

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ
الْحَمْدُ لِلَّهِ الَّذِي
خَلَقَ السَّمَوَاتِ وَالْأَرْضَ
وَالَّذِي يُضَوِّبُ الْمَوْتَى
إِنَّ رَبَّهُ لَسَدِيدٌ
إِلَىٰ عَرْشِهِ الرَّحِيمُ
الَّذِي يُخْرِجُ الْحَيَّ مِنَ الْمَوْتِ
وَيُدْخِلُ الْمَوْتَىٰ فِي الْحَيَاةِ
إِنَّ رَبَّهُ لَسَدِيدٌ
إِلَىٰ عَرْشِهِ الرَّحِيمُ

Lecture # 1

Civil Engineering Practice

Introduction

Instructor:

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Civil Engineering Practice Course

- Credit Hours 3 (2+1)
- Semester Weeks 16/18
- Evaluation/Grading
 - Home Assignments (4) 10%
 - Quiz test (4) unannounced 15%
 - Midterm test: 25%
- Semester Exam 40%
- Industrial visit: Visit to a Construction sites

Course outline

- Earth moving:
 - Labour versus machinery. Factors affecting selection of construction equipment.
 - Principle and use of common earth moving machinery required for different purposes (digging, hauling and compaction etc.).
- Stone crushers: Machines for cleaning and grading of aggregates,
- **Concrete mixers**, vibrators and pneumatic tools,
- Introduction to tunneling, Piles and cofferdams,
- Form work and shuttering. Defects and remedial measures in construction, Principal defects and diagnosis of causes.

- **Forms for Concrete:**

- structures, Form requirements, cost of forms, designing a project for form economy, materials for forms, size of form section, properties of lumber, Fundamental form design.

- **Foundation grouting:**

- Need for grouting, exploring to determine the need for grouting, materials used for grout, drilling patterns, drilling injection holes, preparations for grouting,. Washing the seams, grouting pressures, equipment for cement grouting, injecting cement grout, pressure grouting with asphalt, clay grouting, chemical grouting, determine the effectiveness of grouting.

- **Introduction to work and tendering.**

Week	Date	Class Duration	Topics to be covered
1 st		2 hours	Earth moving :Labor versus machinery Factors affecting selection of construction Equipment
2 nd		2 hours	Principle and use of common earth moving machinery required for different purposes (digging, hauling and compaction etc.
3 rd		2 hours	Stones Aggregates and Concrete: Stone crushers, Machines for cleaning and grading of aggregates Concrete mixers-Types and Uses. Vibrators and pneumatic tools,
4 th		2 hours	First Quiz Introduction to tunneling, Piles and cofferdams. Form work and shuttering.
5 th		2 hours	Defects and remedial measures in construction Principal defects and diagnosis of causes
6 th		2 hours	Forms for Conc. Structures. Form requirements, cost of form. Designing a project for form economy
7 th		2 hours	Second Quiz Materials for forms, size of form section properties of lumber Fundamental of form design.
8 th		2 hours	Foundation grouting Need for grouting Exploring to determine the need for grouting Materials used for grout
9 th		2 hours	Drilling patterns, Drilling injection holes Preparations for grouting
10 th		2 hours	Mid Term Test
11 th		2 hours	Washing the seams, grouting pressures. Equipment for cement grouting, injecting
12 th		2 hours	Cement grout. Pressure grouting with asphalt.
13 th		2 hours	3rd Quiz Clay grouting, chemical grouting Determine the effectiveness of grouting
14 th		2 hour	Tendering: National and International Tendering Tendering Process
15 th		2 hours	PEC bidding Documents-1
16 th		2 hours	4th Quiz Public Procurement Rules-2004

Excavation Works and Equipment

- Various machines do excavation work for varying purposes.
- Excavation contractors may need to perform grading, trenching, digging, dredging or site development work.
- The type of equipment used to perform the excavation work will depend on the type of excavation done.
- Most people are familiar with site-development excavation work. This involves digging a hole for the foundation of a house and grading the area around the home to ready the yard for landscaping.

Site Excavation

- Site excavation is a process in which soil, rock, and other materials are removed from a site, typically with the use of heavy earthmoving equipment such as excavators and bulldozers. There are a number of reasons to conduct a site excavation, ranging from a desire to explore a site to learn more about its archaeological history to an environmental remediation project.
- Depending on the purpose of a site excavation, it may be conducted and supervised by various professionals.
- During new construction on buildings, roads, and other structures, site excavation is one of the earliest stages. The site is excavated to create a level, clean area to work, with the foundations being established in the excavated area.
- A site may also be excavated and backfilled to confirm that the material directly under the site is of high quality. The depth of site excavation can vary, depending on what is being built and where the building is occurring.

Equipment Used for Excavation

- **Excavator:**
 - An excavator is a machine that may also be used for digging or demolition.
 - Excavators can come in a number of sizes, but tend to be designed the same.
 - Usually there is a pivoting cab that rests on an undercarriage. Extending from the middle is an arm that is usually connected to a bucket.
 - On each side of the undercarriage are tracks that are used for mobility.
 - On top of the base is a platform that rotates between 180 and 360 degrees.

- A bulldozer is another item that can come in a range of sizes.
- This vehicle has a tractor style body and also has the track-type undercarriage.
- There is normally some type of metal blade connected to the front of a bulldozer.
- This is used to push heavy loads that can include sand or refuse from a demolished structure.
- The blades are often switched to accommodate the job.

- Dump trucks are earth moving equipment that allow for the transport and deposit of necessary materials at a job site.
- One of the most important features of the dump truck is that it is an efficient means of transportation.
- A dump truck can be driven for long distances at speeds that do not conflict with normal traffic or consume unnecessary amounts of time.
- The other important feature is that the loads that they carry can be deposited with minimal effort since the driver performs this task without having to leave the cab





