

**PROGRAM STRUCTURE****I SEMESTER**

S. No	Course Code	Name of the Course	Employability	Skill Development	Entrepreneurship	Remarks
1	201HS1T01	Communicative English		✓		Students are able to demonstrate communication skills to express fluently in both written as well as oral form of language which is very much essential for the career growth
2	201BS1T01	Differential Equations and Linear algebra		✓		Students are able to demonstrate problem solving skills by modeling physical phenomenon using ordinary differential equations, system of linear equations in various engineering disciplines.
3	201BS1T04	Engineering Chemistry				
4	201ES1T02	Programming for Problem Solving using C	✓			Students are able to acquire skills related to control structures, arrays, string formulas enabling them to be employed in software industry.
5	201ES1I02	Computer Engineering Workshop		✓		Students are able to acquire skills related to microsoft office tools, basics of Machine Learning and IOT.

6	201HS1L01	Communicative English Lab		✓		Students are able to demonstrate technical skills to express fluently in both written as well as oral form of language which is very much essential for the career growth
7	201BS1L03	Engineering Chemistry Lab	✓			
8	201ES1L02	Programming for Problem Solving using C Lab	✓			Students are able to acquire skills related to basic programming using C, enabling them to be employed as software developers.
9	201MC1T01	Environmental Science				

## II SEMESTER

S. No	Course Code	Name of the Course	Employability	Skill Development	Entrepreneurship	Remarks
10	201BS2T07	Numerical Methods and Complex Variables		✓		Students are able to demonstrate problem-solving skills earning numerical methods for solving equations, differential equations, integrals, analytical properties of functions of complex variables, complex integration.
11	201BS2T09	Applied Physics				
12	201ES2T11	Computer Organization	✓			Students are nurtured with the internal organization and functioning of Computer System and enabling them to get employed in the hardware sectors of computers.
13	201ES2T04	Python Programming	✓			Students are able to acquire skills related to python programming, enabling them to be employed as software developers.
14	201ES2T07	Data Structures through C	✓			Students are able to acquire technical skills related to demonstrate fundamental algorithmic problems that enable them to be employed as software developers
15	201BS2T09	Applied Physics Lab	✓			

16	201ES2L06	Data Structures through C Lab	✓			Students are able to acquire programming skills related to OOP's, and Basic Data structure like stacks, queues, linked lists, trees and tries which enable them to employed as a product developer.
17	201ES2L14	Python Programming Lab	✓			Students are able to acquire skills related to python programming, enabling them to be employed as software developers.
18	201MC2L01	Professional Communication Skills Lab			✓	Students are able to apply the knowledge of economic and financial management enabling them to become an entrepreneur in any domain of their choice.
19	201MC2T02	Constitution of India				



## III SEMESTER

S. No	Course Code	Name of the Course	Employability	Skill Development	Entrepreneurship	Remarks
20	201CS3T01	Advanced data structures	✓			Students are able to acquire technical skills related to demonstrate advanced algorithmic problems enabling them to be employed as software developers.
21	201CS3T02	Object Oriented Programming through C++	✓			Students are able to acquire skills related to concepts of object-oriented programming and process of data file manipulations using C++, enabling them to be employed as software developers.
22	201CS3T03	Operating Systems				
23	201CS3T04	Software Engineering	✓			Students are able to acquire skills relates to software engineering, project estimation and management enabling them to acquire employed as software developer.
24	201BS3T13	Discrete Mathematics		✓		Students are able to demonstrate problem solving skills by learning Mathematical logic , Inference Theory, Graph Theory .
25	201CS3L01	Object Oriented Programming through C++ Lab				Students are able to acquire skills related to concepts of object-oriented programming and process of data file manipulations using C++, enabling them to be employed as software developers.

26	201CS3L02	Operating Systems Lab				Students are able to understand and acquire skills related to features and functionalities of operating System and understand the utilization of Input & output and memory operations which enables them to be employed for Hardware core side job opportunities
27	201CS3L03	Unix and Shell Programming Lab		✓		Students can demonstrate programming solving skills by Identifying and using UNIX utilities to create and manage simple file processing operations
28	201SO3L05	Applications of Python numpy		✓		Students are able to apply technical skills related to basics of numpy, arrays in numpy, data representation and preprocessing in numpy
29	201SO3L06	Web application development using full stack frontend development – module –I		✓		Students are able to apply technical skills related to HTML, HTML5, CSS and CSS3
30	201MC3T03	Biology for Engineers				

## IV SEMESTER

S. No	Course Code	Name of the Course	Employability	Skill Development	Entrepreneurship	Remarks
31	201BS4T16	Probability and statistics		✓		Students are able to demonstrate problem solving skills by learning about random variables , probability distributions, sampling theory , test of hypothesis , correlation and regression.
32	201CS4T05	Formal Languages and Automata Theory		✓		Students will be able to acquire technical skills related to Finite Automata, Grammars and Parsers.
33	201CS4T06	Database Management Systems	✓			Students are able to acquire skills related to sql commands, constraints, views, models, transactions, storage and indexing enabling them to be employed for backend developer
34	201CS4T07	Java programming	✓			Students are able to acquire skills related to java programming enabling them to be employed as software developers.
35	201HS4T03	Managerial Economics and Financial Analysis			✓	Students are able to apply the knowledge of economic and financial management enabling them to become an entrepreneur in any domain of their choice.



36	201CS4L04	Database Management Systems Lab	✓			Students are able to acquire skills related to sql commands, constraints, views, models, transactions, storage and indexing enabling them to be employed for backend developer.
37	201CS4L05	Java Programming Lab	✓			Students are able to acquire skills related to java programming enabling them to be employed as software developers.
38	201CS4L06	R Programming Lab		✓		Students are able to acquire technical skills related to list, dictionaries, tuples, functions, classes and statistical methods in R tool
39	201SC4L18	Applications of python-pandas		✓		Students are able to acquire technical skills related to pandas dataframe and series, Preprocessing of dataframe and data cleaning and transformation techniques.
40	201SC4L19	Web application development using full stack frontend development module-II		✓		Students are able to acquire technical skills related to Javascript and XML.
41	201MC4T04	Essence of Indian Traditional Knowledge		✓		



## V SEMESTER

S. No	Course Code	Name of the Course	Employability	Skill Development	Entrepreneurship	Remarks
42	191CS5T08	Compiler Design	✓			Students are able to acquire skills related to design, synthesize and evaluate the performance of Different Language Compilers and enabling them to be employed for designing of Compilers.
43	191CS5T09	Computer Networks				
44	191CS5T10	Database Management Systems	✓			Students are able to acquire skills related to sql commands, constraints, views, models, transactions, storage and indexing enabling them to be employed for backend developer.
45	191CS5T11	Operating Systems	✓			Students are able to understand and acquire skills related to features and functionalities of operating System and understand the utilization of Input & output and memory operations which enables them to be employed for Hardware core side job opportunities
46	191CS5E04	Functional and Logic Programming	✓			Students will be able to acquire technical skills related to logic programming, lists, classes and event handling which enable them to be employed as software developer
47	191CS5E01	Advanced Computer Architecture	✓			Students are able to acquire skills related to design, and synthesize advanced computers enabling them to be employed for designing and manufacturing of computer architectures.

48	191CS5E02	Artificial Intelligence		✓		Students are able to demonstrate technical skill of searching techniques used in AI, Expert systems, Knowledge representation and fuzzy logic.
49	191CS5E05	Software Requirement and Estimation				
50	191CS5E03	Computer Graphics	✓			Students are able to acquire related 2D,3D graphical representations and basic graphic programming using OpenGL enabling them to employed as graphic designer.
51	191CE5O01	Basic Concrete Technology	✓			Students are able to acquire skills related to basic properties of concrete, design, testing of concrete enabling them to be employed for designing and constructional activities.
52	191EE5O01	Electrical Safety		✓		Students are able to demonstrate safety skills by providing knowledge on hazards with growing penetration of electrical devices in strategic areas including Space, mining and Nuclear energy.
53	191EE5O02	Electrical Materials		✓		Students are able to demonstrate technical skills in manufacturing of the electrical components depending on the application.

54	191EE5O03	Basic Electrical Measurements	✓			Students are able to acquire skills related to various types of electrical parameters that enable them to get employed in core (electrical) industry/company related to measurements of electrical parameters.
55	191ME5O01	Renewable Energy Sources		✓		Students are able to acquire skills related to solar, wind and bio-mass energy resources and conversion principles and techniques of various renewable resources.
56	191ME5O02	Fundamentals of Mechanical Engineering		✓		Students are able to acquire skills related to concepts of fundamentals of thermal, manufacturing and design fields in mechanical engineering.
57	191ME5O03	Supply Chain Management		✓		Students are able to acquire skills related to concepts of different levels of supply chain management
58	191ME5O04	3D Printing	✓			Students are able to acquire skills on basic knowledge of various additive manufacturing processes and enabling them to be employed in manufacturing companies.
59	191ME5O05	Entrepreneurship Development and Incubation	✓			Students are able to acquire skills on basic knowledge on concepts of entrepreneurship development.
60	191EC5O01	Signals and Systems		✓		Students are able to acquire skills related to mathematics of signal processing that aids them in getting jobs in industries that use X-rays, MRIs and CT scans, allowing medical images to be analyzed and deciphered by complex data processing techniques.



61	191EC5002	Digital Electronics and Logic Design	✓			Students are able to acquire skills related to design, and synthesize basic of digital ckts enabling them to be employed for designing and manufacturing of electronic equipment.
62	191EC5003	Semiconductor devices	✓			Students are able to acquire skills related to the various power electronic drives which enables them to get employed in semiconductor based industries such as in communications, computing, health care, military systems, transportation, clean energy, etc.
63	191CS5001	Data Structures		✓		Students are able to acquire technical skills related to demonstrate fundamental algorithmic problems.
64	191CS5002	Object Oriented Programming through C++	✓			Students are able to acquire skills related to concepts of object-oriented programming and process of data file manipulations using C++, enabling them to be employed as software developers.
65	191CS5003	Java Programming	✓			Students are able to acquire skills related to java programming enabling them to be employed as software developers.
66	191CS5004	R Programming	✓			Students are able to acquire skills related to R commands, Graphical representation of data sets, and visualization Techniques and also enabling them to be employed for Data analyst
67	191IT5001	Data Base Management Systems	✓			Students are able to acquire skills related to Writing SQL Queries, implement normalization techniques and apply transaction processing techniques enabling them to be employed as a Database Administrator.



68	191IT5O02	Computer Graphics		✓		Students are able to demonstrate technical skill to develop graphical applications using line, polygon, curve drawing and clipping algorithms, design 2d and 3d applications.
69	191MI5O01	Overview of Mining		✓		Students are able to demonstrate technical skill of characterizing different intensifications , modeling and analysis of process in Petroleum Industry.
70	191PT5O01	Process Intensification in Petroleum Industry		✓		Students are able to demonstrate technical skill of characterizing different intensifications , modeling and analysis of process in Petroleum Industry.
71	191PT5O02	Fundamentals of Petroleum Industry		✓		Students are able to demonstrate technical skill of characterizing different streams , modeling and analysis of petroleum industry.
72	191AG5O01	Basic Crop Production Practices	✓			Students are able to acquire skills related to production practices and management techniques of agricultural and horticultural crops enabling them to be employed as agricultural field manager
73	191CS5L04	Operating Systems and Computer Networks Lab	✓			Students are able to understand and acquire skills related to features and functionalities of operating System and understand the utilization of Input & output and memory operations and computer networks which enables them to be employed for Hardware core side job opportunities
74	191CS5L05	Database Management Systems Lab	✓			Students are able to acquire skills related to sql commands, constraints, views, models, transactions, storage and indexing enabling them to be employed for backend developer

75	191HS5T06	Employability Skills - III	✓			This subject helps the students to acquire skills to be placed in a company as it will impart employability skills in students, which will enable the students to feel comfortable to face several competitive examinations with confidence and competence.
76	191PR5P02	Socially Relevant Project	✓			students will be able to demonstrate problem identification, analysis, design solutions or applications in electronics and communication domain through the acquired technical, cognitive, communication and creative skills to address societal needs.
77	191MC5A08	Intellectual Property Rights and Patents				

## VI SEMESTER

S. No	Course Code	Name of the Course	Employability	Skill Development	Entrepreneurship	Remarks
78	191CS6T12	Data Ware Housing and Data Mining	✓			Students are able to acquire technical skills to synthesize and preprocess the raw data, and apply different classification and prediction algorithms which enable them to be employed as Data Analyst.
79	191CS6T13	Object Oriented Analysis of Design		✓		Students are able to acquire technical skills to develop different UML diagrams like usecase, class, sequence, collaboration, component and deployment diagrams
80	191CS6T14	Web Technologies	✓			Students are able to acquire skills related to developing web pages, enabling them to be employed as front end developers.
81	191CS6E09	Scripting languages		✓		Students are able to acquire programming skills related to building scripts that control a sequence of operations.
82	191CS6E06	Advance Operating Systems	✓			Students are able to understand and acquire skills related to features and functionalities of Advanced operating System and understand the utilization of Input & output and memory operations which enables them to be employed for Hardware core side job opportunities
83	191CS6E08	Machine Learning	✓			Students are able to acquire skills related to data science algorithms, enabling them to be employed as data scientists.



84	191CS6E10	Software Testing Methodologies		✓		Students are able to acquire technical skills by applying different software testing techniques and strategies.
85	191CS6E07	Image Processing		✓		Students are able to acquire technical skills related to image segmentation, preprocessing and cleaning techniques.
86	191CS6E11	C# .Net	✓			Students are able to acquire technical skills related to classes, OPP's, inheritance, polymorphism, web development concepts in c# which enable them to be employed as C# developer.
87	191CS6E13	Distributed Systems				
88	191CS6E14	Natural Language Processing		✓		Students are able to acquire technical skills related to word stemming and lemmatization, word preprocessing, word identification, frequency techniques and algorithms needed for language processing.
89	191CS6E15	Software Quality Assurance		✓		Students are able to demonstrate technical skills by Understanding the fundamental concepts of software automation
90	191CS6E12	Cloud Computing	✓			Students are able to acquire skills related to Cloud computing and distributed computing enabling them to be employed for cloud services sector
91	191CE6O02	Disaster Management		✓		Students are able to demonstrate technical skill of characterizing various disasters occurring in the environment and apply them in various disciplines of day to day life



92	191EE6O04	Energy Audit and Conservation Management			✓	the course focuses on the loss and profit studeies and other copmany maintenace activies, creates the intrust amoung the students to have own company.
93	191EE6O05	Non-Conventional Energy resources	✓			Students are able to acquire skills related to various types of pivotal role in the development of a sustainable energy supply enabling the students to get emplyed in renewable energy generation sector.
94	191EE6O06	Instrumentation	✓			Students are able to acquire skills related to various types of electrical instrunments that enable them to get employed in core (electrcal) industry/company releted to instrunmnetation of electial parameters.
95	191ME6O06	Solar Energy Utilization		✓		Students are able to demonstrate problem solving skills in analyzing the basic thermodynamics and basic heat transfer mechanisms.
96	191ME6O07	Basic Thermodynamics and Heat Transfer		✓		Students are able to demonstrate problem solving skills in analyzing the basic thermodynamics and basic heat transfer mechanisms.
97	191ME6O08	Introduction to Hydraulics and Pneumatics		✓		Students are able to demonstrate problem solving skills in analyzing the concepts of hydraulic systems, pneumatic systems and its components.
98	191ME6O09	3D Printing	✓			Students are able to acquire skills on basic knowledge of various additive manufacturing processes and enabling them to be employed in manufacturing companies.

99	191ME6O10	Robotics	✓			Students are able to acquire skills to understand the concepts of robot kinematics, Dynamics and trajectory planning enabling them to be employed in robot manufacturing companies
100	191EC6O04	Biomedical Instrumentation	✓			Students are able to acquire skills to understand and apply the business plan for preparation and evaluation of project and enabling them to be employed as a project engineer in various organizations.
101	191EC6O05	ECAD Tools	✓			Students are able to acquire skills related to python programming, enabling them to be employed as software developers.
102	191ME6O11	Management Science			✓	Students are able to apply the knowledge of economic and financial management enabling them to become an entrepreneur in any domain of their choice.
103	191IT6O03	Computer Organization	✓			Students are able to acquire technical skills which help them to work with the internal organization and functioning of Computer System and enabling them to get employed in the hardware sectors of computers.
104	191CS6O05	Python Programming	✓			Students are able to acquire skills related to python programming, enabling them to be employed as software developers.
105	191CS6O06	Operating Systems	✓			Students are able to understand and acquire skills related to features and functionalities of operating System and understand the utilization of Input & output and memory operations which enables them to be employed for Hardware core side job opportunities
106	191IT6O04	AI Tools and Techniques		✓		Students are able to demonstrate technical skill of searching techniques used in AI, Expert systems, Knowledge representation and fuzzy logic.



107	191CS6O07	Web Technologies	✓			Students are able to acquire skills related to developing web pages, enabling them to be employed as front end developers.
108	191IT6O05	Robotic Process Automation		✓		Skill development applications using UiPath Programming and extraction techniques to deploy robot configurations
109	191CS6O08	Cyber Security	✓			Students are able to acquire skills related to design, develop and evaluate the performance of secure systems enabling them to be employed for designing and manufacturing of secure communication equipment.
110	191CS6O09	AR / VR	✓			Students are able to acquire skills related to Designing and Developing 3d User Interfaces, 3D Interaction Techniques and Virtual Reality applications that enabling them to be employed as interior designers and developer in industry.
111	191MI6O02	Industrial Safety Practices				
112	191MI6O03	Electrical Equipment's in Mines				
113	191PT6O03	Unconventional Hydrocarbon Resources		✓		Students are able to demonstrate technical skill of characterizing Resources
114	191PT6O04	Asset Management			✓	Students are able to demonstrate Competency in the domain of Asset Management.

115	191AG6O02	Weather forecast in Agriculture	✓			Students are able to acquire skills related to biomass and agrochemical conversion techniques, biomass production and bio-diesel production enabling them to be employed in any bio mass energy sector.
116	191AG6O03	Bio-energy systems design and applications	✓			Students are able to acquire skills related to biomass and agrochemical conversion techniques, biomass production and bio-diesel production enabling them to be employed in any bio mass energy sector.
117	191ME6O12	Entrepreneurship Development and Incubation	✓			Students are able to acquire skills on basic knowledge on concepts of entrepreneurship development.
118	191CS6L06	Data Mining and Object Oriented Analysis of Design Lab		✓		Students are able to acquire technical skills to develop different UML diagrams like usecase, class, sequence, collaboration, component and deployment diagrams and also apply different mining algorithms
119	191CS6L07	Web Technologies Lab	✓			Students are able to acquire skills related to developing web pages, enabling them to be employed as front end developers.
120	191HS6T07	Employability Skills - IV	✓			This subject helps the students to acquire skills to be placed in a company as it will impart employability skills in students, which will enable the students to feel comfortable to face several competitive examinations with confidence and competence.
121	191MC6A09	Professional Ethics and Human Values			✓	Students are able to apply the knowledge of Software Project Management skills and enabling them to become an entrepreneur in any domain of their choice.



## VII SEMESTER

S. No	Course Code	Name of the Course	Employability	Skill Development	Entrepreneurship	Remarks
122	171CS7T18	Cryptography and Network Security		✓		Students are able to acquire technical skills to work with different cryptographic techniques, Symmetric and asymmetric cryptographic techniques, key management and security at network level.
123	171IT7T05	Big Data Analytics	✓			Students are able to acquire technical skills to work with data on cloud using PIG and HIVE tools which enable them to be employed as Big Data Analyst.
124	171CS7T20	Cloud Computing	✓			Students are able to acquire skills related to Cloud computing and distributed computing enabling them to be employed for cloud services sector
125	171IT7T06	Mobile Computing	✓			Students are able to acquire technical skills which helps them in developing mobile applications using J2EE and android which enable them to be employed as Mobile Application Developer.
126	171CS7E13	Software Project Management			✓	Students are able to apply the knowledge of Software Project Management skills and enabling them to become an entrepreneur in any domain of their choice.
127	171IT7E06	Machine Learning	✓			Students are able to acquire skills related to data science algorithms, enabling them to be employed as data scientists.

128	171CS7E15	Image Processing		✓		Students are able to acquire technical skills related to image preprocessing, image segmentation, classification algorithms
129	171CS7E16	Cyber Laws		✓		Students are able to acquire skills related to cybercrimes, laws and acts to protect data from cyber thefts
130	171CS7E19	Information Retrieval Systems		✓		Students are able to acquire technical skills related to information retrieval systems by using various retrieving techniques used in real time environment.
131	171IT7E07	Human Computer Interaction		✓		Students are able to acquire technical skills in identifying the design issues and constraints while designing the GUI for an application.
132	171IT7E08	Distributed Systems				Students are able to acquire skills to understand the protocols and architectures needed to establish a distributed network
133	171IT7E09	Decision Support System				Students are able to acquire skills related to classification and regression techniques
134	171IT7L04	Mobile Computing Lab	✓			Students are able to acquire technical skills which helps them in developing mobile applications using J2EE and android which enable them to be employed as Mobile Application Developer.
135	171CS7L13	Big Data Analytics Lab	✓			Students are able to acquire technical skills to work with data on cloud using PIG and HIVE tools which enable them to be employed as Big Data Analyst.

## VIII SEMESTER

S. No	Course Code	Name of the Course	Employability	Skill Development	Entrepreneurship	Remarks
137	171CS8E21	Agile Methodologies	✓			Students are able to acquire skills relates to software Process models and enabling them to acquire employed as software developer.
138	171CS8E22	Cyber Security	✓			Students are able to acquire skills related to design, develop and evaluate the performance of secure systems enabling them to be employed for designing and manufacturing of secure communication equipment.
139	171CS8E23	Distributed Databases		✓		Students are able to demonstrate technical skills of Query Optimization, Reliability and Concurrency Control in projects.
140	171IT8E10	Pattern Recognition		✓		Students are able to acquire technical skills to design systems and algorithms for pattern recognition, with focus on sequences of patterns that are analyzed using, e.g., hidden Markov models (HMM).
141	171IT8O01	Management Information System		✓		Students are able to demonstrate technical skill to demonstrate System Analysis, Design and decision making in a business environment.
142	171CS8O01	Microprocessor and Multi Core Systems		✓		Students are able to demonstrate technical skills of modern multi-core processors and its applications.
143	171CS8O02	Embedded Systems		✓		Students are able to demonstrate technical skills of Simulators, emulators, Debuggers, Embedded Product Development life cycle and Real Time Operating System.
144	171IT8O02	Computer Vision		✓		Students are able to demonstrate technical skill of implementing Camera and Projection models, image formation, image features, image calibration techniques and implement image segmentation and object



						identification techniques.
145	171EE8O05	Robotics		✓		Students are able to acquire skills related to the measurement of linear and angular measuring instruments, working of measuring instruments and control systems.
146	171CS8O04	Operations Research		✓		Students are able to demonstrate technical skill to formulate and solve problems as networks and graphs.
147	171CS8O05	Optical Communications	✓			Students are able to acquire skills related to design, fabricate and evaluate the performance of optical communication systems enabling them to be employed for designing, manufacturing and implementation of fiber optic communication systems
148	171EE8O07	Internet of Things	✓			Students are able to acquire skills related to Internet of Things and enabling them to be employed for IoT sector.
149	171EC8O02	Disaster Management		✓		Students are able to demonstrate technical skill of characterizing various disasters occurring in the environment and apply them in various disciplines of day to day life
150	171CS8O07	Nano Technology and its Applications		✓		Students are able to acquire technical skills by understanding the basic mathematical techniques for describing nano systems.
151	171IT8P02	Major Project	✓			students will be able to demonstrate problem identification, analysis, design solutions or applications in electronics and communication domain through the acquired technical, cognitive, communication and creative skills to address societal needs.
152	171EC8O02	Disaster		✓		Students are able to demonstrate technical skill of characterizing various disasters occurring in the environment and apply them in various



		Management				disciplines of day to day life
153	171CS8O06	Renewable Energy sources		✓		Students are able to acquire technical skills by understanding the basic mathematical techniques for describing nano systems
154	171CS8O07	Nano Technology and its Applications		✓		students will be able to demonstrate problem identification, analysis, design solutions or applications in Nano technology
155	171CS8P02	Project Work	✓			students will be able to demonstrate problem identification, analysis, design solutions or applications in electronics and communication domain through the acquired technical, cognitive, communication and creative skills to address societal needs.
<b>TOTAL</b>		<b>155</b>	<b>74</b>	<b>58</b>	<b>13</b>	



**Program coordinator**



**Head of the Department**

*Head of the Department*  
Department of IT  
Aditya Engineering College