The University of Jordan
King Abdullah II School for Information Technology
Business Information Technology Department
Document Analysis & Recognition (1904252)

Pre-requisite(s): Discrete Mathematics (1901101), Theory of Algorithms (1901341)

Course Web Site: http://elearning.ju.edu.jo

Course Coordinator: Dr. Omar Sultan Al-Kadi

Course Description:
To provide a comprehensive knowledge of theoretical background and practical applications of digital image processing techniques, analysis and enhancement both in the spatial and frequency domains; also to be able to work with different image compression techniques.

Intended Learning Outcomes (ILO):
On successfully completing the module, the students are expected to have gained good knowledge of:

No.	Course Intended Learning Outcomes (CILOs)
	Knowledge
A	Apply principle processing and analysis techniques for image document enhancement both in the spatial and frequency domains
B	Being able to determine the type of distortion in an image, and apply appropriate filtering techniques for image enhancement
C	Understanding 2D Fourier transform concepts, and their use in frequency domain filtering.
D	Understand how to represent an image using different colour models and how to convert from one colour model to another for improved visualization
E	Applying basic image compression techniques, and using image morphology for character/ feature segmentation
	Professional Skill
G	Demonstrate how to solve practical problems with some basic image processing techniques.
H	Demonstrated teamwork and communication skills through course projects

Teaching and Learning Methodology:

Method	Lecture	Demo	Laboratory
Learning outcomes	A+B+C+D+E	A+B+C+D+E	G+H
Assessment	Exams + Assignment + Programming project		

Textbook and Materials:

- Digital Image Processing, 3nd/ed By Rafael C. Gonzalez and Richard E. Woods, Prentice-Hall; 2008 ISBN: 0131687288

- Digital Image Processing Using MATLAB, 2nd/ed By Rafael C. Gonzalez, Richard E. Woods, Steven L. Eddins, Prentice-Hall; 2009 ISBN: 0982085400

Course Objectives

On completion of this course, students should be able to:

- Cover the basic theory and algorithms that are widely used in digital image processing
- Gain experience in applying image processing algorithms for document analysis and recognition applications
- Familiarize with MATLAB Image Processing Toolbox

Attendance and Responsibilities:

Students are responsible for class attendance and for all material covered in class. It is the students' responsibility to turn in their homework assignments to their instructors by the announced due date/time.

Class Participation:

Class participation will account for a small percentage of the grade; participation requires reading ahead the assigned material before each class session and being engaged in class discussions, and actively participating in group activities.

Tentative Schedule: *(The coverage order is subject to change as the instructor sees fit)*

Week/Date	Topics	PPT
1	Introduction to Image Processing	**Chapter1**
2 & 3	Digital Image Fundamentals	**Chapter2**
4 & 5	Intensity Transformation and Spatial Filtering	**Chapter 3**
6 & 7	Image Enhancement in the Frequency Domain	**Chapter4**
8 & 9	Image Restoration	**Chapter5**
10 & 11	Color Image Processing	**Chapter6**
12 & 13	Selected topics on Morphological Image Processing	**Chapter9**
14	Programming project submission	**-**
15	Review	

Grading and Evaluation Criteria: 100 points distributed as follows:

Weight	Criteria	Comments
30%	Midterm Exam	TBA (in due course)
20%	Programming project	Last week of semester

50%	Final Exam	TBA (in due course)

Intended (Tentative) Grading Scale:

Range	LG	الحرف	Range	LG	الحرف	Range	LG	الحرف
90 - 100	A	أ	74 - 77	B-	ب-	56 - 60	D+	د+
86 - 89	A-	أ-	70 - 73	C+	ج+	50 - 55	D	د
82 - 85	B+	ب+	66 - 69	C	ج	45 - 49	D-	د-
78 - 81	B	ب	61 - 65	C-	ج-	0 - 44	F	هـ

Additional Reading

- Image Processing: dealing with Texture, By Maria Petrou and Pedro Garcia Sevilla, 1st ed, Wiley, 2006.
- K. Jain, Fundamentals of Digital Image Processing, Prentice-Hall, 1988.

Regulations:

1. Every student is expected to completely adhere to the exams dates and projects strict deadlines, absolutely no exceptions will be given.
2. Maximum allowable absence 15% of number of Lectures/Semester

- الامتناع المدبر عن حضور المحاضرات أو الدروس أو عن الأعمال الاخرى التي تقضي الأنظمة بالمواظبة عليها ، وكل تحريض على هذا الامتناع سوف يؤدي الى حرمان الطالب من المادة المعنية.
- في حالة التغيب عن امتحان ال Mid Term لن يكون هناك امتحان تعويضي الا في حالة وجود عذر وحالة طارئة من المستشفى. على الطالب ابراز العذر لمدرس المادة في فتره لا تتجاوز الثلاثة ايام من تاريخ الامتحان, وللمدرس الحق في قبول او رفض العذر , وحسب التعليمات.

- **Concerns or complaints should be expressed in the first instance to the module lecturer; if no resolution is forthcoming then the issue should be brought to the attention of the module coordinator (for multiple sections) who will take the concerns to the module representative meeting. Thereafter problems are dealt with by the Department Chair and if still unresolved the Dean and then ultimately the Vice President. For the final complaints, there will be a committee to review grading the final exam.**
- **For more details on University regulations please visit http://www.ju.edu.jo/rules/index.htm**