DIPLOMA(CSE) LNCT University

V Semester Syllabus

Theory of Computation (501)/(DCS-501)

COURSE OUTCOMES:

After Completing the course student should be able to:

CO1	Outline the concept of Finite Automata and Regular Expression
CO2	Illustrate the design of Context Free Grammar for any language set
CO3	Demonstrate the push down automaton model for the given language
CO4	Make use of Turing machine concept to solve the simple problems
CO5	Explain decidability or undecidability of various problems

COURSE CONTENTS:

UNIT I AUTOMATA THEORY:

Basic machine, FSM , Transition graph, Transition matrix, Deterministic and non- deterministic FSM'S, Equivalence of DFA and NDFA, Mealy & Moore machines, minimization of finite automata, Two-way finite automata. Regular Sets and Regular Grammars, Alphabet, words, Operations, Regular sets, Finite automata and regular expression, Pumping lemma and regular sets, Application of pumping lemma, closure properties of regular sets.

UNIT II CONTEXT –FREE GRAMMARS:

Introduction to CFG, Regular Grammars, Derivation trees and Ambiguity, Simplification of Context free grammars, Normal Forms (Chomsky Normal Form and Greibach Normal forms).

UNIT III PUSHDOWN AUTOMATA:

Definition of PDA, Deterministic Pushdown Automata, PDA corresponding to given CFG, CFG corresponding to a PDA.Context Free Languages: The pumping lemma for CFL's, Closure properties of CFL's, Decision problems involving CFL's.

UNIT IV TURING MACHINES:

Introduction, TM model, representation and languages acceptability of TM, Church's hypothesis, composite & iterated TM. Turing machine as enumerators, Properties of recursive & recursively enumerable languages, Universal Turing machine.

UNIT V RELATED PROBLEMS:

P, NP, NP complete and NP hard problems, examples of these problems like Hamiltonian path problem, traveling sales man problem etc.

Reference Books: -

1. John E. Hopcroft, Jeffery Ullman," Introduction to Automata theory, Languages & computation", Narosa Publishers.
2. K.L.P Mishra & N. Chandrasekaran, "Theory of Computer Science", PHI Learning.
3. Michael Sipsev, "Theory of Computation", Cenage Learning.
4. John C Martin, "Introduction to languages and theory of computation", McGraw Hill.
5. Daniel I.A. Cohen, "Introduction to Computer Theory", Wiley India.
6. Kohavi,"Switching & Finite Automata Theory", TMH.

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V Semester Syllabus

Web Technology(502)/(DCS-502)

COURSE OUTCOMES:

After Completing the course student should be able to:

CO1	Analyze web servers with their features and characteristics.
CO2	Apply web design issues for web publishing.
CO3	Develop web elements using HTML and DHTML web technologies.
CO4	Use CSS and XML for static and dynamic web development.
CO5	Differentiate e-commerce models B2B, B2C and C2C.

COURSE CONTENTS:

UNIT I INTRODUCTION TO WEB DESIGN

Web page and Web site - Web publishing Process of Web, publishing, planning, organizing, Hierarchical, Linear, Webbed. Implementing, Testing, Maintenance

UNIT II HTML

Introduction, Head section–Prologue, Link, Base, Meta, Script, Style, Body Section – Header, Paragraphs, Text Formatting, Linking, Internal Linking, Embedding Images, Lists, Tables, Frames. Other Special Tags and Characters, HTML Forms

UNIT III JAVA SCRIPT

Introduction, Language Elements– Identifiers, Expressions, Keywords, Operators, Statements, Functions, Object of Java Scripts – Window Object, Document Object, Forms Objects, Text Boxes and Text Areas, Buttons, Radio Buttons and Check Boxes, The Select Object, Other Object – The Date Object, The Math Object, The String Object, Regular Expressions, Arrays, Worked Examples

UNIT IV DHTML

Introduction, Cascading Style Sheet (CSS) – Coding, Properties of Text, Property Values, Other Style Values, In-Line Style Sheet, Embedded Style Sheet, External Style Sheet, Grouping, Inheritance, Classes as Selector, ID as Selector, Contextual Selector, Pseudo Classes and Pseudo Elements, Positioning, Backgrounds, Element Dimensions

UNIT V XML BASICS

Introduction, HTML vs XML, Syntax of the XML Document, XML Attributes, Publishing The Site Uploading Web pages - Using FTP and using Web Page Editors, Web hosting - Shared hosting Running a Local Web server.

Reference Books: -

1. Allen D.W. & Steve Johnson; the Learning Guide to Internet; B.P.B.Publication.
2. Alexis Leon and Matthew Leon; Internet for every one; Vikas publishing house Pvt. Ltd.New Delhi

3. Internet for Dummy, Pustak Mahal, NewDelhi
4. Dixit Manish (1999); Internet, An Introduction, CI Stems TMH Series ,Tata McGraw Hill publishing company limited, NewDelhi.
5. Design Web Pages, BPBPublication.

List of suggestive core experiments: -

1. Design a Home Page of Website using HTML Tags.
2. Write an HTML Document to provide a form that collects names and phone numbers.
3. Write a program in Java Script to compare numbers whose inputs will be taken from HTML Form.
4. Write a JAVA Script function to display current date and time using Date Object.
5. Write a Java Script to generate Random Numbers
6. Design three pages of your Home Page and link all of them to a single style sheet.
7. Design a webpage that demonstrates blinking and scrolling text.\
8. Design a e Commence Site displaying the detail of the items that are sold in that store. The Site should provide a feature to sort the items based on the prize of the Items.
9. Design a XML document using basic syntax.
10. Uploading websites on FTP and Local Server.

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Cyber Security (503)/(DCS-503)

COURSE OUTCOMES:

After Completing the course student should be able to:

CO1	Evaluate the computer network and information security needs of an organization.
CO2	Describe various cybercrimes along with perceptions of cyber criminals.
CO3	Explain the law perspective of all cybercrimes.
CO4	Explain Relevancy, Admissibility, proof and probative value of e-evidence.
CO5	Describe tools and methods used in cybercrime.

COURSE CONTENTS:

UNIT I INTRODUCTION OF CYBER CRIME:
Challenges of cyber crime, Classifications of Cybercrimes: Email Spoofing, Spamming, Internet Time Theft, Salami attack/Salami Technique,

UNIT II ONLINE FRAUDS:
Web jacking, Online Frauds, Software Piracy, Computer Network Intrusions, Password Sniffing, Identity Theft, cyber terrorism, Virtual Crime, Perception of cyber criminals: hackers

UNIT III CYBER CRIME AND CRIMINAL JUSTICE:
Concept of Cyber Crime and the IT Act, 2000, Hacking, Teenage Web Vandals, Cyber Fraud and Cheating, Defamation, Harassment and E-mail Abuse, Other IT Act Offences, Monetary Penalties, jurisdiction and Cyber Crimes.

UNIT IV ACTS & EVIDANCES:
The Indian Evidence Act of 1872 v. Information Technology Act, 2000: Status of Electronic Records as Evidence, Proof and Management of Electronic Records; Relevancy, Admissibility and Probative Value of E-Evidence, Proving Digital Signatures, Proof of Electronic Agreements, Proving Electronic Messages.

UNIT V TOOLS AND METHODS IN CYBERCRIME:
Proxy Servers and Anonymizers, Password Cracking, Key loggers and Spyware, virus and worms, Trojan Horses, Backdoors, DoS and DDoS Attacks , Buffer and Overflow, Attack on Wireless Networks, Phishing : Method of Phishing, Phishing Techniques

Reference Books: -

1. Principles of Cyber crime, Jonathan Clough Cambridge University Press
2. John R. Vacca, Computer Forensics:Computer Crime Scene Investigation, 2nd Edition, Charles River Media, 2005
3. Cyber Law Simplified, VivekSood, Pub: TMH.
4. Cyber Security by Nina Godbole, SunitBelapure Pub: Wiley-India
5. Information Warfare: Corporate attack and defense in digital world, William Hutchinson, Mathew Warren, Elsevier.
6. Cyber Laws and IT Protection, Harish Chander, Pub:PHI.

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V Semester Syllabus

Machine Learning (504)/(DCS-504)

COURSE OUTCOMES:

After Completing the course student should be able to:

CO1	Describe the terminologies, definitions and basic concepts of machine learning
CO2	Explain the different supervised and unsupervised machine learning algorithms in detail
CO3	Apply the machine learning algorithms on a given dataset.
CO4	Design the different machine learning applications using the state of art Python libraries/tools.
CO5	Calculate the target values, accuracy, precision and f1-score of different algorithms

COURSE CONTENTS:

UNIT I INTRODUCTION TO MACHINE LEARNING :
Scope and limitations, advantages machine learning models, Supervised Learning, Unsupervised Principle Components Analysis etc.

UNIT II SUPERVISED LEARNING TECHNIQUES:-
Decision Trees, Naive Bayes, Classification, Support vector machines for classification problems, Random forest for classification and regression problems

UNIT III UNSUPERVISED LEARNING
Clustering: k-means, adaptive hierarchical clustering, Gaussian mixture model, Optimization Using Evolutionary Techniques.

UNIT IV NEURAL NETWORKS:
Introduction of Neural Network, Neural network representation, Advantages and disadvantages Neural Networks as a paradigm for parallel processing Perceptron Learning.

UNIT V DESIGN AND ANALYSIS OF MACHINE LEARNING EXPERIMENTS:
Factors, response and strategy of experimentation, Guidelines for machine learning experiments, cross-validation and resampling methods.

Reference Books: -

1. Machine Learning. Tom Mitchell. First Edition, McGraw- Hill, 1997.
2. Introduction to Machine Learning Edition 2, by Ethem Al paydin
3. Introduction to Machine learning, Nils J.Nilsson
4. Machine learning for dummies, IBM Limited ed, by Judith Hurwitz and Daniel Kirsch .

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Software Engineering (505)/ (DCS-505)

COURSE OUTCOMES:
After Completing the course student should be able to:

CO1	Compare software development models with their merits and demerits and analyze agile and object-oriented model.
CO2	Illustrate functional, non-functional requirements, elicitation techniques and various types of analysis modeling in the field of software engineering.
CO3	Apply architectural, component-level design, class-level and interface-level design for software development.
CO4	Interpret use of test results of various types of testing at different levels of construction for software development.
CO5	Analyze various types of maintenance, reverse engineering for software development and to expose Advanced Topics in Software Engineering.

COURSE CONTENTS:

UNIT I INTRODUCTION TO SOFTWARE ENGINEERING
Software characteristics, Software myths. Components, application; process, methods, tools & view of S/E; software process Capability Maturity Model, life cycle models (water fall, incremental, spiral, RAD, prototyping, object oriented) fourth generation model.

UNIT II SOFTWARE PROJECT PLANNING
Responsibilities of Software Project manager, Project planning Objective, Software scope, Software project estimation technique, Decomposition techniques, Estimation models, Scheduling, staffing, Risk Management, Software configuration Management

UNIT III SOFTWARE REQUIREMENT ANALYSIS, SPECIFICATION & MODELING
Analysis principles, system specification, software requirement specifications, functional specifications, software prototyping, specification, data modeling, data flow diagrams, ER Diagram, Mechanics of structured analysis, data dictionary.

UNIT IV OBJECT –ORIENTED CONCEPT
Object Oriented Concepts, Unified Modeling language Diagram (Use Case Diagram, Class Diagram, Sequence Diagram, State Chart Diagram) Elements Of Object Modeling, Management Of Object Oriented Software Projects, Object Oriented Analysis, Domain Analysis, OOA Process Conventional v/s OO Approach, Object –Relationship Model

UNIT VDESIGN CONCEPT PRINCIPLE AND METHODS
Design Process, Design Principles, Design Concepts, Effective Modular Design, Design Documentation, Architectural Design, and Architectural Design Process, Optimization, Procedural Design, Software Testing Software Testing Fundamentals: Principles & objectives, V model, Software Reliability And Quality Management: Concepts of S/W Quality Control and Assurance,

Software Reliability, ISO 9000 & 9001, Standard SEI –CMM

Reference Books: -

1. Roger S. Pressman, Software Engineering A Practitioner's Approach, McGraw-Hill.
2. Software engineering A Precise Approach by Pankaj Jalote's ,Wiley India.
3. Rajib Mall, Fundamental of Software Engineering, PHI.
4. Software Engineering by Kassem A. Saleh J.Ross Publishing

List of suggestive core experiments: -

1. Identifying the Requirements from Problem Statements.
2. How to Choose right Software development life cycle model?.
3. To perform the system analysis: Requirement analysis, SRS for Library Management System.
4. To perform the function oriented diagram: DFD
5. To perform the user's view analysis: Use case diagram.
6. To draw the structural view diagram: Class diagram.
7. To draw the behavioral view diagram: Sequence diagram.
8. Explain testing Strategies.
9. To design a test case for implementation of calculator
10. To compute cyclometic complexity for any flow graph

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Minor project (506)/(DCS-506)

COURSE OUTCOMES:
After Completing the course student should be able to:

Develop project using different technologies.