

CE 505: Design of Construction Systems

Course Description:

Advanced design of concrete formwork and falsework systems. Design for excavation and marine construction including temporary retaining structures and cofferdams. Aggregate production operations, including blasting, crushing, and conveying systems. Rigging system design.

Course objectives (course designed to):

Expose students to the basic concepts involved in designing construction facilities and provide students with practice in developing detailed designs for selected facilities or portions of facilities. Examples of such systems include:

Course Outcomes (students should be able to):

1. Develop ability to create project management plans and processes for heavy civil projects.
2. Apply cost, schedule, and contract administration tools to heavy civil projects such as: highways, bridges, water treatment plants, etc.
3. Develop ability to perform and document quantity surveying accurately by applying standard estimating techniques to specific construction projects and produce the engineer's estimated quantities for heavy civil bid packages.
4. Understand how to develop unit prices based on crew-based and production-based pricing and apply those to properly bid on engineer's estimated quantities.
5. Understand specialized scheduling techniques such as linear scheduling.
6. Understand fundamentals of infrastructure asset management.

Course Topics

- Construction Vehicle Loads
- Formwork Design (concrete formwork & falsework)
- Aggregate Production
 - Drilling and Blasting
 - Rock Crushing
 - Conveying
- Rigging
- Temporary retaining structures, especially cofferdams