



Princess Sumaya جامعة  
University الأميرة سميرة  
for Technology للتكنولوجيا

**Princess Sumaya University for Technology  
The King Hussein School for Information Technology  
Computer Science Department**

**Course Syllabus – Fall Semester 2021/2022**

**CS 11428: Artificial Intelligence**

**1. Course Information**

<b>Catalog Description</b>	Introduction to AI and its scope and applications. AI programming languages. Knowledge representation. Heuristic search and problem solving with different strategies. Introduction to knowledge based systems. Expert systems. Natural language processing machine learning. Other applications. Project is required.	
<b>Credit Hours</b>	3	
<b>Prerequisite</b>	CS11212 Data structure	
<b>Course Type</b>	Lecture	
<b>Required/Elective</b>	Elective	
<b>Textbook</b>	Artificial Intelligence: A Guide to Intelligent Systems by Michael Negnevitsky	
<b>References</b>	<ol style="list-style-type: none"><li>1. Artificial Intelligence: A Modern Approach by Stuart Russell and Peter Norvig</li><li>2. Deep Learning with Python 1st Edition by François Chollet</li><li>3. Deep Learning with Keras: Implementing deep learning models and neural networks with the power of Python by <a href="#">Antonio Gulli</a> , <a href="#">Sujit Pal</a> .</li><li>4. Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems 2nd Edition by Aurélien Géron</li></ol>	
<b>Instructor</b>	Dr. Rawan Ghnemat Office: IT 305	Email: <a href="mailto:r.ghnemat@psut.edu.jo">r.ghnemat@psut.edu.jo</a> Office Phone Ext.: 262
<b>Class Schedule</b>	<b>M,Wed.:12:30-02:00</b>	
<b>Class Location</b>		

Office Hours	S,Tu,Th.:10:00-11:00 and S,Tu,Th.:12:00-01:00
Teaching Assistant	No

## 2. Course Contents

Online lecture	Topic(s)	Chapter in Text
Lecture 1, lecture 2 1 week	Introduction what is AI, history,	Ch1
Lecture Blind lecture Hsearch HW1 1 week	Problem Solving 1: uninformed search strategies	Chapter 3 Reference 1
Lecture G1, lecture G2. Genetic algorithm example Example, HW2 1 week	Problem Solving 2: Informed (Heuristic) search.	Chapter 4 Reference 1
	Assignment 1,2	
Rule based expert system s Experts systems worksheet 2 weeks	Introduction to knowledge based intelligent systems. Rule-based expert systems Fuzzy rule based expert system	Chapters 2 Chapter 4
ML01 ML02 Important python packages Machine learning project California housing prices (2 weeks )	Machine learning	Ch.1 Ch2 Ch3 Reference 4

<b>ANN1</b> <b>ML exercise</b> <b>Titanic example</b> <b>HW3</b> <b>2 week</b>	<b>Artificial neural networks</b>	<b>Ch6 until 6.5</b>
	<b>Assignment 3</b>	
<b>CNN1,</b> <b>2 week</b>	<b>Deep learning</b>	<b>Ch5 ref2</b>
	<b>Project work start</b>	
<b>CNN2</b> <b>2 week</b>	<b>Convolutional neural networks</b>	<b>Ch5 ref2</b>
<b>Cats vs dogs example</b> <b>Fruits classification</b>	<b>Hands on deep learning using keras and tensorflow</b>	
<b>1 week</b>	<b>Knowledge engineering and data mining</b>	<b>Ch9</b>
	<b>Project presentation</b>	
	<b>Exam revision</b>	

### 3. Assessment Policy

<b>Assessment Tool</b>	<b>Expected Due Date</b>	<b>Weight</b>
Assignments	All Course duration	15%
project		15%
midterm Exam		30%
Final Exam		40%

### 4. Contribution of the Course to the Professional Component

Computer Science Topics	100%
General Education	30%
Mathematics & Basic Sciences	20%

### 5. Expected level of proficiency from students entering the course

Mathematics	Good
Physics	Not applicable
Technical writing	some

Computer programming	Good
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## 6. Material available to students, instructors, TAs, and department at end of course

	Students	Department	Instructors	TA(s)
Course objectives and outcomes form	X	X	X	
Lecture notes, homework assignments, and solutions	X	X	X	
Samples of homework solutions from 3 students		X		
Samples of lab reports of 3 students		X		
Samples of exam solutions from 3 students		X		
Course performance form from student surveys		X	X	
End-of-course instructor survey		X	X	

## 7. Relationship to Program Outcomes

a	Strong	Strong: (a), (b), (c), and (i)
b	Strong	
c	Strong	
i	Strong	

## 8. Course Objectives

<p>The primary objective of this course is to introduce the basic principles, techniques, and applications of Artificial Intelligence. Emphasis will be placed on the teaching of these fundamentals with the appropriate tools and software of implanting them .Assigned projects promote a 'hands-on' approach for understanding, as well as a challenging avenue for exploration and creativity. Specifically:</p> <ol style="list-style-type: none"> <li>1. Gain a historical perspective of AI and its foundations</li> <li>2. Become familiar with basic principles of AI toward problem solving, inference, perception, knowledge representation, and learning.</li> <li>3. Investigate applications of AI techniques in intelligent systems, expert systems, artificial neural networks and other machine learning models.</li> <li>4. Experience AI development tools such as an 'AI language', expert system shell, and/or data mining tool.</li> <li>5. Experiment with a machine learning model for simulation and analysis.</li> <li>6. Explore the current scope, potential, limitations, and implications of intelligent systems.</li> </ol>
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## 9. Course Outcomes

<p>Upon completion of this course, students will be able to:</p> <ul style="list-style-type: none"> <li>• Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.</li> </ul>
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- Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
- Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent systems, expert systems, artificial neural networks and other machine learning models.
- Demonstrate proficiency developing applications in an 'AI language', expert system shell, or data mining tool.
- Demonstrate proficiency in applying scientific method to models of machine learning.
- Demonstrate an ability to share in discussions of AI, its current scope and limitations.