Basic Information:

Title:	Artificial Intelligence	**Code**	IT 462
Program:	BBIT	**Credit Hours:**	Three (03)
Sessions:	30 Classes + Mid Term + Final Term	**Pre-Requisite:**	Object Oriented Programming

Course Description:

This course aim at basic principles, techniques, and applications of Artificial Intelligence. Coverage includes knowledge representation, logic, inference, problem solving, search algorithms, learning, planning, etc. Students will experience programming in AI language tools. Potential areas of further exploration include expert systems, neural networks, fuzzy logic, robotics, natural language processing, and computer vision.

Learning Outcomes:

After the completion of this course, it is expected that students who will involve themselves in the knowledge base working of the course will be capable to

- ✓ *Define and explain Artificial Intelligence*
- ✓ *Appreciated different areas of Artificial Intelligence*
- ✓ *Represent knowledge required for soma application areas of AI*
- ✓ *Appreciate the importance of predicate calculus*
- ✓ *Can apply predicate calculus to provide basic level of solution related to AI*

Teaching Learning Methodology:

The formal teaching component of this course consists of active student participation in and contribution to all forms of teaching and learning i.e. lectures, discussions, research assignments and projects. Lectures will be twice a week of 90 min each.

Group Configurations:

One of the objectives of this course is to encourage and facilitate teamwork. Class will have to make a group of four for projects and research assignments. It is recommended that student will form their own groups. As a general guideline, your group should have members with diverse skill sets including people who are proficient or have aptitude for different subject areas.

Weekly Term Plan

Wk	Lecture Topic
01.	*AI Scope, Introduction and Areas of AI*
02.	*Propositional Calculus*
03.	*The Predicate Calculus*
04.	*Natural Deduction: Inference Rules*
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06.	*Categorical Syllogisms*
07.	*Problem Solving*
08.	***Mid Term Examination***
09.	*Knowledge Representation and Reasoning*
10.	*Expert Systems*
11.	*Machine Learning*
12.	*Understanding Natural Language*
13.	*Fuzzy Logic*
14.	*Ai Problem Solving Automated Reasoning*
15.	*Final Term Project Presentation*
16.	***Final Term Examination***

Topics in Detail

No	Title
1	*AI Scope, Introduction and Areas of AI,* *Overview and The Introduction to The Field of AI, Definitions and Areas of AI*
2	*Propositional Calculus,* *Propositional Logic,* *Symbols and Translation, Types of Propositions,* *Truth Functions, Truth Table for Propositions to Validate Arguments*
3	*The Predicate Calculus,* *The Components of Categorical Propositions,* *Quality, Quantity, and Distribution, Conversion, Obversion, and Contraposition*
4	*Categorical Syllogisms,* *Standard Form, Mood, and Figure,* *Rules and Fallacies,* *Venn Diagram to Check The Validity of Categorical Syllogism.*
5	*Natural Deduction:*
6	*Inference Rules, Rules of Replacement to Construct Formal Proof*
7	*Problem Solving, Classical Approach, Generate and Test,* *Problem Representation,* *Components of Problem Solving, Search Strategies*
8	***Mid Term Examination***
9	*Knowledge Representation and Reasoning* *The AI Cycle, The Dilemma, Knowledge and Its Types,* *Formal KR Techniques, Facts, Rules, Semantic Networks, Frames, Logic, Reasoning and Its Types*
10	*Expert Systems,* *Expert System Structure, Characteristics of Expert Systems,* *Programming Vs. Knowledge Engineering,* *Inference Mechanisms*
11	*Machine Learning* *3 Phases in Machine Learning, Learning Techniques, Applied Learning, Symbol-Based,* *Learning, Problem and Problem Spaces*
12	*Understanding Natural Language, The Natural Language Understanding Problem,* *Deconstructing Language: An Analysis, Syntax, Transition Network Parsers and Semantics,* *Stochastic Tools for Language Understanding, Natural Language Applications*
13	*Programming Logic (Prolog), Programming Tools of AI*
14	
15	*Term Project Presentation*
16	***Final Term Examination***

Text & Recommended Readings	Assignment Specification	
A. *Artificial Intelligence: Structure and Strategies of Complex Problem Solving 6th Edition* *George Luger, ISBN-13: 978-0-321-54589-3*	*Microsoft Word for Documentation*	
	Headings	*Arial 11pt Bold*
B. *Introduction to Logic, 14th Edition 2018* *Irving M. Copi, Carl Cohen* *ISBN-13:978-1292024820*	*Normal Text*	*Times New Roman 10pt*
	Header Footer	*Times New Roman 8pt*
	Paragraph	*Single Line Spacing*
	First Line Indent	*1.0 cm*
	Page Margins	*2 cm from each side*

Grading Policy:

Final Grade for this course will be the cumulated result of the following term work both with relevant participation according to the quoted percentage.

Sessional	25%
Assignments	10 %
Quizzes	10%
Presentations	05%

Mid Term	35%
Mid Term Exam	25%
Lab Work/ Lab Mid Exam	10%

Final Term	40%
Final Exam	30%
Case Study/ Project/ Term Paper	10%

Remember subdivision of Mid Term and Final Term Examination should be done only in case of very essential and major Grading Instruments.

Dishonest Practices & Plagiarism

Any student found responsible for dishonest practice/cheating (e.g. copying the work of others, use of unauthorized material in Grading Instruments) in relation to any piece of Grading Instrument will face penalties like deduction of marks, grade 'F' in the course, or in extreme cases, suspension and rustication from IBIT.

For details consult Plagiarism Policy of the University at http://pu.edu.pk/dpcc/downloads/Plagiarism-Policy.pdf

Grading System:

Letter Grade	Grade Point	Num Equivalence
A	4.00	85 – 100 %
A-	3.70	80 – 84 %
B+	3.30	75 – 79%
B	3.00	70 – 74 %
B-	2.70	65 – 69 %
C+	2.30	61 – 64 %
C	2.00	58 – 60 %
C-	1.70	55 – 57 %
D	1.00	50 – 54 %
F	0.00	Below 50 %
I	Incomplete	*
W	Withdraw	*

Norms to Course:

- ✓ *Submission Date and Time for the term instruments is always __Un-Extendable__.*
- ✓ *7 Absentees in class will be result in forced withdrawal. (__PU Policy__)*
- ✓ *Re-sit in Mid and Final Term will cause you a loss of 2 and 3 grade marks respectively. (__PU Policy__)*
- ✓ *This is your responsibility to keep track of your position in class evaluation units.*
- ✓ *After the submission date, NO excuse will be entertained.*
- ✓ ***Keep a copy of all submitted Grading Instruments.***
- ✓ *Assignment is acceptable only in its Entirety.*
- ✓ *No make up for any assignment and quiz.*
- ✓ *Copied & Shared work will score Zero.*
- ✓ *Assignments are Individual.*

Good Luck