MCA SEMESTER – III					
Code	**Title**	**Marks of ESE**	**Marks of CIA**	**Credit**	**Total Marks**
CSC-10	Software Engineering	70	30	4	100
CSC-11	Theory of Computation and Automata Theory	70	30	4	100
CSC-12	Artificial Intelligence	70	30	4	100
CSC-13	.Net Programming	70	30	4	100
AECC-2	Human Values, Professional Ethics & Gender Sensitization	50	50	4	100
CSC-14	Practical based on CSC-13	70	30	5	100
		Total		**25**	**600**

MCA Semester – III

CSC-10	Software Engineering	Credit: 4

Unit-1.Introduction to Software Engineering: Definition, Software development and life-cycle models, CMM, Software Quality, role of metrics and measurement.

Unit-2.Requirements Analysis and Specification: SRS Building Process, Specification Languages, Validation of SRS, metrics, monitoring and control, Object Oriented analysis.

Unit-3.Software Project Planning: Software Cost Estimation Techniques, Project Scheduling & Tracking, Project Team Standards, software configuration management, management.

Unit-4.System Design and Implementation: Design Concepts and Notations, Functional & Object Oriented Design Concepts, Design Strategies, Design specification and verification, Metrics, Design Translation Process.

Unit-5. Software Testing: Testing Strategies & Techniques, Debugging, Software Maintenance,

Unit-6. Software Quality Assurance : Quality Concepts, Matrix for Software Quality, Quality Movement, Software Quality Assurance, Software Review, Formal Technical Reviews, Formal Approaches to Software Quality Assurance, Software Reliability, ISO 9000 quality Standards, IEEE Standards.

Reference Books:

1. Jain, Software Engineering, OUP.
2. Pressman, Software Engineering, TMH.
3. Rajib Mall, Fundamentals of Software Engineering, PHI.
4. Sommerville, Software Engineering, PE.

CSC-11	Theory of Computation and Automata Theory	Credit: 4

Unit-1. Theory of Automation: Definition, description, DFA,NFA, Transition systems,2DFA, equivalence of DFA & NDFA, Regular expressions, regular grammer, FSM with output (mealy and moore models), Minimization of finite automata.

Unit-2. Formal Languages: Definition & description, Pharse structured grammars & their classification, Chomskey classification of languages, closure properties of families of language, regular grammar, regular set & their closure properties, finite automata, equivalence of FA and regular expression, equivalence of two way finite automata, equivalence of regular expressions.

UNIT-3. Context-Free grammar & PDA: Properties unrestricted grammar & their equivalence, derivation tree simplifying CFG, unambiguifying CFG, productions, normal form for CFG, Pushdown automata, 2 way PDA, relation of PDA with CFG, Determinism & Non determinism in PDA & related theorems, parsing and pushdown automata.

Unit-4. Turing Machine : Model, design, representation of TM, language accepted by TM, universal Turing machine, determine & non-determinism in TM, TM as acceptor/generator/algorithms, multi-dimensional, multitracks, multitape, Two way infinite tape, multihead, Halting problems of TM.

Unit-5. Computability: Concepts, Introduction to complexity theory, Introduction to undecidaibility, recursively enumerable sets, primitive recursive functions, recursive set, partial recursive sets, concepts of linear bounded Automata, context sensitive grammars & their equivalence.

Reference Books:

1. Hopcroft & Ullman "Introduction to Automata theory, languages & Computation", Narosha Publishing house.
2. Lewish Papadimutrau "Theory of Computation" , Prentice Hall of India, New Delhi.
3. Peter linz, "An Introduction to formal language and automata", Third edition, Narosa publication.
4. Marvin L. Minskay "Computation : Finite & Infinite Machines", PHI.
5. Mishra & Chander Shekhar "Theory of Computer Science (Automate, Language & Computations), PHI.

CSC-12	Artificial Intelligence	Credit: 4

Unit 1.Introduction: Definitions and approaches, Foundations of A.I., History of AI, Areas and state of the art in AI, AI Programming languages, Concept of Intelligent Agents.

Unit 2.Problem Solving: Problem solving as state space search, production system, control strategies and problem characteristics; Search techniques - Breadth First and Depth-first, Hill-climbing, Heuristics, Best-First Search, A* algorithm, Problem reduction and AO* algorithm, Constraints satisfaction, Means Ends Analysis, Game Playing.

Unit 3.Knowledge Representation and Reasoning: Syntactic and Semantic representation, Predicate and prepositional logic, Resolution, Unification, Deduction and theorem proving, Question answering; Forward versus backward reasoning, Matching, Indexing; Ontological Engineering, Formal Theory of Beliefs, Semantic Net, Frames, Conceptual Dependencies and Scripts, Truth Maintenance Systems.

Unit 4.Selected Topics and Applications: Philosophical issues, Introduction to Natural Language Processing, Expert Systems and Multiagent Systems, Learning.

Unit 5. Introduction to AI Programming: LISP/PROLOG: Introduction to LISP programming: Syntax and numeric functions, Basic list manipulation functions, predicates and conditionals, input output and local variables, iterative and recursion, property lists and arrays.

Reference Books:

1. Padhy, Artificial Intelligence and Intelligent Systems, OUP.
2. Russel and Norvig, Artificial Intelligence: A Modern Approach, PE.
3. Rich and Knight, Artificial Intelligence, TMH.
4. Winston and Horn, LISP, PE.

CSC-13	.Net Programming	Credit: 4

Unit-1. Microsoft .NET Framework: The .NET Framework classes –Common Language Runtime – Common Type system and Common Language specification – Visual studio .NET IDE. Visual Basic .NET – Visual Basic .NET IDE –Variables – Data types – Constants – Arrays – Dynamic arrays- Controlling the flow – if statement – select case – Loops.

Unit-2. Procedures: modular coding, arguments – Structures- Collections: Advanced array, Arraylist and hash table. Lists- sorted list. Creating custom class, adding methods and properties. Building Windows Applications – working with forms.

Unit-3.Basic windows controls: common dialog controls- Rich text box control- Debugging and Error Handling: types of errors, Exceptions and structured exception handling – Accessing databases – Building Database applications with ADO .Net- ADO .Net objects.

Unit-4. ASP .NET: Introducing web developer tools – Introduction to ASP .NET server Programming – Using variables and constants in web forms – Working with web objects to store data – Designing .NET web Applications –Programming with Visual Basic .NET – Advanced web controls – Managing data with ASP .NET

Unit-5. C# Programming: Evolution of C# and .NET – Why C# - Elements of C# program – Programming Example – Data types and Expressions – Making decisions – Repeating Instructions – Arrays and Collection – Controls – Programming based on events – Database access with ADO .NET

Reference Books:

1. David Chappell, Understanding .NET , Pearson education.
2. David.S.Platt, Introducing Microsoft .Net , PHI.
3. G.AndrwDuthie , Microsoft ASP .NET Programming with Microsoft Visual C# .NET step by step , PHI.
4. George Shepherd, Microsoft ASP .NET 3.5 , PHI.

AECC-2	Human Values, Professional Ethics & Gender Sensitization	Credit: 4

Unit-1. Human Values: Morals, values, ethics – integrity – work ethics –service learning –civic virtue – respect for others- living peacefully - Caring –sharing –honesty – courage –valuing time – cooperation – commitment –empathy – self-confidence –spirituality – character.

Unit-2. Professional Ethics: Profession- and professionalism - Two models of professionalism – Professional etiquette -Three types of Ethics or morality Responsibility in Engineering – Engineering

standards –Engineering Ethics – Positive and Negative Faces. Professional Codes and Code of conduct of Institute of Engineers.

Unit-3. Professional Responsibilities: Ethical standards Vs Professional Conduct – Zero Tolerance for Culpable Mistakes – Hazards and Risks- Risk benefit analysis– congeniality, collegiality and loyalty. Respect for authority – conflicts of interest.

Unit-4. Professional Rights: professional rights and employee rights communicating risk and public policy – Whistle blowing - Professionals /engineers as managers, advisors, experts, witnesses and consultants – moral leadership- Regulatory compliances, Monitoring and control.

Unit-5.Ethics in global context: Global issues in MNCs- Problems of bribery, extortion, and grease payments – Problem of nepotism, excessive gifts – paternalism – different business practices – negotiating taxes.

Reference Books:

1. Dr. Rajan Mishra, Human Values: Laxmi Publications Pvt. Ltd.
2. S B George, Human Values and Professional Ethics, Vikas Publishing.
3. P.S. Rathore. Business Ethics And Communication; S.Chand Publishing.

CSC-14	Practical based on CSC-13	Credit: 5

1. Create minimum two simple applications using controls. Eg: Calculator, Drawing Pictures using GDI, Animationand Trainer Kit.
2. Write a program to simulate MS – OFFICE word and Excel packages with minimum five features.
3. Develop minimum two database applications using ADO.Net.
   Example:
   (i) Online Banking
   (ii) Online Shopping
   (iii) Online Recruitment System.
   (iv) Online Railway Reservation System.

The application should be developed with the option of navigation in between forms. For eg. The online Banking should be developed with the web pages to look into the account details, deposit and withdraw.

4. Develop Console application.
   (i) Using Structure
   (ii) Using arrays
   (iii) Creating functions and Procedures
   (iv) Create a new class, add methods and properties