



GE105: Introduction to Engineering Design

Course Information

Dr. Mohammed A. Khamis

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So What is the Course About?



*This should be you by
the end of this course!*

GE105: Introduction to Engineering Design

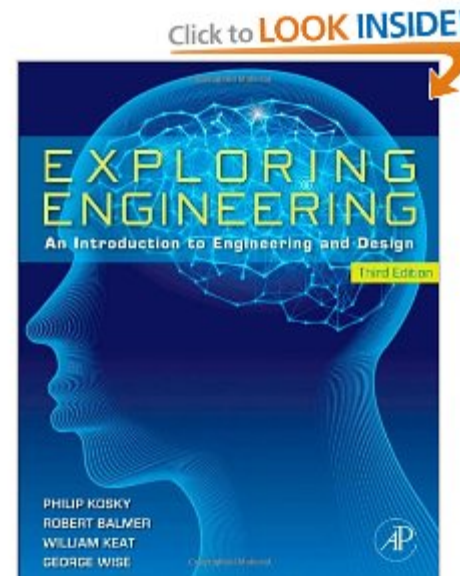
Information

- Credits: 2(1,1,2)
- Prerequisites: GE104
- Instructor: **Dr. Mohammed Khamis**
- Office Phone No.: **4674889**
- Email: **mokhamis@ksu.edu.sa**
- Office no: **2B 76**

Suggested Book

Exploring Engineering: An Introduction to Engineering and Design

[Philip Kosky](#) , [Robert T. Balmer](#) ,
[William D. Keat](#) , [George Wise](#)



Lecturing Styles Used

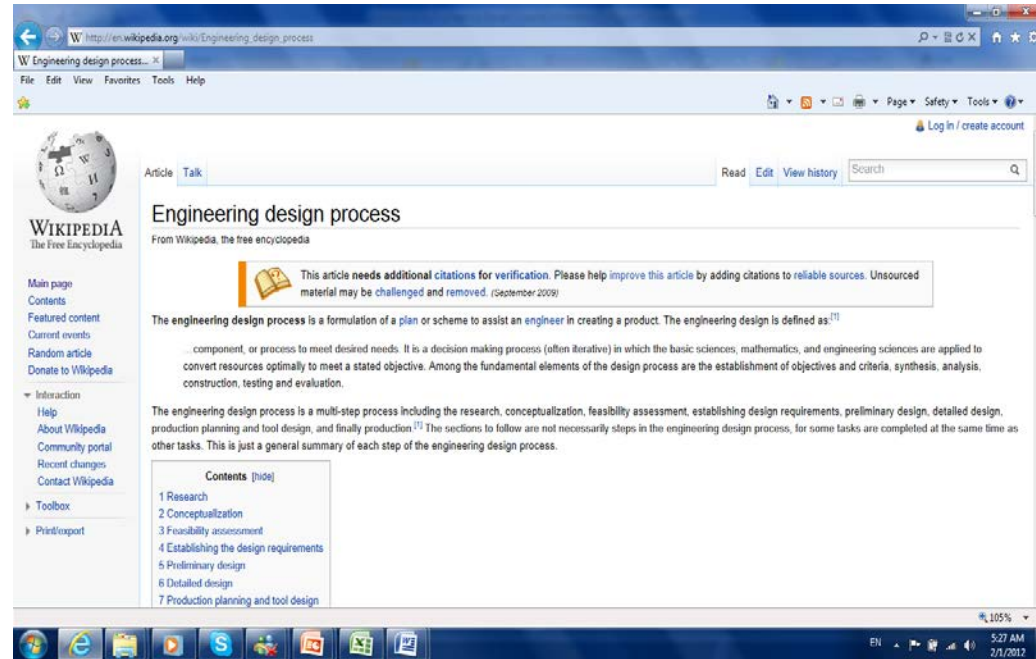
- **Lecture Classes:** Normal Lecture Classes
 - Lecture (10:00 – 10:50 AM) - Sundays
 - Tutorial (10:00 – 10:50 AM) - Tuesdays
 - Studios (01:00 – 02:50 AM) - Thursdays
 - Location (1B - 015)
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- **Studios:** Design project classroom meetings.
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- **Tutorials:** Overview of homework assignments and Exam problem solving



Final Year Design Project

Sources of Help

- Your Professor
 - Office number **2B 76**
 - Office hours:
 - (Sundays-Tuesdays: 1:00-2:00)
 - Email: mokhamis@ksu.edu.sa
- These power point presentations
 - uploaded on my personal website:
<http://fac.ksu.edu.sa/mokhamis>
- Additional materials on the website of (Prof. Mohamed Elmadany)
- Recommended Text Book
- King Salman Library (never underestimate a library!)
- The World Wide Web
- Wikipedia.com



Wikipedia.com

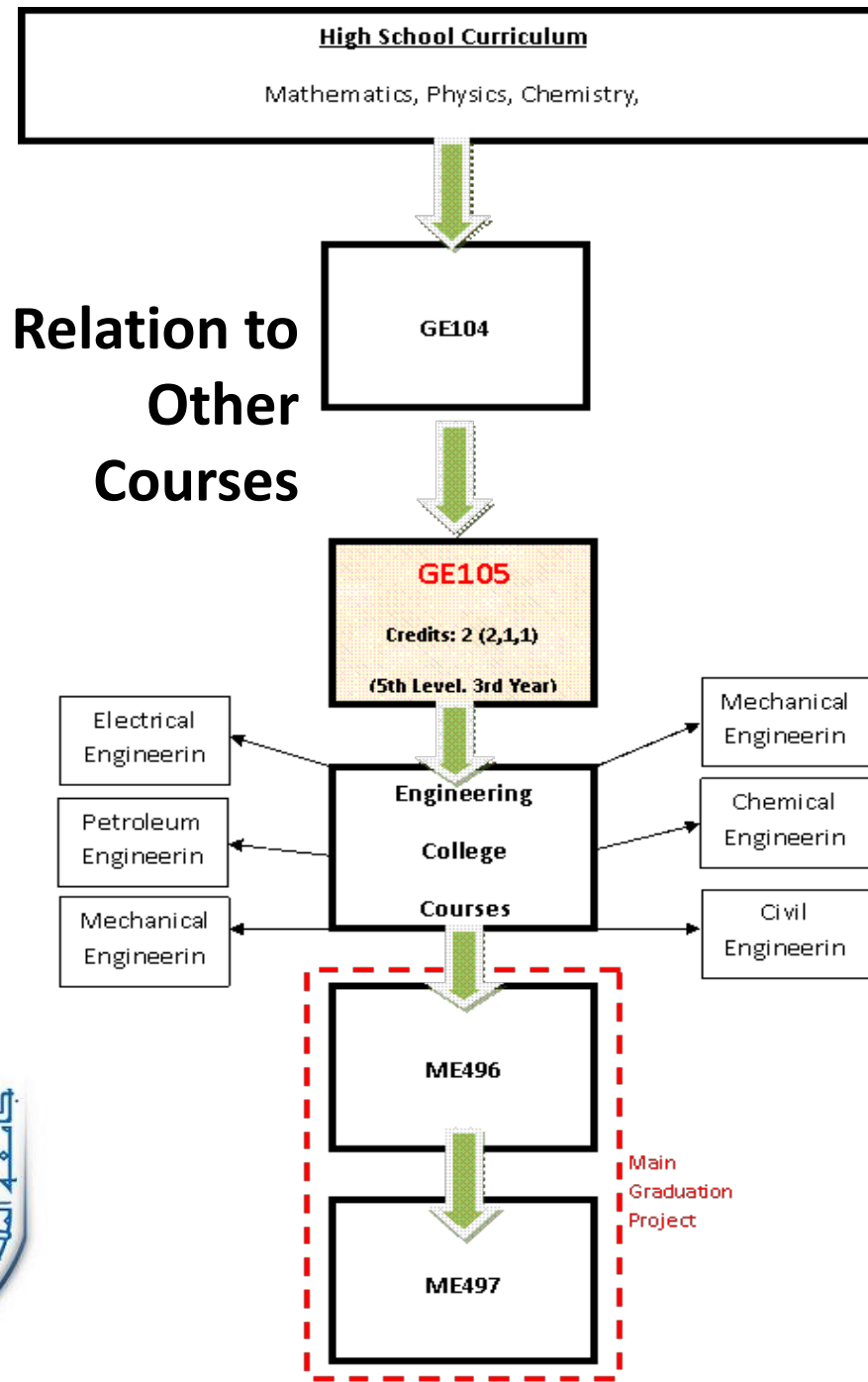
Relation to Other Courses

Engineering Specializations Taught GE105:

- Mechanical Engineering
- Electrical Engineering
- Petroleum and Natural Gas Engineering
- Civil Engineering
- Chemical Engineering



Relation to Other Courses



Course Description

- Introducing and practicing the engineering professional culture and ethics
- Enhancing on personal skills such as:
 - Teamwork;
 - Leadership;
 - Written and oral presentation
- Introduction to the design process.
- Techniques for stimulation of ideas.
- Human factors in design
- Intellectual property (rights)
- Legal and regulatory matters



Intellectual Property



Leadership

Objectives

- Expose students to engineering in their sophomore year.
- Adhere to professionalism and ethics.
- Give practice in open-ended problems, identifying the important variables, and the use of the design process and problem-solving skills.
- Broaden skills in team work, group dynamics, critical thinking, planning and scheduling through design project.
- Enable students to consider safety, ethical, legal, environmental, human factors, and other societal constraints in execution of their design projects.
- Provide opportunities for students to develop oral and written communication skills.



Students Teamwork in Projects



Students Practice of Communications Skills

Learning Outcomes- Knowledge

- Ability to prepare a need-assessment, define and formulate the problem, consider the problem constraints, and specify a deliverable for a project.
- Ability to solve open-ended design problems, cope (deal) with decision making and satisfy competing objectives.
- Ability to synthesize gathered information to solve open-ended problems.
- Ability to use the engineering design process to carry out a project.
- Ability to conceptualize alternative concepts, evaluate and select preferred alternative, and implement the preferred design using engineering tools.
- Understand the importance of professional and ethical responsibility.
- Understand ethics, environmental and legal issues.



Engineering Problem Solving Meetings

Learning Outcomes- Cognitive Skills

- Ability to apply design heuristic (discover) of recognition of the problem, problem definition, criteria, and constraints
- Ability to apply creative techniques to generate alternative solutions (concepts)
- Ability to apply procedures to evaluate the solutions and select the "best" solution, decide on a course of action and implement the selected solution
- Ability to synthesize and critically judge the relevant gathered information to solve open-ended problems
- Ability to exercise professional and ethical responsibility in carrying out the design project
- Ability to consider human factors and legal factors in the design problems



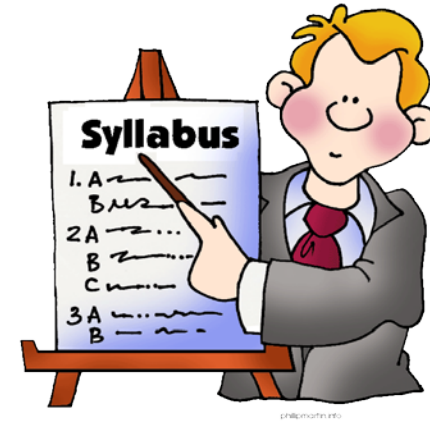
A Student Doing Some Critical Thinking!

Learning Outcomes- Interpersonal Skills

- Ability of the students to take the responsibility to solve given assignments on their own and submit the solution on time.
- Ability to engage and work effectively in teams with full group interaction during the work on the design project, exercise full responsibility in holding team meetings, distribute tasks, leadership and team dynamics.
- Ability to manage the time between self study, solving assignments, carrying out the design project activities, and submitting project reports.
- Ability to find out the proper action when confronted (face, challenge) with engineering ethical problems.



Standard Syllabus



Chapter	Title
1	Course Overview; course, deliverables, team formation, project selection
2	Introduction to Engineering; definitions, engineering functions, career paths, engineering profession
3	Fundamentals of Engineering Design; an overview of engineering design, design process
4	Problem-solving skills
5	Creativity in Engineering Design
6	Origin and Identification of the Design Problems
7	Teamwork and Team Dynamics, Project Management
8	Engineering Ethics and Intellectual Property
	Final Exam

Course is Open to Any Other Extended Useful Discussions

Grading

Grading Scheme

Assessment Tasks:	Proportion of Final
• Tutorial:	10%
• Quizzes & Class work:	15%
• Design Project:	35%
– [Progress Reports/Final Report/Oral Presentation]	
• <u>Final Exam:</u>	40%
• Total	100%



Required From Student

- Assignments
- Quizzes
- Design Project
 - Studios
 - Teamwork
 - Meeting Logs Retention
 - Project Report
 - Joint Presentation
- Final Exam
- **Contributing to any open classroom discussions**
- **Good attendance is a must**

Finally

- Work Hard and Enjoy the Course
- Produce Results Not Excuses!
- Be a Source of Pride to Yourself, Parents, Country and Religion...