اعتماد
NCAAA

T4

2020

Course Specifications

Course Title:	Computer Vision
Course Code:	501574-3
Program:	Bachelor in Computer Engineering
Department:	Department of Computer Engineering
College:	College of Computers and Information Technology
Institution:	Taif University

Table of Contents

A. Course Identification

1. Credit hours:3

2. Course type

a.　University ☐　College ☐　Department ☐　　　Others ☐

b.　　　Required ■　　　Elective ■

3. Level/year at which this course is offered:　10/5

4. Pre-requisites for this course (if any): 202262-3 (Linear Algebra)

5. Co-requisites for this course (if any)**: 501481-3 (Artificial Intelligence)**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	45
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify)	
	Total	45

B. Course Objectives and Learning Outcomes

1. Course Description

This course introduces the basic concepts of computer vision, its applications and techniques. Topics treated in the course include low level image processing, segmentation, boundary detection, fitting, stereo correspondence, 3-Dreconstruction, recognition and detection.

2. Course Main Objective

1. Introduce typical application domains where computer vision techniques are used.
2. Introduce methods and tools for developing computer vision applications.
   Develop techniques to emulate human vision capabilities.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Identify the fundamental concepts in Digital image processing and computer vision.	K1
1.2		
1.3		
1...		
2	**Skills**	
2.1	Apply image preprocessing algorithms and computer vision techniques for detection	S1
2.2	Apply engineering design to produce solutions that meet specified needs with consideration of computer vision problems	S1
2.3		
2...		
3	**Values**	
3.1	Acquire and apply new knowledge as needed, using appropriate learning strategies and tools.	V1
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to computer vision, image processing, basic image processing operations	5
2	Image Filtering and Fourier Transform	5
3	Image pyramids and Applications	3
4	Edge detection and line fitting	5
5	Robust fitting (RANSAC)	2
6	Machine Learning : Overview, Clustering, Classification	10
7	Interest points: corners (Harris-Laplacian)	5
8	Feature description SIFT	5
9	Recognition: PCA	3
10	Recognition: EigenFaces	2
Total		45

D. Teaching and Assessment
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.1	Identify the fundamental concepts in Digital image processing and computer vision.	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments
1.2			
2.0	**Skills**		
2.1	Apply image preprocessing algorithms and computer vision techniques for detection	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments Projects
2.2	Apply engineering design to produce solutions that meet specified needs with consideration of computer vision problems	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments Projects
3.0	**Values**		
3.1	Acquire and apply new knowledge as needed, using appropriate learning strategies and tools.	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments Projects
3.2		Lecture Discussion Problem Solving	Written Exams Quizzes Assignments Projects
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignments	Continues	5%
2	Midterm Exam	7	20%
3	Project	14	15%
4	Quizzes	Continues	10%
5	Final Exam	16	50%
7			
8			

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:
- 6 hours per week in pre-determined office hours
- Consultation by appointment (as needed)
- Through emails
- Through Blackboard Learn

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Computer Vision: Algorithms and Applications by Szeliski, R, Publisher Prentice Hall 1st Edition, Springer; 2011, ISBN-10: 1848829345
Essential References Materials	Digital Image Processing Using Matlab by Gonzalez,R.C, Woods,R.E and Eddin,S.L, Publisher: Gatesmark Publishing, 2nd Edition 2009, ISBN-10: 0982085400
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Traditional Classrooms,
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Extent of achievement of course learning outcomes	Students	Indirect (Survey)
Effectiveness of teaching and assessment	Students	Indirect (Survey)
Extent of achievement of course learning outcomes	Faculty	Course Report

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Computer Engineering Council / Curriculum Committee
Reference No.	16
Date	4/3/2022

قسم هندسة الحاسب
Computer Engineering Department

جامعة الطائف
TAIF UNIVERSITY

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