SCHOOL OF SCIENCE AND TECHNOLOGY

SEMESTER:	FALL 2022
COURSE:	APT3010 - INTRODUCTION TO ARTIFICIAL INTELLIGENCE
LECTURER :	Fredrick Michael Ogore
TIME/DAYS:	*FRIDAY :8 :00AM-11 :00AM*
VENUE:	NIRO/ ICTC/ LAB4.
CREDIT:	*3 Units*
OFFICE HOURS:	MON *10:00AM – 12:00PM / Virtually OR By Appointment*
CONTACT:	*email:* **fogore@usiu.ac.ke** *or Tel:* **+254-717105568**

Pre requisite: APT1030

Purpose of the Course

This is an introductory course on Artificial Intelligence (AI). The main purpose of this course is to provide the most fundamental knowledge to the students so that they can understand what AI is with minimal theoretic proofs and formal notations to enable students to get the full picture of AI easily. AI techniques and algorithms for solving those problems will be examined. Students will learn about the methods and tools that will allow them to build complete systems that can interact intelligently with their environment by learning and reasoning about the world. Programming languages such as Lisp, Python, and Theano among others may be used.

Expected Learning outcomes of the Course

Upon successful completion of the course, the learner will be able to:

1. Identify an "Artificially" Intelligent system.
2. Apply Artificial Intelligence techniques for problem solving
3. Implement classical Artificial Intelligence techniques, such as search algorithms, minimax algorithm, constraint satisfaction, knowledge representation, and machine learning
4. Explain the limitations of current Artificial Intelligence techniques

Link To University Mission Outcomes

CLO	Aligned to the *following university mission outcomes*:					
	Higher order	Global understanding and multicultural	Community service	Literacy	Preparedness for	Leadership and
1. Identify an "Artificially" Intelligent system	✓			✓	✓	
2. Apply Artificial Intelligence techniques for problem solving	✓			✓	✓	✓
3. Implement classical Artificial Intelligence techniques, such as search algorithms, minimax algorithm, constraint satisfaction, knowledge representation, and machine learning	✓				✓	✓
4. Explain the limitations of current Artificial Intelligence techniques	✓			✓	✓	

Link To School Mission Outcomes

CLO	Aligned to the *following school mission outcomes*:						
	1. Critical Thinking	2. Effective Communication	3. Preparedness for	4. Research and	5. Multidisciplinary	6. Professional and	7. Service to
1. Identify an "Artificially" Intelligent system	✓		✓				
2. Apply Artificial Intelligence techniques for problem solving	✓	✓	✓	✓			

3. Implement classical Artificial Intelligence techniques, such as search algorithms, minimax algorithm, constraint satisfaction, knowledge representation, and machine learning	✓		✓	✓			
4. Explain the limitations of current Artificial Intelligence techniques	✓	✓	✓				

Link To Program Learning Outcomes

PLO	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7
	1. Develop integrated software for businesses/organizati	2. Conceptualize and implement integrated systems	3. Demonstrate competence in the use of modern computer	4. Write programs using modern programming languages	5. Explain the concepts underlying computer informatics	6. Exhibit professional behavior and ethics	7. Develop skills to use tools, techniques and application skills in one
APT 3010 - INTRODUCTION TO ARTIFICIAL INTELLIGENCE	**I**	**I**	**A**	**A**	**I**	**B**	**I**

Key: B-Beginner, I-Intermediate, A-Advanced

Course Content

WEEK	TOPIC	REFERENCE/Class Activities.
1	Introduction to Artificial Intelligence	Chapter 1 Introduce the course, set pace for the semester, create class groups. Discuss AI Career Path and Modern trends.[Open Discussion]
2	Introduction to Python	Create groups of 4 to work on end semester Python project for AI. Activity: ❖ Lesson ❖ Group Discussion.
3	Intelligent Agents • Agent Environments • Types of Agents	Chapter 2: Activity: ❖ Lesson ❖ Group Discussion. *Take away Assignment*: Modern AI Agents.
4	Problem Solving by Searching • Informed Search	Chapter 3 Activity: ❖ Lesson ❖ Group Discussion.
5	Problem Solving by Searching • Uninformed Search	Chapter 3: Project Progress report #1(Be uploaded on blackboard)-10 Marks.
6	Problem Solving by Searching • Adversarial Search	Chapter 3 Activity: ❖ Lesson ❖ Group Discussion. ❖ Library assignment
7	• MID SEMESTER EXAMS • Revision Exercises	Project Progress report #2(Be uploaded on blackboard)-10Marks
8	Problem Solving using Constraint satisfaction	Chapter 5 **Guest speaker:** AI Kenya representative or from AICare Company.
9	Knowledge and Reasoning • Logical Agents • First-Order Logic	Chapter 7 & 8 Activity: Class presentation :Different Trending AI areas. Objective: Knowledge and building presentation skills.

10	Knowledge and Reasoning • Knowledge Representation	Chapter 11 Project Progress report #3(Be uploaded on blackboard) Library Assignment-2
11	Uncertainty • Quantifying Uncertainty • Probabilistic Reasoning • Decision Making	Chapter 13: Draft Project Presentation.[15 marks]
12	Machine Learning • Supervised Learning • Unsupervised Learning	Chapter 18 FINAL PROJECT PRESENTATION
13	Philosophical issues	Chapter 26
14	FINAL EXAM	

Mode of Delivery

Lectures; Class discussions; Case analysis; Lab Exercises/Projects; Directed readings; Research and out-of-class assignments

Instructional Materials and Equipment

Computers, projectors, whiteboard, marker pens, audiovisual equipment and e-learning platform

Key Institutional Academic Policies

- Plagiarism will lead to disqualification of the work in question
- Cases of cheating will result to an automatic F
- You will get an F if you miss more than 7 classes
- There will be no make ups without approval from the Dean
- Mobile phones should be switched OFF during class session.
- Computers should only be used for approved classroom activities during class sessions.
- Students who come 10min after class has started will not be allowed into the classroom.

Course Assessment

❖ Project Reports	10%
❖ Final Project Presentation	20%
❖ Group Work	10%
❖ Library assignments	5 %
❖ **Class participation**	5%
❖ Mid-Semester Exam	20%
❖ Final examination	30%
TOTAL	**100%**

Core Reading Materials for the Course

a) Textbooks

Russel,S., Norvig,P.(2016). *Artificial Intelligence*,(2nd edition) Prentice-Hall, Inc.,

Luger,G.F., Stubblefield,W.A.(1993) *Artificial Intelligence*. The Benjamin/Cummings Publishing Company, Inc

b) Journals

- Artificial Intelligence Journal
  https://www.journals.elsevier.com/artificial-intelligence

c) E-resources

- https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-034-artificial-intelligence-fall-2010/

Recommended Reference Materials

a) Textbooks

Zboril,F., Hanacek,P.(1990). Artificial intelligence, Texts, BUT Brno, Marik,V., Stepanková,O., Lazansky,J. (1997)Artificial intelligence,ACADEMIA Praha,

b) Journals

- Artificial Intelligence Joutnal
- https://www.journals.elsevier.com/artificial-intelligence

c) E-resources

- https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-034-artificial-intelligence-fall-2010/