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Programme:-MCA (AIML) **Semester - IV** **wef: July 2025**

Name of Paper	Paper Code	Theory					
		Credit			Marks		
Artificial Intelligence and its Applications	**MAI-401**	**L**	**T**	**J**	**EST**	**CAT**	**Total**
		3	1	0	80	20	100

Course Objective	The primary objective of this course is to introduce the basic principles, techniques, and applications of Artificial Intelligence. And basic exposition to the goals and methods of Artificial Intelligence.

Units	Contents (*Theory*)	Hours /week
I	General Issues and Overview of AI the AI problems, what is an AI technique, Characteristics of AI applications. Introduction to LISP programming: Syntax and numeric functions, Basic list manipulation functions, predicates and conditionals, input output and local variables, iteration and recursion, property lists and array	8
II	Problem Solving, Search and Control Strategies General problem solving, production systems, control strategies forward and backward chaining, exhaustive searches depth first breadth first search. Heuristic Search Techniques Hill climbing, branch and bound technique, best first search & A* algorithm, AND / OR graphs, problem reduction & AO* algorithm, constraint satisfaction problems.	8
III	Knowledge Representations First order predicate calculus, skolemization, resolution principle & unification, interface mechanisms, horn's clauses, semantic networks, frame systems and value inheritance, scripts, conceptual dependency.	8
IV	Natural Language processing Parsing techniques, context free grammar, recursive transitions nets (RNT), augmented transition nets (ATN). Game playing: Minimax search procedure, alpha-beta cutoffs, additional refinements. Planning: Overview, an example domain the block word, component of planning systems, goal stack planning, non linear planning.	8

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V	Probabilistic Reasoning and Uncertainty Probability theory, bayes theorem and bayesian networks, certainty factor. Expert Systems Introduction to expert system and application of expert systems, various expert system shells, knowledge acquisition, case studies, MYCIN. Learning: Rote learning, learning by induction, explanation based learning	8

Text Books/ReferenceBooks:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Dan W. Patterson	Introduction to Artificial Intelligence and Expert Systems	1st	Prentice India
Nils J. Nilson	Principles of Artificial Intelligence	1st	Narosa Publishing House
Clocksin&C.S.Melish	Programming in PROLOG	5th	NarosaPublishing House
M. Sasikumar, S. Ramani etc.	Rule based Expert System	1st	Narosa Publishing House
Elaine Rich and Kevin Knight	Artificial Intelligence	1st	Tata McGraw Hill

COURSE OUTCOMES: Students will be able to

CO1	Demonstrate fundamental understanding of artificial intelligence (AI) and its foundations.
CO2	Apply basic principles of AI in solutions that require toward problem solving and searching.
CO3	Explain the concept of Knowledge Representation
CO4	Illustrate the NLP and game playing.
CO5	Explain Bayesian Network, Causality, Uncertain Reasoning and Expert Systems with its application.

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Name of Paper	Paper Code	Theory					
		Credit			Marks		
Software Testing and Quality Assurance	MAI-402 (E-III (1))	L	T	J	EST	CAT	Total
		3	1	0	80	20	100

Course Objective	Learn to apply the testing strategies and methodologies in projects and understand test management strategies and tools for testing and detail about various quality assurance models.

Units	Contents (*Theory*)	Hours /week
I	**Software Testing Fundamentals:** Introduction, Testing objectives, Test information flow, Testing life-cycle, Test Cases, Designing test cases, Testing as an engineering activity, Role of process in software quality, Testing as a process, Basic definitions, Software testing principles, The tester's role in a software development organization, Origins of defects, Defect classes, The defect repository and test design, Defect examples, Developer / Tester support for developing a defect repository	8
II	**Testing techniques and levels of testing:**Using White Box Approach to Test design - Static Testing Vs. Structural Testing, Code Functional Testing, Coverage and Control Flow Graphs, Using Black Box Approaches to Test Case Design, Random Testing, Requirements based testing, Decision tables, State-based testing, Cause-effect graphing, Error guessing, Compatibility testing, Levels of Testing -Unit Testing, Integration Testing, Defect Bash Elimination. System Testing - Usability and Accessibility Testing, Configuration Testing, Compatibility Testing	8
III	**Software test automation andquality metrics:** Software Test Automation, Skills needed for Automation, Scope of Automation, Design and Architecture for Automation, Requirements for a Test Tool, Challenges in Automation Tracking the Bug, Debugging. Testing Software System Security - Six-Sigma, TQM - Complexity Metrics and Models, Quality Management Metrics, Availability Metrics, Defect Removal Effectiveness, FMEA, Quality Function Deployment, Taguchi Quality Loss Function, Cost of Quality	8

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IV	**Fundamentals of software quality assurance**: SQA basics, Components of the Software Quality Assurance System, software quality in business context, planning for software quality assurance, product quality and process quality, software process models, 7 QC Tools and Modern Tools	8
V	**Quality assurance models:** Models for Quality Assurance, ISO-9000 series, CMM, CMMI, Test Maturity Models, SPICE, Malcolm Baldrige Model- P-CMM. **Software quality assurance trends:** Software Process- PSP and TSP, OO Methodology, Clean-room software engineering, Defect Injection and prevention, Internal Auditing and Assessments, Inspections & Walkthroughs, Case Tools and their Affect on Software Quality	8

Text Books/ReferenceBooks:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Srinivasan Desikan, Gopalaswamy Ramesh	Software Testing: Principles and Practices	1st	Pearson
Aditya P. Mathur	Foundations of Software Testing	1st	Pearson
S.A.Kelkar	Software quality and Testing	1st	PHI
William Perry	Effective Methods of Software Testing	3rd	Wiley Publishing

COURSE OUTCOMES: Students will be able to

CO1	Understand the basics of testing, test planning & design and test team organization.
CO2	Investigate the scenario and to select the proper testing technique.
CO3	Use test automation techniques & tools for estimation of cost.
CO4	Illustrate Software Quality Assurance basics, components and tools.
CO5	Explain Quality assurance models and trends.

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Name of Paper	Paper Code	Theory					
		Credit			Marks		
		L	T	J	EST	CAT	Total
Digital Marketing	MAI-402 (E-III (2))	3	1	0	80	20	100

Course Objective	The objective of this course is to provide a comprehensive understanding of digital marketing techniques from multiple perspectives, including those of analysts, consumers, and entrepreneurs.

Units	Contents (*Theory*)	Hours /week
I	**Introduction To Digital Marketing:** Overview of Digital Marketing, Traditional Marketing vs. Digital Marketing, Importance of Digital Marketing in the Modern Business World, Key Digital Marketing Channels and Tools, DMI Framework, DMI Quality Scale.Responsibilities of a Digital Marketer. **Website Planning & Analysis**: Overview of Website Planning, Defining the Purpose and Objectives, Understanding the Target Audience, Setting SMART Goals and KPIs, Definition and importance of domain names and extensions, hosting servers and its type.	**8**
II	**Search Engine Optimization (SEO):** SEO Concepts, SEO Process, Keyword research , Organic vs. paid results, Onpage&Offpage SEO, Universal SEO/ Voice search, Local SEO, Technical SEO, E-commerce SEO, Internal and external linking, Backlinking, Google Play SEO/ SEO for Apps, Algorithm Updates, Structured Data, Application of Webmaster Tool.	**8**
III	**Search Engine Marketing (SEM):** Introduction to Search Engine Marketing, Keyword Auctions, Paid search advertising, PPC (Pay-per-click), Bidding strategies, Budget Optimization, Mobile Ad campaigns, Google Display Networks (GDN), YouTube Marketing: Introduction and Ad Formats ,Shopping Campaigns, Google Adwords.	**8**
IV	**Social Media Marketing (SMM) :**Introduction to Fundamentals of SMM, Planning SMM, How & Why of SMM, SMM for businesses, SMM tools: Buffer, Hootsuite, SEMRUSH, Buzzsumo, ChatGPT, HubSpot, Facebook Marketing, Youtube Shorts, Twitter Ads, LinkedIn Ads, IGTV, Instagram for Business, CPV (Cost-per-volume), CPC (Cost-per-click), CPM (Cost-per-volume).	**8**
V	**Emerging Trends and Ethical Considerations:** AI and Machine Learning in Digital Marketing- AI-Powered Tools for Content Creation and Optimization, Machine Learning Algorithms for Predictive Marketing, Chatbots and Conversational Marketing.	**8**

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	Advanced Mobile Marketing- In-App Advertising and Mobile User Experience Optimization, Location-Based Marketing: Geo-Targeting and Beacon Technology **Ethical and Legal Aspects of Digital Marketing-** Data Privacy Laws: GDPR, CCPA, and Global Compliance, Ethical Marketing Practices and Avoiding Manipulative Tactics. **Capstone Project-** Comprehensive Digital Marketing Strategy Development, Real-World Application and Presentation to Industry Professionals.	

Text Books/Reference Books:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Ryan Deiss and Russ Henneberry	Digital Marketing for Dummies	1st ed.	John Wiley & Sons.
Ian Dobson	The Art of Digital Marketing: The Definitive Guide to Creating Strategic, Targeted, and Measurable Online Campaigns	1st ed.	Wiley
Puneet Singh Bhatia	Fundamentals of Digital Marketing	1st ed.	Pearson
Vandana Ahuja	Digital Marketing	1st ed.	Oxford University Press

COURSE OUTCOMES: Students will be able to

CO1	Plan, analyze, and implement digital marketing strategies.
CO2	Explain advanced SEO techniques and tools to enhance website visibility and performance across search engines.
CO3	Develop expertise in creating, managing, and optimizing paid search campaigns.
CO4	Acquire skills to design, execute, and analyze social media campaigns to enhance brand presence.
CO5	Understand and apply the latest digital marketing trends and best practices while adhering to ethical standards and legal requirements in the evolving digital landscape.

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Name of Paper	Paper Code	Theory					
		Credit			Marks		
		L	T	J	EST	CAT	Total
Computer Ethics	MAI-402 (E-III (3))	3	1	0	80	20	100

Course Objective	To create awareness on Engineering Ethics and Human Values and To study the moral issues and decisions confronting individuals and organizations engaged in engineering profession.

Units	Contents (*Theory*)	Hours /week
I	An Overview of Ethics: Ethics: Definition of Ethics, The Importance of Integrity, The Difference between Morals, Ethics, and Laws. Ethics in the Business World: Why Fostering Good Business Ethics Is Important, Improving Corporate Ethics, Creating an Ethical Work Environment, Including Ethical Considerations in Decision Making. Ethics in Information Technology Ethics for IT Workers and IT Users: IT Technicians, IT Professionals: Are ITWorkers Professionals, Professional Relationships, Professional Codes of Ethics, Certification, Government Licensing, IT Professional Malpractice. IT Users, Common Ethical Issues for IT Users	8
II	Computer and Internet Crime, IT Security Incidents: A Major Concern, Why Computer Incidents Are So Prevalent, Types of Exploits, Types of Perpetrators, Federal Laws for Prosecuting Computer Attacks, Implementing Trustworthy Computing: Risk Assessment, Establishing a Security Policy, Educating Employees, Prevention, Detection, Response. Privacy: Privacy Concerns abound with New IRS Systems, Privacy Protection and the Law: Privacy Laws, Applications, and Court Rulings. Key Privacy and Anonymity Issues, Treating Consumer Data Responsibly.	8
III	Freedom of Expression: First Amendment Rights, Obscene Speech, Defamation, Freedom of Expression: Key Issues, Controlling Access to Information on the Internet, Anonymity on the Internet, Defamation and Hate Speech, Corporate Blogging, Pornography. Intellectual Property: What Is Intellectual Property? Copyrights: Copyright Term, Eligible Works, Fair Use Doctrine, The Prioritizing Resources and Organization for Intellectual Property (PRO-IP) Act of 2008, General Agreement on Tariffs and Trade (GATT), The WTO and the WTO TRIPS Agreement (1994), The World Intellectual Property Organization (WIPO) Copyright Treaty (1996), The Digital Millennium Copyright Act (1998), Patents. Open Source Code, Competitive Intelligence, Cyber squatting.	8

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IV	Software Development: Strategies for Engineering Quality Software,:TheImportance of Software Quality, Software Product Liability, Software Development Process, Capability Maturity Model Integration. Key Issues in Software Development, Development of Safety - Critical Systems, Quality Management Standards The Impact of Information Technology on Productivity and Quality of Life: The Impact of IT on the Standard of Living and Worker Productivity, IT Investment and Productivity, The Digital Divide, The Impact of IT on Healthcare Costs, Electronic Health Records, Use of Mobile and Wireless Technology in the Healthcare Industry, Telemedicine, Medical Information Web Sites for Laypeople	8
V	Social Networking,the Use of Social Networks in the Hiring Process, Social Shopping Web Sites, Social Networking Ethical Issues, Cyberbullying, Cyberstalking, Encounters with Sexual Predators, Uploading of Inappropriate Material, Online Virtual Worlds, Crime in Virtual Worlds, Educational and Business Uses of Virtual Worlds. Ethics of IT Organizations: Key Ethical Issues for Organizations, The Need for Nontraditional Workers, Contingent Workers, Advantages of Using Contingent Workers, Disadvantages of Using Contingent Workers, Deciding When to Use Contingent, Outsourcing, Offshore Outsourcing, Pros and Cons of Offshore Outsourcing.	8

Text Books/Reference Books:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
George W. Reynolds	Ethics in information technology	6th	Cengage Learning
Deborah Johnson	Computer Ethics	4th	Pearson
Richard Spinello and Herman Tavani	CyberEthics	6th	Jones & Bartlett Learning

COURSE OUTCOMES: Students will be able to

CO1	Identify ethical issues in computing work, applications, and/or use cases, and distinguish them from technical, legal, commercial, or PR issues/challenges
CO2	Learn the need for professional ethics, codes of ethics and roles, concept of security, risk assessment
CO3	Explain fundamental ethical concerns in computing (eg. privacy, security, fairness, transparency, accountability, safety, control, manipulation/deception, trust, etc.
CO4	Illustrate key issues in Software Development.
CO5	Write ethical issues related with Social Networking and IT organization

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Name of Paper	Paper Code	Theory					
		Credit			Marks		
		L	T	J	EST	CAT	Total
Blockchain and Crypto Currency	**MAI-402 (E-III (4))**	3	1	0	80	20	100

Course Objective	The main objective to provide conceptual understanding of how blockchain technology can be used to innovate and improve business processes.

Units	Contents (*Theory*)	Hours /week
I	**Overview of blockchain**: Why Blockchain - The Structure of Blockchain - Data Structure of Blockchain - Data Distribution in Blockchain - Block Validation. Block Validators: Proof of Work – Proof of Stake - Proof of Activity - Proof of Elapsed Time - Proof of Burn.	8
II	**Cryptocurrency:** Overview. Bitcoin: Bitcoin Working - Bitcoin Transactions - Bitcoin Mining - Value of Bitcoin -Community, Politics and Regulations – Advantages – Disadvantages. Ethereum: Overview –Decentralized Application. Components of Ethereum: Smart contracts – Ether –Ethereum Clients - Ethereum Virtual Machine – Etherscripter.	8
III	**Hyperledger:** Introduction. Digital Tokens: Overview - Initial Coin Offering – OmiseGO – EOS – Tether. MetaMask: Wallet Seed - MetaMask Transactions. Mist: Overview - Mist wallet. Truffle: Features of Truffle – Development Truffle boxes - Community truffle box.	8
IV	**Solidity:** Smart Contracts - Contract and Interfaces - Hyperledger Fabric: Introduction - Fabric v/s Ethereum– Hyperledger Iroha - Features of Iroha. Hyperledger Sawtooth: Components of sawtooth - Proof of Elapsed time.	8
V	**Blockchain Platforms:** Multichain– HydraChain. Future Blockchain: IOTA – Corda - Chain Core. Blockchain Framework: CoCo Framework – Tierion – Bigchain DB	8

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Text Books/Reference Books:-			
Name of Authors	**Titles of the Book**	**Edition**	**Name of the Publisher**
Josh Thompson	'Blockchain: The Blockchain for Beginnings, Guild to Blockchain Technology and Blockchain Programming	1st	Create Space Independent Publishing Platform, 2017
Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder	Bitcoin and cryptocurrency technologies: a comprehensive introduction	1st	Princeton University Press, 2016

COURSE OUTCOMES: Students will be able to	
CO1	Write the concepts of Blockchain technologies.
CO2	Explain Bitcoin and Crypto currency technologies.
CO3	Understand the concept of hyper ledger in block chain.
CO4	Illustrate Solidity concept in blockchain.
CO5	Explain Blockchain framework.

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Name of Paper	Paper Code	Theory					
		Credit			Marks		
Dot Net Technology	MAI-403 (E-IV (1))	L	T	J	EST	CAT	Total
		3	1	0	80	20	100

Course Objective	The objective this course is study web development technology and tools provided by Microsoft .NET platform. Students are expected to learn how to design and develop web application along with database connectivity using Microsoft .NET Technology

Units	Contents (*Theory*)	Hours /week
I	**The .Net framework**: Introduction, The Origin of .Net Technology, Common Language Runtime (CLR), Common Type System (CTS), Common Language Specification (CLS), Microsoft Intermediate Language (MSIL), Just-In –Time Compilation, Framework Base Classes. **Assemblies and Attribute:** .Net Assemblies features and structure, private and share assemblies, Built-In attribute and custom attribute. Introduction about generic. **C -Sharp Language (C#):** Introduction, Data Types, Identifiers, Variables, Constants, Literals, Array and Strings, Object and Classes, Inheritance and Polymorphism, Operator Overloading, Interfaces, Delegates and Events. Type conversion.	8
II	**OOP C#:** Classes and Objects Instance Variables, Methods, Constructors, Properties, Access Specifiers, Static members and methods Inheritance Levels of Inheritance, Constructor and Inheritance, Polymorphism, Interfaces, Abstract classes, Delegates, Indexers, Sealed Classes, Exception handling Collections and Generics Bounded and Unbounded Collections, Generic classes, Functions, Constraints on Generic Programming	8
III	**Databases and C#:** File Handling Text Files, Binary Files, String Processing, Serialization and Deserialization ADO.Net Connected and Disconnected, Architecture of ADO, Datasets, Data Readers, Data Adapters, Working with Stored Procedures LINQ and the ADO.NET Entity Framework LINQ Introduction, Mapping Your Data Model to an Object Model, Introducing	8

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	Query Syntax	
IV	**Asp.Net Web Applications:** Life cycle of Asp.Net web pages, Role of client side scripting, postback posting and cross page posting, asp.net compilation model, asp. Controls, Server Controls (basic controls, Calendar, AdRotator, File Upload, Validation Controls	8
V	**Data and State Management in ASP.NET:**ASP.NET Websites with Themes and Master Pages, Data Source Controls, Data Bound Controls, ASP.NET State Management-Client Side and Server Side. ASP.NET and AJAX	8

Text Books/Reference Books:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Schildt, Herbert	C# 4.0: the complete reference	I	McGraw-Hill Education
ChiragPatel	Advance .NET Technology	II	DreamTech Press
Andrew Trolsen,	Pro C# 5.0 and the .NET 4.5 Framework	II	APress
ImarSpaanjaars	Beginning ASP.NET 4.5: in C# and VB	I	Wrox Publication

COURSE OUTCOMES: Students will be able to

CO1	Create UI applications using C#.
CO2	Develop Web applications using various controls and programming techniques.
CO3	Solve identity management problems in web Applications application using session management and AJAX concepts.
CO4	Design and develop secure web applications using asp.net according to industry standards.
CO5	Use State Management inasp.net Web application.

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Name of Paper	Paper Code	Theory					
		Credit			Marks		
		L	T	J	EST	CAT	Total
Mobile Computing	**MAI-403 (E-IV (2))**	3	1	0	80	20	100

Course Objective	The objective of this course is to explain the principles and theories of mobile Computing technologies. Also to describe infrastructures and technologies of mobile computing technologies.

Units	Contents (*Theory*)	Hours /week
I	**WIRELESS COMMUNICATION FUNDAMENTALS:** Introduction to Mobile Computing- Mobile Computing V/S Wireless Computing –Mobile Computing Applications- Characteristics of Mobile Computing- Structure of Mobile Computing Applications. Generations of Mobile Communication Technologies- Multiplexing – Spread spectrum- MAC Protocols –SDMA - TDMA - FDMA - CDMA	8
II	**TELECOMMUNICATION SYSTEMS:** Introduction to Cellular Systems- GSM – System Architecture – Protocols – Connection Establishment – Frequency Allocation Routing – Mobility Management – Security – GPRS- Architecture - Handover	8
III	**MOBILE NETWORK LAYER:** Mobile IP – DHCP – Proactive protocol- DSDV, Reactive Routing Protocols – DSR, AODV Hybrid routing –ZRP, Wireless LAN – IEEE 802.11 Standards – Architecture – services – HIPERLAN – Ad- Hoc Network – Blue Tooth.	8
IV	**Mobile AD-HOC Networks AD - HOC Basics** Basic Concepts – Characteristics – Applications – Design Issues – Routing – Essential of Traditional Routing Protocols –Popular Routing Protocols – Vehicular Ad Hoc networks (VANET) – MANET Vs VANET – Security.	8
V	**MOBILE PLATFORMS AND APPLICAT IONS 9 Mobile** Device Operating Systems – Special Constrains & Requirements – Commercial Mobile Operating Systems – Software Development Kit: Ios, Android, BlackBerry, Windows Phone – M Commerce – Structure – Pros & Cons – Mobile Payment System – Security Issues.	8

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Text Books/Reference Books:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Jochen Schiller	Mobile Communications	Second Edition	Prentice Hall of India Pearson Education, 2003
William Stallings	Wireless Communications and Networks	Second Edition	Prentice Hall of India Pearson Education, 2004

COURSE OUTCOMES: Students will be able to

CO1	Understand fundamentals of wireless communications.
CO2	Analyze security, energy efficiency, mobility, scalability, and their unique characteristics in wireless networks.
CO3	Demonstrate basic skills for cellular networks design.
CO4	Understand Mobile AD-HOC Networks
CO5	Illustrate different mobile platforms and their applications

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Name of Paper	Paper Code	Theory					
		Credit			Marks		
		L	T	J	EST	CAT	Total
Advance Web Technologies	MAI-403 (E-IV(3))	3	1	0	80	20	100

Course Objective	The objective is to equip students with the knowledge and skills to develop, deploy, and maintain dynamic, scalable, and efficient web applications using modern technologies and frameworks."

Units	Contents (*Theory*)	Hours /week
I	**Advance Javascript:** Functional programming, asynchronous JavaScript, advanced object-oriented programming, modules and bundlers, error handling and debugging, advanced JavaScript patterns, modern JavaScript features, event loop and concurrency, functional reactive programming, performance optimization techniques, web APIs, browser compatibility, responsive design principles.	8
II	**Introduction to MERN Stack & Setting Up Environment:** MongoDB, Express.js, React.js, Node.js, RESTful API design, state management (Context API, Redux), third-party libraries and APIs integration, authentication and authorization (JWT, OAuth2.0), server-side rendering with React, Express.js middleware, form handling and data validation, real-time communication (WebSockets, Socket.IO)	8
III	**Performance Optimization and Deployment on AWS:** Deployment on AWS, Elastic Beanstalk setup, EC2 Instances deployment, Serverless architecture with AWS Lambda and API Gateway, Database configuration (Amazon RDS, DynamoDB), Storage setup (Amazon S3), Security and Access Controls (IAM, Security Groups), Monitoring and Scaling (CloudWatch, Auto Scaling), Domain Name and SSL Certificate setup (Route 53, AWS Certificate Manager), Testing and Validation, Backup and Disaster Recovery (RDS backups, snapshots, AWS Backup), Cost Optimization (AWS Cost Explorer, Spot Instances, Reserved Instances).	8
IV	**Web Security:** Common Vulnerabilities- XSS (Cross-Site Scripting), CSRF (Cross-Site Request Forgery), SQL Injection, DDOs Attack, Brute Force **Security Best Practices:** HTTPS and SSL/TLS, Secure Coding Practices, Security Headers and CORS, Data Encryption and Secure Storage	8

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V	**Advanced Testing:** Unit testing with Jest, integration testing with Supertest, frontend testing with React Testing Library, backend testing with Mocha, asynchronous testing techniques, test-driven development (TDD) practices, mocking and stubbing APIs and dependencies, end-to-end testing with tools like Cypress, snapshot testing with Jest or Storybook, performance testing and optimization, security testing considerations, continuous integration and deployment (CI/CD) pipelines, monitoring and logging strategies, handling testing in micro services architectures.	8

Text Books/Reference Books:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Douglas Crockford	JavaScript: The Good Parts	1st ed.	O'Reilly Media.
Alex Banks and Eve Porcello	Learning React	1st ed.	O'Reilly Media.
Richard York	Web Development with jQuery (WROX)	1st ed.	WROX
Robin Nixon ,SPD	Learning PHP, MySQL & JavaScript with j Query, CSS & HTML5	4th ed.	SPD (Shroff Publishers & Distributors)
Gene Kim, Kevin Behr, and George Spafford	The Phoenix Project: A Novel	2018	IT Revolution Press

COURSE OUTCOMES: Students will be able to

CO1	Create responsive and interactive web applications by using JavaScript, and jQuery.
CO2	Establish a robust development environment for building modern web applications."
CO3	Perform optimization and DevOps to build efficient, scalable web applications.
CO4	Illustrate mitigating common web vulnerabilities.
CO5	Write testing strategies, techniques, and tools of software quality and reliability.

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Name of Paper	Paper Code	Theory					
		Credit			Marks		
		L	T	J	EST	CAT	Total
E- Commerce & ERP	MAI-403 (E-IV(4))	3	1	0	80	20	100

Course Objective	The objective of this course is to provide adequate knowledge and understanding about E-Commerce practices to the students.

Units	Contents (*Theory*)	Hours /week
I	**Introduction to E-Commerce:** Introduction, E-commerce or Electronic Commerce- An Overview, Electronic Commerce – Cutting edge, Electronic Commerce Framework Evolution of E-commerce: Introduction, History of Electronic Commerce, Advantages and Disadvantage of E-commerce, Roadmap of e-commerce in India	8
II	**Network Infrastructure:** Introduction, Network Infrastructure- an Overview, The Internet Hierarchy, Basic Blocks of e-commerce, Networks layers & TCP/IP protocols, The Advantages of Internet, World Wide Web **E-Commerce Infrastructure:** Introduction, Ecommerce Infrastructure-An Overview, Hardware, Server Operating System, Software, Network Website	8
III	**Business Models of E – Commerce:** Model Based On Transaction Type, Model Based On Transaction Party - B2B, B2C, C2B, C2C, E – Governance. **E – Payment Mechanism:** Payment through card system, E – Cheque, E – Cash, E – Payment Threats & Protections. **E – Marketing :** Home –shopping, E-Marketing, Tele-marketing	8
IV	**Electronic Data Interchange(EDI):** The Meaning of EDI, History of EDI, EDI Working Concept, Implementation difficulties of EDI, Financial EDI, EDI and Internet E-Marketing: The scope of E-Marketing, Internet Marketing Techniques Website Design Issues: Factors that Make People Return to Your Site, Strategies for Website Development	8
V	**Enterprise Resource Planning (ERP) :** Features, capabilities and Overview of Commercial Software, re-engineering work processes for IT applications, Business Process Redesign, Knowledge engineering and data warehouse . Business Modules: Finance, Manufacturing (Production), Human Resources, Plant Maintenance, Materials Management, Quality Management, Sales & Distribution ERP Package, ERP Market: ERP Market Place, SAP AG, PeopleSoft, BAAN, JD Edwards, Oracle Corporation ERP-Present and Future: Enterprise Application Integration (EAI), ERP and E-Commerce, ERP and Internet, Future Directions in ERP	8

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Text Books/ Reference Books:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Murthy	E – Commerce	2nd	Himalaya Publishing
Reynolds	Beginning E-Commerce	1st	SPD
Elsenpete	E-Business: A beginners Guide	1st	Tata McGraw-Hill
Ravi Kalakota& Andrew B Whinston	Frontiers of Electronic Commerce	1st	Pearson Education.

COURSE OUTCOMES: Students will be able to

CO1	Analyze the impact of E-commerce on business models and strategy
CO2	Describe the Network and E commerce infrastructure.
CO3	Explain Business Models of E – commerce, E – Payment Mechanism and E marketing concepts.
CO4	Reframe Explain Electronic Data Interchange (EDI)
CO5	Understand the basics of Enterprise Resource Planning (ERP)

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Name of Paper	Paper Code	Practical				
		Credit		Marks		
Major Project-I (Based on Computer Application)	**MAI-404**	**P**	**J**	**ESP**	**CAP**	**Total**
		0	12	200	100	300

Design a project to fulfill all the requirements of any firm/company/society etc. and automate its functioning. Suitable reports should be generated periodically.

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Name of Paper	Paper Code	Practical				
		Credit		Marks		
Major Project-II (Based on AI Application)	**MAI-405**	**P**	**J**	**ESP**	**CAP**	**Total**
		0	12	200	100	300

Design a project to fulfill all the requirements of any firm/company/society etc. and automate its functioning using the concepts of Artificial Intelligence.