

CMOL1	Fundamentals of Artificial Intelligence	L	T	P	C
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Course Objectives:

The main objectives of this course are

1. Present various problem-solving methodologies.
2. Learn logical representation of natural language sentences.
3. Understand the role of various planning techniques in solving problems.
4. Describe how to develop an expert system for a given knowledge base.

Course Content:

UNIT-I	CO1	12 Hours
<p>Introduction to AI: Foundations of AI - The History of AI - Applications of AI - AI Agents & Environments - Problem Solving using Search Algorithms.</p> <p>Heuristic Search Techniques: Generate-and-Test - Hill Climbing - Best-First Search – Problem Reduction - Constraint Satisfaction - Means-Ends Analysis.</p>		
UNIT-II	CO2	12 Hours
<p>Knowledge Representation Issues: Representations and Mappings - Approaches to knowledge representation - Issues in knowledge representation</p> <p>Knowledge Representation Using Predicate Logic: Representing Simple Facts in Logic - Representing Instance and ISA Relationships - Computable Functions and Predicates - Resolution.</p>		
UNIT-III	CO3	12 Hours
<p>Representing Knowledge Using Rules: Procedural versus Declarative Knowledge – Logic Programming - Forward Versus Backward Reasoning - Matching - Control Knowledge.</p> <p>Slot and Filler Structures: Semantic Nets - Conceptual Dependency, Scripts.</p>		
UNIT-IV	CO4	12 Hours
<p>Planning: Overview - An Example Domain: The Blocks World - Component of Planning Systems - Goal Stack Planning - Non-linear Planning using constraint posting, Hierarchical planning, Reactive systems.</p> <p>Expert Systems: Representing and using domain knowledge, Expert system shells, Explanation, Knowledge Acquisition.</p>		

Learning Resources:

Text Book:

1. Elaine Rich & Kevin Knight, Artificial Intelligence, 2nd Edition, (Tata McGraw Hill Edition).

Reference Books:

1. Artificial Intelligence, 3rd Edn., Patrick Henry Winston, 3rd Edn., Pearson Education.
2. A First Course in Artificial Intelligence, Deepak Khemani, Tata Mc-Grah Hill.
3. Artificial Intelligence and Expert systems – Patterson, Pearson Education.
4. Russel and Norvig, Artificial Intelligence, Pearson Education/ PHI.

Course Outcomes:

After successful completion of the course, the students will be able to:

- CO 1. Apply problem solving techniques for solving simple AI problems.
- CO 2. Explain knowledge representation issues.
- CO 3. Represent the given natural language sentences using appropriate knowledge representation structures.
- CO 4. Discuss various planning strategies and develop an expert system for given knowledge base.

CMOL2	PROGRAMMING in C++	L	T	P	C
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Pre – Requisites: C Programming.

COURSE OBJECTIVES:

The students will be able to understand

- Object Oriented Programing features and C++ concepts.
- The concepts of Encapsulation, Polymorphism, and Inheritance.
- The concepts of Runtime polymorphism, Exception, and Templates.
- The disk access throw C++ I/O and other advanced concepts.

UNIT-I	CO1	12 Hours
<p>An Overview of C++: The Origins of C++, What is Object Oriented Programming, some C++ fundamentals, Old-Style Vs Modern C++, Introducing C++ Classes, Function Overloading, Operator Overloading, Inheritance, Constructors and Destructors, The C++ Keywords, The General Form of a C++ Program.</p> <p>Classes and Objects: Classes, Structures and Classes, Unions and Classes are Related, Friend Functions, Friend Classes, Inline Functions, Parameterized Constructors, Static Class Members, When Constructors and Destructors are Executed, Scope Resolution Operator, Nested Classes, Local Classes, Passing and Returning Objects, Object Assignment</p> <p>Arrays, Pointers, References and the Dynamic Allocation: Arrays of Objects, Pointers, References, Dynamic Allocation Operators, the Placement Forms of new and delete.</p>		
UNIT-II	CO2	12 Hours
<p>Function Overloading, Copy Constructors and Default Arguments: Function Overloading, Overloading Constructor Functions, Copy Constructors, Finding the Address of an Overloaded Function, Overload Anachronism, Default Arguments, Function Overloading and Ambiguity.</p> <p>Operator Overloading: Creating Member Operator Function, Overloading Using a Friend Function, Overloading new delete, Overloading Special Operators & Comma Operator</p> <p>Inheritance: Base-Class Access Control, Inheritance and protected members, Inheriting Multiple Base Classes, Constructors, Destructors and Inheritance, Granting Access, Virtual Base Classes.</p>		
UNIT-III	CO3	12 Hours
<p>Virtual Functions & Polymorphism: Virtual Functions, The Virtual Attribute is inherited, Virtual Functions are Hierarchical, Pure Virtual Functions, Using Virtual Functions, Early Vs Late Binding.</p> <p>Templates: Generic Functions, Applying Generic Functions, Generic Classes, Typename and export Keywords, Power of Templates.</p> <p>Exception Handling: Fundamentals, Derived-Class Exceptions, Options, Terminate() and unexpected(), uncaught_exception(), exception and bad_exception Classes, Applying Exception Handling.</p>		
UNIT-IV	CO4	12 Hours
<p>The C++ I/O System Basics: Old Vs. Modern C++ I/O, Streams, Stream Classes, Formatted I/O, Overloading << and >>, Creating Manipulators.</p> <p>C++ File I/O: File Classes, Opening and Closing a File, Text Files, Unformatted Binary I/O, get(), Getline() functions, Detecting EOF Random Access.</p> <p>Runtime Type ID and the Casting Operators: RTTI, Casting Operators, Dynamic_cast, Reinterpret_cast.</p>		

Namespaces, Conversion Functions and other Advanced Topics: Namespaces, The std Namespace, Creating Conversion Functions, const Member Functions and mutable, Volatile Member Functions, Explicit Constructors, asm Keyword, Linkage Specification, Array-Based I/O, Dynamic Arrays, Binary I/O with Array-Based Streams, Differences between C and C++.

Introducing Standard Template Library: An Overview of STL

Learning Resources:

Text Book:

1. The Complete Reference - C++ - Herbert Schildt, 4/e, Tata McGraw Hill.

Reference Books:

1. Bjarne Stroustrup, "The C++ Programming Language", Special Edition, Pearson Education.
2. C++ - How to Program – Dietel & Dietel
3. Programming in C++ - Barkakati
4. Mastering C++ by Venugopal.

COURSE OUTCOMES:

After successful completion of the course student shall be able to:

- CO 1. define and use classes and Object in solving problems.
- CO 2. apply the concept of encapsulation, polymorphism, and Inheritance.
- CO 3. implement the concepts of Runtime polymorphism, Exception handling and Templates.
- CO 4. develop applications with C++ File I/O and other advanced concepts.