TOPICS COVERED

- Civil engineering project life cycle
- **Feasibility study & Design considerations**
- Environmental impact assessment (EIA)
- **Drainage and sewage impact assessments (DIA & SIA)**
- Traffic impact assessment (TIA)
- **Site Formation**
- Foundation design
- **Superstructure design**
- FEM structural design concept
WELCOME TO CIVL4950

CIVIL ENGINEERING
CAPSTONE DESIGN PROJECT
Prof. Ben Y B Chan

- Assistant Professor (Civil and Environmental Engineering)
- Associate Director (Center for Engineering Education Innovation)

Prof. Paul Pang

- Adjunct Professor (Civil and Environmental Engineering)
- Former AD of Building Department
INSTRUCTORS

Ir. Joseph Mak
- Senior Engineer, Housing Department
- Structures

Ir. Dr. Benjamin Sun
- Director, AECOM
- Site Formation & Foundation
OBJECTIVES

• Integrate students’ knowledge and technical skills from prior coursework into a comprehensive design project.

• Involve students actively in planning and design of a realistic civil engineering project.

• Foster teamwork and multi-disciplinary coordination towards solving open-ended design problems.

• Prepare students for professional practice in the engineering industry.
Students are divided into teams of 16-17 and each team is required to design a real civil engineering structure in HK.

Each team is required to be sub-divided into 3 groups each responsible for a design area.

- Team A (4-5 students) shall cover EIA /DIA/SIA/TIA,
- Team C (6-7 students) shall cover Geotechnics & Foundation, and
- Team D (6-7 students) shall cover Structural Design in relation to the project.
TEAM PROJECT

- Project team in a consultant company
  - Team A – EIA/DIA/SIA/TIA
    - Environmental Engineering
    - Hydraulics and Hydrology
    - Geotechnical Engineering
    - Transportation Engineering
  - Team B – Foundation Design
    - Geotechnical Engineering
  - Team C – Superstructure Design
    - Structural Engineering
    - Material Engineering
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<tr>
<th>Date</th>
<th>7:00pm - 8:20pm</th>
<th>8:30pm - 9:50pm</th>
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<tr>
<td></td>
<td>Lecturer</td>
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<td>05/09</td>
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<td><strong>Project Briefing</strong></td>
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<td><strong>Break</strong></td>
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<td>19/09</td>
<td>CHAN</td>
<td>FEM in Design (ETABS)</td>
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<td>26/09</td>
<td>MAK</td>
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<td>03/10</td>
<td>D. CHAN</td>
<td>Architectural Aspect of Civil Eng. Design</td>
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<td>10/10</td>
<td>SUN</td>
<td>Site Form., GI &amp; Geo. Design</td>
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<td>17/10</td>
<td>CHAN</td>
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<td>29/10</td>
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<td><strong>Site Visit (Sunday)</strong></td>
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<td>31/10</td>
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<td><strong>Project Debriefing &amp; Experience Sharing (All)</strong></td>
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<td><strong>Deadline for report submission</strong></td>
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<td>Spring</td>
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<td><strong>Design Presentation</strong></td>
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ASSESSMENTS

• Quiz, Site visit and lecture attendance (10%)

• Scenario-based problem solving module (20%)

• Project Reports (30%)
  • 15% for individual report and
  • 15% for the 4 reports taken together

• Project Presentation (40%)
  • 25% for 25 minutes presentation
  • 15% for Q&A session
• Students are REQUIRED to attend the lectures in relation to their design area. (i.e. Members of team D need to attend the two lectures delivered by Ir Joesph Mak)

• All students are required to attend the site visit and the project meeting
Each group is required to schedule a meeting with the instructors (representing the Client) to demonstrate the group’s cooperation and communication in design project planning, multi-disciplinary interaction and progress monitoring.

Rundown for the project meeting
- Prepare a proper agenda for the meeting
- Short report from each sub-team about their progress
- The instructors will seek for information about the design project
Each team is required to submit a report for its area covered. As inter-team co-operation is crucial to achieve a well-coordinated and optimal design solution for the project, the assessment of the reports is 15% for individual report and 15% for the 4 reports taken together.

Assessment of the 15% for overall design

- Consistency of format
- Consistency of design parameters
- Consistency of assumptions
FORMAT OF PRESENTATION

- Project Presentation
  - Clients (Layman)
  - Technical Advisers

- Each group is required to do a 20-25 minute presentation of the design project.

- Each group selects 5 members to conduct the presentation.
FOR PRESENTERS

❖ Each presenter has 4-5 minutes
  ○ Introduction + Conclusion [4-5 mins]
  ○ EIA [4-5 mins]
  ○ TIA [4-5 mins]
  ○ Geotechnics [4-5 mins]
  ○ Structures [4-5 mins]

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20-25 mins

❖ Each presenter will be asked 2 questions individually during Q&A.
(Note: Not including follow-up questions)
PRESENTATION MARKING (100%)

- **Content (50%)**
  - Define and prioritize objectives
  - State design parameters
  - Identify constraints
  - Justify assumptions made
  - Propose and evaluate alternatives (incl. costs)
  - Recommend solutions

- **Delivery (30%)**
  - Cooperation
  - Fluency & time control
  - Presentation Skills

- **Visual aids (20%)**
  - Accuracy
  - Consistence
  - Graphics
  - Logic
  - Relevance
FOR NON-PRESENTERS

- Members not presenting are called ‘non-presenters’

- Non-presenters will each have about 5 minutes for Q&A.

- Non-presenters need to:
  - State his/her involvement in the project.
  - Answer questions, general or technical, related to the project. Questions may not be restricted only to his/her report topic.