ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD  
(Department of Computer Science)

WARNING
1. PLAGIARISM OR HIRING OF GHOST WRITER(S) FOR SOLVING THE ASSIGNMENT(S) WILL DEBAR THE STUDENT FROM AWARD OF DEGREE/CERTIFICATE, IF FOUND AT ANY STAGE.
2. SUBMITTING ASSIGNMENTS BORROWED OR STOLEN FROM OTHER(S) AS ONE’S OWN WILL BE PENALIZED AS DEFINED IN “AIOU PLAGIARISM POLICY”.

Course: Artificial Intelligence (3451)  
Level: BS (CS)  
Semester: Spring, 2013  
Total Marks: 100  
Pass Marks: 50

ASSIGNMENT No. 1

Note: All questions are compulsory. Each question carries equal marks.

Q. 1 (a) What is an artificial intelligence? How it can be beneficial for decision making?
(b) Discuss the applications of artificial intelligence in real world with suitable examples.

Q. 2 Explain the following terms with suitable examples.
(a) Heuristic Pruning
(b) Hill Climbing
(c) Logic Agents
(d) Reflex Agents

Q. 3 Briefly discuss the following search techniques.
(a) Best first search
(b) Beam search
(c) Depth first search

Q. 4 (a) How programs are defined in Lisp? Explain with the help of examples.
(b) Explain the scope of variables and debugging in the context of Lisp with examples.

Q. 5 Differentiate between
(a) Forward and backward chaining
(b) Syntax and Semantics
ASSIGNMENT No. 2

Total Marks: 100
Pass Marks: 50

Q. 1 Explain in detail the use of knowledge engineering for planning.

Q. 2 (a) What are the major problems of knowledge representation?
(b) Differentiate between selection and projection.

Q. 3 (a) What are the major approaches to semantic nets?
(b) Discuss some applications of speech recognition in detail. Give suitable examples.

Q. 4 (a) Differentiate between prepositional and predicate logic. Give examples for each.
(b) Discuss the structure ambiguity in natural language in detail.

Q. 5 Write detail note on the following:
(a) Learning in problem solving
(b) Classification of learning strategies

3451 Artificial Intelligence
Credit Hours: 3 (3+0)

Recommended Book:
Artificial Intelligence: A Modern Approach by Russel & Norving

Course Outlines:
Unit No. 1 Artificial Intelligence and Intelligent Agents
Introduction, Intelligence Defined, Aspects of Human Intelligence, Artificial Intelligence as a Discipline, Purpose, Uses and Applications of A.I in Manufacturing, Medicine, Defense, Chemistry, and other Applied Disciplines, Tools and Techniques used in A.I, Intelligent Agents, Structure of Intelligent Agents.

Unit No. 2 Search
Search Theory, Formulating Problems, solving Problems, finding Paths, Avoiding Repeated States, State Transition Diagram, Constraint Satisfaction, Depth First, Breadth first, Hill Climbing, Beam Search, Best First Search, Alpha-Beta Search, A * Search, Branch and Bound, Heuristic Pruning, Heuristic Continuation and Dynamic Programming Searches.
Unit No. 3 Programming Practice
Introduction to Lisp, Defining Programs, Basic Flow of Control, Basic Debugging, Recursions, The For Function, Scope of Variables, Local Variables, Building up List Structure.

Unit No. 4 Logic & Deduction

Unit No. 5 Planning

Unit No. 6 Knowledge Representation

Unit No. 7 Natural Language Processing
Syntax Analysis/Parsing, Semantic Analysis, Problems, Pragmatics, Morphology, Applications of NLP, Disadvantages of NLP, Monolingual, Bilingual, Multilingual, Structure Ambiguity in Natural Language, Discourse Understanding, Discourse Boundaries
Speech Recognition: Structure, Advantages, Applications of Speech Recognition, Problems of Speech Recognition.

Unit No. 8 Learning
Introduction, Rote Learning, Learning by Taking Advice, Learning in Problem Solving, Learning from Examples (Induction), Learning from Observations, Explanation Based Learning, Learning by Experience,
Unit No. 9 Expert Systems (ES)

Note: Students/groups shall be given simple problems at different points to understand and apply AI techniques learned in particular unit. A teacher may take a simple problem and carry it over to clarify the concept throughout the course. Students/groups shall be given additional home problems to practice during open lab at home.