Programme Educational Objectives

Within 3-5 years of education, graduates of MCA programme of CSIBER institute will be able to:

- PEO 1: Design and develop quality software using emerging technologies as per industry standards
- PEO 2: Exhibit lifelong learning capabilities with concern to drastic changes in emerging technologies.
- PEO 3: Exhibit successful professional career by providing software solutions for complex problems in a time-bound manner.
- PEO 4: Adopt themselves to the constantly evolving technology by peer reviewing, by working collaboratively and developing expertise in emerging fields.

MCA Programme Outcomes

- PO 1: Apply the knowledge of computing and mathematics to understand problems in different domains.
- PO 2: Analyze problems to identify and understand the requirements appropriate to its solution.
- PO 3: Design and develop a computer-based solution to meet desired requirements with understanding of social concerns.
- PO 4: Design and conduct experiments to identify alternative solutions and interpret results.
- PO 5: Use current tools and techniques, advanced technological frameworks to enhance computing skills.
- PO 6: Understanding professional, ethical, legal, security and social issues and responsibilities.
- PO 7: Work effectively as an individual and in a team with diverse and multidisciplinary professionals to accomplish a common goal.
- PO 8: Communicate effectively, comprehend and write effective reports and make effective presentations.

Semester	I	Total Credit	4
Course Code	CC 101	Credit Pattern	L-48, T-12, P-0
Course Title	COMPUTER ORGANIZATION AND ARCHITECTURE		
Course Objectives			
1	To feature a strong emphasis on the fundamentals underlying digital circuit design		
2	To build problem-solving skills required for digital circuit design		
3.	To explore computer design components like Boolean Algebra, Combinational, Sequential Circuit Design, Memory and CPU Organization, Input Output Processing		
Course Outcomes: The students will able to			
1.	Build understanding and problem-solving skills required for digital circuit design		
2.	Learn the basic concepts used in the digital domain like number systems, logic gates, Boolean algebra and K-maps etc		
3.	Present hardware operation and circuit designs used in digital computers.		

Semester	I	Total Credit	4
Course Code	CC 102	Credit Pattern	L-48, T-12, P-0
Course Title	Software Engineering And Object Oriented Design		
Course Objectives			
1	To learn and understand the principles of Software Engineering		
2	To Learn and understand Software Development Life Cycle		
3.	To introduce object oriented concepts and its representation in UML		
4.	To provide knowledge about object oriented model and its constituents		
Course Outcomes: The students will able to			
1.	Compare and chose a process model for a software project development		
2.	Analyze and design software of software system		
3.	Understand UML, its components, notation and syntax		
4.	Draw the models for object oriented system		

Semester	I	Total Credit	4
Course Code	CC 103	Credit Pattern	L-45, T-8, P-7
Course Title	PROGRAMMING WITH ‘C’ AND ‘C++’		
Course Objectives			
1	To teach how to write programs in C language		
2	To explain the data types and structures with their usage		
3.	To demonstrate implementation of flat files using C language		
4.	To introduce and explain the concepts like classes, constructors, destructors, inheritance, overloading, polymorphism and stream I/O operation.		
Course Outcomes: The students will able to			
1.	Write correct programs in C AND C++language		
2.	Understand use of data types and structures		
3.	Utilize Object Oriented Programming concepts to design C++ programs.		

Semester	I	Total Credit	4
Course Code	CC 104	Credit Pattern	L-45, T-8, P-7
Course Title	Web Design and Development		
Course Objectives			
1	To teach the basic internet concepts and train them to develop internet applications.		
2	Knowledge of the new JavaScript APIs.		
3.	To introduce various tools for web services.		
4	To introduce PHP and MySQL and its usages		
Course Outcomes: The students will able to			
1.	Design and develop internet applications.		
2.	Do JavaScript APIs.		
3.	Use various tools for web services.		
4.	Design and develop web application using PHP and MySQL		

Semester	I	Total Credit	4
Course Code	DSE 101	Credit Pattern	L-48, T-12, P-0
Course Title	A. E-Commerce		
Course Objectives			
1	To Understand the nature of E-commerce recognize the business impact and potential of e-commerce explain the technologies required to make e-Commerce viable;		
2	To discuss the current drivers and inhibitors facing the business world in adopting and using e-commerce and the trends in e-Commerce and the use of the Internet.		
3.	Conceive, specify, prototype, and evaluate design artifacts addressing the business case and the user experience requirements		
4	To apply the concepts of Internet security and multimedia in e-business applications.		
	To discuss e-commerce from an enterprise point of view.		
Course Outcomes: The students will able to			
1.	Integrate the knowledge of foundational functional areas of commerce in order to develop a holistic perspective on the role of IT in organizations.		
2.	Select and apply appropriate models to analyze the role of IT in an organization.		

Semester	I	Total Credit	4
Course Code	DSE 101	Credit Pattern	L-45, T-15, P-0
Course Title	B. Ethical Hacking		
Course Objectives			
1	The main aim is study Concepts of Hacking its types.		
2	To familiarize the student with ethical hacking concepts and tools.		
3.	To introduce various ethical hacking skills and types of attacks.		
Course Outcomes: The students will able to			
1.	Will be able to identify the type of hacking attack		
2.	Will be acquainted with ethical hacking skills		
3.	Will be able to handle DOS,web and social engineering attacks		
4.	will study IPR and Patenting		
Semester	I	Total Credit	4

Course Code	GE 101-A	Credit Pattern	L-45, T-8, P-7
Course Title	**FUNDAMENTALS OF MANAGEMENT**		
Course Objectives			
1	To Understand the different concept in Management.		
2	To understand the evolution of Management Thought.		
3	To introduce students to CSR.		
Course Outcomes: Students will be able to			
1	Discuss management evolution and how it can affect future managers		
2	Analyze and attain elementary level of skills in management process and functions: planning, organizing, leading, deciding, motivating and controlling.		
3	Evaluate leadership styles to anticipate the consequences of each leadership style		
4	Describe concept of CSR.		

Semester	I	Total Credit	4
Course Code	GE 101-B	Credit Pattern	L-45, T-8, P-7
Course Title	**ENVIRONMENT AND DEVELOPMENT**		
Course Objectives			
1	To make the students to understand the basics functional areas of Environment.		
2	To understand the procedural part getting environmental clearance to any new project.		
3	To develop the Environment Management System for an industry.		
Course Outcomes: The students will able to			
1	Differentiate biotic and abiotic components of ecosystem & able to understand concept of habitat, interactions in between different components & their Interrelationships.		
2	Develop ability of identification of local issues related with natural resources.		
3	Adopt various pollution control techniques.		
4	Students will know the protocol & prepare for EIA & EMS Reports.		
5	Students will know various environmental policies as well as National & International Organizations involved.		

Semester	I	Total Credit	4
Course Code	GE 101-C	Credit Pattern	L-45, T-8, P-7
Course Title	INDIAN SOCIAL PROBLEMS AND SERVICES		

Course Objectives	
1	To understand the nature and concept of social problems.
2	To study the causes and consequences of social problems.
3	To understand the various social/welfare services provided by GO's & NGO's.

Course Outcomes: Students will be able to	
1	Understand the application of various social/welfare services provided by GO's & NGO's in respect of Social Problems and Social Services.
2	Identify the social economic factors and their implications in the implementation of social welfare schemes.

Semester	I	Total Credit	4
Course Code	GE 101-D	Credit Pattern	L-44, T-08, P-08
Course Title	PRINCIPLES OF ECONOMICS		

Course Objectives	
1	To introduce the basic terms and principles of economics
2	Explain the scope and approach of economic analysis

Course Outcomes: Students will be able to	
1	The student will understand the application of economics an his personal and professional life.
2	Identify the economic factors and their implications in the working of different organizations

Semester	I	Total Credit	2
Course Code	AEC-101	Credit Pattern	L-26, T-4
Course Title	Business Communication		

Course Objectives	
1	To familiarize learners with the mechanics of communication.
2	To develop students written expression of thought and build connections between content areas
3	To develop students oral communication skills by a variety of communication activities, from informal discussion to formal presentation

Semester	II	Total Credit	4
Course Code	CC 201	Credit Pattern	L-45, T-15, P-0
Course Title	**Relational Database Management Systems**		
Course Objectives			
1	The main aim is study principles of Design and Development of Database.		
2	To study the key characteristics of a database management system and to know what are the advantages and disadvantages of each DBMS. To understand & make use of a data model(s) for designing and outlining the database schema;		
3.	To understand why Normalization is important and phases of it. To know the features of database transactions; atomicity, consistency, isolation, and durability (ACID) etc		
Course Outcomes: The students will able to			
1.	After studying unit I, students will learn importance of Database concepts and Designing		
2.	The will study different types of Data Modeling Techniques		
3.	They will be able to study design and constraints and techniques		
4.	They will study Normalization phases in database design and importance		

Semester	II	Total Credit	4
Course Code	CC 202	Credit Pattern	L-48, T-0, P-12
Course Title	**Discrete Mathematics and Statistical Computing**		
Course Objectives			
1	Students will learn basic methods of Discrete Mathematics and apply the basic methods of discrete mathematics in Computer Science. They will be able to use these methods in subsequent courses in the design and analysis of algorithms, software engineering, Artificial Intelligence.		
2	Topics like Propositional and Predicate Calculus provide the foundation for imbedding logical reasoning in computer science.		
Course Outcomes: The students will able to			
1.	Use logical notation to define and reason about fundamental mathematical concepts such as sets, relations, and functions		
2.	Reason mathematically about basic data types and structures (such as numbers, sets, graphs, and trees) used in computer algorithms and systems; 3. Apply graph theory models of data structures and state machines to solve problems of connectivity and constraint satisfaction,		

Semester	II	Total Credit	4
Course Code	CC 203	Credit Pattern	L-48, T-0, P-12
Course Title	**Data and File Structures**		
Course Objectives			
1	To find out types and difference between primitive and non-primitive structures.		
2	To Design and apply appropriate data structures for solving computing problems.		
3.	To Understand and use various file structures.		
Course Outcomes: The students will able to			
1.	Differentiate between primitive and non-primitive structures.		
2.	Design and apply appropriate data structures for solving computing problems.		
3.	Understand and use various file structures.		

Semester	II	Total Credit	4
Course Code	CC 204	Credit Pattern	L-45, T-8, P-7
Course Title	Core Java		

Course Objectives	
1	To provide a student with the solid foundation of the syntax and semantics of java Programming and object-oriented concepts in Java.
2	To familiarize the student to the application of Exception Handling mechanism in Java application
3.	To familiarize the student to the development of console-based and event handling applications in Java
4	To demonstrate use of multi-threaded application development in Java.
5.	To demonstrate interfacing Java application with various Database Management Systems.

Course Outcomes: The students will able to	
1.	To design console based application, accessing command-line arguments and parameterized applets.
2.	To design java applications employing streams and exception handling mechanism in Java.
3.	To explore different types of JDBC drivers for connecting and accessing data from different backend database management systems.
4.	To design and develop networked applications in both connection-oriented and connectionless architecture in Java.
5.	To design and implement event handling applications in Java using AWT and Swing.

Semester	II	Total Credit	4
Course Code	DSE 201	Credit Pattern	L-45, T-8, P-7
Course Title	A. Service Oriented Architectures		

Course Objectives	
1	To get knowledge about SOA
2	To study Web Services such as SOAP,WSDL,UDDI
3.	To Study Server side web technology (XML)
4	To study Service Oriented architecture
5.	To study SOA layers.

Course Outcomes: The students will able to	
1.	Able to understand SOA in detail.
2.	Able to understand SOAP, WSDL web services and their working
3.	Able to understand web service framework
4.	Able to understand Message exchange patterns and service activity
5.	Able to understand SOA layers.

Semester	II	Total Credit	4
Course Code	DSE-201	Credit Pattern	L-45, T-8, P-7
Course Title	B. Cloud Computing		
Course Objectives			
1	To understand the concept of Virtualization and design of cloud Services		
2	To understand cloud computing technologies.		
3.	To introduce the broad perceptive of cloud architecture and model To learn to design the trusted cloud Computing system		
4	To introduce the fundamental ideas of the cloud computing model and its origin		
5.	To introduce the broad perceptive of cloud architecture and model To learn to design the trusted cloud Computing system		
6.	To understand the features of cloud simulator		
Course Outcomes: The students will able to			
1.	Able to identify the architecture and delivery models of cloud computing.		
2.	Able to identify infrastructure.		
3.	Helps to understand security, privacy and interoperability issues.		
4.	Enable to select suitable cloud player		
5.	Enable to apply suitable virtualization concept		
6.	Enable to implement cloud services and set a private cloud		

Semester	II	Total Credit	4
Course Code	GE 201-A	Credit Pattern	L-45, T-7, P-8
Course Title	FUNDAMENTALS OF ACCOUNTING		
Course Objectives			
1.	To acquaint the students regarding basic accounting concepts.		
2.	To judge students ability to make financial statements.		
Course Outcomes			
	The students will able to learn:		
1.	How to exhibit the basic accounting concepts and its application.		
2.	To demonstrate basis of financial statements analysis.		
3.	To construct of working capital, ratio analysis and cost accounting.		

Semester	II	Total Credit	4
Course Code	GE 201-B	Credit Pattern	L-45, T-15, P-0
Course Title	DISASTER MANAGEMENT		

Course Objectives	
1	To understand the concept and impact of disasters.
2	To understand the causes, effects and control measures of disasters.
Course Outcomes: The students will able to	
1	Know the fundamentals of Disaster Management
2	Do strategic Management for Natural Disasters.
3	Do strategic Management for Man Made & Technological Disasters.
4	Do Pre, Emergency & Post Disaster Management Plan.

Semester	II	Total Credit	4
Course Code	GE 201	Credit Pattern	L-45, T-8, P-7
Course Title	C. SOCIAL WELFARE AND ADMINISTRATION		

Course Objectives	
1	To develop skills required for NGO's Management.
2	To understand the process of Social Welfare administration.
3	To know the various schemes of social welfare
Course Outcomes: Students will be able to	
1	Understand the application of various social/welfare services provided by GO's & NGO's in respect of systematic implementation of welfare policies
2	Identify the administrative process and their implications in the implementation of social welfare schemes.

Semester	II	Total Credit	4
Course Code	GE 201	Credit Pattern	L-44, T-08, P-08
Course Title	D. Principles of Micro Economics		

Course Objectives	
1	To explain the microeconomic factors in and economy
2	To highlight significance if the microeconomic factors
Course Outcomes: Students will be able to	
1	Understand the micro variables and approach for microeconomic issues
2	Analyse the process of factor price determination at micro level

Semester	II	Total Credit	2
Course Code	AEC-201	Credit Pattern	L-22, T-8
Course Title	Soft Skill and Personality Development		
Course Objectives			
1	Develop effective communication skills		
2	Develop broad career plans		
Course Outcomes			
After completion of this course the student will be able to:			
1	Match the job requirements and skill sets.		
2	Evaluate the employment market.		

Semester	III	Total Credit	4
Course Code	CC 301	Credit Pattern	L-48, T-12, P-0
Course Title	Operating System		
Course Objectives			
1	To Introduce Operating System, Functions and operations.		
2	To learn and understand Process Management.		
3	To learn and understand Memory Management.		
4	To learn and understand the File system Concepts		
Course Outcomes: The students will able to			
1	Understand the basic concepts and functions of operating systems.		
2	Understand Processes and Threads		
3	Analyze Scheduling algorithms.		
4	Understand the concept of Deadlocks.		
5	Analyze various memory management schemes.		
6	Understand I/O management and File systems.		
7	Familiar with the basics of Linux system and Mobile OS like iOS and Android.		

Semester	III	Total Credit	4
Course Code	CC 302	Credit Pattern	L-48, T-12, P-0
Course Title	DESIGN AND ANALYSIS OF ALGORITHM		
Course Objectives			
1	To provide a solid foundation in algorithm design and analysis.		
2	Become familiar with fundamental data structures and with the manner in which these data structures can best be implemented; become accustomed to the description of algorithms in both functional and procedural styles.		
3	To develop problem solving abilities using mathematical theories.		
4	To apply algorithmic strategies while solving problems. Also expected to understand find out the time complexity of the algorithm.		
5	To study the important algorithmic design paradigms and methods of analysis.		
Course Outcomes: After successful completion of the course, the students would be able to			

1.	Learn good principles of algorithm design;
2.	To analyze worst-case running times of algorithms using asymptotic analysis.
3.	Describe the Divide-and-Conquer, Bound and Branch-programming, greedy paradigm and explain when an algorithmic design situation calls for it.
4.	Explain the major graph algorithms and their analyses. Employ graphs to model problems.

Semester	**III**	**Total Credit**	**4**
Course Code	**CC 303**	**Credit Pattern**	**L-48, T-12, P-0**
Course Title	**.Net Technologies I**		
Course Objectives			
1	To explore the knowledge on different types of applications of .net		
2	To know about the design methodologies with concentration on object oriented concepts		
3	Giving the students a complete knowledge on .net framework and .net environment.		
4	To introduce a student to an entirely a new way to build distributed, desktop and mobile applications		
Course Outcomes: The students will able to			
1	The syntax and semantics of C# and procedural programming including variable definitions, arithmetic and boolean expressions, control structures, methods, subroutines, arrays, and references.		
2	Event-based programming and GUI design.		
3	An idea of what objects are how to design programs using object-oriented design.		

Semester	**III**	**Total Credit**	**4**
Course Code	**CC 303**	**Credit Pattern**	**L-48, T-12, P-0**
Course Title	**.Net Technologies I**		
Course Objectives			
1	To explore the knowledge on different types of applications of .net		
2	To know about the design methodologies with concentration on object oriented concepts		
3	Giving the students a complete knowledge on .net framework and .net environment.		
4	To introduce a student to an entirely a new way to build distributed, desktop and mobile applications		
Course Outcomes: The students will able to			
1	The syntax and semantics of C# and procedural programming including variable definitions, arithmetic and boolean expressions, control structures, methods, subroutines, arrays, and references.		
2	Event-based programming and GUI design.		
3	An idea of what objects are how to design programs using object-oriented design.		

Semester	**III**	**Total Credit**	**4**
Course Code	**DSE301**	**Credit Pattern**	**L-45, T-7, P-8**
Course Title	**Optimization Techniques**		
Course Objectives: Equip students with the ability to**:**			

1	To introduce various deterministic decision models and design algorithms and flowcharts for solution.
2	To equip the students in decision making through operational research techniques.
Course Outcomes: Students will be able to	
1.	Analyze the data available for decision making.
2.	Analyze company/organization data for taking management decision.

Semester	**III**	**Total Credit**	**4**
Course Code	DSE 301(B)	**Credit Pattern**	**L-48, T-12, P-0**
Course Title	**Computer Graphics**		
Course Objectives			
1.	To understand the basics and elements of computer graphics.		
2.	To understand the basic idea of scan conversion techniques and various algorithms in graphic primitive generation.		
3.	To learn basic of 2D and 3D transformation and its techniques .		
4.	To understand and learn the concepts of viewing transformations, clipping, projections and rendering with algorithms		
Course Outcomes: After successful completion of the course, the students would be able to			
1.	Present various aspects of computer graphics		
2.	Design and develop graphics programming.		
3.	Build understanding and problem-solving skills required for graphics applications		

Semester	**III**	**With effect from**	**2017-18**
Course Code	**GE301(A)**	**Type**	**Generic Elective Course**
Course Title	**Agri Business Environment and Cooperation**		
Course Objectives			
1	The Course Highlights the Importance of Agri Business in the Context of Developing Economies.		
2	The course highlights the entrepreneurial aspects of Agri-buisness		
3	It Explains the Significance of Co-Operation in Agriculture and Agri-Business.		

Semester	**III**	**Total Credit**	**4**
Course Code	**GE 301 B**	**Credit Pattern**	**L-45, T-8, P-7**
Course Title	**SUSTAINABLE AGRICULTURE**		
Course Objectives			
1	To prevent Natural Capital Degradation		
2	To maintain Sustainablity in Agroecosystem for Ecological Balance		
3.	To have Self Sufficiency in Food Production of Requisite Quality & Quantity		
Course Outcomes: The students will able to			
1.	After studying unit I, students will learn importance of agriculture for tropical countries like India. They will learn agri-ecosystem & its components. They will know the essential features of traditional, transitional & modern agriculture. They will learn importance of biodiversity in agri-ecosystem.		

2.	They will be aware of Irrigation water quality & requirements. They will know Water management for sustainability. They will understand importance of soil & land resource, methods of soil & water conservation.
3.	They will be able to manage pest through Integrated Approach(IPM) & use biopesticides.
4.	They will be able to manage soil health through Integrated Plant Nutrient Management (IPNM) concept.

Semester	**III**	**Total Credit**	**4**
Course Code	**GE 301 D**	**Credit Pattern**	**L-40, T-10, P-10**
Course Title	**Fundamentals of Macro Economics**		
Course Objectives			
1	To explain the various macro economic variables in an economy		
2	To highlight the interrelationship between the various macro variables		
Course Outcomes: Students will be able to			
1	Recognise the macro variables in any economy		
2	Understand the economic theories variations in macro variables and policies to regulate them.		

Semester	**III**	**Total Credit**	**2 (Value Added)**
Course Code	**AEC 201 (A)**	**Credit Pattern**	**L-22, T-4, P-4**
Course Title	**GERMAN**		
Course Objectives			
1	To create an awareness about a foreign language		
2	To understand the basic script of the language		
3	To understand the culture and tradition of the county		
Course Outcomes: Students will be able to;			
1	This course will crate platform for the students to get prepared for Star Deutch exam (A1 exam by Goethe Institute, Max Muller Bhavan) .The students will find it very easy to pursue for this exam after completion of this course and they will have overall idea about the German language as well teaching methods followed to learn any foreign language .		
2	This course enables the students to understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concert type. To enable to students to introduce him/herself and others and can ask and answer question about personal details such as where he /she lives, people he /she knows lives, people he /she knows and things he /she has To make him/her interact in a simple way provided the other person talks slowly and clearly and is prepared to help. To help him/her to use the basic grammar concepts correctly. To enable the students to read and write simple text. The students learn 400-600 words of vocabulary.		

Semester	III	Total Credit	2
Course Code	AEC 201(B)	Credit Pattern	L-22, T-4, P-4
Course Title	JAPANESE		
Course Objectives			
1	To create an awareness about a foreign language		
2	To understand the basic script of the language		
3	To understand the culture and tradition of the county		
Course Outcomes: Students will be able to;			
1	This course enables the students to understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concert type. To enable to students to introduce him/herself and others and can ask and answer question about personal details such as where he /she lives, people he /she knows lives, people he /she knows and things he /she has To make him/her interact in a simple way provided the other person talks slowly and clearly and is prepared to help. To help him/her to use the basic grammar concepts correctly.		

Semester	III	Total Credit	2
Course Code	AEC 201 (C)	Credit Pattern	L-22, T-4, P-4
Course Title	FRENCH		
Course Objectives			
1	To create an awareness about a foreign language		
2	To understand the basic script of the language		
3	To understand the culture and tradition of the county		
Course Outcomes: Students will be able to;			
1	This course will create a platform for the students to get prepared for DELF (A1.1 exam by Alliance Francaise). The students will find it very easy to pursue for this exam after completion of this course and they will have overall idea about the French language as well teaching methods followed to learn any foreign language.		
2	This course enables the students to understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concert type. To enable the students to introduce him/herself and others and can ask and answer questions about personal details such as where he /she lives, people he /she knows lives, people he /she knows and things he /she has To make him/her interact in a simple way provided the other person talks slowly and clearly and is prepared to help. To help him/her to use the basic grammar concepts correctly. To enable the students to read and write simple text. The students learn 400-600 words of vocabulary.		

Semester	IV	Total Credit	4
Course Code	CC401	Credit Pattern	L-48, T-12, P-0
Course Title	COMPUTER COMMUNICATION AND NETWORK		
Course Objectives			
1	To learn technology behind network architecture with layered organization.		
2	Gain in depth knowledge of network core and network edge		
3.	Uniform coverage of principles, architecture, practical insights of networks		
Course Outcomes: The students will able to			
1.	Present conceptual aspects of network applications such as web, file transfer, e-mail, and remote access, file sharing etc.		
2.	Understand layered architecture of TCP/IP model and design network applications		
3.	Build understanding and problem-solving skills required for network design		

Semester	IV	Total Credit	4
Course Code	CC 402	Credit Pattern	L-48, T-12, P-0
Course Title		Software Project Management and Quality Assurance	
Course Objectives			
1	To introduce the tasks and concepts in project management.		
2	To find out various metrics and its usage		
3.	To understand various methods of quality assurance.		
4.	To find out the activities in software maintenance and configuration management.		
Course Outcomes: The students will able to			
1.	To understand the tasks and concepts in project management.		
2.	To collect and use metrics.		
3.	To find out quality of software and the process		
4.	To understand activities in software maintenance and configuration management.		

Semester	IV	Total Credit	4
Course Code	CC 403	Credit Pattern	L-44, T-8, P-8
Course Title	Linux Programming		
Course Objectives			
1	To familiarize the student with Linux operating system environment.		
2	To demonstrate various tools and techniques used by Linux Programmers and the familiarize with various system calls .		
3	To make them familiarize with various administration tools, backup and restore utilities.		
Course Outcomes			
After completion of this course the student will be able to:			
1	Students will able to differentiate between Linux and other operating systems.		
2	Students will able to install and administer Linux Servers .Use various Filters and editors		
3	Students shall be able to progress as a Developer or Linux Administrator using the acquired skill set.		
4	Students will able to program the system to enhance the abilities.		

Semester	IV	Total Credit	4
Course Code	CC404	Credit Pattern	L-45, T-8, P-7
Course Title	.Net Technologies-II		

Course Objectives	
1	To provide the knowledge on developing internet applications and how to design and implement complete applications over the web using web form and MVC technology.
2	Giving the students a quick review on web servers, client side programming, server side programming and various web technologies.
3	Giving the students depth knowledge about database management using ADO.net and entity framework technologies
4	Giving the students hands on exercise on developing ASP.net MVC applications.

Course Outcomes: The students will able to	
1.	Create web applications using different web application templates.
2.	Database management using ADO.net and entity framework technologies
3.	Use various ASP.net server controls like navigation and validation controls
4.	Implement web application using MVC architecture

Semester	IV	Total Credit	4
Course Code	DSE 401 A	Credit Pattern	L-48, T-12, P-0
Course Title	Compiler Construction		

Course Objectives	
1	To design and implement a compiler using a software engineering approach
2	To demonstrate how to apply the theory of language translation to build compilers and interpreters.
3	To illustrate the building of translators both from scratch and using compiler generators.
4	To explore the main issues of the design of translators
5	To expose the student to the construction of a compiler/interpreter for a small language

Course Outcomes: Students will be able to;	
1	Understand the structure of compilers
2	Understand the basic techniques used in compiler construction such as lexical analysis, top-down, bottom-up parsing
3	Understand the basic techniques used in compiler construction such as context-sensitive analysis, and intermediate code generation
4	Understand the basic data structures used in compiler construction such as abstract syntax trees, symbol tables.
5	Understand the basic data structures used in compiler construction such as three-address code, and stack machines.

Semester	IV	Total Credit	4
Course Code	DSE 401 B	Credit Pattern	L-45, T-8, P-7
Course Title	SIMULATION MODELLING AND EXPERT SYSTEM		
Course Objectives			
1	Simulation Modeling and Simulation of Models to study real-world facilities and Processes constitute an important Computer Application. The Simulation Techniques have wide applications in every branch of social, physical and natural sciences, Engineering, medicine and Business. In this paper, the discrete event simulation is introduced in detail, with some applications. In this paper an overview of expert system is discussed.		
Course Outcomes			
After completion of this paper student shall be able to			
1	Understand and Develop simulation models in different areas.		
2	Design and develop expert systems in different areas.		

Semester	IV	Total Credits:	4
Course Code	GE 401 A	Credit Pattern	L-45, T-8, P-7
Course Title	BUSINESS ETHICS		
Course Objectives			
1	To enable students to understand the concept, importance of ethics, professional ethics.		
2	To inculcate ethical values in students		
3	To identify ethical issues and dilemma in various functions		
Course Outcomes: Students will be able to;			
1.	Understand ethical principles in business.		
2.	Analyze unethical issues and take ethical decisions.		
3.	Solve ethical dilemmas in the organization.		
4.	Build ethical culture in the organization.		

Semester	IV	Total Credit	2
Course Code	AEC 401(A)	Credit Pattern	L-48, T-12, P-0
Course Title	INTERNET OF THINGS		
Course Objectives			
1	Provide an overview of concepts, main trends and challenges of Internet of Things.		
2	Get knowledge of IoT Key Technologies such as RFID, Wireless Networks etc.		
3.	To make students aware of Internet of Things applications.		
4	Develop skills related to the IoT technologies for practical IoT applications.		
Course Outcomes: The students will able to			
1.	Explain and interpret the Internet of Things concepts and applications.		
2.	Use the knowledge and skills acquired during the course for the design of simple IoT		
3.	Analyze applications of IoT in real time scenario		

Semester	IV	Total Credit	4
Course Code	AEC 401(B)	Credit Pattern	L-48, T-12, P-0
Course Title	Big Data Analytics		

Course Objectives	
1	To master the concepts of HDFS and MapReduce framework
2	To introducerHadoop 2.x Architecture
3	To introduce data loading techniques using Sqoop and Flume
4	To familiarize the student with data loading and data analytics
5	To userstandHBase and MapReduce integration

Course Outcomes: Students will be able to;	
1	Master data loading techniques using Sqoop and Flume.
2	Setup Hadoop Cluster and write Complex MapReduce programs
3	Perform data analytics using Pig, Hive and YARN
4	Implement best practices for Hadoop development
5	Implement Advanced Usage and Indexing
6	Schedule jobs using Oozie
7	Work on a real life Project on Big Data Analytics

Semester	V	Total Credit	4
Course Code	CC501	Credit Pattern	L-48, T-12, P-0
Course Title	DATA WARE HOUSING AND DATA MINING		

Course Objectives	
1	To provide students with basic concepts of data warehouse and data mining.
2	To develop abilities to solve real time problem by applying appropriate data mining algorithm.
3	To make students acquaint to different tools and techniques used for Knowledge Discovery in Databases.

Course Outcomes: The students will able to	
1.	Develop acquaintance with the tools and techniques used for Knowledge Discovery in Databases.
2.	Discover interesting patterns from large amounts of data to analyze and extract patterns to solve problems
3.	Evaluate and select appropriate data-mining algorithms
4.	Apply, and interpret and report the output appropriately

Semester	V	Total Credit	4
Course Code	CC 502	Credit Pattern	L-48, T-12, P-0
Course Title	Artificial Intelligence and Soft Computing		

Course Objectives	
1	To endow with various disciplines of artificial intelligence and its applications
2	To explore knowledge representation techniques in AI.
3	To demonstrate machine learning through artificial neural networks

4	To explain handling uncertainty using fuzzy logic.
Course Outcomes: The students will able to	
1.	Apply problem solving by intelligent search approach.
2.	Represent knowledge using AI knowledge representation techniques.
3.	Design machine learning solution to real life problems.
4	Derive solutions for problems with uncertainty using fuzzy theory.

Semester	**V**	**Total Credit**	
Course Code	**CC 503**	**Credit Pattern**	
Course Title	**Machine Learning with Python**		
Course Objectives			
1	Provide a concise introduction to the fundamental concepts in machine learning and popular machine learning algorithms		
2	To familiarize various python data structures		
3	To familiarize various python libraries for machine learning		
4	To demonstrate implementation of various machine learning algorithms using python		
Course Outcomes: The students will able to			
1.	Understand various concepts of machine learning		
2.	Able to use various python data structures fluently		
3.	Able to use various python libraries for machine learning		
4.	Able to implement supervised and unsupervised machine learning algorithms using python.		

Semester	**V**	**Total Credit**	**4**
Course Code	**CC 504**	**Credit Pattern**	**L-45, T-7, P-8**
Course Title	**Mobile Computing**		
Course Objectives			
1	To introduce challenges in app development for thin clients.		
2	To provide acquaintance with popular Android editors such as Eclipse/Android Studio.		
3	To familiarize the students about android stack, android sdk, application life cycle, and basic components.		
4	To introduce Android's APIs for data storage, retrieval, user preferences, files, databases, and content providers		
5	To introduce persistent data storage using SQLite		
Course Outcomes: Students will be able to;			
1	Build android apps in Eclipse/Android Studio.		
2	Design and develop useful Android applications using activities, intent and manifest		
3	Design and develop useful Android applications Utilizing the power of background services, threads, and notifications		
4	Develop applications for data storage and retrieval.		
5	Sharing data between applications using Content Provider.		

Semester	V	Total Credit	4
Course Code	DSE- 501	Credit Pattern	L-48, T-12, P-0
Course Title	A. Network Administration and Security		
Course Objectives			
1	Network security today has become of vital importance, which calls for studying and knowing what is an attack, types of attacks, Understand various security attacks at Application Level Network Levels.		
2	To know about Cookies, Services and mechanisms applied, To understand Security services Confidentiality Authenticity Availability, Audit_ ability, Access Control, Integrity, Non-reputability, Integrity check, Digital signature		
Course Outcomes: The students will able to			
1.	After studying various aspects of Network security, the students can imbibe some of these security features while designing and development of applications, which do they develop during their real career path and also implement these security techniques in their organizational networks.		

Semester	V	Total Credit	4
Course Code	CC 501	Credit Pattern	L-48, T-12, P-0
Course Title	B. Distributed Databases		
Course Objectives			
1	To be aware of the principal challenges that have to be addressed in the development of distributed database systems.		
2	Understand distributed database-processing concepts to study about the design and architecture of distributed database		
Course Outcomes: The students will able to			
1.	Students will enhance their knowledge abilities to Distributed Database concepts and can apply these concepts in real world problem solving.		