



**Jordan University of Science and Technology**  
**Faculty of Computer & Information Technology**  
**Computer Science Department**

CS496 Special Topics In Computer Science 1

First Semester 2021-2022

**Course Catalog**

3 Credit Hours. This course provides a comprehensive introduction to computer vision. It is therefore primarily concerned with the problem of capturing and making sense of digital images. The field draws heavily on many major subjects including digital image processing, artificial intelligence, feature extraction and selection, image classification and recognition, and scene understanding. This course also provides an introduction to deep learning with neural networks which are currently being used in the development of real-world computer vision systems that mimic the capabilities of the human eye-brain system. Students will learn and develop the intuitions of computer vision methods in class as well as hands on experience to solve real-life vision problems.

**Text Book**

<b>Title</b>	Computer Vision: Algorithms and Applications
<b>Author(s)</b>	Richard Szeliski
<b>Edition</b>	2nd Edition
<b>Short Name</b>	Ref#1
<b>Other Information</b>	2021

**Course References**

Short name	Book name	Author(s)	Edition	Other Information
Ref #2	Digital Image Processing	Gonzalez, R. C. and Woods, R. E.	4th Edition	2017
Ref #3	Deep Learning: From Basics to Practice	Glassner, A.	1st Edition	2018
Ref #4	Machine learning: a probabilistic perspective	Murphy, K. P.	1st Edition	2012

**Instructor**

Name	Dr. Ahmad Alzubi
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Office Location	A1 Level-3
Office Hours	Sun : 11:00 - 12:30 Mon : 10:00 - 11:30 Tue : 11:00 - 12:30 Wed : 10:00 - 11:30
Email	agalzubi@just.edu.jo

<b>Class Schedule &amp; Room</b>
Section 1: Lecture Time: Mon, Wed : 13:00 - 14:30 Room: CS01-PH3 L-1

<b>Tentative List of Topics Covered</b>		
<b>Weeks</b>	<b>Topic</b>	<b>References</b>
Week 1	Introduction to computer vision	From <b>Ref#1</b>
Weeks 2, 3	Image formation	From <b>Ref#1</b> , From <b>Ref #2</b>
Weeks 4, 5, 6	Image processing	From <b>Ref#1</b> , From <b>Ref #2</b>
Week 7	Model fitting and optimization	From <b>Ref#1</b>
Weeks 8, 9, 10	Deep Learning	From <b>Ref#1</b>
Weeks 11, 12, 13	Recognition	From <b>Ref#1</b>
Weeks 14, 15	Feature detection and matching	From <b>Ref#1</b>

<b>Mapping of Course Outcomes to Program Student Outcomes</b>	<b>Course Outcome Weight (Out of 100%)</b>	<b>Assessment method</b>
Understanding the theoretical and practical aspects of human and machine vision systems and the importance of computing with images [1SO1]	10%	
Describing the foundation of image formation, analysis, processing, matching and alignment with a probabilistic perspective [1SO1]	15%	
Grasping the principles of machine learning and deep neural networks [1SO1]	25%	
Working on various computer vision applications including object and scene recognition, image classification, semantic segmentation, and video understanding [1SO6]	30%	
Understanding feature detection and matching approaches necessary to build various computer vision applications [1SO6]	20%	

Relationship to Program Student Outcomes (Out of 100%)					
SO1	SO2	SO3	SO4	SO5	SO6
50					50

Evaluation	
Assessment Tool	Weight
Midterm Exam	30%
Final Exam	50%
Project and Assignments	20%

Policy	
Attendance	Attendance is very important for the course. In accordance with university policy, students missing more than 20% of total classes are subject to failure. Penalties may be assessed without regard to the student's performance. Attendance will be recorded at the beginning or end of each class.
Quizzes	No makeup.
Assignments	Cheating is prohibited under JUST strict laws. No late submissions are accepted.
Exams	The format for the exams is generally (but NOT always) as follows: General calculations, Multiple-Choice, True/False, Analyze a Problem, etc.

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