

<p>Kingdom of Saudi Arabia Ministry of Higher Education <b>Qassim University</b> College of Engineering</p>		<p>المملكة العربية السعودية وزارة التعليم العالي جامعة القصيم كلية الهندسة</p>
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## Digital Signal Processing

**College: Engineering**

**Department: Electrical**

**First: Course Definition**

**1- Course Code EE623**

**2- Units: 3**

**3 – Semester**

**4 -Prerequisite**

**5- Co-requisite**

**6- Location** (if not on main Campus):

**Second: Course Objectives**

This course provides an introduction to basic concepts and methodologies for digital image processing in both theoretical and practical aspects, and develops a foundation that can be used as the basis for further study and research in this field.

**Third: Course Specifications**

**1- Topics to be covered**

Subject	No of Weeks	Units
Introduction:Image Model,Image Acquacision,Termnologies	3	9
Histogram manipulation	2	6
Filters	3	9
Image restoration	2	6
Image segmentation	2	6
Image classification	1	3
Morphological image processing	2	6

**2- Course components (Total hrs in the Semester)**

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Lecture	lab	Other
30	30	

### 3- Intended Learning Outcomes of the Course (ILO's)

#### a. Knowledge

##### *i) Description of the knowledge to be acquired:*

On completing this course the student should know

- a1- Digital image fundamentals
- a2- Basic techniques of image enhancement and image restoration
- a3- Image segmentation and classification techniques
- a4- Basic morphological operations
- a5- Application field

##### *ii) Teaching strategies to be used to develop that knowledge*

Lectures & Seminars

Tutorials

Computer-lab Sessions

Reading Materials

Independent Work

##### *iii) Methods of assessment of knowledge acquired*

Exams

Open book Exam

Quizzes

Course Work

#### b- Cognitive (Intellectual) Skills

##### *i) Cognitive skills to be developed*

- The most important intellectual skills developed in the course will enable the student to
  - b1- Enhance the ability to choose the appropriate technique for a given problem.
  - b2- Go through the detailed computational procedures of image processing techniques.
  - b3- Develop image processing tool-box.
  - b4- Analyze and test image processing techniques in real-world applications

##### *ii) Teaching strategies to be used to develop these cognitive skills*

Computer-lab Sessions

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Practical lab work  
Web-site Searches  
Independent Work  
Group Work  
Case Studies

*iii) Methods of assessment of students' cognitive skills*  
Open book Exam  
Take home Exam  
Case Study Analysis  
Group Project  
Individual Project

### ***c. Interpersonal Skills and Responsibility***

*i) Description of the interpersonal skills and capacity to carry responsibility to be developed*  
- On completing this course, the student should be able to apply  
c2- Different spatial filters for image enhancement.  
c3- Different filters in frequency domain.  
c4- Different segmentation and classification techniques  
c5- Morphological operations on grey level images.

*ii) Teaching strategies to be used to develop these skills*  
Practical lab work  
Web-site Searches  
Independent Work  
Group Work  
Case Studies  
Presentations

*iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility*  
Case Study Analysis  
Oral Presentations  
Practical  
Group Project

### ***d. Communication, Information Technology and Numerical Skills***

*i) Description of the skills to be developed in this domain*  
- On completing this course the student should be able to

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- d1- Have oral communications skills through project presentation.
- d2- Learn Team-work skills through case studies.
- d3- Read advanced textbooks and research literature in the image-processing field

- ii) *Teaching strategies to be used to develop these skills*  
Case Studies  
Presentations
- iii) *Methods of assessment of students numerical and communication skills*  
Report Writing  
Case Study Analysis  
Oral Presentations  
Individual Project
- e. Psychomotor (if applicable) & Other Non-cognitive Skills**

*i) Description of the psychomotor or other skills to be developed and the level of performance required*

*ii) Teaching strategies to be used to develop these skills-*

*iii) Methods of assessment of student's psychomotor skills*  
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**4- Student Assessment Schedule**

<i>Serial</i>	<i>Assessment tool (test, group project, examination etc.)</i>	<i>Week due</i>	<i>Weight</i>
1			
2			
3			
4			
5			

**5- Student Support**

**6- Learning Resources**

- i) Essential Books (References)*  
Digital image processing ,Rafael C. Gonzalez and Richard E.Woods ,second edition,2002

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- ii) Course Notes**
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- iii) Recommended Books**
- Digital Image Processing , Kenneth R. Castliman, Prentice-Hall, Inc., 1996
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- iv) Electronic Books & Web Sites:**
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- v) Periodicals**
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**7- Course Evaluation and Improvement Processes**

- i) Strategies for Obtaining Student Feedback on Effectiveness of Teaching**
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- ii) Other Strategies for Evaluation of Teaching by the Instructor or by the Department**
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- iii) Processes for Improvement of Teaching**
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- iv) Processes for verifying standards of student achievement (e.g. check marking by an independent faculty member of a sample of student work, periodic exchange and remarking of a sample of assignments with a faculty member in another institution)**
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- v) Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.**
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