



CEE 4120

Construction Operations

This is a heavy/highway construction course that teaches the basics of major construction delivery methods and equipment operations. It is intended for all CEE students and highly recommended for those who expect to work in heavy/civil projects in the future, either from a design or construction perspective. The topics introduced are site development, volume estimation, earthmoving materials, equipment economics, excavation, the stability of excavations, loading, and hauling, cranes, equipment safety, automated construction, laser scanning for reconstruction, robotics, and field demonstration.



Key Points

- Earthmoving / Lifting equipment
- Construction Robots
- Drone/ 3D laser scanning
- Field Trips

Grading Criteria

- Participation (10%)
- HW & Quiz (20%)
- 2 Exams (40%)
- Final Exam (30%)

For questions, contact

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Week	Topics	Remarks
1	Course Introduction Project Delivery Methods Site Investigation	
2	Excavation Protection (safety) Equipment Cost Estimating	HW#1 (Excavation)
3	Equipment Economics I- Depreciation	In-class exercise
4	Ownership & Operation Cost Introduction to CAT Performance Handbook	HW#2 (O&O)
5	Fundamentals of Earthmoving-I	Quiz#1 CAT O&O
6	Exam 1	
7	Fundamentals of Earthmoving-II	HW#3 (Soil)
8	Tractors/Loaders	HW#4 Equipment power
9	Excavator	HW #5 Tractor/ Loader
10	Laser Scanning for 3D reconstruction and documentation	Hand-on practice of 3D reconstruction
11	No class	Spring Break
12	Scrapers/Trucks	HW#6 Trucks
13	Exam 2	
14	Crane	
15	Crane rigging estimation	
16	Automated Construction Equipment	RICAL Tour