Debre Markos University
Bure Campus
Department of Computer Science

Course Code: CoSc 4142
Course Title: Artificial Intelligence
Module Name: Intelligent System
Module No. CoSc- M3141
Course Chair
Office location: CS dep't head office
Instructor name: Sileshi G
Consultation Hours: **ECTS** 6
Contact Hours Lecture Tutorial Lab/Practical Home Study Total
Target Group: 4th year Computer Science Students
Year /Semester Year IV, semester I
Status of the Course: Parallel
Course description
The purpose of this course is

The purpose of this course is to give students an understanding of Artificial Intelligence methodologies, techniques, tools and results. Students will use at least one AI-language [Lisp, Prolog]. Students will learn the theoretical and conceptual components of this discipline and firm up their understanding by using AI and Expert System tools in laboratory sessions, projects and home assignments.

Course Objective:
At the end of this course the students will be able to:
- ✓ Understand reasoning, knowledge representation and learning techniques AI
- ✓ Intelligence strengths and weaknesses of these techniques and their applicability to different tasks.
- ✓ Assess the role of AI in gaining insight into intelligence and perception
- ✓ Know classical examples of AI
- ✓ Know characteristics of programs can be considered "intelligent"
- ✓ Understand the use of heuristics in search problems and games
- ✓ Know variety of ways to represent and retrieve knowledge and information
- ✓ Know fundamentals of AI in modern programming language
- ✓ Consider ideas and issues associated with social technical and ethical uses of machines that involve artificial intelligence

Content
CHAPTER 1:
1.   **Introduction to AI**
1.   1. Objectives/Goals of AI
1.2.   What is AI?
1.   3. Approaches to AI – making computer:
1.   3.1. Think like a human (Thinking humanly)
1.   3.2. Act like a human (Acting humanly)
1.   3.3. Think rationally (Thinking rationally)
1.   3.4. Act rationally (Acting rationally)
1.4. The Foundations of AI
    1.5. Bits of History and the State of the Art

CHAPTER 2:
2**. Intelligent Agents**
2.1. Introduction
2.2. Agents and Environments
2.3. Acting of Intelligent Agents (Rationality)
2.4. Structure of Intelligent Agents
2.5. Agent Types
2.5.1. Simple reflex agent
2.5.2. Model-based reflex agent
2.5.3. Goal-based agent
2.5.4. Utility-based agent
2.5.5. Learning agent
2.6. Important Concepts and Terms
CHAPTER 3:
3.   Solving Problems
by Searching and
Constraint Satisfaction
Problem
3.   1. Problem Solving by Searching
3.2.   Problem Solving Agents
3.   3. Problem Formulation
3.   4. Search Strategies
3.   5. Avoiding Repeated States
3.   6. Constraint Satisfaction Search
3.   7. Games as Search Problems

CHAPTER 4:
4.   **Knowledge and Reasoning**
4.   1. Logical Agents
4.2.   Propositional Logic
4.   3. Predicate (First-Order) Logic
4.   4. Inference in First-Order Logic
4.   5. Knowledge Representation
4.   6. Knowledge-based Systems

CHAPTER 5. Learning
    5.1. Learning from Examples/Observation
    5.2. Knowledge in Learning
    5.3. Learning Probabilistic Models
    5.4. Neural Networks
Assessment Method (Continuous):
Quizzes and Tests
Assignments
Lab exam
Final exam
Text Book
Russell, S. and P. Norvig (1995) Artificial Intelligence: A Modern Approach
Prentice-Hall.
Reference
1. Luger, G. (2002) Artificial Intelligence, 4th ed. AddisonWesley.
2. Bratko, Ivan (1990) PROLOG Programming for Artificial Intelligence, 2nd
ed. Addison-Wesley, 1990
Software Requirement: PROLOG, LISP and PYTHON;