1. **Course number and name:**
   COE 420 – Software Engineering

2. **Credits and contact hours**
   3 credit hours, 4 contact hours

3. **Instructor's or course coordinator's name:**
   Dr. Raafat Aburukba

4. **Textbook, title, author, and year**
   R. Pressman, *Software Engineering: A Practitioner's Approach*, 7th edition. McGraw-Hill, 2009.

   Other supplemental materials
   I. Sommerville, *Software Engineering*, 8th edition. Addison Wesley, 2007.

5. **Specific course information**
   a. **Brief description of content of the course (catalog description)**
   Introduces the basic principles and practices of software engineering. Emphasizes the different phases of the software development process and quality issues. Includes the following topics: software life cycle models; general design, implementation and testing issues; specification and design methodologies; model-based approaches to software design; project management and the use of various design and development tools.

   b. **Prerequisites or co-requisites**
   Prerequisites: CMP 305 (Data Structures and Algorithms) and COE 312 (Software Design for Engineers) or CMP 256 (GUI Design and Programming)

   c. **Indicate whether a required, elective, or selected elective course in the program**
   Major requirement.

6. **Specific goals for the course**
   a. **Specific outcomes of instruction**
   This course requires the student to demonstrate the following:
      1. Describe major elements of the software life cycle
      2. Elicit, analyze, prioritize and document requirements for a software system
      3. Design, build and test a system based on its requirements specification using industrial-strength design techniques and development tools
      4. Apply project management techniques to software projects
      5. Estimate the cost and effort required to complete a software project
      6. Compose effective technical reports for a technical audience
      7. Communicate clearly and present software engineering content

b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course

This course contributes in a significant way to the accomplishment of the following program outcomes:

Program outcome	Emphasis in this course
(a) an ability to apply knowledge of mathematics, science, and engineering	●
(b) an ability to design and conduct experiments, as well as to analyze and interpret data	
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	●
(d) an ability to function on multidisciplinary teams	◑
(e) an ability to identify, formulate, and solve engineering problems	◑
(f) an understanding of professional and ethical responsibility	
(g) an ability to communicate effectively	◑
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i) a recognition of the need for, and an ability to engage in life-long learning	
(j) a knowledge of contemporary issues	○
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	●

Emphasis: ● High; ◑ Medium; ○ Low; Blank – Nothing Specific Expected

7. Brief list of topics to be covered
i. Introduction to Software Engineering
ii. Requirements Engineering
iii. Design
iv. Implementation
v. Reliability & Testing
vi. Project Management
vii. Review and Evaluation