ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

UNIT I

Overview of AI, Problems, Problem space and searching techniques, Definition- production system, Control strategies-forward and backward chaining, Heuristic search techniques-Hill Climbing, Best first Search, A* algorithm, AND/OR Graphs.

UNIT II

Knowledge representation-Propositional Logic, First Order predicate logic, Skolemization, Resolution Principles and unification, Horn clause

Expert System: Introduction, Component, development process. Learning, Planning and Explanation in Expert Systems, Study of existing expert systems: MYCIN & AM

UNIT III

Machine Learning: Learning, Types of Machine Learning, Learning: Supervised, Unsupervised, Semi supervised and Reinforcement learning. Data source, Curse of dimensionality, Overview of Dimension Reduction

Unit-IV

Supervised learning: Regression & Classification : Linear regression, Logistic regression, Support Vector Machines, Baye"s classifiers, Decision Trees, Ensemble Learning, Nearest Neighbor Methods, Applications

Unit-V

Neural Architecture: Human brain, Neuron model, Single layer, perceptron, Multiple layer perceptron, Forwards and Backwards Propagation, Error, learning rule. Back propagation: generalized delta rule, Neural network applications.

Unsupervised learning: Clustering, K-means algorithm, Association rules, Applications.

EMBEDDED SYSTEMS

UNIT I

Overview and General Purpose Processor

Overview: Overview of embedded systems, Design challenges, common design metrics, processor technologies: general purpose processors, single-purpose processors, application specific Instruction set processors, IC technologies- full custom/VLSI, semicustom ASIC, PLD, Design Technologies- compilation/ synthesis, libraries/ IP, test/ verification.

General-Purpose Processors: Basic architecture, data path, control unit, memory, operation, instruction execution, pipelining, superscalar and VLIW architectures, programmers view, instruction set, program and memory data space, registers, I/O, interrupts, development environment, design flow and tools, debugging and testing, selecting a microprocessor.

UNIT II

Custom Processors

Custom-Single purpose processors: Custom single purpose processor design, optimizing custom single processors. Standard single-purpose processors: peripherals Timers, counters, watchdog timers, UART, Pulse width modulator, LCD controller, Keypad controller, ADC, Real time clocks.

UNIT III

Application Specific Instruction Set Processors

Application Specific Instruction Set Processor (ASIP) Design: ASIP Design methodologies, steps involved in ASIP design: application analysis, design space exploration, generation of software tools like compiler, debugger, instruction set simulator etc., and synthesizing processor. Simulation based and scheduler based design space exploration techniques and their comparison.

UNIT IV

Memory and Interfacing

Memory: Memory write ability and storage performance, Common memory types, composing memories, memory hierarchy and cache, advanced RAM:DRAM, FPM DRAM, EDO DRAM, SDRAM, RDRAM, Memory management.

Interfacing: Arbitration, Muti-level bus architectures, Serial protocols: I2C bus, CAN bus, Fire Wire bus, USAB, Parallel protocols: PCI and ARM bus, Wireless Protocols: IrdA, Bluetooth, IEEE802.11.

UNIT V

Case Study

Case study of embedded system (Digital Camera): Introduction to a simple digital camera- user‟s perspective and designer‟s perspective, requirements specification- non functional requirements, informal functional specification, refined functional specification. Design alternatives- microcontroller alone, microcontroller and CCDPP, microcontroller and CCDPP/ Fixed-Point DCT, microcontroller and CCDPP/DCT.

DIGITAL MARKETING

UNIT-I

Introduction to Digital Marketing:
Importance of digital marketing, Difference between traditional and digital marketing, recent trends and current scenario of the industry, Case studies on digital marketing strategies
Website Planning and Creation:
Adding content, install and activate plug-in, incorporate design elements to website.

UNIT-II

Search Engine Optimization (SEO)

various search engines and their algorithms, various to make a website rank ,different aspects of SEO like on-page and off-page optimization, keywords research, meta tags, meta description, link building and more.

UNIT-III

Search Engine Marketing
Advertisement Strategies, SEM activities via Google Ads platform, Google Keyword Planner, search volume, cost-per-click (CPC), and customer lifetime value (CLV) and other such metrics. (10 Lectures)

UNIT-IV

Social Media Marketing
Marketing on Paid advertisements on social media platforms like Facebook, Instagram, Effective social media strategies on platforms such as Facebook, Twitter, Google+, Snapchat etc, building a social media campaign, write ad copies and ad creatives., case studies on social media strategies

UNIT-V

Web Analytics, Digital Media Planning and Buying, Web Remarketing, Email Marketing, Mobile Marketing, E-Commerce Management, Content Strategy, Ad sense, Blogging and Affiliate Marketing.

INFORMATION SYSTEMS & CYBER SECURITY

UNIT I

Security Essentials

Introduction, Elements of Information security, Security Policy, Techniques, steps, Categories, Operational Model of Network Security, Basic Terminologies in Network Security.

UNIT II

Cyber Crime

Introduction to cyber crime, Categories of cyber crime, Types of Cyber crimes, cyber space and information technology, Nature and scope of cyber crime, Jurisdiction of cyber crime

Cyber crime issues: unauthorized access, white collar crimes, viruses, malwares, worms, Trojans, logic bomb, Cyber stalking, Cyber Pornography, Hacking, Phishing, espionage, e- fraud, threatening email, Cyber Terrorism.

UNIT III

Cyber Laws and Security

Introduction to Cyber Law, Definition, Objectives of Cyber Law, Need, Scope, Copyright issues in Cyberspace, Data encryption, Cryptography, Digital Signatures, Password, Encrypted smart card, Bio-metric, firewall. Information Security Management System and other Security Compliances, Security Assurance, Security Laws, International Standards, Security Audit, SSE- CMM / COBIT etc.

UNIT IV

Information Technology Act

Background of Information Technology Act 2000, Preliminary, Definitions, amendments, Authentication of electronic records, Legal recognition of electronic records, Legal recognition of digital signatures, Attribution, Regulation of Certifying Authorities, Acknowledgment and Dispatch of electronic records, Secure records and secure digital signatures, Functions of controller, Duties of Subscribers, Penalties and Offences.

Overview of amended laws by the IT Act, 2000: The Indian Penal Code, The Indian Evidence Act, The Banker''s Book Evidence Act, The Reserve Bank of India Act, Cyber Theft and the Indian Telegraph Act, Digital Signatures and certificate- legal issues.

UNIT V

Intellectual Property Rights

Introduction to Intellectual Property (IP), different types of IPs and its importance in the present scenario, objectives of copyright, Requirement and meaning of copyright, copyright as a bundle of rights, Copyright acts: Copyright Act, 1957,Trade Mark Act, 1999, Framing, Linking and

Infringement, Information Technology act related to copyright, Linking and Infringement, information Technology act related to Copyright.

COMPILER DESIGN

UNIT I

Introduction to translators, compilers, interpreters, compilation process. Programming language grammars, derivations, reductions, regular expression, context free language and grammar.

Lexical analyzer, input buffering, specification and recognition of tokens, introduction to finite automata, regular expressions to NFA, minimization of DFA, keywords and reserved word policies, LEX, the lexical analyzer generator.

UNIT II

Syntax analyzer, context free grammars, top down parsing, brute force parser, recursive descent parser, LL(1) parser, Bottom up parsing, operator precedence parsing, simple precedence parsing, LR parser, LALR parser, YACC, the parser generator.

UNIT III

Syntax directed translation schemes, implementation of syntax directed translators, synthesized attributes, inherited attributes, dependency graph, evaluation order, construction of syntax trees, directed acyclic graph of expression, bottom up evaluation of S- attributed definitions, L attributed definitions, top down translation of L - attributed definitions.

UNIT IV

Errors, lexical phase errors, syntactic phase errors. Intermediate languages, postfix notation, syntax trees, parse trees, three address code, triples and indirect triples. Translation of assignment statements, Symbol tables, operation on symbol tables, and symbol table organization for non-block structured languages, symbol table organization for block, structured languages.

UNIT V

Run time storage management, storage allocation and referencing data in block structured language, storage allocation. Code optimization, sources of optimization, loop optimization, DAG and optimization of basic blocks. Code generation, a machine model, next use information register allocation and assignment, a simple code generator, code generation from DAG"s, Peephole optimization.

SOFT COMPUTING

UNIT I

Introduction:
Definition of Soft Computing, Conception of Soft Computing, Importance of SoftComputing, The Soft Computing – development history. Difference between Hard and Soft computing, Requirement of Soft computing, Major Applications Areas of Soft Computing.

UNIT II

Neural Networks
Neural Network, Applications of ANN, Learning rules and various activation functions, Single layer Perceptron‛s, Back Propagation networks, Architecture of Back propagation (BP) Networks, Backpropagation Learning, Variation of Standard Back propagation Neural Network, Introduction to Associative Memory, Adaptive Resonance theory and Self Organizing Map, Recent Applications.

UNIT III

Fuzzy Systems
Introduction to Fuzzy logic, Fuzzy Set theory, Fuzzy versus Crisp set, Fuzzy Rule based systems,Predicate logic, Fuzzy Decision Making, Fuzzy Control Systems, Fuzzy Classification, Fuzzy membership functions, Operations on Fuzzy sets. Fuzzy relations, Fuzzy proposition, Fuzzy implications, Fuzzy inferences Fuzzy Relation, Fuzzification, Minmax Composition, Defuzzification Method.

UNIT IV

Genetic Algorithm: History of Genetic Algorithms (GA), Working Principle, Various Operators- Reproduction, Crossover, Mutation, Convergence of GA, Bit wise operation in GA, Solving optimization problems, Multi-level Optimization.

UNIT V

Multi-objective Optimization Problem Solving: Concept of multi-objective optimization problems (MOOPs) and issues of solving them. Multi-Objective Evolutionary Algorithm (MOEA). Recent Trends in various classifiers, Swarm Optimizations algorithms: ant colony , Bee colony. Introduction to basic Particle Swarm Optimization (PSO) algorithm – Swarm intelligence.