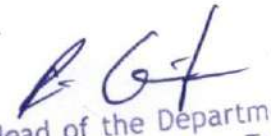

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V SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191PT5T08	Instrumentation and Process Control	PCC	3	0	0	3	3
191PT5T09	Well Logging and Mud Logging	PCC	3	0	0	2	2
191PT5T10	Drilling Technology	PCC	3	0	0	3	3
191PT5T11	Thermodynamics for Petroleum Engineers	PCC	3	0	0	3	3
----	Professional Elective-I	PEC	3	0	0	3	3
----	Open Elective -I	OEC	3	0	0	3	3
191PT5L04	Drilling Fluids Lab	PCC	0	0	2	2	1
191PT5L05	Instrumentation, Process Dynamics and Control Lab	PCC	0	0	3	3	1.5
191ES5T16	Employability Skills – III	ESC	0	0	2	2	1
191PR5P01	Socially Relevant Project	PROJ	0	0	0	0	1
191MC5A08	Intellectual Property Rights and Patents	MC	2	0	0	2	0
TOTAL			18	0	7	24	21.5

VI SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191PT6T12	Petroleum Refinery and Petrochemical Engineering	PCC	3	0	0	3	3
191PT6T13	Petroleum Production Engineering	PCC	3	0	0	3	3
191PT6T14	Petroleum Reservoir Engineering-I	PCC	3	0	0	3	3
----	Professional Elective -II	PEC	3	0	0	3	3
----	Professional Elective -III	PEC	3	0	0	3	3
----	Open Elective -II	OEC	3	0	0	3	3
191PT6L06	Petroleum Reservoir Engineering Lab	PCC	0	0	2	2	1
191PT6L07	Petroleum Analysis Lab	PCC	0	0	3	3	1.5
191ES6T17	Employability Skills - IV	ESC	0	0	2	2	1
191MC6A09	Professional Ethics and Human Values	MC	2	0	0	2	0
TOTAL			18	0	7	25	21.5


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VII SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191PT7T15	Petroleum Reservoir Engineering – II	PCC	3	0	0	3	3
191PT7T16	Design of Surface Facilities	PCC	3	0	0	3	3
----	Professional Elective -IV	PEC	3	0	0	3	3
----	Professional Elective -V	PEC	3	0	0	3	3
----	Open Elective –III	OEC	3	0	0	3	3
191PT7L08	Petroleum Equipment Design and Simulation Lab	PCC	0	0	2	2	1
191PT7L09	Petroleum Reservoir Simulation Lab	PCC	0	0	2	2	1.5
191PR7P02	Internship	PROJ	0	0	0	0	2
191PT7P03	Project Part 1	PROJ	0	0	0	0	2
TOTAL			15	0	4	19	21.5

VIII SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
----	Professional Elective -VI (MOOCs)	PEC	3	0	0	3	3
----	Open Elective -IV (MOOCs)	OEC	3	0	0	3	3
191PT8P04	Project Part 2	PROJ	0	0	0	-	7
TOTAL			6	0	0	6	13

BSC: Basic Sciences Courses; HSMC: Humanities and Social Sciences including Management Courses; ESC: Engineering Sciences Courses; PCC: Professional Core Courses; PEC: Professional Elective Courses; OEC: Open Elective Courses; SSC: Self Study Course; MC: Mandatory Courses; PROJ: Project.

PROFESSIONAL ELECTIVES

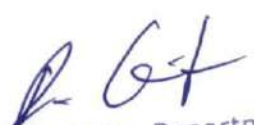
Professional Elective – I (V Semester)			Professional Elective – II (VI Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	191PT5E03	Well Engineering and Design	1	191PT6E06	Well Completions, Testing and Services
2	191PT5E02	Pipeline Engineering	2	191PT6E05	Operational and Maintenance of Pipelines
3	191PT5E01	Natural Gas Engineering and Processing	3	191PT6E04	Fundamentals of Liquefied Natural gas
Professional Elective – III (VI Semester)			Professional Elective – IV (VII Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	191PT7E09	Unconventional Hydrocarbon Resources	1	191PT7E10	Enhanced Oil Recovery
2	191PT7E08	Storage and Transportation of Crude oil and Natural gas	2	191PT7E12	Petroleum Economics and Policies and Regulations
3	191PT7E07	Advanced Separation Techniques	3	191PT7E11	Petroleum Corrosion Technology

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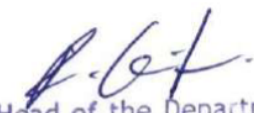
OPEN ELECTIVE - I (V Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE5001	Basic Concrete Technology	CE, EEE	CE
2	191EE5001	Electrical Safety	EEE	EEE
3	191EE5002	Electrical Materials	EEE	EEE
4	191EE5003	Basic Electrical Measurements	EEE, ECE	EEE
5	191ME5001	Renewable Energy Sources	CE, EEE, ME, Ag. E	ME
6	191ME5002	Fundamentals of Mechanical Engineering	ME	ME
7	191ME5003	Supply Chain Management	ME	ME
8	191ME5004	3D Printing	ME	ME
9	191ME5005	Entrepreneurship Development and Incubation		ME
10	191EC5001	Signals & Systems	EEE, ECE	ECE
11	191EC5002	Digital Electronics and Logic Design	EEE, ECE, CSE, IT	ECE
12	191EC5003	Semi conductor devices	EEE, ECE	ECE
13	191CS5001	Data Structures	EEE, ECE, CSE, IT	CSE
14	191CS5002	Object Oriented Programming through C++	CSE, IT	CSE
15	191CS5003	Java Programming	CSE, IT	CSE
16	191CS5004	R Programming		CSE
17	191IT5001	Database Management Systems	CSE, IT	IT
18	191IT5002	Computer Graphics	CSE, IT	IT
19	191MI5001	Overview of Mining	Min.E	Min.E
20	191PT5001	Process Intensification in Petroleum Industry	PT	PT
21	191PT5002	Fundamentals of Petroleum Industry	PT	PT
22	191AG5001	Basic Crop Production Practices	Ag.E	Ag.E


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OPEN ELECTIVE - II (VI Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE6O02	Disaster Management		CE
2	191EE6O04	Energy Audit and Conservation Management	EEE	EEE
3	191EE6O05	Non-Conventional Energy Sources	EEE	EEE
4	191EE6O06	Instrumentation	EEE, ECE, Ag. E	EEE
5	191ME6O06	Solar Energy Utilisation	ME, Ag. E	ME
6	191ME6O07	Basic Thermodynamics and Heat Transfer	EEE, ME, PT, Ag.E, Min.E	ME
7	191ME6O08	Introduction to Hydraulics and Pneumatics	CE, ME, PT	ME
8	191ME6O09	3D Printing	ME	ME
9	191ME6O10	Robotics	ME	ME
10	191ME6O11	Management Science	CE, CSE, IT, PT, Min. E	ME
11	191ME6O12	Entrepreneurship Development and Incubation		ME
12	191EC6O04	Biomedical Instrumentation		ECE
13	191EC6O05	ECAD Tools	ECE	ECE
14	191CS6O05	Python Programming	EEE, CSE, IT	CSE
15	191CS6O06	Operating Systems	CSE, IT	CSE
16	191CS6O07	Web Technologies	CSE, IT	CSE
17	191CS6O08	Cyber Security	CSE, IT	CSE
18	191CS6O09	AR / VR		CSE
19	191IT6O03	Computer Organization	CSE, IT	IT
20	191IT6O04	AI Tools & Techniques	CSE, IT	IT
21	191IT6O05	Robotic Process Automation		IT
22	191MI6O02	Industrial Safety Practices	Ag.E	Min.E
23	191MI6O03	Electrical Equipment in Mines		Min.E
24	191PT6O03	Unconventional Hydrocarbon Resources	PT	PT
25	191PT6O04	Asset Management		PT
26	191AG6O02	Weather forecast in Agriculture		Ag.E
27	191AG6O03	Bio-energy systems design and applications		Ag.E

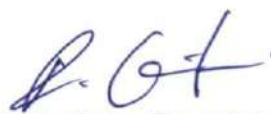

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VII SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
171PT7T15	Integrated Asset Management and Petroleum Economics	PC	3	1	0	4	3
171PT7T16	Petroleum Reservoir Engineering - II	PC	3	1	0	4	3
171PT7T17	IOR and EOR Techniques	PC	3	1	0	4	3
171PT7T18	Oil and Gas Processing Plant Design	PC	3	1	0	4	3
---	Professional Elective - IV	PE	3	1	0	4	3
---	Professional Elective - V	PE	3	1	0	4	3
171PT7L07	Petroleum Equipment Design and Simulation Lab	PC	0	0	3	3	2
171PT7L08	Petroleum Reservoir Engineering Lab	PC	0	0	3	3	2
171HS7A04	Managerial Economics and Financial Analysis	HSS	2	0	0	2	0
171PT7P01	Industry Oriented (Internship) Minor Project	PR	0	0	0	0	1
TOTAL			20	6	6	32	23

VIII SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
---	Professional Elective - VI	PE	3	1	0	4	3
---	Open Elective	OE	3	1	0	4	3
171PT8P02	Major Project	PR	0	0	0	0	14
TOTAL			6	2	0	8	20


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Professional Elective – I (V Semester)

S.No	Course Code	Name of the Course
	171PT5E01	Well Engineering and Design
2	171PT5E02	Fundamentals of Liquefied Natural Gas
3	171PT5E03	Pipeline Engineering

Professional Elective – II (VI Semester)

S.No	Course Code	Name of the Course
1	171PT6E04	Petroleum Refining and Petrochemical Engineering
2	171PT6E05	Storage and Transportation of Crude Oil and Natural Gas.
3	171PT6E06	Reservoir Stimulation

Professional Elective – III (VI Semester)

S.No	Course Code	Name of the Course
1	171PT6E07	Natural Gas Hydrates
2	171PT6E08	Natural Gas Engineering
3	171PT6E09	Horizontal Well Technology

Professional Elective – IV (VII Semester)

S.No	Course Code	Name of the Course
1	171PT7E10	Coal Bed Methane
2	171PT7E11	Offshore Engineering
3	171PT7E12	Petroleum Corrosion Technology

Professional Elective – V (VII Semester)

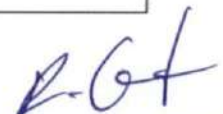
S.No	Course Code	Name of the Course
1	171PT7E13	Shale Gas Reservoir Engineering
2	171PT7E14	Subsea Engineering
3	171PT7E15	Reservoir Modeling and Simulation

Professional Elective – VI (VIII Semester)

S.No	Course Code	Name of the Course
1	171PT8E16	HSE and FE in Petroleum Industry
2	171PT8E17	Reliability and Risk Management in Petroleum Operations
3	171PT8E18	Deep Sea Production Systems

Open Elective (VIII Semester)

S.No	CourseCode	Name of the Course
1	171PT8O01	Green Technologies
2	171PT8O02	Non-Conventional Sources of Energy
3	171PT8O03	Alternative Energy Sources for Automobiles
4	171PT8O04	Waste Water Treatment
5	171PT8O05	Computational Fluid Dynamics
6	171PT8O06	Process Intensification in Petroleum Industry
7	171EC8O02	Disaster Management


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PROGRAM STRUCTURE**I SEMESTER**

Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201HS1T01	Communicative English	HSMC	Theory	3	0	0	3	3
201BS1T01	Differential equations and Linear algebra	BSC	Theory	3	0	0	3	3
201BS1T02	Engineering Physics	BSC	Theory	3	0	0	3	3
201ES1T04	Principles of Agronomy and Soil Science	ESC	Theory	3	0	0	3	3
201ES1T05	Engineering Graphics	ESC	Theory	1	0	4	5	3
201HS1L01	Communicative English Lab	HSMC	Lab	0	0	3	3	1.5
201BS1L01	Engineering Physics Lab	BSC	Lab	0	0	3	3	1.5
201ES1L04	Soil Science and Agronomy Field Lab	ESC	Lab	0	0	3	3	1.5
201MC1T01	Environmental Science	MC	Theory	2	0	0	2	0
TOTAL				15	0	13	28	19.5

II SEMESTER

Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS2T05	Partial Differential Equations and Vector Calculus	BSC	Theory	3	0	0	3	3
201BS2T08	Chemistry of Materials	BSC	Theory	3	0	0	3	3
201ES2T06	Engineering Mechanics	ESC	Theory	3	0	0	3	3
201ES2T08	Programming for Problem Solving Using C	ESC	Theory	3	0	0	3	3
201ES2L07	Engineering Workshop	ESC	Lab	0	0	3	3	1.5
201ES2L12	Computer Aided Drafting Lab	ESC	Lab	0	0	3	3	1.5
201HS2L02	Professional communications skills Lab	HSMC	Lab	0	0	3	3	1.5
201BS2L05	Engineering Chemistry Lab	BSC	Lab	0	0	3	3	1.5
201ES2L10	Programming for Problem Solving Using C Lab	ESC	Lab	0	0	3	3	1.5
201MC2T02	Constitution of India	MC	Theory	2	0	0	2	0
TOTAL				14	0	15	29	19.5

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III SEMESTER

Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS3T12	Integral Transforms and Applications of Partial Differential Equations	BSC	Theory	3	0	0	3	3
201AG3T01	Surveying and Levelling	PCC	Theory	3	0	0	3	3
201AG3T02	Fluid Mechanics and Open Channel Hydraulics	PCC	Theory	3	0	0	3	3
201AG3T03	Thermodynamics, Refrigeration and Air Conditioning	PCC	Theory	3	0	0	3	3
201AG3T04	Strength of Materials	PCC	Theory	3	0	0	3	3
201AG3L01	Surveying and Levelling Lab	PCC	Lab	0	0	3	3	1.5
201AG3L02	Fluid Mechanics and Open Channel Hydraulics Lab	PCC	Lab	0	0	3	3	1.5
201AG3L03	Thermodynamics, Refrigeration and Air Conditioning Lab	PCC	Lab	0	0	3	3	1.5
201SC3L11 201SC3L12	Skill Oriented Course-I	SC	Lab	0	0	4	4	2
	1. Computer Aided Manufacturing							
	2. Computer Aided Design Using Solid Works							
201MC3T03	Biology for Engineers	MC	Theory	2	0	0	2	0
TOTAL				17	0	13	30	21.5

IV SEMESTER

Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201ES4T21	Soil Mechanics	ESC	Theory	3	0	0	3	3
201BS4T15	Numerical Methods and Statistical Techniques	BSC	Theory	3	0	0	3	3
201AG4T05	Heat and Mass Transfer	PCC	Theory	3	0	0	3	3
201AG4T06	Tractor Systems and Controls	PCC	Theory	3	0	0	3	3
201HS4T07	Entrepreneurship Development and Business Management	HSMC	Theory	3	0	0	3	3
201ES4L17	Soil Mechanics Lab	ESC	Lab	0	0	3	3	1.5
201AG4L04	Tractor Systems and Controls Lab	PCC	Lab	0	0	3	3	1.5
201AG4L05	Heat and Mass Transfer Lab	PCC	Lab	0	0	3	3	1.5
201SC4L22 201SC4L23	Skill Oriented Course-II	SC	Lab	0	0	4	4	2
	1. Analysis/Simulation using MATLAB							
	2. Food Quality and Control							
201MC4T04	Essence of Indian Traditional Knowledge	MC	Theory	2	0	0	2	0
Total				17	0	13	30	21.5

BSC: Basic Sciences Courses; HSMC: Humanities and Social Sciences including Management Courses; ESC: Engineering Sciences Courses; PCC: Professional Core Courses; SC: Skill Oriented Course; PEC: Professional Elective Courses; OEC: Open Elective Courses; MC: Mandatory Courses; PROJ: Project.

HONORS PROGRAM

Specialization: Soil and Water Engineering

S.No.	Course Code	COURSE TITLE	L	T	P	C	SEMESTER
1.	201AG4H01	Water Quality and Management Measures	3	1	0	4	IV
2.	201AG5H04	Sprinkler and Micro Irrigation Systems	3	1	0	4	V
3.	201AG6H07	Management of Canal Irrigation System	3	1	0	4	VI
4.	201AG7H10	Remote Sensing and GIS Applications	3	1	0	4	VII

Specialization: Farm Machinery and Power Engineering

S.No.	Course Code	COURSE TITLE	L	T	P	C	SEMESTER
1.	201AG4H02	Machine Design	3	1	0	4	IV
2.	201AG5H05	Farm Machinery Design and Production	3	1	0	4	V
3.	201AG6H08	Mechanics of Tillage and Traction	3	1	0	4	VI
4.	201AG7H11	Tractor and Farm Machinery Operation and Maintenance	3	1	0	4	VII

Specialization: Processing and Food Engineering

S.No.	Course Code	COURSE TITLE	L	T	P	C	SEMESTER
1.	201AG4H03	Food Plant Design and Management	3	1	0	4	IV
2.	201AG5H06	Post Harvest Engineering of Horticultural Crops	3	1	0	4	V
3.	201AG6H09	Dairy and Food Engineering	3	1	0	4	VI
4.	201AG7H12	Waste and By-products Utilization	3	1	0	4	VII

MINOR PROGRAM

S.No.	Course Code	COURSE TITLE	L	T	P	C	SEMESTER
1.	201AG4M01	Groundwater, Wells and Pumps	3	1	0	4	IV
2.	201AG4M02	Tractor and Automotive Engines	3	1	0	4	IV
3.	201AG4M03	Engineering Properties of Agricultural Produce	3	1	0	4	IV
4.	201AG5M04	Irrigation Engineering	3	1	0	4	V
5.	201AG5M05	Tractor Systems and Controls	3	1	0	4	V
6.	201AG5M06	Post Harvest Engineering of Cereals, Pulses and Oil	3	1	0	4	V

		Seeds					
7.	201AG6M07	Drainage Engineering	3	1	0	4	VI
8.	201AG6M08	Farm Machinery and Equipment-I	3	1	0	4	VI
9.	201AG6M09	Post Harvest Engineering of Horticultural Crops	3	1	0	4	VI
10.	201AG7M10	Sprinkler and Micro Irrigation Systems	3	1	0	4	VII
11.	201AG7M11	Farm Machinery and Equipment-II	3	1	0	4	VII
12.	201AG7M12	Food Packaging Technology	3	1	0	4	VII

N.V. *[Signature]*

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V SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191AG5T09	Strength of Materials	PCC	2	1	0	3	3
191AG5T10	Theory and Design of Agricultural Machinery	PCC	2	1	0	3	3
191AG5T11	Agricultural Process Engineering and Food Quality	PCC	2	1	0	3	3
----	Professional Elective -I	PEC	2	1	0	3	3
----	Open Elective-I	OEC	2	1	0	3	3
191AG5L07	Soil Mechanics Lab	PCC	0	0	2	2	1
191AG5L08	Theory and Design of Agricultural Machinery LAB	PCC	0	0	2	2	1
191AG5L09	Agricultural Process Engineering and Food Quality LAB	PCC	0	0	3	3	1.5
191HS5T06	Employability Skills - III	HSS	0	0	0	0	1
191PR5P02	Socially Relevant Project	PROJ	0	0	0	0	1
	Intellectual Property Rights and Patents	HSS					
TOTAL			10	5	7	22	20.5

VI SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191AG6T12	Irrigation and Drainage Engineering	PCC	2	1	0	3	3
191AG6T13	Post-Harvest Engineering for Horticultural Produce	PCC	3	0	0	3	3
191AG6T14	Agricultural Machinery and Equipment	PCC	2	1	0	3	3
----	Professional Elective -II	PEC	2	1	0	3	3
----	Professional Elective -III	PEC	2	1	0	3	3
----	Open Elective-II	OEC	2	1	0	3	3
191AG6L10	Irrigation and Drainage Engineering LAB	PCC	0	0	2	2	1
191AG6L11	Agricultural Machinery and Equipment Lab	PCC	0	0	3	3	1.5
191HS6T07	Employability Skills – IV	HSS	0	0	0	0	1
	Professional Ethics and Human Values	HSS					
TOTAL			13	5	4	22	21.5

VII SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191AG7T15	Dairy and Food Engineering	PCC	2	1	0	3	3
191AG7T16	Soil and Water Conservation Engineering	PCC	2	1	0	3	3
----	Professional Elective -IV	PEC	2	1	0	3	3
----	Professional Elective -V	PEC	2	1	0	3	3
----	Open Elective-III	OEC	2	1	0	3	3
191AG7P03	Internship	PRC	0	0	0	0	2
191AG7L12	Dairy and Food Engineering Lab	PCC	0	0	2	2	1
191AG7L13	Soil and Water Conservation Engineering LAB	PCC	0	0	2	2	1
191AG7P04	Project Part 1	PROJ	0	0	4	4	2
TOTAL			10	5	8	23	21

VIII SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
----	Professional Elective -VI	PEC	2	1	0	3	3
----	Open Elective-IV	OEC	2	1	0	3	3
191AG8P05	Project Part 2	PROJ	0	0	14	14	7
TOTAL			4	2	14	20	13

BSC: Basic Sciences Courses; HSMC: Humanities and Social Sciences including Management Courses; ESC: Engineering Sciences Courses; PCC: Professional Core Courses; PEC: Professional Elective Courses; OEC: Open Elective Courses; MC: Mandatory Courses; PROJ: Project.

Sl. No.	Track Title/ Sub Specialization	Professional Elective I	Professional Elective II	Professional Elective III	Professional Elective IV	Professional Elective V	Professional Elective VI
1	Farm Machinery Engineering	Mechanical Measurement and Instrumentation 191AG5E02	Human Engineering and Safety 191AG6E06	Design of Agricultural Machinery 191AG6E07	Soil Dynamics in Tillage and Traction 191AG7E11	Production Technology in Agricultural Machinery 191AG7E15	Hydraulic Devices and Control 191AG8E16
2	Soil Water and Conservation Engineering	Theory of Structures 191AG5E03	Agricultural Structures 191AG6E04	Watershed Planning and Management 191AG6E09	Water Quality and Pollution Control 191AG7E12	Microirrigation Engineering 191AG7E14	Introduction to Remote Sensing and GIS 191AG8E17
3	Agricultural Process and Food Engineering	Engineering Properties of Biological Material 191AG5E01	Agro Industries and By-Product Utilization 191AG6E05	Seed Processing and Storage Engineering 191AG6E08	Food Packaing Technology 191AG7E10	Food Processing Plant Design and Layout 191AG7E13	Novel Technologies for Food Processing and Shelf Life Extension 191AG8E18

Open Elective - I (V Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE5001	Basic Concrete Technology	CE, EEE	CE
2	191EE5001	Electrical Safety	EEE	EEE
3	191EE5002	Electrical Materials	EEE	EEE
4	191EE5003	Basic Electrical Measurements	EEE, ECE	EEE
5	191ME5001	Renewable Energy Sources	CE, EEE, ME, Ag. E	ME
6	191ME5002	Fundamentals of Mechanical Engineering	ME	ME
7	191ME5003	Supply Chain Management	ME	ME
8	191ME5004	3D Printing	ME	ME
9	191ME5005	Entrepreneurship Development and Incubation		ME
10	191EC5001	Signals & Systems	EEE, ECE	ECE
11	191EC5002	Digital Electronics and Logic Design	EEE, ECE, CSE, IT	ECE
12	191EC5003	Semi conductor devices	EEE, ECE	ECE
13	191CS5001	Data Structures	EEE, ECE, CSE, IT	CSE
14	191CS5002	Object Oriented Programming through C++	CSE, IT	CSE
15	191CS5003	Java Programming	CSE, IT	CSE
16	191CS5004	R Programming		CSE
17	191IT5001	Data Base Management Systems	CSE, IT	IT
18	191IT5002	Computer Graphics	CSE, IT	IT
19	191MI5001	Overview of Mining	Min.E	Min.E
20	191PT5001	Process Intensification in Petroleum Industry	PT	PT
21	191PT5002	Fundamentals of Petroleum Industry	PT	PT
22	191AG5001	Basic Crop Production Practices	Ag.E	Ag.E


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Open Elective - II (VI Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE6O02	Disaster Management		CE
2	191EE6O04	Energy Audit and Conservation Management	EEE	EEE
3	191EE6O05	Non Conventional Energy resources	EEE	EEE
4	191EE6O06	Instrumentation	EEE, ECE, Ag. E	EEE
5	191ME6O06	Solar Energy Utilisation	ME, Ag. E	ME
6	191ME6O07	Basic Thermodynamics and Heat Transfer	EEE, ME, PT, Ag.E, Min.E	ME
7	191ME6O08	Introduction to Hydraulics and Pneumatics	CE, ME, PT	ME
8	191ME6O09	3D Printing	ME	ME
9	191ME6O06	Robotics	ME	ME
10	191ME6O11	Management Science	CE, CSE, IT, PT, Min. E	ME
11	191ME6O07	Biomedical Instrumentation		ECE
12	191ME6O08	ECAD Tools	ECE	ECE
13	191CS6O05	Python Programming	EEE, CSE, IT	CSE
14	191CS6O06	Operating Systems	CSE, IT	CSE
15	191CS6O07	Web Technologies	CSE, IT	CSE
16	191CS6O08	Cyber Security	CSE, IT	CSE
17	191CS6O09	AR / VR		CSE
18	191IT6O03	Computer Organization	CSE, IT	IT
19	191IT6O04	AI Tools & Techniques	CSE, IT	IT
20	191IT6O05	Robotic Process Automation	Ag.E	IT
21	191MI6O02	Industrial Safety Practices		Min.E
22	191MI6O03	Electrical Equipment's in Mines		Min.E
23	191PT6O03	Unconventional Hydrocarbon Resources	PT	PT
24	191PT6O04	Asset Management		PT
25	191AG6O02	Weather Forecast in Agriculture		Ag.E
26	191AG6O03	Bio-Energy Systems Design and Applications		Ag.E
27	191ME6O12	Entrepreneurship Development and Incubation		ME

VII SEMESTER

Course Code	Name of the Course	Category	Total number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total hours	
171AG7T18	Micro Irrigation Engineering	PC	3	1	---	4	3
171AG7T19	Farm Machinery and Equipment – II	PC	3	1	---	4	3
171AG7T20	Dairy and Food Engineering	PC	3	1	---	4	3
171ES7T26	Mechanical Measurements and Instrumentation	ES	3	1	---	4	3
---	Professional Elective – IV	PE	3	1	---	4	3
---	Professional Elective – V	PE	3	1	---	4	3
171AG7L06	Farm Machinery Lab – II	PC	---	---	3	3	2
171AG7L07	Dairy and Food Engineering Lab	PC	---	---	3	3	2
171AG7P01	Industry Oriented (Internship) Minor Project	PR	---	---	---	---	1
TOTAL			18	6	6	30	23

VIII SEMESTER

Course Code	Name of the Course	Category	Total number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total hours	
---	Professional Elective - VI	PE	3	1	---	4	3
---	Open Elective	OE	3	1	---	4	3
171AG8P02	Major Project	PR	---	---	---	---	14
TOTAL			6	2	0	8	20

Professional Elective – I (V Semester)

S.No	Course Code	Name of the Course
1	171AG5E01	Agro Industries and Bi-Product Utilization
2	171HS5E01	Managerial Economics and Financial Analysis
3	171AG5E02	Rural Water Supply, Sanitation and Environmental Engineering

Professional Elective – II (VI Semester)

S.No	Course Code	Name of the Course
1	171AG6E03	GIS and Remote Sensing
2	171AG6E04	Human Engineering and Safety
3	171AG6E05	Production Technology of Agricultural Machinery

Professional Elective – III (VI Semester)

S.No	Course Code	Name of the Course
1	171AG6E06	Green House / Poly House Technology
2	171AG6E07	Optimization, Operations Research and Systems Engineering
3	171AG6E08	Industrial Engineering and Management

Professional Elective – IV (VII Semester)

S.No	Course Code	Name of the Course
1	171AG7E09	Seed Processing and Storage Engineering
2	171AG7E10	Food Processing Plant Design and Layout
3	171AG7E11	Food Packaging Technology

Professional Elective – V (VII Semester)

S.No	Course Code	Name of the Course
1	171AG7E12	Aqua Cultural Engineering
2	171AG7E13	Soil Dynamics in Tillage and Traction
3	171AG7E14	Computational Fluid Dynamics

Professional Elective – VI (VIII Semester)

S.No	Course Code	Name of the Course
1	171AG8E15	Hydraulic Devices and Control
2	171AG8E16	Watershed Management
3	171AG8E17	Design of Agricultural Machinery

Open Elective (VIII Semester)

S.No	CourseCode	Name of the Course
1	171AG8O01	Digital Control systems
2	171AG8O02	Industrial Pollution Control Engineering
3	171AG8O03	Mechatronics
4	171AG8O04	Water Resources Systems Planning and Management
5	171CS8O04	Operations Research
6	171AG8O05	Image Processing Techniques

AR 20 COURSE STRUCTURE

PROGRAM STRUCTURE

I SEMESTER

S.No.	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
1.	Communicative English	HSC	Theory	3	0	0	3	3
2.	Differential equations and Linear algebra	BSC	Theory	3	0	0	3	3
3.	Engineering Physics	BSC	Theory	3	0	0	3	3
4.	Essential Electrical and Electronics Engineering	ESC	Theory	3	0	0	3	3
5.	Engineering Graphics	ESC	Theory	1	0	4	5	3
6.	Communicative English Lab	HSC	Lab	0	0	3	3	1.5
7.	Engineering Physics Lab	BSC	Lab	0	0	3	3	1.5
8.	Essential Electrical and Electronics Engineering Lab	ESC	Lab	0	0	3	3	1.5
9.	Environmental Science	MC	Theory	2	0	0	2	0
TOTAL				15	0	13	28	19.5

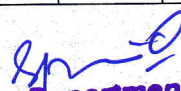
II SEMESTER

S.No.	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
1.	Partial Differential Equations and Vector Calculus	BSC	Theory	3	0	0	3	3
2.	Chemistry of Materials	BSC	Theory	3	0	0	3	3
3.	Engineering Mechanics	ESC	Theory	3	0	0	3	3
4.	Programming for Problem Solving Using C	ESC	Theory	3	0	0	3	3
5.	Engineering Workshop	ESC	Lab	0	0	3	3	1.5
6.	Computer Aided Drafting Lab	ESC	Lab	0	0	3	3	1.5
7.	Professional Communications Skills Lab	HSC	Lab	0	0	3	3	1.5
8.	Engineering Chemistry Lab	BSC	Lab	0	0	3	3	1.5
9.	Programming for Problem Solving Using C Lab	ESC	Lab	0	0	3	3	1.5
10.	Constitution of India	MC	Theory	2	0	0	2	0
TOTAL				14	0	15	29	19.5


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III SEMESTER								
S.N.o	Name of the Course	Course Component	Course Type	Periods/Week				Credits (C)
				Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
1.	Numerical Methods and Integral Transforms	BSC	Theory	3	0	0	3	3
2.	Basic Mechanical Engineering	ESC	Theory	3	0	0	3	3
3.	Mining Geology	PCC	Theory	3	0	0	3	3
4.	Mine Surveying	PCC	Theory	3	0	0	3	3
5.	Development of Mineral Deposits	PCC	Theory	3	0	0	3	3
6.	Geology Lab	PCC	Lab	0	0	3	3	1.5
7.	Basic Mechanical Engineering Lab	PCC	Lab	0	0	3	3	1.5
8.	Mine Surveying Lab -I	PCC	Lab	0	0	3	3	1.5
9.	<u>Skill Oriented Course-I</u> Geo-Statistics through SURPAC	SOC	Project	1	0	2	3	2
10.	Biology for Engineers	MC	Theory	2	0	0	2	0
TOTAL				18	0	13	31	21.5

IV SEMESTER								
S.N.o	Name of the Course	Course Component	Course Type	Periods/Week				Credits (C)
				Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
1.	Complex Variables and Statistical Methods	BSC	Theory	3	0	0	3	3
2.	Fundamentals of Rock Mechanics	PCC	Theory	3	0	0	3	3
3.	Surface Mining	PCC	Theory	3	0	0	3	3
4.	Underground Coal Mining Technology	PCC	Theory	3	0	0	3	3
5.	Managerial Economics and Financial Accountancy	BSC	Theory	3	0	0	3	3
6.	Rock Mechanics Lab	PCC	Lab	0	0	4	4	2
7.	Mine Surveying Lab -II	PCC	Lab	0	0	3	3	1.5
8.	Data Analytics for Mining using Python	SOC	Lab	1	0	2	3	2
9.	Essence of Indian Traditional Knowledge	MC	Theory	2	0	0	2	0
TOTAL				17	0	11	28	20.5


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V SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191MI5T09	Mine Systems Engineering	PCC	3	0	0	3	3
191MI5T10	Underground Metal Mining Technology	PCC	3	0	0	3	3
191MI5T11	Mine Environment & Ventilation Engineering	PCC	3	0	0	3	3
191MI5T12	Mine Machinery	PCC	3	0	0	3	3
----	PE-I	PEC	3	0	0	3	3
----	OE-I	OEC	3	0	0	3	3
191MI5L04	Mine Environment & Ventilation Engineering Lab	PCC	0	0	4	4	2
191HS5T06	Employability Skills – III	HSMC	0	0	2	2	1
191PR5P02	Socially Relevant Project	PROJ	0	0	0	0	1
191MC5A08	Intellectual Property Rights and Patents	MC	2	0	0	2	0
TOTAL			18	0	6	24	22

VI SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191MI6T13	Mineral Processing Technology	PCC	3	0	0	3	3
191MI6T14	Mine Hazards & Rescue	PCC	3	0	0	3	3
191MI6T15	Environmental Management in Mines	PCC	2	0	0	2	2
----	PE-II	PEC	3	0	0	3	3
----	PE-III	PEC	3	0	0	3	3
----	OE-II	OEC	3	0	0	3	3
191MI6L05	Mine Planning & Design Lab	PCC	0	0	4	4	2
191MI6L06	Mineral Processing Lab	PCC	0	0	3	3	1.5
191HS6T07	Employability Skills – IV	HSMC	0	0	2	2	1
191MC6A09	Professional Ethics and Human Values	MC	2	0	0	2	0
TOTAL			17	0	9	26	21.5

VII SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
191MI7T16	Mine Legislation & General Safety	PCC	3	0	0	3	3
191MI7T17	Mineral Economics	PCC	3	0	0	3	3
191MI7T18	Strata Mechanics	PCC	3	0	0	3	3
----	PE-IV	PEC	3	0	0	3	3
----	PE-V	PEC	3	0	0	3	3
----	OE-III	OEC	3	0	0	3	3
191MI7P03	Internship	PROJ	0	0	0	0	2
191MI7P04	Project Part I	PROJ	0	0	0	0	2
TOTAL			6	0	0	18	22

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VIII SEMESTER

Course Code	Name of the Course	Course Component	Periods/Week				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
----	PE-VI (MOOCs)	PEC	3	0	0	3	3
----	OE-IV (MOOCs)	OEC	3	0	0	3	3
191MI8P05	Project Part 2	PROJ	0	0	0	0	7
TOTAL			6	0	0	6	13

BSC: Basic Sciences Courses; HSMC: Humanities and Social Sciences including Management Courses; ESC: Engineering Sciences Courses; PCC: Professional Core Courses; PEC: Professional Elective Courses; OEC: Open Elective Courses; SSC: Self Study Course; MC: Mandatory Courses; PROJ: Project.

PROFESSIONAL ELECTIVES

Professional Elective – I (V Semester)			Professional Elective – II (VI Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	191MI5E02	Environmental Impact Assessment	1	191MI6E06	Mine Health & Safety Engineering
2	191MI5E03	Planning of Underground Coal Mining Project	2	191MI6E07	Planning of Underground Metal Mining Project
3	191MI5E04	Sustainable Mining	3	191MI6E05	Green Mining
4	191MI5E01	Drilling & Blasting	4	191MI6E08	Rock Fragmentation Engineering
Professional Elective – III (VI Semester)			Professional Elective – IV (VII Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	191MI6E10	Environmental Pollution & Control	1	191MI7E16	Safety Practices in Mines
2	191MI6E11	Planning of Surface Mining Project	2	191MI7E14	Planning for Mine Closure & Reclamation
3	191MI6E09	Deep Sea Mining	3	191MI7E13	Geo Spatial Imaging & Geo-informatics
4	191MI6E12	Rock Excavation Engineering	4	191MI7E15	Rock Slope Technology
Professional Elective – V (VII Semester)			Professional Elective – VI (VIII Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	191MI7E18	Industrial Safety	1	191MI8E24	Waste Water Treatment and Recycling
2	191MI7E19	Mine Closure & Reclamation	2	191MI8E21	Advance Surveying Technology
3	191MI7E20	Space Mining Technology	3	191MI8E23	Solar Energy Utilisation
4	191MI7E17	Ground Control	4	191MI8E22	Flow through porous media

OPEN ELECTIVE - I (V Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE5O01	Basic Concrete Technology	CE, EEE	CE
2	191EE5O01	Electrical Safety	EEE	EEE
3	191EE5O02	Electrical Materials	EEE	EEE
4	191EE5O03	Basic Electrical Measurements	EEE, ECE	EEE
5	191EE5O03	Renewable Energy Sources	CE, EEE, ME, Ag. E	ME
6	191ME5O02	Fundamentals of Mechanical Engineering	ME	ME
7	191ME5O03	Supply Chain Management	ME	ME
8	191ME5O04	3D Printing	ME	ME
9	191ME5O05	Entrepreneurship Development and Incubation		ME
10	191EC5O01	Signals & Systems	EEE, ECE	ECE
11	191EC5O02	Digital Electronics and Logic Design	EEE, ECE, CSE, IT	ECE
12	191EC5O03	Semi conductor devices	EEE, ECE	ECE
13	191CS5O01	Data Structures	EEE, ECE, CSE, IT	CSE
14	191CS5O02	Object Oriented Programming through C++	CSE, IT	CSE
15	191CS5O03	Java Programming	CSE, IT	CSE
16	191CS5O04	R Programming		CSE
17	191IT5O01	Data Base Management Systems	CSE, IT	IT
18	191IT5O02	Computer Graphics	CSE, IT	IT
19	191MI5O01	Overview of Mining	Min.E	Min.E
20	191PT5O01	Process Intensification in Petroleum Industry	PT	PT
21	191PT5O02	Fundamentals of Petroleum Industry	PT	PT
22	191AG5O01	Basic Crop Production Practices	Ag.E	Ag.E

OPEN ELECTIVE - II (VI Semester)

S. No	Course Code	Course Name	Not Offered to Branches	Offered By Department
1	191CE6O02	Disaster Management		CE
2	191EE6O04	Energy Audit and Conservation Management	EEE	EEE
3	191EE6O05	Non Conventional Energy resources	EEE	EEE
4	191EE6O06	Instrumentation	EEE, ECE, Ag. E	EEE
5	191ME6O06	Solar Energy Utilisation	ME, Ag. E	ME
6	191ME6O07	Basic Thermodynamics and Heat Transfer	EEE, ME, PT, Ag.E, Min.E	ME
7	191ME6O08	Introduction to Hydraulics and Pneumatics	CE, ME, PT	ME
8	191ME6O09	3D Printing	ME	ME
9	191ME6O10	Robotics	ME	ME
10	191ME6O11	Management Science	CE, CSE, IT, PT, Min. E	ME
11	191ME6O12	Entrepreneurship Development and Incubation		ME
12	191EC6O04	Biomedical Instrumentation		ECE
13	191EC6O05	ECAD Tools	ECE	ECE
14	191CS6O05	Python Programming	EEE, CSE, IT	CSE
15	191CS6O06	Operating Systems	CSE, IT	CSE
16	191CS6O07	Web Technologies	CSE, IT	CSE
17	191CS6O08	Cyber Security	CSE, IT	CSE
18	191CS6O09	AR / VR		CSE
19	191IT6O03	Computer Organization	CSE, IT	IT
20	191IT6O04	AI Tools & Techniques	CSE, IT	IT
21	191IT6O05	Robotic Process Automation		IT
22	191MI6O02	Industrial Safety Practices	Ag.E	Min.E
23	191MI6O03	Electrical Equipment's in Mines		Min.E
24	191PT6O03	Unconventional Hydrocarbon Resources	PT	PT
25	191PT6O04	Asset Management		PT
26	191AG6O02	Weather forecast in Agriculture		Ag.E
27	191AG6O03	Bio-energy systems design and applications		Ag.E

VII SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
171MI7T17	Mine Economics	PC	3	1	0	4	3
171MI7T18	Mine Health and Safety Engineering	PC	3	1	0	4	3
171MI7T19	Mine Legislation and General Safety	PC	3	1	0	4	3
171MI7T20	Mine Management	PC	3	1	0	4	3
---	Professional Elective - IV	PE	3	1	0	4	3
---	Professional Elective - V	PE	3	1	0	4	3
171MI7L07	Mine Planning and Design Lab	PC	0	0	3	3	2
171ES7L16	Mechanical Engineering Lab	ES	0	0	3	3	2
171MI7P01	Industry Oriented (Internship) Minor Project	PR	0	0	0	0	1
TOTAL			18	6	6	30	23

VIII SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
---	Professional Elective - VI	PE	3	1	0	4	3
---	Open Elective	OE	3	1	0	4	3
171MI8P02	Major Project	PR	0	0	0	0	14
TOTAL			6	2	0	8	20


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Professional Elective – I (V Semester)

S.No	Course Code	Name of the Course
1	171MI5E01	Maintenance and Reliability Engineering
2	171MI5E02	Mine Construction and Management
3	171MI5E03	Industrial Management and Labor Relations

Professional Elective – II (VI Semester)

S.No	Course Code	Name of the Course
1	171MI6E04	Advanced Geo Mechanics
2	171MI6E05	Mine Fire and Spontaneous Heating
3	171MI6E06	Mineral Exploration

Professional Elective – III (VI Semester)

S.No	Course Code	Name of the Course
1	171MI6E07	Advance Surveying Technology
2	171MI6E08	Mine Subsidence Engineering
3	171MI6E09	Rock Fragmentation Engineering

Professional Elective – IV (VII Semester)

S.No	Course Code	Name of the Course
1	171MI7E10	Planning of UGMM Project
2	171MI7E11	Planning of UGCM Project
3	171MI7E12	Planning of Surface Mining Project

Professional Elective – V (VII Semester)

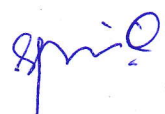
S.No	Course Code	Name of the Course
1	171MI7E13	Mine mechanization
2	171MI7E14	Advance Underground Coal Mining Technology
3	171MI7E15	Mine Blasting operation

Professional Elective – VI (VIII Semester)

S.No	Course Code	Name of the Course
1	171MI8E16	Mine Systems Engineering
2	171MI8E17	Advance Surface Mining Technology
3	171MI8E18	Advanced Underground Metal Mining Technology

Open Elective (VIII Semester)

S.No	CourseCode	Name of the Course
1	171EE8O05	Robotics
2	171MI8O01	Environmental Impact Assessment
3	171MI8O02	Mine Closure and Reclamation
4	171MI8O03	Fundamentals of Communication
5	171MI8O04	Remote Sensing and GIS
6	171MI8O05	Quantitative Decision Making


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PROGRAM STRUCTURE

I SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
192TE1T01	Advanced Fluid Mechanics	PCC	3	0	0	3	3
192TE1T02	Computational Fluid Dynamics	PCC	3	0	0	3	3
---	Professional Elective-I	PEC	3	0	0	3	3
---	Professional Elective-II	PEC	3	0	0	3	3
192HS1T01	Research Methodology and IPR	HSMC	2	0	0	2	2
192TE1L01	Computational Fluid Dynamics Lab-1	PCC	0	0	4	4	2
192TE1L02	Thermal Engineering Lab-1	PCC	0	0	4	4	2
---	Audit Course-1	MC	2	0	0	2	0
TOTAL			16	0	8	24	18

II SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
192TE2T03	Advanced Heat Transfer	PCC	3	0	0	3	3
192TE2T04	Thermal Measurement and Process Controls	PCC	3	0	0	3	3
---	Professional Elective-III	PEC	3	0	0	3	3
---	Professional Elective-IV	PEC	3	0	0	3	3
192TE2L03	Computational Fluid Dynamics Lab-II	PCC	0	0	4	4	2
192TE2L04	Thermal Engineering Lab-II	PCC	0	0	4	4	2
192TE2P01	Mini Project with Seminar	PROJ	2	0	0	2	2
---	Audit Course-2	MC	2	0	0	2	0
TOTAL			16	0	8	24	18

III SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
---	Professional Elective-V	PEC	3	0	0	3	3
---	Open Elective	OEC	3	0	0	3	3
192TE3P02	Dissertation I/ Industrial Project	PROJ	0	0	20	20	0
TOTAL			6	0	20	26	6

IV SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
192TE4P03	Dissertation II	PROJ	0	0	32	32	26
TOTAL			0	0	32	32	26

BSC: Basic Sciences Courses; HSMC: Humanities and Social Sciences including Management Courses; PCC: Professional Core Courses; PEC: Professional Elective Courses; OEC: Open Elective Courses; MC: Mandatory Courses; PROJ: Project.

Audit Course-1 & Audit Course-2 has to be chosen from the following list of courses.

S. No	Course Code		Name of the Course
	I Semester	II Semester	
1	192MC1A01	192MC2A01	English for Research Paper Writing
2	192MC1A02	192MC2A02	Disaster Management
3	192MC1A03	192MC2A03	Sanskrit for Technical Knowledge
4	192MC1A04	192MC2A04	Value Education
5	192MC1A05	192MC2A05	Constitution of India
6	192MC1A06	192MC2A06	Pedagogy Studies
7	192MC1A07	192MC2A07	Stress Management by Yoga
8	192MC1A08	192MC2A08	Personality Development through Life Enlightenment Skills
9	192MC1A09	192MC2A09	Soft Skills

Professional Elective – I (I Semester)			Professional Elective – II (I Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	192TE1E01	Advanced IC Engines, Electric and Hybrid vehicles	1	192TE1E05	Gas Turbines
2	192TE1E02	Gas Dynamics	2	192TE1E06	Alternative Fuel Technologies
3	192TE1E03	Cryogenic Engineering	3	192TE1E07	Energy Conservation and Management
4	192TE1E04	Advanced Thermodynamics	4	192TE1E08	Theory and Technology of Fuel Cells
Professional Elective – III (II Semester)			Professional Elective – IV (II Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	192TE2E09	Equipment Design for Thermal Systems	1	192TE2E13	Jet Propulsion and Rocket Engineering
2	192TE2E10	Solar Energy Technologies	2	192TE2E14	Automotive Engineering
3	192TE2E11	Advanced Power Plant Engineering	3	192TE2E15	Modeling and I.C. Engines
4	192TE2E12	Combustion, Emissions and Environment	4	192TE2E16	Renewable Energy Technologies
Professional Elective – V (III Semester)			Open Elective (III Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	192TE1E17	Optimization Techniques and Applications	1	----	MOOCs-II#
2	192TE1E18	Design and Analysis of Experiments	2	----	Courses offered by other Departments in the College
3	192TE1E19	Convective Heat Transfer			
4	192TE1E20	Waste to Energy			
5	-----	MOOCs-I*			

*MOOCs-I: A student should select a 12 weeks course which is not opted/ studied earlier.

#MOOCs-II: A student should select a 12 weeks course in Engineering/ Management/ Mathematics offered by other than parent department.



Open Elective – Courses offered by Departments

S. No	Course Code	Name of the Course	Not offered to the students of the following M. Tech Specializations	Offered by Dept.
1.	192ST3O01	Repair & Rehabilitation of Structures	ST	CE
2.	192ST3O02	Green Building Systems	ST	CE
3.	192ST3O03	Basic Concrete Technology	ST	CE
4.	192ST3O04	Basic Foundation Engineering	ST	CE
5.	192PD3O01	Renewable Energy Technologies	PED	EEE
6.	192PD3O02	Hybrid Electric Vehicles	PED	EEE
7.	192PD3O03	Energy Audit and conservation Management	PED	EEE
8.	192PD3O04	Neural Networks and Fuzzy Logic	PED	EEE
9.	192PD3O05	Industrial Safety	PED	EEE
10.	192PD3O06	Composite Materials	PED	EEE
11.	192TE3O01	Energy Systems	TE	ME
12.	192TE3O02	Fuels and Combustion	TE	ME
13.	192TE3O03	Green Engineering Technology	ST, TE	ME
14.	192TE3O04	IC Engines	TE	ME
15.	192TE3O05	Automotive Technology	TE	ME
16.	192ES3O01	Embedded System Design	ES	ECE
17.	192ES3O02	Digital System Design	VLSID	ECE
18.	192ES3O03	Programming Languages for Embedded Systems	ES	ECE
19.	192ES3O04	Sensors & Actuators	ES	ECE
20.	192VD3O01	Physical Design Automation	VLSID	ECE
21.	192VD3O02	VLSI Technology	VLSID	ECE
22.	192VD3O03	Nano-electronics	VLSID	ECE
23.	192CS3O01	Python Programming (CSE)	CSE, SE	CSE
24.	192CS3O02	Principles of Cyber Security	CSE	CSE
25.	192CS3O03	Internet of Things	CSE, SE	CSE
26.	192CS3O04	Machine Learning	CSE, SE	CSE
27.	192CS3O05	Artificial Intelligence	SE	IT
28.	192CS3O06	Deep Learning	CSE, SE	IT
29.	192PE3O01	Introduction to Petroleum Engineering	PE	PT
30.	192PE3O02	Process Intensification	PE	PT
31.	192PE3O03	Fundamentals of Liquefied Natural Gas	PE	PT
32.	192PE3O04	Subsea Engineering	PE	PT
33.	192PE3O05	Geology	PE, ST	PT
34.	192PE3O06	HSE in Petroleum Industry	PE	PT



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...and to break
...the way to the future
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PROGRAM STRUCTURE

I SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
192PD1T01	Electrical Machine Modeling and Analysis	PCC	3	0	0	3	3
192PD1T02	Analysis of Power Electronic Converters	PCC	3	0	0	3	3
----	Professional Elective – I	PEC	3	0	0	3	3
----	Professional Elective – II	PEC	3	0	0	3	3
192HS1T01	Research Methodology and IPR	HSMC	2	0	0	2	2
192PD1L01	Power Electronics Simulation Laboratory	PCC	0	0	4	4	2
192PD1L02	Power Converters Laboratory	PCC	0	0	4	4	2
----	Audit Course – 1		2	0	0	2	0
TOTAL			16	0	08	24	18

Professional Elective – I (I Semester)	
Course Code	Name of the Course
192PD1E01	Modern Control Theory
192PD1E02	Power Quality and Custom Power Devices
192PD1E03	Programmable Logic Controllers & Applications

Professional Elective – II (I Semester)		
S.No	Course Code	Name of the Course
1	192PD1E04	Artificial Intelligence Techniques
2	192PD1E05	Renewable Energy Technologies
3	192PD1E06	HVDC Transmission and Flexible AC Transmission Systems

S.No	Course Code		Name of the Course
	I Semester	II Semester	
01	192MC1A01	192MC2A01	English for Research Paper Writing
02	192MC1A02	192MC2A02	Disaster Management
03	192MC1A03	192MC2A03	Sanskrit for Technical Knowledge
04	192MC1A04	192MC2A04	Value Education
05	192MC1A05	192MC2A05	Constitution of India
06	192MC1A06	192MC2A06	Pedagogy Studies
07	192MC1A07	192MC2A07	Stress Management by Yoga
08	192MC1A08	192MC2A08	Personality Development through Life Enlightenment Skills
09	192MC1A09	192MC2A09	Soft Skills


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II SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
192PD2T03	Switched Mode Power Conversion	PCC	3	0	0	3	3
192PD2T04	Power Electronic Control of Electrical Drives	PCC	3	0	0	3	3
----	Professional Elective – III	PEC	3	0	0	3	3
----	Professional Elective – IV	PEC	3	0	0	3	3
192PD2L03	Electric Drives Simulation Laboratory	PCC	0	0	4	4	2
192PD2L04	Electric Drives Laboratory	PCC	0	0	4	4	2
192PD2P01	Mini Project with Seminar	PROJ	0	0	4	4	2
----	Audit Course – 2	----	2	0	0	2	0
TOTAL			14	0	12	26	18

Professional Elective – III (II Semester)	
Course Code	Name of the Course
192PD2E07	Control & Integration of Renewable Energy Systems
192PD2E08	Hybrid Electric Vehicles
192PD2E09	Digital Control Systems

Professional Elective – IV (II Semester)	
Course Code	Name of the Course
192PD2E10	Advanced Digital Signal Processing
192PD2E11	Applications of Power Converters
192PD2E12	Microcontrollers

S.No	Course Code		Name of the Course
	I Semester	II Semester	
01	192MC1A01	192MC2A01	English for Research Paper Writing
02	192MC1A02	192MC2A02	Disaster Management
03	192MC1A03	192MC2A03	Sanskrit for Technical Knowledge
04	192MC1A04	192MC2A04	Value Education
05	192MC1A05	192MC2A05	Constitution of India
06	192MC1A06	192MC2A06	Pedagogy Studies
07	192MC1A07	192MC2A07	Stress Management by Yoga
08	192MC1A08	192MC2A08	Personality Development through Life Enlightenment Skills
09	192MC1A09	192MC2A09	Soft Skills


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III SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
----	Professional Elective – V	PEC	3	0	0	3	3
----	Open Elective	OEC	3	0	0	3	3
192PD3P02	Dissertation I/ Industrial Project	----	0	0	20	20	0
TOTAL			6	0	20	26	6

Professional Elective – V (III Semester)	
Course Code	Name of the Course
192PD3E13	Digital Signal Processing Controlled Drives
192PD3E14	Smart Grid Technologies
192PD3E15	Modeling & Simulation of Power Electronic Systems
----	MOOCs-I *

Open Elective (III Semester)	
Course Code	Name of the Course
---	MOOCs- II #
---	Courses offered by other departments in the college


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 Dept: Of Electrical & Electronics Engineering
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Open Elective – Courses offered by Departments

S. No	Course Code	Name of the Course	Not offered to the students of the following M.Tech Specializations	Offered by Dept.
1.	192ST3O01	Repair & Rehabilitation of Structures	ST	CE
2.	192ST3O02	Green Building Systems	ST	CE
3.	192ST3O03	Basic Concrete Technology	ST	CE
4.	192ST3O04	Basic Foundation Engineering	ST	CE
5.	192PD3O01	Renewable Energy Technologies	PED	EEE
6.	192PD3O02	Hybrid Electric Vehicles	PED	EEE
7.	192PD3O03	Energy Audit and conservation Management	PED	EEE
8.	192PD3O04	Neural Networks and Fuzzy Logic	PED	EEE
9.	192PD3O05	Industrial Safety	PED	EEE
10.	192PD3O06	Composite Materials	PED	EEE
11.	192TE3O01	Energy Systems	TE	ME
12.	192TE3O02	Fuels and Combustion	TE	ME
13.	192TE3O03	Green Engineering Technology	ST,TE	ME
14.	192TE3O04	IC Engines	TE	ME
15.	192TE3O05	Automotive Technology	TE	ME
16.	192ES3O01	Embedded System Design	ES	ECE
17.	192ES3O02	Digital System Design	VLSID	ECE
18.	192ES3O03	Programming Languages for Embedded Systems	ES	ECE
19.	192ES3O04	Sensors & Actuators	ES	ECE
20.	192VD3O01	Physical Design Automation	VLSID	ECE
21.	192VD3O02	VLSI Technology	VLSID	ECE
22.	192VD3O03	Nano-electronics	VLSID	ECE
23.	192CS3O01	Python Programming (CSE)	CSE, SE	CSE
24.	192CS3O02	Principles of Cyber Security	CSE	CSE
25.	192CS3O03	Internet of Things	CSE, SE	CSE
26.	192CS3O04	Machine Learning	CSE, SE	CSE
27.	192CS3O05	Artificial Intelligence	SE	IT
28.	192CS3O06	Deep Learning	CSE, SE	IT
29.	192PE3O01	Introduction to Petroleum Engineering	PE	PT
30.	192PE3O02	Process Intensification	PE	PT
31.	192PE3O03	Fundamentals of Liquefied Natural Gas	PE	PT
32.	192PE3O04	Subsea Engineering	PE	PT
33.	192PE3O05	Geology	PE, ST	PT
34.	192PE3O06	HSE in Petroleum Industry	PE	PT


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IV SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
192PD4P03	Dissertation II	PROJ	0	0	32	32	26
TOTAL			0	0	32	32	26


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PROGRAM STRUCTURE

I SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
192CS1T01	Mathematical Foundations of Computer Science	BSC	3	0	0	3	3
192CS1T02	Advanced Data Structures & Algorithms	PCC	3	0	0	3	3
---	Professional Elective-I	PEC	3	0	0	3	3
---	Professional Elective-II	PEC	3	0	0	3	3
192HS1T01	Research Methodology and IPR	HSMC	2	0	0	2	2
192CS1L01	Advanced Data Structures & Algorithms Lab	PCC	0	0	4	4	2
192CS1L02	Advanced Computing Lab	PCC	0	0	4	4	2
---	Audit Course-1	MC	2	0	0	2	0
TOTAL			16	0	8	24	18

II SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
192CS2T03	Machine learning	PCC	3	0	0	3	3
192CS2T04	MEAN Stack Technologies	PCC	3	0	0	3	3
---	Professional Elective- III	PEC	3	0	0	3	3
---	Professional Elective- IV	PEC	3	0	0	3	3
192CS2L03	Machine Learning with Python lab	PCC	0	0	4	4	2
192CS2L04	MEAN Stack Technologies Lab	PCC	0	0	4	4	2
192CS2P01	Mini Project with Seminar	PROJ	2	0	0	2	2
---	Audit Course-2	MC	2	0	0	2	0
TOTAL			16	0	8	22	18

III SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
---	Professional Elective-V	PEC	3	0	0	3	3
---	Open Elective	OEC	3	0	0	3	3
192CS3P02	Dissertation-I/ Industrial Project	PROJ	0	0	20	20	0
TOTAL			6	0	20	26	6

IV SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
192CS4P03	Dissertation-II	PROJ	0	0	32	32	26
TOTAL			0	0	32	32	26

BSC: Basic Sciences Courses; HSMC: Humanities and Social Sciences including Management Courses; PCC: Professional Core Courses; PEC: Professional Elective Courses; OEC: Open Elective Courses; MC: Mandatory Courses; PROJ: Project.

Audit Course -1 & Audit Course -2 has to be chosen from the following list of courses.

S. No	Course Code		Name of the Course
	I Semester	II Semester	
01	192MC1A01	192MC2A01	English for Research Paper Writing
02	192MC1A02	192MC2A02	Disaster Management
03	192MC1A03	192MC2A03	Sanskrit for Technical Knowledge
04	192MC1A04	192MC2A04	Value Education
05	192MC1A05	192MC2A05	Constitution of India
06	192MC1A06	192MC2A06	Pedagogy Studies
07	192MC1A07	192MC2A07	Stress Management by Yoga
08	192MC1A08	192MC2A08	Personality Development through Life Enlightenment Skills
09	192MC1A09	192MC2A09	Soft Skills

Professional Elective – I (I Semester)			Professional Elective – II (I Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	192CS1E01	Big Data Analytics	1	192CS1E04	Advanced Computer Networks
2	192CS1E02	Digital Image Processing	2	192CS1E05	Internet of Things
3	192CS1E03	Advanced Operating Systems	3	192CS1E06	Object Oriented Software Engineering
Professional Elective – III (II Semester)			Professional Elective – IV (II Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	192CS2E07	Advanced Databases and Mining	1	192CS2E10	Cloud Computing
2	192CS2E08	Ad Hoc & Sensor Networks	2	192CS2E11	Principles of computer security
3	192CS2E09	Soft Computing	3	192CS2E12	High Performance Computing
Professional Elective – V (III Semester)			Open Elective (III Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	192CS3E13	Deep Learning	1	---	MOOCs- II #
2	192CS3E14	Social Network Analysis	2	---	Courses offered by other departments in the college
3	---	MOOCs - I*			

***MOOCS- I:** A student should select a 12 weeks course which is not opted/ studied earlier.

MOOCS-II: A student should select a 12 weeks course in Engineering/ Management/ Mathematics offered by other than parent department

Open Elective – Courses offered by Departments

S. No	Course Code	Name of the Course	Not offered to the students of the following M. Tech Specializations	Offered by Dept.
1.	192ST3O01	Repair & Rehabilitation of Structures	ST	CE
2.	192ST3O02	Green Building Systems	ST	CE
3.	192ST3O03	Basic Concrete Technology	ST	CE
4.	192ST3O04	Basic Foundation Engineering	ST	CE
5.	192PD3O01	Renewable Energy Technologies	PED	EEE
6.	192PD3O02	Hybrid Electric Vehicles	PED	EEE
7.	192PD3O03	Energy Audit and conservation Management	PED	EEE
8.	192PD3O04	Neural Networks and Fuzzy Logic	PED	EEE
9.	192PD3O05	Industrial Safety	PED	EEE
10.	192PD3O06	Composite Materials	PED	EEE
11.	192TE3O01	Energy Systems	TE	ME
12.	192TE3O02	Fuels and Combustion	TE	ME
13.	192TE3O03	Green Engineering Technology	ST, TE	ME
14.	192TE3O04	IC Engines	TE	ME
15.	192TE3O05	Automotive Technology	TE	ME
16.	192ES3O01	Embedded System Design	ES	ECE
17.	192ES3O02	Digital System Design	VLSID	ECE
18.	192ES3O03	Programming Languages for Embedded Systems	ES	ECE
19.	192ES3O04	Sensors & Actuators	ES	ECE
20.	192VD3O01	Physical Design Automation	VLSID	ECE
21.	192VD3O02	VLSI Technology	VLSID	ECE
22.	192VD3O03	Nano-electronics	VLSID	ECE
23.	192CS3O01	Python Programming (CSE)	CSE, SE	CSE
24.	192CS3O02	Principles of Cyber Security	CSE	CSE
25.	192CS3O03	Internet of Things	CSE, SE	CSE
26.	192CS3O04	Machine Learning	CSE, SE	CSE
27.	192CS3O05	Artificial Intelligence	SE	IT
28.	192CS3O06	Deep Learning	CSE, SE	IT
29.	192PE3O01	Introduction to Petroleum Engineering	PE	PT
30.	192PE3O02	Process Intensification	PE	PT
31.	192PE3O03	Fundamentals of Liquefied Natural Gas	PE	PT
32.	192PE3O04	Subsea Engineering	PE	PT
33.	192PE3O05	Geology	PE, ST	PT
34.	192PE3O06	HSE in Petroleum Industry	PE	PT

PROGRAM STRUCTURE

I SEMESTER

Course Code	Course Title	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
192VD1T01	CMOS Analog IC Design	PCC	3	0	0	3	3
192VD1T02	CMOS Digital IC design	PCC	3	0	0	3	3
---	Professional Elective – I	PEC	3	0	0	3	3
---	Professional Elective - II	PEC	3	0	0	3	3
192HS1T01	Research methodology and IPR	HSMC	2	0	0	2	2
192VD1L01	CMOS Analog IC Design Lab	PCC	0	0	4	4	2
192VD1L02	CMOS Digital IC Design Lab	PCC	0	0	4	4	2
---	Audit course-1	MC	2	0	0	2	0
TOTAL			16	0	8	24	18

II SEMESTER

Course Code	Course Title	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
192VD2T03	Mixed Signal & RF IC Design	PCC	3	0	0	3	3
192VD2T04	Physical Design Automation	PCC	3	0	0	3	3
---	Professional Elective – III	PEC	3	0	0	3	3
---	Professional Elective - IV	PEC	3	0	0	3	3
192VD2L03	Mixed Signal IC Design Lab	PCC	0	0	4	4	2
192VD2L04	Physical Design Automation Lab	PCC	0	0	4	4	2
192VD2P01	Mini Project with Seminar	PROJ	0	0	4	4	2
---	Audit Course – 2	MC	2	0	0	2	0
TOTAL			14	0	12	26	18

III SEMESTER

Course Code	Course Title	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
---	Professional Elective - V	PEC	3	0	0	3	3
---	Open Elective	OEC	3	0	0	3	3
192VD3P03	Dissertation-I/ Industrial Project	PROJ	0	0	20	20	0
TOTAL			3	0	20	26	06

IV SEMESTER

Course Code	Course Title	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
192VD4P04	Dissertation-II	PROJ	0	0	32	32	26
TOTAL			0	0	32	32	26

BSC: Basic Sciences Courses; HSMC: Humanities and Social Sciences including Management Courses; PCC: Professional Core Courses; PEC: Professional Elective Courses; OEC: Open Elective Courses; MC: Mandatory Courses; PROJ: Project.

Audit Course -1 & Audit Course -2 has to be chosen from the following list of courses.

S. No	Course Code		Name of the Course
	I Semester	II Semester	
1	192MC1A01	192MC2A01	English for Research Paper Writing
2	192MC1A02	192MC2A02	Disaster Management
3	192MC1A03	192MC2A03	Sanskrit for Technical Knowledge
4	192MC1A04	192MC2A04	Value Education
5	192MC1A05	192MC2A05	Constitution of India
6	192MC1A06	192MC2A06	Pedagogy Studies
7	192MC1A07	192MC2A07	Stress Management by Yoga
8	192MC1A08	192MC2A08	Personality Development through Life Enlightenment Skills
9	192MC1A09	192MC2A09	Soft Skills

Professional Elective – I (I Semester)			Professional Elective – II (I Semester)		
S. No	Course Code	Name of the Course	S. No	Course Code	Name of the Course
1	192VD1E01	VLSI Technology	1	192VD1E04	Device Modelling
2	192VD1E02	Nano materials and Nanotechnology	2	192VD1E05	Nano-Electronics
3	192VD1E03	MEMS Technology	3	192VD1E06	Photonics
Professional Elective – III (II Semester)			Professional Elective – IV (II Semester)		
S. No	Course Code	Name of the Course	S. No	Course Code	Name of the Course
1	192VD2E07	Design For Testability	1	192VD2E10	Microcontrollers & programmable Digital Signal Processors
2	192VD2E08	IoT & Its Applications	2	192EM2E11	Network Security & Cryptography
3	192VD2E09	VLSI Signal Processing	3	192VD2E11	Low Power VLSI Design
Professional Elective – V (III Semester)			Open Elective (III Semester)		
S. No	Course Code	Name of the Course	S. No	Course Code	Name of the Course
1	192VD3E12	Scripting Languages for VLSI	1	---	MOOCs- II #
2	192VD3E13	Digital System Design & Verification	2	---	Courses offered by other departments in the college
3	192EM3E14	Hardware Software co-design			
4	---	MOOCs - I*			

*MOOCS- I: A student should select a 12 weeks course which is not opted/ studied earlier.

MOOCS- II: A student should select a 12 weeks course in Engineering/ Management/ Mathematics offered by other than parent department.

Open Elective – Courses offered by Departments

S. No	Course Code	Name of the Course	Not offered to the students of the following M.Tech Specializations	Offered by Dept.
1.	192ST3O01	Repair & Rehabilitation of Structures	ST	CE
2.	192ST3O02	Green Building Systems	ST	CE
3.	192ST3O03	Basic Concrete Technology	ST	CE
4.	192ST3O04	Basic Foundation Engineering	ST	CE
5.	192PD3O01	Renewable Energy Technologies	PED	EEE
6.	192PD3O02	Hybrid Electric Vehicles	PED	EEE
7.	192PD3O03	Energy Audit and conservation Management	PED	EEE
8.	192PD3O04	Neural Networks and Fuzzy Logic	PED	EEE
9.	192PD3O05	Industrial Safety	PED	EEE
10.	192PD3O06	Composite Materials	PED	EEE
11.	192TE3O01	Energy Systems	TE	ME
12.	192TE3O02	Fuels and Combustion	TE	ME
13.	192TE3O03	Green Engineering Technology	ST,TE	ME
14.	192TE3O04	IC Engines	TE	ME
15.	192TE3O05	Automotive Technology	TE	ME
16.	192ES3O01	Embedded System Design	ES	ECE
17.	192ES3O02	Digital System Design	VLSID	ECE
18.	192ES3O03	Programming Languages for Embedded Systems	ES	ECE
19.	192ES3O04	Sensors & Actuators	ES	ECE
20.	192VD3O01	Physical Design Automation	VLSID	ECE
21.	192VD3O02	VLSI Technology	VLSID	ECE
22.	192VD3O03	Nano-electronics	VLSID	ECE
23.	192CS3O01	Python Programming (CSE)	CSE, SE	CSE
24.	192CS3O02	Principles of Cyber Security	CSE	CSE
25.	192CS3O03	Internet of Things	CSE, SE	CSE
26.	192CS3O04	Machine Learning	CSE, SE	CSE
27.	192CS3O05	Artificial Intelligence	SE	IT
28.	192CS3O06	Deep Learning	CSE, SE	IT
29.	192PE3O01	Introduction to Petroleum Engineering	PE	PT
30.	192PE3O02	Process Intensification	PE	PT
31.	192PE3O03	Fundamentals of Liquefied Natural Gas	PE	PT
32.	192PE3O04	Subsea Engineering	PE	PT
33.	192PE3O05	Geology	PE, ST	PT
34.	192PE3O06	HSE in Petroleum Industry	PE	PT

PROGRAM STRUCTURE

I SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
192ST1T01	Theory of Elasticity	PCC	3	0	0	3	3
192ST1T02	Structural Dynamics	PCC	3	0	0	3	3
192ST1T03	Advanced Concrete Technology	PCC	2	0	0	2	2
---	Professional Elective-1	PEC	3	0	0	3	3
---	Professional Elective-2	PEC	3	0	0	3	3
192ST1L01	Advanced Concrete Technology Laboratory	PCC	2	0	4	6	2
192ST1L02	Advanced Structural Engineering Laboratory	PCC	0	0	4	4	2
---	Audit Course-1	MC	2	0	0	0	0
TOTAL			18	0	8	24	18

II SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
192ST2T04	Finite Element Methods in Structural Engineering	PCC	3	0	0	3	3
192ST2T05	Theory of Plates and Shells	PCC	3	0	0	3	3
---	Professional Elective-III	PEC	3	0	0	3	3
---	Professional Elective-IV	PEC	3	0	0	3	3
192ST2L03	Computer Aided Design Laboratory	PCC	0	0	4	4	2
192ST2L04	Structural Design laboratory	PCC	0	0	4	4	2
192ST2P01	Mini Project With Seminar	PROJ	0	0	4	4	2
---	Audit Course-2	MC	2	0	0	2	0
TOTAL			14	0	12	26	18

III SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
---	Professional Elective-V	PEC	3	0	0	3	3
---	Open Elective	OEC	3	0	0	3	3
192ST3P02	Dissertation-I/ Industrial Project	PROJ	0	0	20	20	0
TOTAL			6	2	20	26	6

IV SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
192ST4P03	Dissertation – II	PROJ	0	0	32	32	26
TOTAL			0	0	32	32	26

BSC: Basic Sciences Courses; HSMC: Humanities and Social Sciences including Management Courses; PCC: Professional Core Courses; PEC: Professional Elective Courses; OEC: Open Elective Courses; MC: Mandatory Courses; PROJ: Project.

Audit Course-1 & Audit Course-2 has to be chosen from the following list of courses.

S.No	Course Code		Name of the Course
	I Semester	II Semester	
01	192MC1A01	192MC2A01	English for Research Paper Writing
02	192MC1A02	192MC2A02	Disaster Management
03	192MC1A03	192MC2A03	Sanskrit for Technical Knowledge
04	192MC1A04	192MC2A04	Value Education
05	192MC1A05	192MC2A05	Constitution of India
06	192MC1A06	192MC2A06	Pedagogy Studies
07	192MC1A07	192MC2A07	Stress Management by Yoga
08	192MC1A08	192MC2A08	Personality Development through Life Enlightenment Skills
09	192MC1A09	192MC2A09	Soft Skills

Professional Elective – I (I Semester)			Professional Elective – II (I Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	192ST1E01	Matrix Analysis of Structures	1	192ST1E04	Bridge Engineering
2	192ST1E02	Analytical & Numerical Methods for Structural Engineering	2	192ST1E05	Repair and Rehabilitation of Structures
3	192ST1E03	Design of RCC Foundations	3	192ST1E06	Advanced Reinforced Concrete Design
Professional Elective – III (II Semester)			Professional Elective – IV (II Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	192ST2E07	Stability of Structures	1	192ST2E10	Earthquake Resistant Design of Buildings
2	192ST2E08	Advanced Steel Design	2	192ST2E11	Precast and Prefabricated Structures
3	192ST2E09	Analysis of Offshore Structures	3	192ST2E12	Earth Retaining Structures
Professional Elective – V (III Semester)			Open Elective (III Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	192ST3E13	Design of Pre-stressed Concrete structures	1	---	MOOCs-II #
2	192ST3E14	Structural Health Monitoring	2	---	Courses offered by other departments in the college
3	192ST3E15	Industrial Structures			
4	192STMOOC1	MOOCs-I*			

*MOOCs- I: A student should select a 12 weeks course which is not opted/ studied earlier.

MOOCs- II: A student should select a 12 weeks course in Engineering/ Management/ Mathematics offered by other than parent department.

Open Elective – Courses offered by Departments

S. No	Course Code	Name of the Course	Not offered to the students of the following M. Tech Specializations	Offered by Dept.
1.	192ST3O01	Repair & Rehabilitation of Structures	ST	CE
2.	192ST3O02	Green Building Systems	ST	CE
3.	192ST3O03	Basic Concrete Technology	ST	CE
4.	192ST3O04	Basic Foundation Engineering	ST	CE
5.	192PD3O01	Renewable Energy Technologies	PED	EEE
6.	192PD3O02	Hybrid Electric Vehicles	PED	EEE
7.	192PD3O03	Energy Audit and conservation Management	PED	EEE
8.	192PD3O04	Neural Networks and Fuzzy Logic	PED	EEE
9.	192PD3O05	Industrial Safety	PED	EEE
10.	192PD3O06	Composite Materials	PED	EEE
11.	192TE3O01	Energy Systems	TE	ME
12.	192TE3O02	Fuels and Combustion	TE	ME
13.	192TE3O03	Green Engineering Technology	ST, TE	ME
14.	192TE3O04	IC Engines	TE	ME
15.	192TE3O05	Automotive Technology	TE	ME
16.	192ES3O01	Embedded System Design	ES	ECE
17.	192ES3O02	Digital System Design	VLSID	ECE
18.	192ES3O03	Programming Languages for Embedded Systems	ES	ECE
19.	192ES3O04	Sensors & Actuators	ES	ECE
20.	192VD3O01	Physical Design Automation	VLSID	ECE
21.	192VD3O02	VLSI Technology	VLSID	ECE
22.	192VD3O03	Nano-electronics	VLSID	ECE
23.	192CS3O01	Python Programming (CSE)	CSE, SE	CSE
24.	192CS3O02	Principles of Cyber Security	CSE	CSE
25.	192CS3O03	Internet of Things	CSE, SE	CSE
26.	192CS3O04	Machine Learning	CSE, SE	CSE
27.	192CS3O05	Artificial Intelligence	SE	IT
28.	192CS3O06	Deep Learning	CSE, SE	IT
29.	192PE3O01	Introduction to Petroleum Engineering	PE	PT
30.	192PE3O02	Process Intensification	PE	PT
31.	192PE3O03	Fundamentals of Liquefied Natural Gas	PE	PT
32.	192PE3O04	Subsea Engineering	PE	PT
33.	192PE3O05	Geology	PE, ST	PT
34.	192PE3O06	HSE in Petroleum Industry	PE	PT

PROGRAM STRUCTURE

I SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
192PE1T01	Offshore Drilling.	PCC	3	0	0	3	3
192PE1T02	Fundamentals of Petroleum Geology and Reservoir Engineering. (NON-PE stream)						
192PE1T03	Reservoir Stimulation (PE stream)	PCC	3	0	0	3	3
192PE1T04	Petroleum Well Drilling and Production Engineering. (NON-PE stream)						
---	Professional Elective – I	PEC	3	0	0	3	3
---	Professional Elective – II	PEC	3	0	0	3	3
192HS1T01	Research Methodology and IPR	HSMC	2	0	0	2	2
192PE1L01	Advanced Numerical Methods and Applied Statistics Laboratory (MATLAB Based)	PCC	0	0	4	4	2
192PE1L02	Drilling Simulation Laboratory	PCC	0	0	4	4	2
---	Audit Course 1	MC	2	0	0	2	0
TOTAL			16	0	8	24	18

II SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
192PE2T05	Artificial Lift Techniques	PCC	3	0	0	3	3
192PE2T06	Reservoir Modeling & Simulation	PCC	3	0	0	3	3
---	Professional Elective – III	PEC	3	0	0	3	3
---	Professional Elective – IV	PEC	3	0	0	3	3
192PE2L03	Reservoir Simulation Laboratory	PCC	0	0	4	4	2
192PE2L04	Flow Assurance Laboratory	PCC	0	0	4	4	2
192PE2P01	Mini Project with Seminar	PROJ	2	-	-	2	2
---	Audit Course 2	MC	2	0	0	2	0
TOTAL			16	0	8	24	18

III SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
---	Professional Elective -V	PEC	3	0	0	3	3
---	Open Elective	OEC	3	0	0	3	3
192PE3P02	Dissertation-I/ Industrial Project	PROJ	0	0	20	20	0
TOTAL			6	0	20	26	6

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IV SEMESTER

Course Code	Name of the Course	Course Component	Total Number of contact hours				Credits (C)
			Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
192PE4P03	Dissertation-II	PROJ	0	0	32	32	26
TOTAL			0	0	32	32	26

BSC: Basic Sciences Courses; HSMC: Humanities and Social Sciences including Management Courses; PCC: Professional Core Courses; PEC: Professional Elective Courses; OEC: Open Elective Courses; MC: Mandatory Courses; PROJ: Project.

Audit Course-1 & Audit Course-2 has to be chosen from the following list of courses.

S. No	Course Code		Name of the Course
	I Semester	II Semester	
1	192MC1A01	192MC2A01	English for Research Paper Writing
2	192MC1A02	192MC2A02	Disaster Management
3	192MC1A03	192MC2A03	Sanskrit for Technical Knowledge
4	192MC1A04	192MC2A04	Value Education
5	192MC1A05	192MC2A05	Constitution of India
6	192MC1A06	192MC2A06	Pedagogy Studies
7	192MC1A07	192MC2A07	Stress Management by Yoga
8	192MC1A08	192MC2A08	Personality Development through Life Enlightenment Skills
9	192MC1A09	192MC2A09	Soft Skills

Professional Elective – I (I Semester)			Professional Elective – II (I Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	192PE1E01	Advanced Numerical Methods and Applied Statistics	1	192PE1E03	Transportation of Oil and Gas
2	192PE1E02	CBM& Shale Gas Engineering	2	192PE1E04	Advanced Well Logging Techniques & Well Testing Analysis
Professional Elective – III (II Semester)			Professional Elective – IV (II Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	192PE2E05	Advanced EOR Techniques	1	192PE2E07	Flow Assurance
2	192PE2E06	Advanced Well Completions	2	192PE2E08	Advanced Horizontal Well Technology
Professional Elective – V (III Semester)			Open Elective (III Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	---	MOOCs-I*	1	---	MOOCs- II #
			2	---	Courses offered by other departments in the college

*MOOCs- I: A student should select a 12 weeks course which is not opted/ studied earlier.

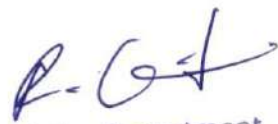
MOOCs- II: A student should select a 12 weeks course in Engineering/ Management/ Mathematics offered by other than parent department.

Aditya Engineering College (A)

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Professional Elective – V (III Semester) (MOOCS-I)		
S. No	Course Code	Name of the Course
1	---	Remote Sensing Essentials.
2	---	Geomorphology.
3	---	Environmental Remediation of Contaminated Sites.
4	---	Membrane Technology.
5	---	Offshore Structures Under Special Environmental Loads Including Fire Resistance.
6	---	Non-Conventional Energy Resources.


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Open Elective – Courses offered by Departments

S. No	Course Code	Name of the Course	Not offered to the students of the following M. Tech Specializations	Offered by Dept.
1.	192ST3O01	Repair & Rehabilitation of Structures	ST	CE
2.	192ST3O02	Green Building Systems	ST	CE
3.	192ST3O03	Basic Concrete Technology	ST	CE
4.	192ST3O04	Basic Foundation Engineering	ST	CE
5.	192PD3O01	Renewable Energy Technologies	PED	EEE
6.	192PD3O02	Hybrid Electric Vehicles	PED	EEE
7.	192PD3O03	Energy Audit and conservation Management	PED	EEE
8.	192PD3O04	Neural Networks and Fuzzy Logic	PED	EEE
9.	192PD3O05	Industrial Safety	PED	EEE
10.	192PD3O06	Composite Materials	PED	EEE
11.	192TE3O01	Energy Systems	TE	ME
12.	192TE3O02	Fuels and Combustion	TE	ME
13.	192TE3O03	Green Engineering Technology	ST, TE	ME
14.	192TE3O04	IC Engines	TE	ME
15.	192TE3O05	Automotive Technology	TE	ME
16.	192ES3O01	Embedded System Design	ES	ECE
17.	192ES3O02	Digital System Design	VLSID	ECE
18.	192ES3O03	Programming Languages for Embedded Systems	ES	ECE
19.	192ES3O04	Sensors & Actuators	ES	ECE
20.	192VD3O01	Physical Design Automation	VLSID	ECE
21.	192VD3O02	VLSI Technology	VLSID	ECE
22.	192VD3O03	Nano-electronics	VLSID	ECE
23.	192CS3O01	Python Programming (CSE)	CSE, SE	CSE
24.	192CS3O02	Principles of Cyber Security	CSE	CSE
25.	192CS3O03	Internet of Things	CSE, SE	CSE
26.	192CS3O04	Machine Learning	CSE, SE	CSE
27.	192CS3O05	Artificial Intelligence	SE	IT
28.	192CS3O06	Deep Learning	CSE, SE	IT
29.	192PE3O01	Introduction to Petroleum Engineering	PE	PT
30.	192PE3O02	Process Intensification	PE	PT
31.	192PE3O03	Fundamentals of Liquefied Natural Gas	PE	PT
32.	192PE3O04	Subsea Engineering	PE	PT
33.	192PE3O05	Geology	PE, ST	PT
34.	192PE3O06	HSE in Petroleum Industry	PE	PT

PROGRAM STRUCTURE

I SEMESTER

Course Code	Name of the Course	Lecture (L)	Tutorial (T)	Practice (P)	Credits (C)
194MB1T01	Management and Organizational Behavior	4	0	0	4
194MB1T02	Managerial Economics	4	0	0	4
194MB1T03	Accounting for Managers	4	0	0	4
194MB1T04	Quantitative Analysis for Business Decisions	4	0	0	4
194MB1T05	Legal and Business Environment	4	0	0	4
194MB1T06	Business Communication and Soft Skills	4	0	0	4
---	Open Elective-I	4	0	0	4
194MB1L01	Business Communication and Soft Skills Lab.	0	0	2	2
194MB1L02	Information Technology – Lab – I (Spreadsheet and Tally)	0	0	2	2
TOTAL		28	0	2	32

II SEMESTER

Course Code	Name of the Course	Lecture (L)	Tutorial (T)	Practice (P)	Credits (C)
194MB2T07	Financial Management	4	0	0	4
194MB2T08	Human Resource Management	4	0	0	4
194MB2T09	Marketing Management	4	0	0	4
194MB2T10	Operations Management	4	0	0	4
194MB2T11	Business Research Methods	4	0	0	4
---	Open Elective-II	4	0	0	4
194MB2L03	IT-Lab – 2 (R Programming)	0	0	2	2
TOTAL		24	0	2	26


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III SEMESTER

Course Code	Name of the Course	Lecture (L)	Tutorial (T)	Practice (P)	Credits (C)
194MB3T12	Strategic Management	4	0	0	4
194MB3T13	Operations Research	4	0	0	4
---	Elective - I	4	0	0	3
---	Elective - II	4	0	0	3
---	Elective - III	4	0	0	3
---	Elective – IV	4	0	0	3
194MB3P01	Industrial Project based on Summer Internship	4	0	0	4
TOTAL		28	0	2	24

IV SEMESTER

Course Code	Name of the Course	Lecture (L)	Tutorial (T)	Practice (P)	Credits (C)
194MB4T14	Supply Chain Management and Analytics	4	0	0	4
194MB4T15	Innovation and Entrepreneurship	4	0	0	4
---	Elective – V	4	0	0	3
---	Elective - VI	4	0	0	3
---	Elective - VII	4	0	0	3
---	Elective - VIII	4	0	0	3
194MB4C01	Comprehensive Viva - Voce	2	0	0	2
TOTAL		26	0	2	22

Note: The Student has to choose the Electives from the four Specializations available (HR, Finance, Marketing, Systems).


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Elective	Human Resource Management	FINANCE	MARKETING	SYSTEMS
Elective – I:	Leadership and Change Management (194HR3E01)	Investment Analysis and Portfolio Management (194FI3E01)	Consumer Behavior (194MA3E01)	Data Mining for Business Decisions (194SY3E01)
Elective – II	Performance Evaluation and Compensation Management (194HR3E02)	Managing Banks and Financial Institutions (194FI3E02)	Retail Management (194MA3E02)	Managing Software Projects (194SY3E02)
Elective – III	Human Capital Management (194HR3E03)	Financial Markets and Services (194FI3E03)	Strategic Marketing Management (194MA3E03)	Web Designing (194SY3E03)
Elective – IV	Manpower Planning, Recruitment, and Selection (194HR3E04)	Taxation (194FI3E04)	Digital and Social Media Marketing (194MA3E04)	Business Analytics (194SY3E04)
Elective – V	Labour Welfare and employment laws (194HR4E05)	Financial Derivatives (194FI4E05)	Services Marketing (194MA4E05)	Big Data Analytics (194SY4E05)
Elective – VI	International HRM (194HR4E06)	Global Financial Management (194FI4E06)	Promotional and Distribution Management (194MA4E06)	Enterprise Resource Planning (194SY4E06)
Elective – VII	Employee Relations and Engagement (194HR4E07)	Risk Management (194FI4E07)	Green Marketing (194MA4E07)	Cyber Laws & Security (194SY4E07)
Elective – VIII	Strategic HRM (194HR4E08)	Behavioral Finance (194FI4E08)	Global Marketing Management (194MA4E08)	Artificial Intelligence and Machine Learning (194SY4E08)

Open Electives:

OPEN ELECTIVE-I			OPEN ELECTIVE-II		
S. No	Course Code	Name of the Course	S. No	Course Code	Name of the Course
1	194MB1O01	Cross Cultural Management.	1	194MB2O04	Project Management.
2	194MB1O02	Rural Innovation Projects.	2	194MB2O05	Technology Management.
3	194MBMOOC1	MOOCs: SWAYAM/NPTEL related to Management Courses other than listed courses in the syllabus.	3	194MB2O06	Lean Management.
			4	194MB2O07	Data base Management System.

PROGRAM STRUCTURE

I SEMESTER

Course Code	Name of the Course	Lecture (L)	Credits (C)
195IM1T01	English Language – I	4	4
195IM1T02	Business Mathematics & Statistics	4	4
195IM1T03	Fundamentals of Business Organization	4	4
195IM1T04	Financial Accounting – I	4	4
195IM1T05	Fundamentals of Computers	4	4
TOTAL		20	20

II SEMESTER

Course Code	Name of the Course	Lecture (L)	Credits (C)
195IM2T06	English Language – II	4	4
195IM2T07	Business Environment	4	4
195IM2T08	Managerial Economics	4	4
195IM2T09	Financial Accounting – II	4	4
195IM2T10	Organizational Communications	4	4
TOTAL		20	20

III SEMESTER

Course Code	Name of the Course	Lecture (L)	Credits (C)
195IM3T11	Principles of Management	4	4
195IM3T12	Cost Accounting	4	4
195IM3T13	Banking Theory & Practice	4	4
195IM3T14	Business Law	4	4
195IM3T15	Entrepreneurship Development	4	4
TOTAL		20	20

IV SEMESTER

Course Code	Name of the Course	Lecture (L)	Credits (C)
195IM4T16	Organizational Behavior	4	4
195IM4T17	Management Accounting	4	4
195IM4T18	Company Law	4	4
195IM4T19	Elements of Direct & Indirect Taxes	4	4
195IM4T20	Management Information Systems	4	4
TOTAL		20	20

V SEMESTER

Course Code	Name of the Course	Lecture (L)	Credits (C)
195IM5T21	Financial Management	4	4
195IM5T22	Marketing Management	4	4
195IM5T23	Human Resource Management	4	4
195IM5T24	Operations Management	4	4
195IM5T25	Business Research Methodology	4	4
TOTAL		20	20

VI SEMESTER

Course Code	Name of the Course	Lecture (L)	Credits (C)
195IM6T26	Operations Research	4	4
195IM6T27	International Business	4	4
195IM6T28	Strategic Management	4	4
195IM6T29	Decision Support Systems	4	4
195IM1P01	Summer Internship (6 Weeks)	2	4
TOTAL		18	20

Note: The Student has to choose the Electives from the four Specializations available

(HR, Finance, Marketing, Systems)

VII SEMESTER

Course Code	Name of the Course	Lecture (L)	Credits (C)
19IM7T30	Knowledge Management	4	4
19IM7T31	Strategic Cost Management	4	4
-	Elective - I	4	4
-	Elective - II	4	4
-	Elective - III	4	4
TOTAL		20	20

VIII SEMESTER

Course Code	Name of the Course	Lecture (L)	Credits (C)
19IM8T32	Total Quality Management	4	4
19IM8T33	Project Management	4	4
-	Elective - IV	4	4
-	Elective - V	4	4
-	Elective - VI	4	4
TOTAL		20	20

VII SEMESTER

Course Code	Name of the Course	Lecture (L)	Credits (C)
175IM7T30	Knowledge Management	4	4
175IM7T31	Strategic Cost Management	4	4
---	Elective - I	4	4
---	Elective - II	4	4
---	Elective - III	4	4
TOTAL		20	20

VIII SEMESTER

Course Code	Name of the Course	Lecture (L)	Credits (C)
175IM8T32	Total Quality Management	4	4
175IM8T33	Project Management	4	4
---	Elective - IV	4	4
---	Elective - V	4	4
---	Elective - VI	4	4
TOTAL		20	20

IX SEMESTER

Course Code	Name of the Course	Lecture (L)	Credits (C)
175IM9T34	Intellectual Property Rights	4	4
175IM9T35	Corporate Governance	4	4
---	Elective - VII	4	4
---	Elective - VIII	4	4
---	Elective - IX	4	4
TOTAL		20	20

X SEMESTER

Course Code	Name of the Course	Lecture (L)	Credits (C)
175IMAP02	Major Project	---	18
TOTAL		---	18

Elective	HR	FINANCE	MARKETING	SYSTEMS
Elective – I	Human Resource Planning (175HR7E01)	Security Analysis (175FI7E01)	Consumer Behavior (175MA7E01)	E-Business (175SY7E01)
Elective – II	Leadership Management (175HR7E02)	Banking and Insurance Management (175FI7E02)	Rural Marketing (175MA7E02)	Relational Database Management Systems (175SY7E02)
Elective – III	Compensation and Reward Management (175HR7E03)	Advanced Management Accounting (175FI7E03)	Supply Chain Management (175MA7E03)	Web Designing (175SY7E03)
Elective – IV	Performance Management (175HR8E04)	Strategic Financial Management (175FI8E04)	Customer Relationship Management (175MA8E04)	System Analysis & Design (175SY8E04)
Elective – V	Strategic Human Resource Management (175HR8E05)	Portfolio Management (175FI8E05)	Strategic Marketing Management (175MA8E05)	Business Intelligence (175SY8E05)
Elective – VI	Organizational Development & Change Management (175HR8E06)	Financial Markets and Services (175FI8E06)	Services Marketing (175MA8E06)	Enterprise Resource Planning (175SY8E06)
Elective – VII	Global Human Resource Management (175HR9E07)	Global Financial Management (175FI9E07)	Promotion and Distribution Management (175MA9E07)	Cyber Laws & Security (175SY9E07)
Elective – VIII	Labor Welfare & Legislation (175HR9E08)	Risk Management (175FI9E08)	Global Marketing Management (175MA9E08)	Information Systems & Audit (175SY9E08)
Elective – IX	Management of Industrial Relations (175HR9E09)	Tax Management (175FI9E09)	Retail Marketing (175MA9E09)	SAP (175SY9E09)

PROGRAM STRUCTURE

I SEMESTER

Course Code	Name of the Course	Total Number of contact hours				Credits (C)
		Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
203MC1T01	Business Communication	2	0	0	2	2
203MC1T02	Mathematical and Statistical Foundations	3	0	0	3	3
203MC1T03	Computer Organization & Operating Systems	3	1	0	4	4
203MC1T04	Data Structures	3	0	0	3	3
203MC1T05	Object Oriented Programming with JAVA	3	0	0	3	3
203MC1L01	Operating Systems and Linux Lab	0	0	3	3	1.5
203MC1L02	Data Structures Lab	0	0	3	3	1.5
203MC1L03	JAVA Programming Lab	0	0	3	3	1.5
203MC1P01	Socially Relevant Project using Design Thinking	0	0	1	1	0.5
TOTAL		14	1	10	25	20

II SEMESTER

Course Code	Name of the Course	Total Number of contact hours				Credits (C)
		Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
203MC2T06	Database Management Systems	3	0	0	3	3
203MC2T07	Computer Networks	3	0	0	3	3
203MC2T08	Software Engineering and Design Patterns	3	0	0	3	3
203MC2T09	Data Warehousing and Mining	3	0	0	3	3
----	Professional Elective-1	3	0	0	3	3
203MC2L04	DBMS Lab	0	0	3	3	1.5
203MC2L05	Computer Networks Lab	0	0	3	3	1.5
203MC2L06	Software Engineering and Design Patterns Lab	0	0	3	3	1.5
203MC2T10	Employability Skills	0	0	1	1	0.5
203MC2S01	Bridge Course (Python Programming to be taken through MOOCs)	0	0	0	0	0
TOTAL		15	0	10	25	20

III SEMESTER

Course Code	Name of the Course	Total Number of contact hours				Credits (C)
		Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
203MC3T11	Machine Learning with Python	3	0	0	3	3
203MC3T12	Internet of Things	3	0	0	3	3
203MC3T13	Web Technologies	3	0	0	3	3
203MC3T14	Cryptography and Network Security	3	0	0	3	3
----	Professional Elective – II	3	0	0	3	3
203MC3L07	Machine Learning with Python Lab	0	0	3	3	1.5
203MC3L08	IoT Lab	0	0	3	3	1.5
203MC3L09	Web Technologies Lab	0	0	4	4	2
203MC3P02	Internship / Industry Oriented Mini Project/ Skill Development Course (Minimum 6-weeks)	0	0	0	0	2
TOTAL		15	0	10	25	22

IV SEMESTER

Course Code	Name of the Course	Total Number of contact hours				Credits (C)
		Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
----	Professional Elective–III *	3	0	0	3	3
-----	Professional Elective–IV *	3	0	0	3	3
203MC4P03	Project Work/ Dissertation	0	0	0	0	12
TOTAL		6	0	0	6	18

*** Students going for Industrial Project/Thesis will complete these courses through MOOCs (even in earlier semester)**

Professional Elective – I (II Semester)			Professional Elective – II (III Semester)		
S.No	Course Code	Course Title	S.No	Course Code	Course Title
1	203MC2E01	No SQL Databases	1	203MC3E06	Soft Computing
2	203MC2E02	Design and Analysis of Algorithms	2	203MC3E07	Software Project Management
3	203MC2E03	Mobile Application Development	3	203MC3E08	Cloud Computing
4	203MC2E04	Artificial Intelligence	4	203MC3E09	Optimization Techniques
5	203MC2E05	Accounting for Managers	5	203MC3E10	Cyber Security
Professional Elective – III (IV Semester)			Professional Elective – IV (IV Semester)		
S.No	Course Code	Course Title	S.No	Course Code	Course Title
1	203MC4E11	Digital Marketing	1	203MC4E15	Network Programming
2	203MC4E12	Human Resource Management	2	203MC4E16	Block Chain technologies
3	203MC4E13	Deep Learning	3	203MC4E17	Software Testing Methodologies
4	203MC4E14	Ad-hoc and Sensor Networks	4	203MC4E18	Big Data Analytics
5	203MC4S01	MOOCs-1 (NPTEL/SWAYAM) - Full Stack Technologies - Any recommended course	5	203MC4S02	MOOCs-2 (NPTEL/SWAYAM) - Data Science - Any recommended course

Course Code	Name of the Course	Total Number of contact hours				Credits (C)
		Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
193MC4T16	Data Warehousing & Data Mining	3	0	0	3	3
193MC4T17	Full Stack Technologies	3	0	0	3	3
193MC4T18	Python Programming	3	0	0	3	3
Elective – I						
193MC4E01	Embedded Computing	3	0	0	3	3
193MC4E02	Artificial Intelligence					
193MC4E03	MOOCs-1					
Elective – II						
193MC4E04	Cloud Computing	3	0	0	3	3
193MC4E05	Multimedia Application Development					
193MC4E06	MOOCs-2					
193MC4L10	Full Stack Technologies Lab	0	0	3	3	1.5
193MC4L11	Data Mining with R Lab	0	0	3	3	1.5
193MC4L12	Python Programming Lab	0	0	3	3	1.5
TOTAL		15	0	9	24	19.5

V SEMESTER

Course Code	Name of the Course	Total Number of contact hours				Credits (C)
		Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
193MC5T19	Cryptography and Network Security	3	0	0	3	3
193MC5T20	Big Data Analytics	3	0	0	3	3
193MC5T21	Machine Learning	3	0	0	3	3
Elective – III						
193MC5E07	Digital Marketing	3	0	0	3	3
193MC5E08	Natural Language Processing					
193MC5E09	MOOCs-3					
Elective – IV						
193MC5E10	Internet of Things	3	0	0	3	3
193MC5E11	DevOps					
193MC5E12	MOOCs-4					
193MC5L13	Cryptography and Network Security Lab	0	0	3	3	1.5
193MC5L14	Big Data Analytics Lab	0	0	4	4	2
193MC5L15	Machine Learning with Python Lab	0	0	3	3	1.5
TOTAL		15	0	10	25	20

VI SEMESTER

Course Code	Name of the Course	Total Number of contact hours				Credits (C)
		Lecture (L)	Tutorial (T)	Practice (P)	Total Hours	
193MC6R01	Project Seminar	0	0	0	0	2
193MC6P01	Dissertation/ Thesis	0	0	0	0	10
TOTAL		0	0	0	0	12

MC: Mandatory Courses; MOOCs: Massive Open Online Courses; PROJ: Project.

Bendu
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 Department of MCA
 Aditya Engineering College

PROGRAM STRUCTURE

I SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201HS1T01	Communicative English	HSC	Theory	3	0	0	3	3
201BS1T01	Differential Equations and Linear algebra	BSC	Theory	3	0	0	3	3
201BS1T04 221BS1T04	Engineering Chemistry / * Applied Physics	BSC	Theory	3	0	0	3	3
201ES1T02	Programming for Problem Solving using C	ESC	Theory	3	0	0	3	3
201ES1I02	Computer Engineering Workshop	ESC	Integrated	2	0	2	4	3
201HS1L01	Communicative English Lab	HSMC	Lab	0	0	3	3	1.5
201BS1L03 221BS1L03	Engineering Chemistry Lab / * Applied Physics Lab	BSC	Lab	0	0	3	3	1.5
201ES1L02	Programming for Problem Solving using C Lab	ESC	Lab	0	0	3	3	1.5
201MC1T01	Environmental Science	MC	Theory	2	0	0	2	0
TOTAL				16	0	11	27	19.5
II SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS2T07	Numerical Methods and Complex Variables	BSC	Theory	3	0	0	3	3
201BS2T09 221BS2T09	Applied Physics / * Engineering Chemistry	BSC	Theory	3	0	0	3	3
201ES2T15	Digital Logic Design	ESC	Theory	3	0	0	3	3
201ES2T04	Python Programming	ESC	Theory	3	0	0	3	3
201ES2T07	Data Structures through C	ESC	Theory	3	0	0	3	3
201BS2L04 221BS2L04	Applied Physics Lab / *Engineering Chemistry Lab	BSC	Lab	0	0	3	3	1.5
201ES2L06	Data Structures through C Lab	ESC	Lab	0	0	3	3	1.5
201ES2L14	Python Programming Lab	ESC	Lab	0	0	3	3	1.5
201MC2L01	Professional Communication Skills Lab	MC	Lab	0	0	3	3	0
201MC2T02	Constitution of India	MC	Theory	2	0	0	2	0
TOTAL				17	0	16	31	19.5

* To be studied by the students admitted from 2022 onwards

III SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201AM3T01	Introduction to Artificial Intelligence and Machine Learning	PCC	Theory	3	0	0	3	3
201AM3T02	Computer Organization/	PCC	Theory	3	0	0	3	3
221HS3T01	*Managerial Economics and Financial Analysis							
201CS3T03	Operating Systems	PCC	Theory	3	0	0	3	3
201AM3T03	Java programming	PCC	Theory	3	0	0	3	3
201BS3T13	Discrete Mathematics	BSC	Theory	3	0	0	3	3
201AM3L01	Java Programming Lab	PCC	Lab	0	0	3	3	1.5
201CS3L02	Operating Systems Lab	PCC	Lab	0	0	3	3	1.5
201AM3L02	Introduction to Artificial Intelligence and Machine Learning Lab	PCC	Lab	0	0	3	3	1.5
201AM3S01	Skill Oriented Course-I: Natural Language Processing with Python Lab	SC	Lab	0	0	4	4	2
201AM3P01	Community Service Project	PROJ	PROJ	0	0	0	0	4
201MC3T03	Biology for Engineers	MC	Theory	2	0	0	2	0
TOTAL				17	0	13	30	25.5

IV SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201BS4T16	Probability and statistics	BSC	Theory	3	0	0	3	3
201CS4T05	Formal Languages and Automata Theory	PCC	Theory	3	0	0	3	3
201CS4T06	Database Management Systems	PCC	Theory	3	0	0	3	3
201BS4T18	Integral Transforms and Differential Calculus	BSC	Theory	3	0	0	3	3
201HS4T03	Managerial Economics and Financial Analysis/	HSC	Theory	3	0	0	3	3
221AM4T01	*Computer Organization							
201CS4L04	Database Management Systems Lab	PCC	Lab	0	0	3	3	1.5
201AM4L01	Web Application Development Lab	PCC	Lab	0	0	3	3	1.5
201CS4L06	R Programming Lab	PCC	Lab	0	0	3	3	1.5
201AM4S01	Skill Oriented Course -II: Mobile Application Development Lab	SC	Lab	0	0	4	4	2
201MC4T04	Essence of Indian Traditional Knowledge	MC	Theory	2	0	0	2	0
TOTAL				17	0	13	30	21.5

* To be studied by the students admitted from 2022 onwards

V SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201CS5T01	Computer Networks	PCC	Theory	3	0	0	3	3
201AM5T01	Machine Learning	PCC	Theory	3	0	0	3	3
201CS5T03	Data Ware Housing and Data Mining	PCC	Theory	3	0	0	3	3
	Professional Elective -I	PEC	Theory	3	0	0	3	3
201CS5J01	Open Elective - I (OR) Job Oriented Elective –I (Mean Stack Technologies)	OEC	Theory	3	0	0	3	3
201AM5L01	Computer Networks & Data Mining and Warehousing Lab	PCC	Lab	0	0	3	3	1.5
201AM5L02	Machine Learning using Python- Lab	PCC	Lab	0	0	3	3	1.5
201AM5P01	Summer Internship - I	PROJ	PROJ	0	0	0	0	1.5
201CS5S01	Skill Oriented Course – III Robotic Process Automation (or) MEAN Stack Technologies -Module I: MongoDB, Express.js, Angular JS Node.js and AJAX.	SC	Lab	0	0	4	4	2
201CS5S02								
201MC5T01	IPR & Patents	MC	Theory	2	0	0	2	0
TOTAL				17	0	10	27	21.5

VI SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201AM6T01	Deep Learning	PCC	Theory	3	0	0	3	3
201CS6T02	Compiler Design	PCC	Theory	3	0	0	3	3
201AM6T02	Design and Analysis of Algorithms	PCC	Theory	3	0	0	3	3
	Professional Elective II	PEC	Theory	3	0	0	3	3
201CS6J01	Open Elective – II (OR) Job Oriented Elective II (Optimization In Operation Research)	OEC/ JOE	Theory	3	0	0	3	3
201AM6L01	Algorithms for Efficient Coding Lab	PCC	Lab	0	0	3	3	1.5
201CS6L02	Compiler Design & Object Oriented Analysis and Design Lab	PCC	Lab	0	0	3	3	1.5
201AM6L02	Deep Learning with Tensorflow	PCC	Lab	0	0	3	3	1.5
201CS6S01	Skill Oriented Course – IV Big Data: Spark (or) MEAN Stack Technologies Module II: Angular JS and MongoDB	SC	Lab	0	0	4	4	2
201CS6S02								
201MC6T02	Employability Skills	MC	Theory	2	0	0	2	0
201MC6T01	Professional Ethics and Human Values	MC	Theory	2	0	0	2	0
TOTAL				19	0	13	32	21.5

VII SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
	Professional Elective-III	PEC	Theory	3	0	0	3	3
	Professional Elective-IV	PEC	Theory	3	0	0	3	3
	Professional Elective V	PEC	Theory	3	0	0	3	3
201CS7J01	Open Elective - III (OR) Job Oriented Elective III (API and Micro Services)	OEC	Theory	3	0	0	3	3
201CS7J02	Open Elective - IV (OR) Job Oriented Elective IV (Secure Coding Techniques)	OEC	Theory	3	0	0	3	3
201HS7T01	Management Science	HSC	Theory	3	0	0	3	3
201AM7S01 201CS7S02	Skill Oriented Course- V Machine Learning with GO (OR) Continuous Integration and Continuous Delivery using DevOps.	SC	Lab	0	0	4	4	2
201AM7P01	Summer Internship - II	PROJ	PROJ	0	0	0	0	3
201MC7T01	Research Methodology	MC	Theory	2	0	0	0	0
TOTAL				18	0	4	22	23
VIII SEMESTER								
Course Code	Course Title	Course Component	Course Type	Total Number of contact hours				Credits (C)
				Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
201AM8P01	Project (Full semester internship)	PROJ	PROJ	0	0	0	0	8
TOTAL				0	0	0	0	8

BSC: Basic Sciences Courses

PCC: Professional Core Courses

SC: Skill Oriented Course

MC: Mandatory Courses

HSC: Humanities and Social Sciences including Management Courses

ESC: Engineering Sciences Courses

PEC: Professional Elective Courses

OEC: Open Elective Course

PROJ: Project.


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Track	Professional Elective I	Professional Elective II	Professional Elective III	Professional Elective IV	Professional Elective V
Data Science and Machine Intelligence	Data Visualization	Big Data Analytics	Data Science using Python / R	Reinforcement Learning	Agile Methodologies (Using Devops)
Networks	Internet of Things	Cryptography and Network Security	Cloud Computing	Social Networks and Semantic Web	Block-Chain Technologies
Software Systems Engineering	Software Engineering	Object Oriented Analysis and Design	Software Project Management	Soft Computing	Network Programming
Applications/ Generic	AI Chatbots	Machine Learning for Engineering and Science Applications	Recommender Systems	MOOCS-NPTEL/ SWAYAM	MOOCS-NPTEL/ SWAYAM

AR 20 PROGRAM STRUCTURE-DISTRIBUTION OF CREDITS										
SEM	HSC	BSC	ESC	PCC	PEC	OEC	MC	SC	PROJ	Total Credits
I	4.5	7.5	7.5				0			19.50
II		6	13.5				0			19.50
III		3		16.5				2		21.50
IV	3		4.5	12			0	2		21.50
V				12	3	3	1.5	2		21.50
VI				13.5	3	3	0	2		21.50
VII	3				9	6	3	2		23.00
VIII									12	12.00
Credits	10.5	16.5	25.5	54	15	12	4.5	10	12	160
%	6.56%	10.31%	15.94%	33.75%	9.38%	7.50%	2.81%	6.25%	7.50%	100.00%


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Professional Elective – I (V Semester)			Professional Elective – II (VI Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	201AM5E01	Data Visualization	1	201CS6E01	Big Data Analytics
2	201AM5E02	Internet of Things	2	201AM6E01	Cryptography and Network Security
3	201AM5E03	Software Engineering	3	201CS6E03	Object Oriented Analysis and Design
4	201AM5E04	AI Chatbots	4	201AM6E02	Machine Learning for Engineering and Science Applications
Professional Elective – III (VII Semester)			Professional Elective – IV (VII Semester)		
S.No	Course Code	Name of the Course	S.No	Course Code	Name of the Course
1	201AM7E01	Data Science using Python / R	1	201AM7E04	Reinforcement Learning
2	201CS7E02	Cloud Computing	2	201CS7E06	Social Networks and Semantic Web
3	201AM7E02	Software Project Management	3	201AM7E05	Soft Computing
4	201AM7E03	Recommender Systems	4		MOOCS-NPTEL/ SWAYAM
Professional Elective – V (VII Semester)					
S.No	Course Code	Name of the Course			
1	201CS7E10	Agile Methodologies (Using Devops)			
2	201CS7E09	Block-Chain Technologies			
3	201AM7E06	Network Programming			
4		MOOCS-NPTEL/ SWAYAM			

Note : Open Elective Course (OEC) must be selected from the list of Open Elective Courses offered by Other Department(s) only.


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OPEN ELECTIVE - I (V Semester)

S. No	Course Code	Course Name	Offered By Department
1	201CE5001	Basic Concrete Technology	CE
2	201CE5002	Waste Water Management	CE
3	201CE5003	Basic Surveying	CE
4	201EE5001	DC Machines and Transformers	EEE
5	201EE5002	Analog Electronic Circuits	EEE
6	201EE5003	Basic Electrical Measurements	EEE
7	201ME5001	Renewable Energy Sources	ME
8	201ME5002	Fundamentals of Mechanical Engineering	ME
9	201ME5003	Supply Chain Management	ME
10	201ME5004	3D Printing	ME
11	201ME5005	Entrepreneurship Development and Incubation	ME
12	201ME5006	Automobile Engineering	ME
13	201EC5001	Principles of Signals and Systems	ECE
14	201EC5002	Introduction to Internet of Things	ECE
15	201EC5003	Switching Theory and Logic Design	ECE
16	201CS5001	Object Oriented Programming through Java	CSE
17	201CS5002	Data Base Management Systems	CSE
18	201IT5001	Computer Organization	IT
19	201IT5002	Computer Graphics	IT
20	201PT5001	Fundamentals of Petroleum Industry	PT
21	201PT5002	Fundamentals of Chemical Industry	PT
22	201MI5001	Overview of Mining	Min.E
23	201AG5001	Basic Crop Production Practices	Ag.E
24	201AG5002	Groundwater, Wells and Pumps	Ag.E



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OPEN ELECTIVE - II (VI Semester)

S. No	Course Code	Course Name	Offered By Department
1	201CE6O01	Repair and Rehabilitation of Structures	CE
2	201CE6O02	Industrial Waste Water Management	CE
3	201CE6O03	Roadways, Railways and Airways	CE
4	201EE6O01	Induction and Synchronous Machines	EEE
5	201EE6O02	Non-Conventional Energy Resources	EEE
6	201EE6O03	Energy Audit, Conservation and Management	EEE
7	201ME6O01	Solar Energy Utilisation	ME
8	201ME6O02	Basic Thermodynamics and Heat Transfer	ME
9	201ME6O03	Introduction to Hydraulics and Pneumatics	ME
10	201ME6O04	3D Printing	ME
11	201ME6O05	Robotics	ME
12	201ME6O06	Management Science	ME
13	201ME6O07	Entrepreneurship Development and Incubation	ME
14	201ME6O08	Automotive Aerodynamics	ME
15	201EC6O01	Principles of Communications	ECE
16	201EC6O02	Biomedical Instrumentation	ECE
17	201EC6O03	ECAD Tools	ECE
18	201CS6O01	Python Programming	CSE
19	201CS6O02	Web Technologies	CSE
20	201IT6O01	Operating Systems	IT
21	201IT6O02	Robotic Process Automation	IT
22	201PT6O01	Unconventional Hydrocarbon Resources	PT
23	201PT6O02	Asset Management	PT
24	201MI6O01	Industrial Safety Practices	Min.E
25	201MI6O02	Electrical Equipment In Mines	Min.E
26	201AG6O01	Engineering Properties of Agricultural Produce	Ag.E
27	201AG6O02	Plastic Applications In Agriculture	Ag.E


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OPEN ELECTIVE - III (VII Semester)

S. No	Course Code	Course Name	Offered By Department
1	201CE7O01	Natural Disaster Management and Mitigation	CE
2	201CE7O02	Basics of Soil Mechanics	CE
3	201CE7O03	Construction Materials and Equipments	CE
4	201EE7O01	Special Electrical Machines	EEE
5	201EE7O02	Electrical and Hybrid Vehicles	EEE
6	201EE7O03	Instrumentation	EEE
7	201ME7O01	Optimization Techniques	ME
8	201ME7O02	Energy Conservation	ME
9	201ME7O03	Introduction to Material Handling System	ME
10	201ME7O04	Robotics	ME
11	201EC7O01	Discrete Time Signal Processing	ECE
12	201EC7O02	Linear and Digital IC Applications	ECE
13	201EC7O03	Principles of Embedded Systems	ECE
14	201CS7O01	AI Tools and Techniques	CSE
15	201CS7O02	Cyber Security	CSE
16	201IT7O01	Block Chain Technologies	IT
17	201PT7O01	Risk Management in Petroleum Industry	PT
18	201PT7O02	Carbon Sequestration	PT
19	201MI7O01	Communication System in Mines	Min.E
20	201AG7O01	Water Harvesting and Soil Conservation Structures	Ag.E



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OPEN ELECTIVE - IV (VII Semester)

S. No	Course Code	Course Name	Offered By Department
1	201CE7O04	Composite Materials	CE
2	201CE7O05	Basics of RS and GIS	CE
3	201CE7O06	Safety Engineering	CE
4	201EE7O04	Industrial Electrical Systems	EEE
5	201EE7O05	Electrical Materials	EEE
6	201EE7O06	Electrical Safety	EEE
7	201ME7O05	Entrepreneurship Development and Incubation	ME
8	201ME7O06	Automotive Safety	ME
9 °	201ME7O07	Fabrication Processes	°ME
10	201ME7O08	Smart Materials	ME
11	201EC7O04	Fundamentals of Image Processing	ECE
12	201EC7O05	Electronic Measurements and Instrumentation	ECE
13	201EC7O06	Sensors and Actuators	ECE
14	201CS7O03	Introduction to Machine Learning	CSE
15	201CS7O04	Cloud Computing	CSE
16	201IT7O02	Deep Learning	IT
17	201IT7O03	Data Science	IT
18	201PT7O03	Fluidization Engineering	PT
19	201PT7O04	Fundamentals of Mechanical Unit Operations	PT
20	201MI7O02	Drilling and Blasting	Min.E
21	201AG7O02	Agricultural Structures and Protected Cultivation	Ag.E



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JOB ORIENTED ELECTIVES

S. No	Course Code	Course Name	Job Oriented Elective	Semester
JOB ORIENTED ELECTIVE - I (V Semester)				
1		MEAN STACK TECHNOLOGIES	I	V
JOB ORIENTED ELECTIVE - II (VI Semester)				
2		OPTIMIZATION IN OPERATION RESEARCH	II	VI
JOB ORIENTED ELECTIVE - III (VII Semester)				
3		API AND MICRO SERVICES	III	VII
JOB ORIENTED ELECTIVE - IV (VIII Semester)				
4		SECURE CODING TECHNIQUES	IV	VII



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