Pattern Recognition

- **Course number and name:**
  CC 516 – Pattern Recognition

- **Credits and contact hours**
  Credits Hours: 3Hrs
  Contact Hours: In Lecture 2Hrs, and In Tutorial 2Hrs

- **Instructor's or course coordinator's name**
  Coordinator Name: Dr. Rowayda Sadek

- **Text book, title, author, and year**
  - Rafael C. Gonzalez, Richard E. Woods,"Digital Image Processing",2nd Edition, Prentice Hall, 2002.
  - Earl Gose ,Richard Johnson ,Steve Jost. "Pattern Recognition and Image Processing", Prentice Hall ,1996.

- **Specific course information**
  - **a. Catalog description**
    Investigation of the point and smoothing operations - Edge detection algorithms - Connected component methodology - Shape detection - Morphological operations - Statistical decision making - Baye's theorem - Hierarchical and partitional clustering - Feed-forward and feed-backward neural networks.
  - **b. prerequisites or co-requisites**
    Prerequisites: CC511
  - **c. Types of Course (required, elective, or selected elective course) in the program**
    Elective Course

- **Specific goals for the course**
  - **a. Specific outcomes of instruction**
    After the completion of this course the students will be able to:

	Course Learning Outcomes	SO
1	Understand the principles of image analysis and pattern recognition and seeks to develop knowledge on its techniques.	A,J
2	Be familiar with the most frequently used pattern recognition techniques, such as statistical classifiers, clustering and neural networks.	A,J
3	Master the use of the Matlab image toolbox and will be able to apply it to real life problems.	F

Topics to be covered

- Introduction
- Point Operations
- Smoothing Transformations
- Edge detection
- Scene Segmentation and Labelling
- Shape detection
- Boundary detection , gap filling and Hough transform
- Morphological Operations
- Statistical Decision Making
- Minimization of Classification Error
- Hierarchical Clustering
- Partitional Clustering
- Feed Forward Neural Networks
- Feed Backward Neural Networks