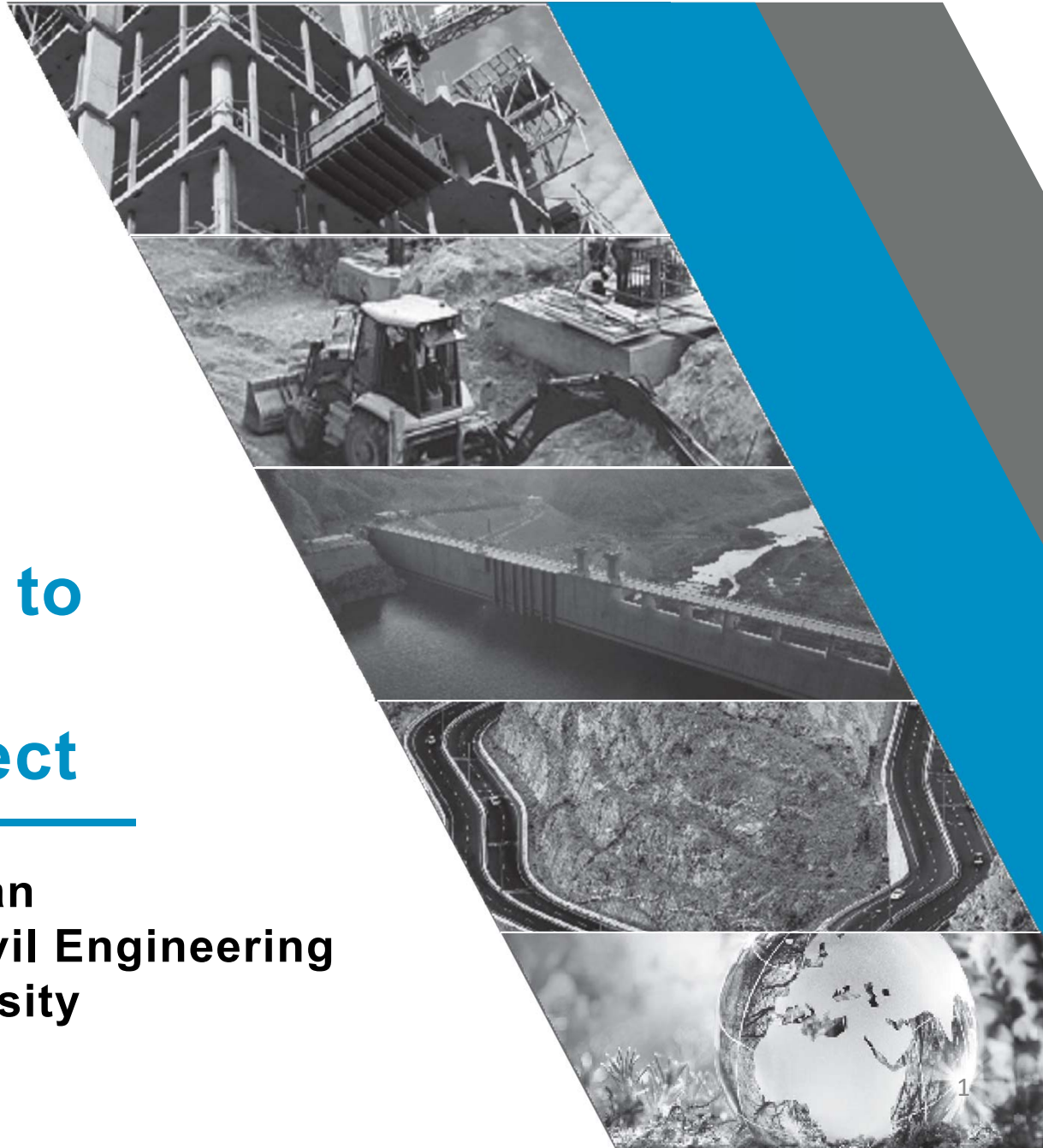


# Introduction to Capstone Design Project

---

**Prof. M. Iqbal Khan**  
**Department of Civil Engineering**  
**King Saud University**



# Definition of Capstone

**is literally,** “one of the finishing or protective stones that form the top of an exterior masonry wall or building.”

**in education it is,** “the crowning academic achievement, point, element, or event and presents the final stroke to prepare graduates to work in the profession”





# Nature of Capstone Design Project

## From Student Prospective

**My Capstone project should pull in skills I have learned from many different areas to make a final product that shows off what I can do and solves a unique problem**

## Capstone projects are selected to encourage students;

- **To think critically.**
- **To create engineering system.**
- **To solve challenging problems.**
- **To develop skills such as oral communication, public speaking, research skills, teamwork, and planning.**



## Capstone Design Projects (CDP) should

**Be interdisciplinary**, in the sense that they require students to apply skills or investigate issues **across many different subject areas or domains of knowledge, at least 3 different disciplines**

Encourage students **to connect their projects to community issues or problems, and solve real-life engineering problems**

**Be subjected to realistic “real-life” constraints** (e.g. economy, environmental, architectural, safety, health, global, society and contemporary issues)



# CDP Learning Outcomes

- Understand the professional and ethical responsibility, key concepts used in management, business, public policy, public administration, leadership principles and licensure.
- Identify the problem based on realistic needs and operation constraints.
- Acquire the related background information, data, knowledge and experiences from credible sources.
- Formulate the problem, covering methodology of integrating knowledge drawn from previous courses and information and address the realistic constraints.
- Generate design alternatives, set methods for their evaluation (covering the design viability and evaluation criteria), and select the preferred alternative.
- Design the preferred alternative based on calculations and/or experimental tools.
- Develop an effective plan for the project using planning techniques to ensure proper project timing and budgeting.
- Work effectively as a member of the project team.
- Present the project professionally by submitting necessary design reports and drawings as well as making an oral presentation.



## CDP is divided into two parts;

### **Part 1 : Graduation Project – I CE 496**

It includes project selection, data collection, identification of real-life constraints (e.g. economy, environmental, global, and contemporary issues), involved disciplines, generation of possible design alternatives considering client needs, selection of the preferred alternative, and preparation of a work plan for implementing and completing the project. Initial report will be submitted with oral presentation to include; project description, objectives , constraints, data and assumption, design alternatives, and the preferred alternative.

### **Part 2 : Graduation Project–II CE 497**

It is the implementation phase of the capstone design project. It includes necessary design calculations and/or use of experimental tools to design the preferred alternative that was selected in CE 496. The final report to be submitted by the team includes the details of preferred design along with pertinent drawings, and summary and conclusions. In addition, the student team should orally present the project to the examining committee.





# Plagiarism?

**Plagiarism means:**

copying words or ideas from someone else as one's own  
to steal and pass off (the ideas or words of another)

to present as new and original an idea or product derived from an existing  
source

to use (another's production) without crediting the source

In other words, plagiarism is an act of fraud. Plagiarism is considered **academic dishonesty** and a **breach of ethics**.

## How to Avoid Plagiarism:

Most of the cases of plagiarism can be avoided by:

- ▶ by citing sources and acknowledging that certain material has been borrowed and
- ▶ providing the necessary information to find that source.

# Grading: CE 496



**Supervisor:**

**40%**

**Based on Student's Semester Work**  
(Motivation, Progress, Participation and Overall performance)  
(Final Report (Report Organization and Main Body))

**Examination Committee:**

**60%**

**Midterm exam (20%)**

Presentation of work done and work progress

**Final Exam and Presentation (40%)**

**Presentation**

(Style, Organization, Technical Content and Presentation Skills and Student's competency)

**Report Evaluation**

(Report Organization, Writing Quality, Main Body of the Report, Design Methodology, Results and Discussions, Capstone Aspect)





## Deadlines: CE 496

<i>S.No.</i>	<i>Assignment</i>	<i>Due Date</i>
1.	Submission of CDP Proposal Form, Sunday	Week # 3
2.	Midterm Exam	Week # 8
3.	Submission of Final Report, Thursday	Week # 15
4.	Final Exam	Week # 16

**Actual dates will be in Instruction Sheet**



# Homework - Proposal

Attendance of first lecture and submission of CDP Proposal Form – 5% marks

## CDP Proposal Form

CDP Proposal Form is available on my website at <http://fac.ksu.edu.sa/miqbal/>

Each project must have at least three specializations involved as follows  
Structural, Geotechnical, Environmental, Transportation, Water Resources,  
Construction Management, Surveying – (any three)

You must fill-in all items of the form in consultation of your Supervisor/s

**Submission deadline –Week#3, Sunday**

This lecture is available at: <http://fac.ksu.edu.sa/miqbal/>  
Password 6264



## Samples of Previous CDPs

- ***Design of tunnel connecting between NEOM in KSA and Sharm El-Sheikh in Egypt , with design of 30 floors high rise administrative building***
- ***Prestressed Post-tensioned Bridge at the Intersection of King Abdullah and Prince Turki Al-Awwal Roads***
- ***Planning and Design of Arabs' Peace Center at Makkah Road in Riyadh***