King Fahd University of Petroleum & Minerals
MECHANICAL ENGINEERING DEPARTMENT
ME 416: Design Project II

Catalogue Description (0-6-2):
The second part of this capstone design project course is completed in semester following the COOP Training and integrates various components of the curriculum in comprehensive engineering experience so that the basic sciences, mathematics, and engineering sciences which the student has learned in his freshman-to-senior years of study can be applied. It considers design of a complete project or system including establishment of objectives and criteria, formulation of the problem statements, preparation of specifications, consideration of alternative solutions, feasibility considerations, and detailed engineering designs. The design should take into consideration appropriate constraints such as economic factors, safety, reliability, ethics and environmental and social impact. Oral presentation and submission of final written report of the design project are essential requirements for the completion of the course. Students Project Team will work closely with their project adviser and are expected to spend about 6 hours per week /per student on the project.

Status in Curriculum (Required or Elective): Required (offered Fall & Spring)

Prerequisites: ME 414

Co-requisites: None

Prerequisites by Topics:
- Engineering Drawing
- Material Science
- Mechanical Engineering Design
- Manufacturing Processes
- Thermal Science

Textbook: None

References:
Engineering Design Methods: Strategies for Product Design, by Nigel Cross, John Wiley & Sons, 3rd edition, 2000.

Coordinators:**Dr. Jafar Albinmousa & Dr. Abdul-Aleem Bangalore Jabbar,** Mechanical Engineering

Goals:**(general objectives)**
The course integrate knowledge acquired from various courses in a capstone manner, involving groups of students in open-ended design effort. The course introduces students to the life cycle of a design project within a team environment.

Course Outline (Lecture Topics): None

Design Activities/Projects:
Students are involved in a complete design cycle: identifying needs, conceptual design, design selection process, engineering analysis, prototyping and testing.

Computer Usage:
Students are encouraged/requested to utilize available computer software in the department such as Microsoft Word, Excel and PowerPoint and addition to SolidWorks, LABVIEW, FLUENT, ANSYS, EES, and MATLAB.

Laboratory:
None

Assessment Tools:
1) Attendance, logbook
2) Accomplishment of design tasks
3) Written report
4) Oral presentation

Course Learning Outcomes:
I- The student should be able to identify customer needs as well as current global and local demands.
II- The student should be able to write product design specifications with engineering metrics
III- The student should be able to know how to generate design concept
IV- The student should be able to hand-sketch and utilize CAD tools and present design concepts
V- The student should be able to work in team to analyze the design though engineering principles

VI- The student should be able to test the designed product, assess its performance, and refine it if needed
VII- The students should be able to effectively communicate their designs through written reports and oral presentations.

Course Learning Outcomes mapped to Student Outcomes:

Student Outcomes	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*	*k*
Course-to-Student outcome mapping	V	VI	I, II	V	I, II, III, V	I, II	II, III, IV, VII	I	I	I	III, IV, V VI
Emphasis*	**S**	**S**	**S**	**S**	**S**	**M**	**S**	**M**	**S**	**S**	**S**

* **L**: Little/None **M**: Moderate **S**: Strong

Status of Continuous Improvement review of this Course:

Date reviewed: 22 February 2015 **Reviewed by:** Dr. Jafar Albinmousa
Prepared by: Dr. Abdul-Aleem Bangalore Jabbar **Date prepared:** January 29, 2014