



Course Specification

(Bachelor)

Course Title: **Engineering Design & Project Management**

Course Code: **CENX 490**

Program: **B.S. in Computer Engineering**

Department: **Department of Computer Engineering**

College: **College of Computer and Information Sciences**

Institution: **King Saud University**

Version: *Course Specification Version Number*

Last Revision Date: *Pick Revision Date.*

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A. General information about the course:

1. Course Identification

1. Credit hours: (3 hours)

2. Course type

A. ☐ University ☐ College ☐ Department ☐ Track ☐ Others
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 8)

4. Course general Description:

Computer engineering discipline: the potential role of computer engineers in modern society, the role of engineering societies and organizations, opportunities for computer engineers; Overview of the engineering design process; Project selection, needs identification and problem statements; Requirements specification; Concept generation and evaluation; System design: bottom-up and top-down design, functional decomposition; Behavior models: state diagrams and flowcharts; Testing; Ethical and legal Issues in the design process; Project management: Project plans, Gantt charts, Cost models, Break-even analysis, Cost estimation.

5. Pre-requirements for this course (if any):

ENGL 110, Technical Writing
CENX 316, Computer Architecture

6. Co-requirements for this course (if any):

7. Course Main Objective(s):

This course introduces students to the fundamentals of the engineering design process and project management in preparation for their graduation projects. The main goals of the course are

- To teach students the nature of computer engineering as a profession.
- To provide students with the necessary knowledge required to conduct a successful design project.
- To teach students the ethical and professional responsibility of engineering in the society.
- To improve students' professional practice skills.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3 hours per week	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Recognize the different type of tests and methods of testing required in computer engineering design projects.	4	Lectures	Exams and Project
1.2	Recognize ethical and legal issues related to computer engineering design.	2	Lectures	Exams and Project
...				
2.0	Skills			
2.1	Apply systematic engineering design methodology to computer engineering projects including problem identification and requirement specification.	2	Lectures	Exams and Project
2.2	Apply systematic evaluation of multiple design concepts using	2	Lectures	Exams and Project



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	qualitative and quantitative tools.			
2.3	Create functional specification of a design concept using functional decomposition and appropriate behavior models.	2	Lectures	Exams and Project
2.4	Apply project management and cost estimation skills to engineering projects.	5	Lectures	Exams and Project
3.0	Values, autonomy, and responsibility			
3.1				
3.2				
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction, Computer engineering disciplines.	2
2.	Professional societies, The potential role of computer engineers, Opportunities for computer engineers.	2
3.	Overview of the Engineering Design Process.	2
4.	Project Selection and Problem Identification.	3
5.	Needs specification (Marketing requirements).	5
6.	Requirements specification (Engineering requirements).	5
7.	Concept generation and evaluation.	5
8.	System design: bottom-up and top-down design, functional decomposition.	3
9.	System design: behavior models, state diagrams, flowcharts.	3
10.	Testing in engineering design projects	6
11.	Project management: Project plan, Gantt charts,	3
12.	Project management: Cost estimation, Cost models, Break-even analysis	2
13.	Ethical and legal Issues in engineering designs	3
14.	Review	1
Total		45



D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Examination	8 or 9	25%
2.	Project	15	15%
3.	Homework Assignments	Bi-weekly	20%
4.	Quizzes	As needed	

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Engineering Design, Planning, and Management, Hugh Jack, 1st Edition, Academic Press, 2013, ISBN: 9780123971586.
Supportive References	Design for Electrical and Computer Engineers: Theory, Concepts, and Practice, Ralph M. Ford and Chris S. Coulston, 1st Edition, McGraw-Hill, 2008, ISBN: 9780073380353.
Electronic Materials	https://lms.ksu.edu.sa
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room with number of seats enough to accommodate enrolled students.
Technology equipment (projector, smart board, software)	Overhead projector with required software to facilitate presentations on smart board.
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Department Council	Course reports are evaluated by the Department Council.
Effectiveness of Students assessment	Faculty-Peer Review	Final examination is moderated.
Quality of learning resources	Students	Indirect – Edu-gate survey.

Assessment Areas/Issues	Assessor	Assessment Methods
The extent to which CLOs have been achieved	Students	Attainment level of every CLO is measured directly.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

