



COURSE INTRODUCTION

CEM 530

CONSTRUCTION EQUIPMENT AND METHODS

BY

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LECTURER

CONSTRUCTION ENGINEERING & MANAGEMENT DEPT

SEPTEMBER 11/2004



CEM 530 Overview

- Syllabus
- Text
- Software
- Course description
- Course objectives
- Article Presentation
- Course Website
- Grading plan
- Class participation / feedback
- Term Paper
- Assignments/ HWs
- Examinations



ABOUT ME

Mr. Mohammed Jalaluddin

Construction Equipment & Methods (CEM 530)

Contact Information & Class Timings

INSTRUCTOR:

Mr. Mohammed Jalaluddin

860-1623 (Day)

860-5417 (Evening)

Email: jalals@kfupm.edu.sa

OFFICE HOURS:

Office at 456 Building 19

Sunday 1:30 P.M. – 3:30 P.M.

Tuesday 1:30 P.M. – 3:30 P.M

After class and by appointment

TIME & PLACE:

Saturday, Monday and Wednesday

9:00 - 10:00 AM

Room 417/ 450 Building 19.

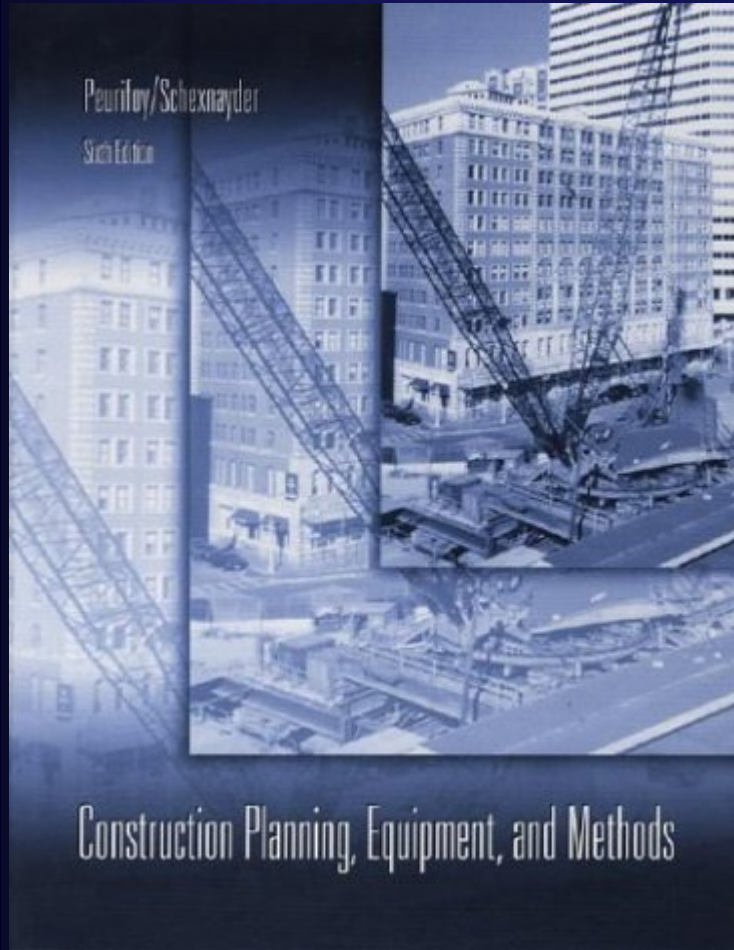


AGENDA

CEM 530: CONSTRUCTION EQUIPMENT & METHODS

1. What are the aims & objectives of the course
2. What will be covered in this course?
3. What is the importance of this course ?
4. What is expected to be successful in course?

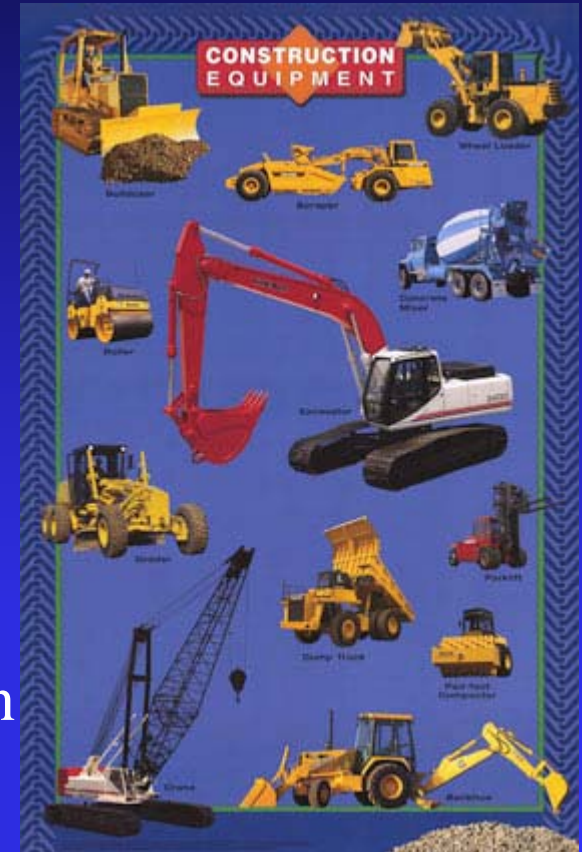
Text



- *“Construction Planning, Equipment, and Methods,”*
by Peurifoy, R., and Schexnayder, C., Sixth Edition, McGraw Hill, Inc
- *Class Notes and Handouts*

Aims

- The course is designed to give students, a working knowledge of different types of construction equipment, operations of various construction equipment and fundamentals of equipment selection, cycle times, production rates and costs.



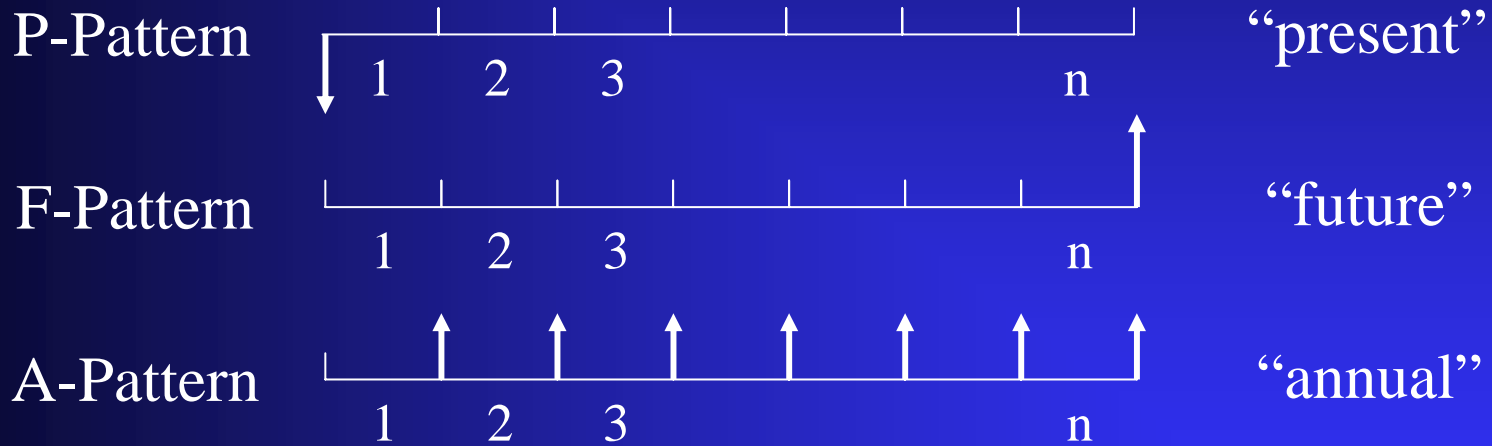


Objectives

- At the completion of this course, the student will be able to:
 - Describe the different types of construction equipment and understand operations of various construction equipment.
 - Demonstrate an understanding of construction equipment selection, cycle times, production rates and costs.
 - Understand the fundamentals of engineering properties of moving earth, material properties, construction methods focusing on equipment-intensive construction activities.
 - Estimate and Perform the analysis needed to determine costs and productions of given construction equipment.
 - Enable selection of right equipment for a job with minimum cost.

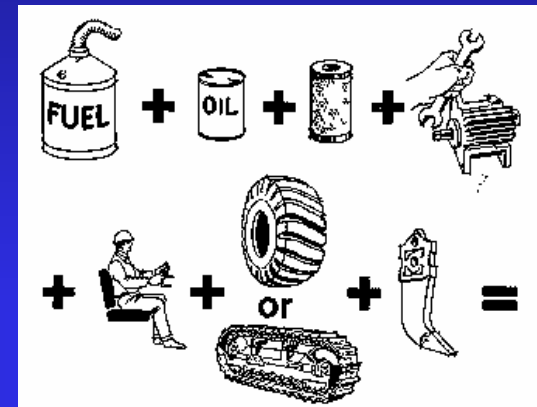
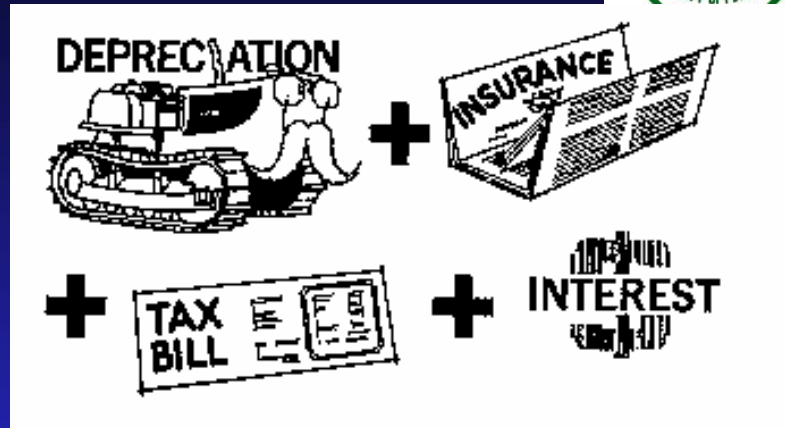
Chapter - I: Introduction, Time Value of Money

- ✓ Equipment Economics
- ✓ Time Value of Money
- ✓ Methods for comparing alternatives
- ✓ Financial Analysis for Single payment and Uniform Series of Payment

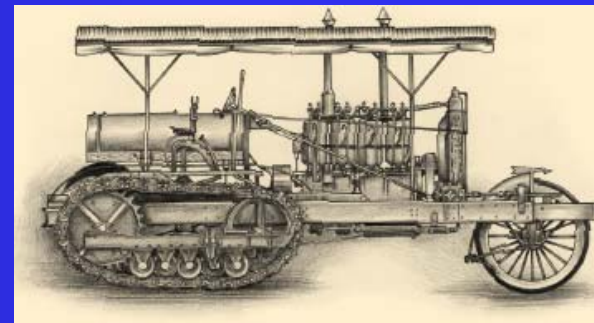


Chapter - 2: Equipment Cost

- ✓ Owing Cost
- ✓ Operating Costs
- ✓ Replacement Decisions
- ✓ Buy, Rent or Lease

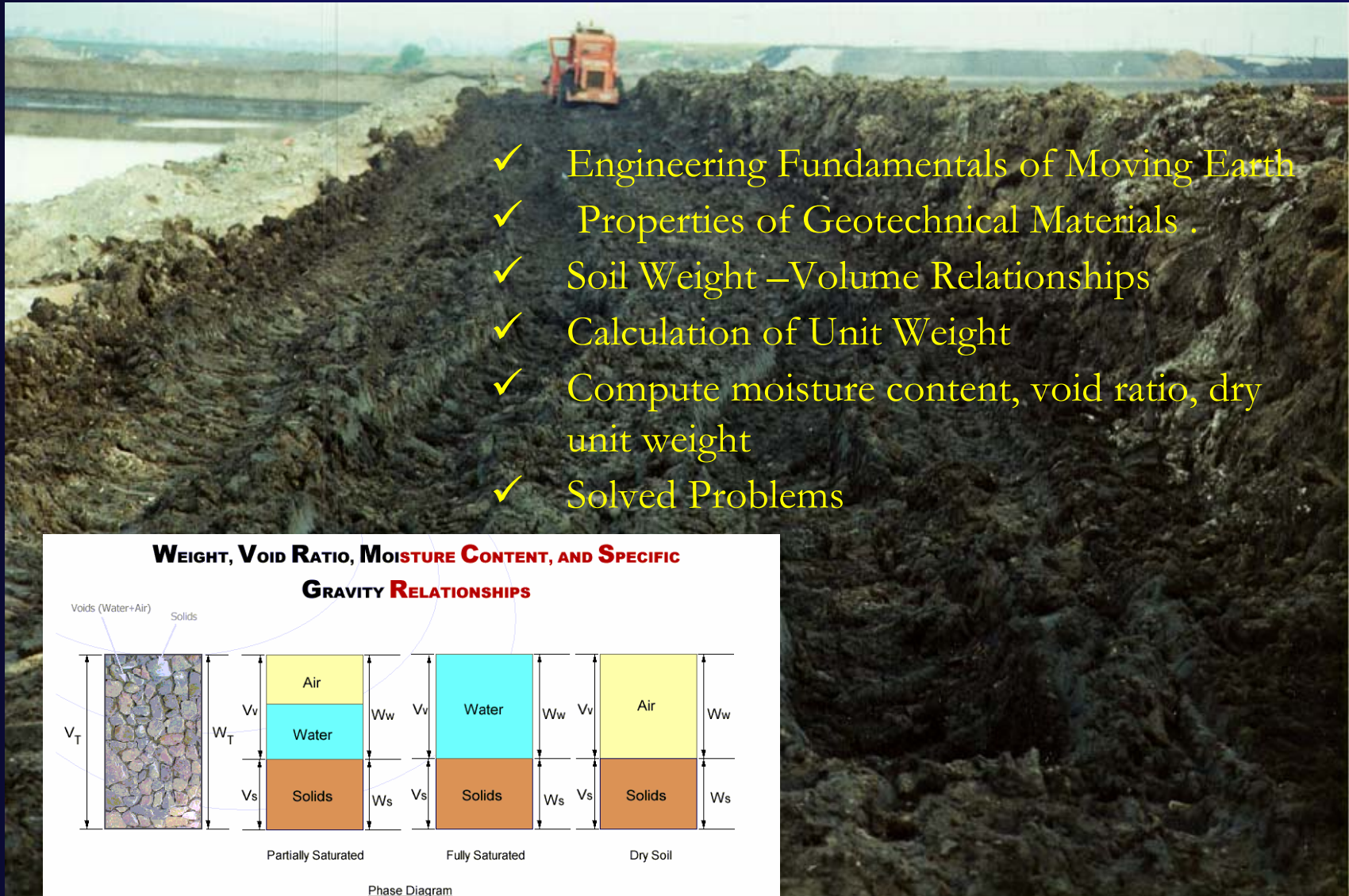


VITO BAUMGARTNER	DOUG OBERHELMAN	GERRY SHAHEEN	GLEN BARTON	JIM OWENS	RICH THOMPSON
Group President	Group President	Group President	Chairman and CEO	Vice Chairman	Group President

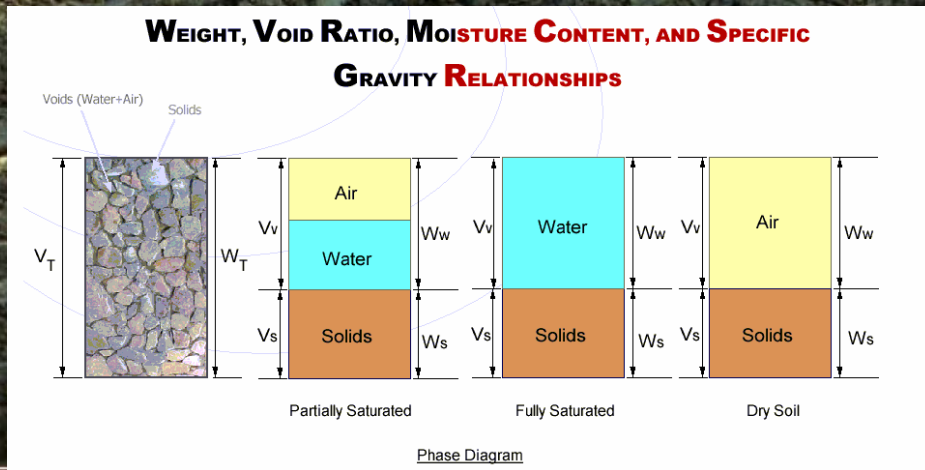


Benjamin Holt

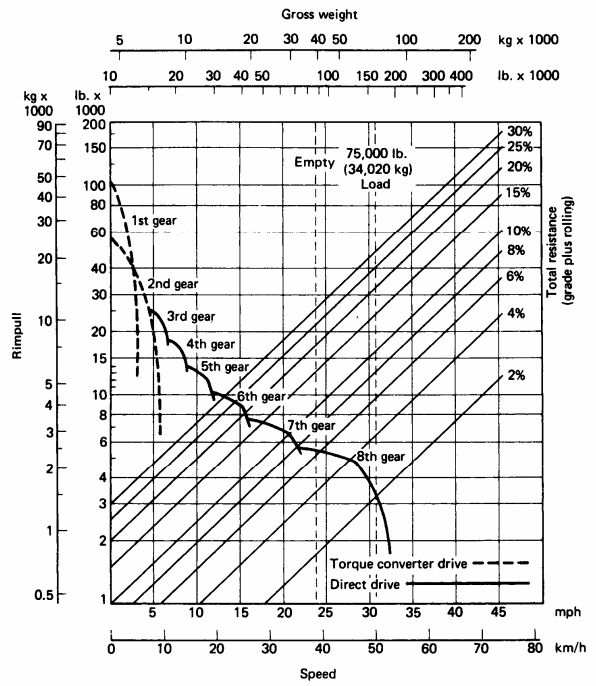
Chapter - 3: Geotechnical Materials, Compaction and Stabilization



- ✓ Engineering Fundamentals of Moving Earth
- ✓ Properties of Geotechnical Materials .
- ✓ Soil Weight –Volume Relationships
- ✓ Calculation of Unit Weight
- ✓ Compute moisture content, void ratio, dry unit weight
- ✓ Solved Problems



Chapter - 4: Machine Power

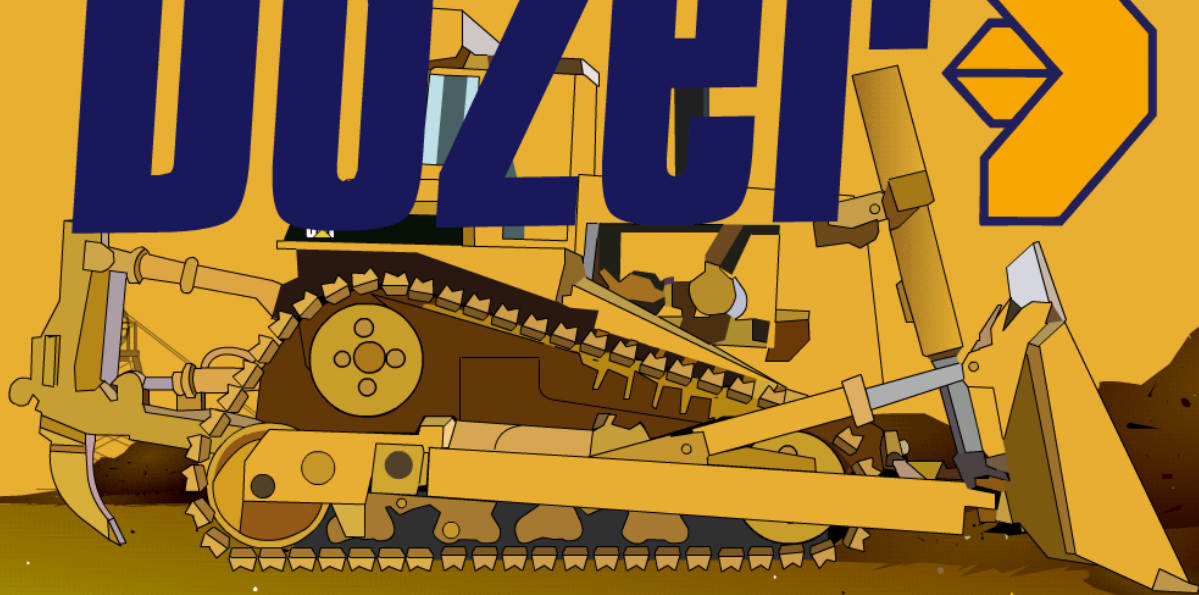


- ✓ Engineering Fundamentals of Moving Equipment
- ✓ Rolling Resistance, Grade Resistance
- ✓ Rimpull , Drawbar Pull
- ✓ Coefficient of Traction
- ✓ Performance charts



Chapter - 5:

Dozer



Description – Dozers & Classification

SAE Blade specifications

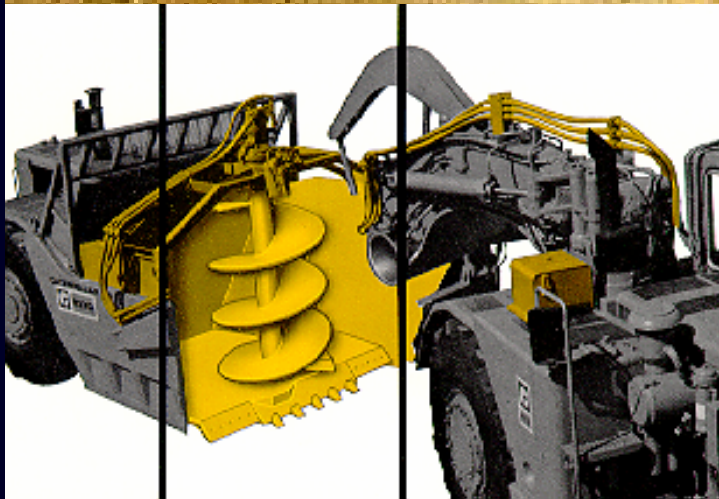
Blade Performance

Tilt, Pitch, Angling

Dozer Production Estimating



Chapter - 6: Scraper



- ✓ Scraper : General Information
- ✓ Scraper Types
 - ✓ Pusher Loaded
 - ✓ Self-Loading
- ✓ Typical Scraper Components
- ✓ Scraper Production Estimating
- ✓ Solved Problems

Chapter - 7: Hydraulic Excavators



- ✓ Hydraulic Excavators
- ✓ Front Shovels
- ✓ Backhoe
- ✓ Description and general information – Front shovels
- ✓ Basic parts and operation of Front shovel
- ✓ Shovel Production
- ✓ Height of cut effect on shovel production
- ✓ Angle of swing effect on shovel production
- ✓ Production efficiency factor

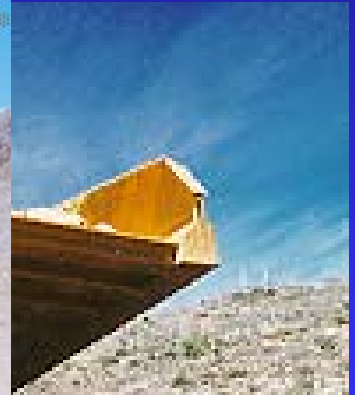
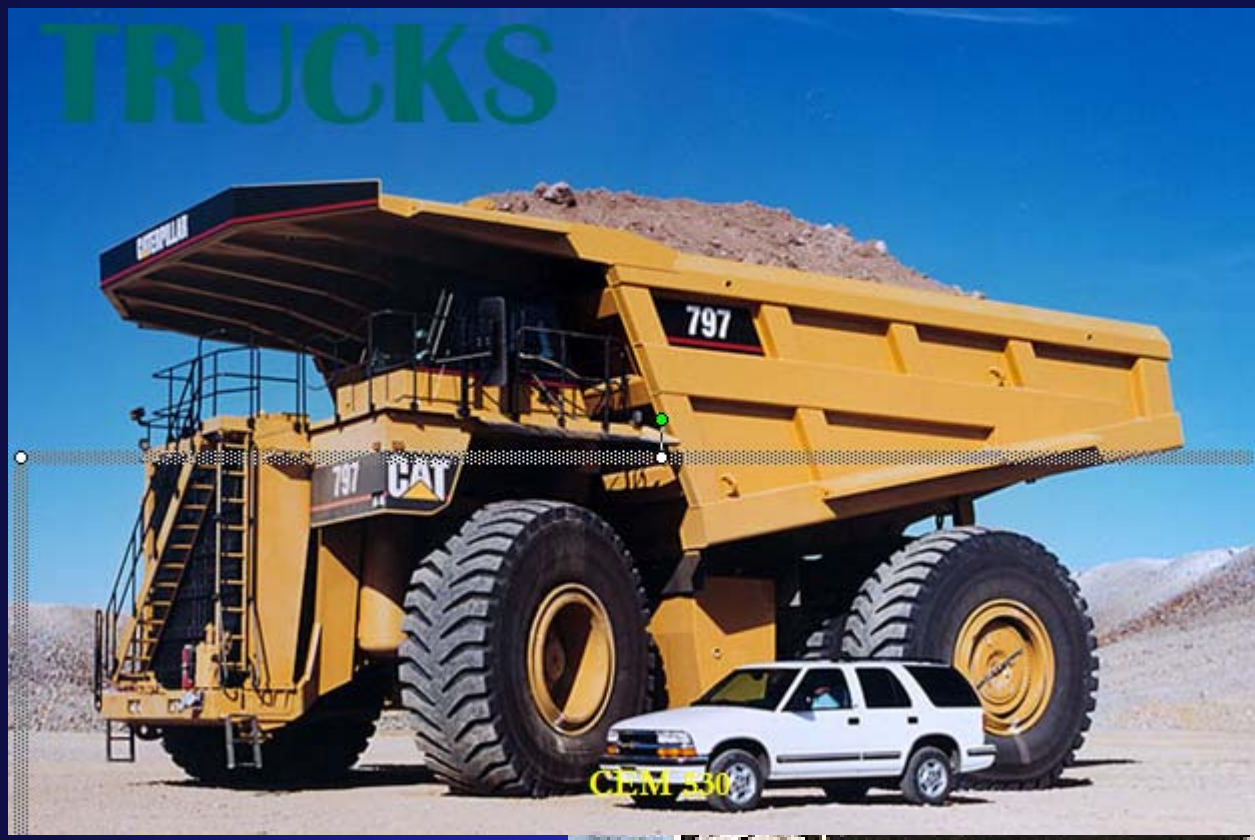
Chapter 8- Cranes



Cranes

- A. General Information
- B. Major Crane types, crane attachments
- C. Lifting capacities

Chapter 9-Trucks and Wagons



Chapter 10-(i.e. compaction)



C747B
C754A
C766C/C778B



Compaction

- A. Operation and Production of Compaction Equipment
- B. Soil Stabilization

Attendance and Participation:



Attendance and Participation:

Regular class attendance is compulsory and missing classes/assignment will lower the component of the grade. Students are expected to attend all lectures participate in the class discussion and submit all assignments on time. In case of absence, inform me *prior to the class through email* .

Homeworks/ Assignments :

Assignments/Homework will be conducted at regular intervals. Each student is responsible to submit assignment. 10 Assignments will be administered during this course. Professional presentation of homework assignments is required. Late homework assignments will not be accepted.

GRADING

- Grading policy for this course will be based on the following table.

Homework/Assignment	15%
Article Presentation	05%
Term Paper	15%
Exam-I	20%
Exam-II	20%
Final Exam	25%



SCHEDULE

Week	Date	Lecture	Exams/Assignment
1	Sept-13 (S)	Course Introduction ,Organization & Scope	
		The Time Value of Money, Concept of Equivalence ,Examples	
	Sept-15(M)	Financial analysis for single payment,uniform series of payments,	
		Discounted Present Worth analysis,Rate of return analysis	
2	Sept-20 (s)	Time Value of Money (Contd):	
		Equipment Economics:	
		• Equipment Cost :Ownership Costs (Estimation of Hourly Cost)	Assignment # 1
	Sept-22 (M)	• Opearting Costs	
		• Equipment selection :Purchasing, leasing and renting equipment	
	• Depreciation methods		
3	Sept-27 (s)	Equipment Economics (Contd)	
		Engineering Fundamentals of Moving Earth	
		Basic engineering properties of soil,	
	Sept-29 (M)	soil classification including moisture content,	
		densities and compaction,	Assignment # 2
4	Oct 4(S)	Engineering Fundamentals of Moving Equipments;	
		Rolling, Penetration and Grade Resistances, Drawbar Pull and Rimpull,and Gradability.	
	Oct 6(M)	Power Output & torque, Performance charts	Assignment # 3

contd



5	Oct 11(S)	Engineering Fundamentals of Moving Equipments (Contd)	
	Oct13(M)	Exam-I	Exam # 1
6	Oct 18(S)	Basic Construction equipment: Tractors and Related Equipment	Submit Termpaper Topic
		General Information :Operation,Production of Tractors	
		Bulldozer	
		Ripper:Ripping Rock	Assignment # 4
7	Oct 25(S)	Scrapers	
	Oct 27(M)	General Information Operation and Production of Loading, Hauling and Dumping Equipment of Scrapers	Assignment # 5
8	Nov 1 (S)	Cranes	
		Types of Cranes, Crane attachments	
	Nov 3(M)	Lifting Capacities of cranes	Assignment # 6
9	Nov 8 (S)	Excavating Equipment: General Information	Submit Article Title
		Operation and Production of Excavating Equipment	
	Nov 10(M)	• Draglines, Loaders	
		• Clamshells,Trenching Machines	
	Hydraulic Excavators	Assignment # 7	
Nov 12- Nov 29		Eid-Al-Fitr Break	
10	Nov 30 (U)	Article/ Paper Presentation	
		Article/ Paper Presentation(Contd)	
	Dec1 (M)	Guest Speakers	Assignment # 8

contd



11	Dec 6 (S)	Article/ Paper Presentation	
		Article/ Paper Presentation(Contd)	
	Dec 8 (M)	Exam Revision	Assignment # 9
12	Dec 13 (S)	Exam -II	
	Dec 15(M)	Trucks and Wagons	
13	Dec 20 (S)	Trucks and Wagons	
		Types ,capacities of Trucks & wagaons,	
	Dec 22 (M)	performace capabilites of Trucks & wagaons	Assignment # 10
14	Dec 27 (S)	Soil Stabilization/Compaction	
		Types of Compaction Equipment	
	Dec 29 (M)	Operation and Production of Compaction Equipment	
15	Jan 3 (S)	Term Paper Presentation	
		Term Paper Presentation(Contd)	
	Jan 5 (M)	Term Paper Presentation(Contd)	
16	10-20 Jan	Final Examination Week	Final Exam

THANK YOU

■ QUESTIONS

