

B-Tech Computer Science & Engineering

Semester-VII

Course Code	Course Title	L – P	Credit
CSE-711T	Artificial Intelligence	4 – 0	4
CSE-712T	Compiler Design	4 – 0	4
CSE-713T	Network Security	4 – 0	4
XXX-ExxX	Elective –V		X
XXX-ExxX	Elective –VI		Y
CSE-714P	Artificial Intelligence Lab	0 – 2	1
CSE-715P	Compiler Design Lab	0 – 2	1
CSE-716P	Minor Project	0 – 4	2
CSE-717P	Industrial Training	0 – 2	1
CSE-718P	Seminar	0 – 2	1
	Total Credits	12-12	18+X+Y

**Artificial Intelligence
CSE- 711T**

**L – P
4 - 0**

Unit I – General Issues and overview of AI

The AI problems: what is an AI technique, Characteristics of AI applications Problem Solving, Search and Control Strategies General Problem solving, Production systems, Control strategies, forward and backward chaining.

Unit II – Search Techniques

Search, Depth first Search, Breadth first Search, Hill climbing, Branch and Bound technique, Best first search and A* algorithm, AND/OR Graphs, Problem reduction and AO* algorithm, Constraint Satisfaction problems Game Playing Min Max Search procedure, Alpha-Beta cutoff.

Unit III – Knowledge Representation

First Order Predicate Calculus, Skolemisation, Resolution Principle and Unification, Inference Mechanisms Horn's Clauses, Semantic Networks, Frame Systems and Value Inheritance, Scripts, Conceptual Dependency Knowledge Acquisition.

Unit IV languages used for AI

AI Programming Languages Introduction to LISP, Syntax and Numeric Function, List manipulation functions, Iteration and Recursion, Property list and Arrays, Introduction to PROLOG with some examples.

Unit V – Expert Systems

Introduction to Expert Systems, Architecture of Expert Systems, fuzzy logic and its applications, Basic Probability Notation, Baye's Rule and Its Use, Representing Knowledge in an Uncertain Domain, Other Approaches to Uncertain Reasoning, Rule-based methods for uncertain reasoning.

Text Books

1. Elaine Rich and Kevin Knight: Artificial Intelligence – Tata McGraw Hill.

Reference Books

1. Char nick “Introduction to Artificial Intelligence”, Addison Wesley.
2. Dan W.Patterson, Introduction to Artificial Intelligence and Expert Systems – Prentice Hal of India.
3. Winston, “LISP”, Addison Wesley.
4. Artificial Intelligence : A Modern Approach, Stuart Rusell, Peter Norving, Pearson Education 2nd Edition.

Compiler Design

CSE-712T

L - P

4 - 0

UNIT I

Introduction to compilers, Phases of Compiler, Compiler construction tools, Classification of grammars, Context free grammars.

UNIT II

Scanners, Top down parsing, LL grammars, Bottom up parsing, Polish expression Operator, Precedence grammar, IR grammars.

UNIT III

Comparison of parsing methods, Error handling. Symbol table handling techniques, Organization for non-block and block structured Languages

UNIT IV

Run time storage administration, Static and dynamic allocation, Intermediate forms of source program, Polish N-tuple and syntax trees, Semantic analysis and code generation.

UNIT V

Code optimization, Folding, redundant sub-expression evaluation, Optimization within Iterative loops.

TEXT BOOKS:

1. Aho, Ullman & Ravi Sethi, "Principles of Compiler Design", Pearson Education

REFERENCE BOOKS:

1. Tremblay, et. al., "The Theory and Practice of Compiler Writing", McGraw Hil, New York
2. Holub, "Compiler Design in C", PHI
3. Andrew L. Appel, "Modern Compiler Implementation in C", Delhi Foundation Books
4. Dick Grune et. Al., "Modern Compiler Design", John Wiley and Sons

Network Security
CSE-713T

L P
4 0

Unit I

Introduction to network security, Secure network services, X.800, Attacks, Security, Architecture, Security Mechanism, Introduction to cryptography, Symmetric and Asymmetric Ciphers, Data Encryption Standard, Design and analysis, AES, IDEA (International Data Encryption), RC4.

Unit II

Public Key Cryptography and Authentication, Approaches to Message, Authentication, Secure Hash Functions, Message Authentication Codes. Public-Key Cryptography Principles, Public-Key Cryptography Algorithms.

Unit III

Web Security Considerations, Secure Socket Layer and Transport Layer Security

Transport Layer Security, HTTPS, Secure Shell (SSH).

Unit IV

Web security, Java, cookies, HTTP/HTTPS, Web objects, DNS security, Smartcards/Biometrics, Privacy, Wireless security.

Unit V

Firewall, The Need for Firewalls, Firewall Characteristics, Types of Firewalls, Firewall Basing, Firewall Location and Configurations.

Book Recommended

1. William Stallings, "Cryptography and Network Security – Principles and Practices", Prentice Hall of India, Third Edition, 2003.

REFERENCES

1. Bruce Schneier, "Applied Cryptography", John Wiley & Sons Inc, 2001.
2. Atul Kahate, "Cryptography and Network Security", Tata McGraw-Hill, 2003.
3. Charles B. Pfleeger, Shari Lawrence Pfleeger, "Security in Computing", Third Edition, Pearson Education, 2003.
4. Networking Essentials by Willium.S.Stallings

**Artificial Intelligence Lab
CSE 714P**

**L – P
0 - 2**

Lab Details:

PROLOG LAB CONTENTS

1. Input & Output
2. Operators and Arithmetic
3. Facts & Variables
4. Simple facts and facts with arguments
5. Rules & Predicates
6. Simple Predicates, Predicate Inference, Goal queries
7. Recursion
8. Graph Traversal
9. Depth First Search, Breadth First Search

Simulators:- 1) Win-Prolog
2) Strawberry Prolog

LISP LAB CONTENTS

1. Data Types
2. symbols & lists
3. Local variables & global variables
4. Standard input/output
5. Functions & predicates
6. User defined functions
7. Recursion
8. factorial, fibanocci

Simulators:- ANSI common Lispworks Studio 6

Compiler Design Lab
CSE 715P

L-P
0-2

Lab Details:

1. Design NFA/DFA to recognize an identifier.
2. Design a Lexical analyzer for the given language.
3. Implement the lexical analyzer using JLex, flex or lex or other lexical analyzer generating tools.
4. Design Predictive parser for the given language
5. Design LALR bottom up parser for the given language.

Minor Project
CSE-716P

L – P
0 -- 4

Objectives

The students will carry out a project in one of the specializations of program under study with substantial multidisciplinary component. Student groups will be formed and a faculty member will be allocated to guide them in such a way so that they carry out a work on a topic as a forerunner to the full fledged project work to be taken subsequently in VIII semester.

Industrial Training
CSE-717P

L – P
0 -- 2

Objectives

Students have to undergo four week practical training in Computer Science and Engineering related industries/ Training Centers / Corporate offices in various domains (hardware, software, networking, maintenance and testing) so that they become aware of the practical application of theoretical concepts studied in the class rooms. At the end of the training student will submit a report as per the prescribed format to the department.

**Seminar
CSE-718P**

**L – P
0 -- 2**

Objectives

It should consist of a talk of 15-20 minutes on a topic preferably from the area in which a student intends to work for his Project during Semester – VII and Semester – VIII. Student will also submit a report as per the prescribed format to the department.