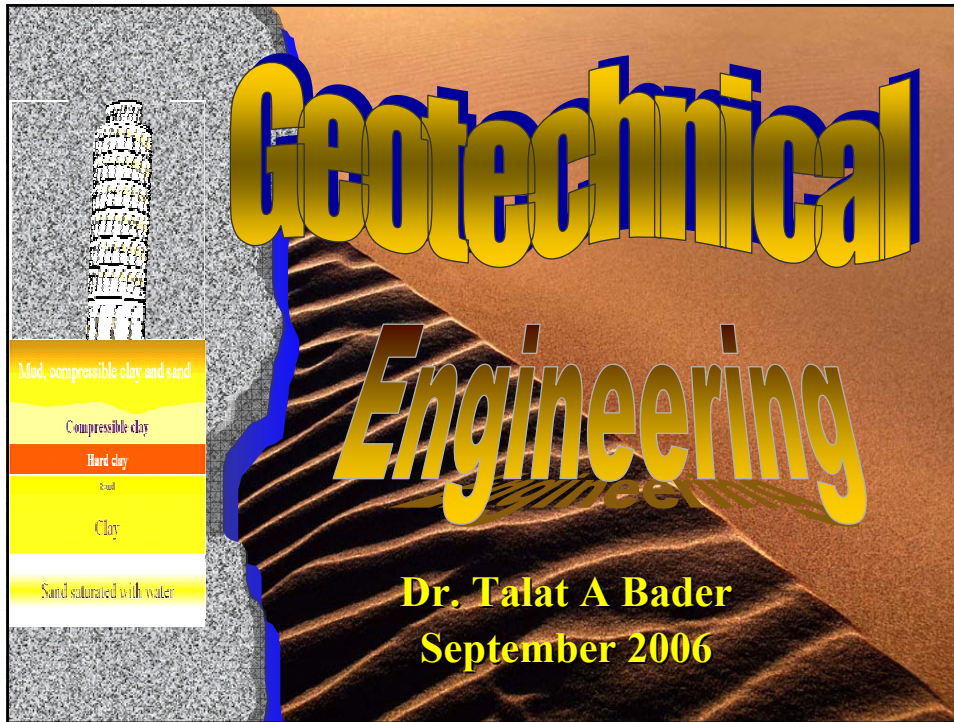


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**CE 353 - Soil Mechanics**

- Faculty :  
**Dr. Talat A Bader**
- Laboratory Assistants :  
**Umran**
- Grader :  
**Mr. xxxxxxxx**

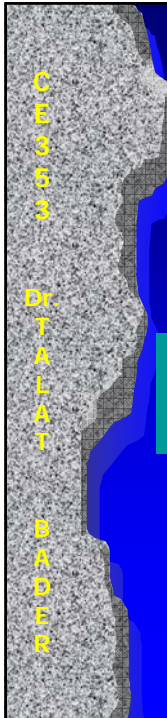


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## CE 353 Soil Mechanics Website


- Homepage is Located in the Following address:
  - ✓ Go to <http://users.kfupm.edu.sa/ce/tbader>
- Contains course information
  - ✓ Schedule, Lectures, Homework, Grades Lab, Handouts, important information, etc.

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## Homework

- Assigned (unannounced) homework is due On Monday's the following Week.
- All homework must be turned in (even if late) to receive a passing grade.
- Late homework = 0 except for one time per semester



## Exams

First Exam	Monday	9 October	9 pm
Second Exam	Monday	20 November	7 pm
Final Lab	Saturday	January 13	2 pm
Final Exam	Wednesday	January 22	7 pm

Check the Web for details

## Grading Soil Mechanics

● The final course grade will be determined using the following parts:

- ✓ two exams ( 18% + 20% ) 38%
- ✓ homework, quizzes & attendance 12%
- ✓ average of lab reports 20%
- ✓ final exam 30%

$$\Sigma = 100\%$$



## Homework 1

- Due next Wednesday by 9:00am Before class.
- Send me an e-mail with what ever question in your mind to my address [tbader@kfupm.edu.sa](mailto:tbader@kfupm.edu.sa)
- In the subject follow the following:
- Subject:ID#\_CE353\_homework 1
- Subject:201068\_CE353\_Homework 01

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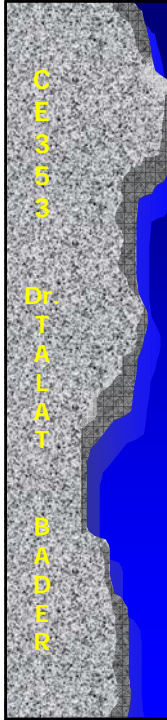
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## Topics in Soil Mechanics

- Description of Soils
- Soil Composition
- Soil Compaction
- Classification of Soil
- Flow of Water in Soil: Permeability and Seepage





## Topics in Soil Mechanics

- Effective Stress Concepts
- Stresses in a Soil Mass
- Compressibility of Soil
- Shear Strengths of Soil
- Soil Bearing Capacity
- Lateral Earth Pressure



## خلق الانسان

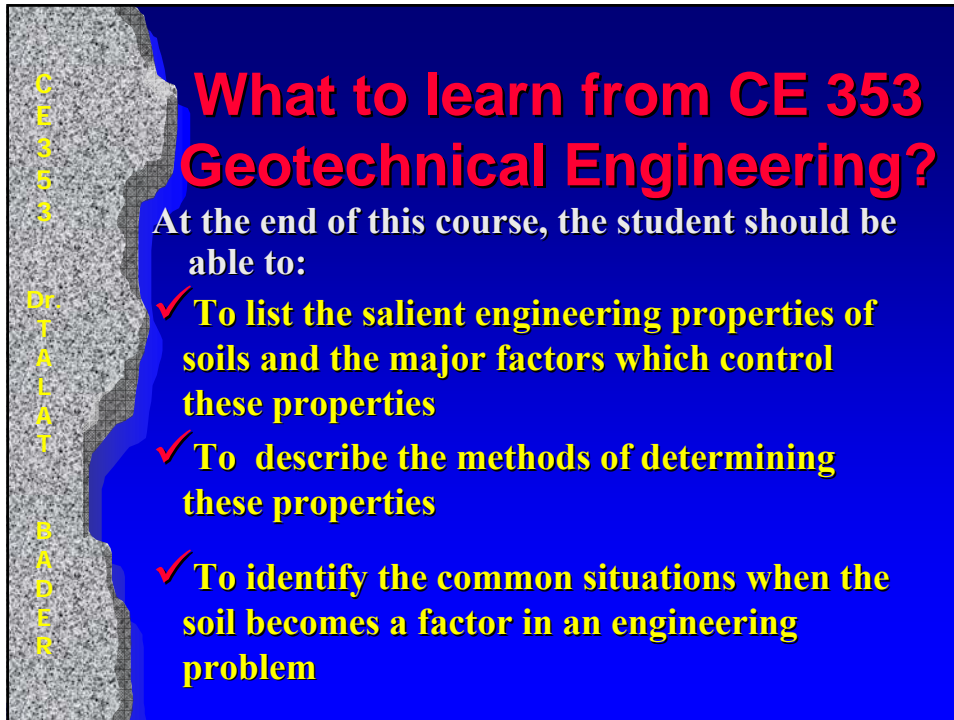
- كيف خلق الله تعالى الانسان؟
  - أخبر الله سبحانه وتعالى ملائكة بأنه سيخلق بشرا خليفة له في الأرض.
  - فقال الملائكة: (أَتَجْعَلُ فِيهَا مَنْ يُفْسِدُ فِيهَا وَيَسْفِكُ الدِّمَاءَ وَنَحْنُ نُسَبِّحُ بِحَمْدِكَ وَنُقَدِّسُ لَكَ)
  - جمع الله سبحانه وتعالى قبضة من تراب الأرض، فيها الأبيض والأسود والأصفر والأحمر - ولهذا يجيء الناس ألوانا مختلفة - ومزج الله تعالى التراب بالماء فصار صلصالا من حمأ مسنون. تعفن الطين وانبعثت له رائحة.
  - ونفخ فيه من روحه سبحانه .. فتحرك جسد آدم ودبت فيه الحياة.
  - وأصدر الله سبحانه وتعالى أمره للملائكة أن تسجد له.
  - فتح آدم عينيه فرأى الملائكة كلهم ساجدين له . ما عدا إبليس الذي كان يقف مع الملائكة



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**CE 353**  
**Dr. TALAT BADER**

## What to learn from CE 353 Geotechnical Engineering?

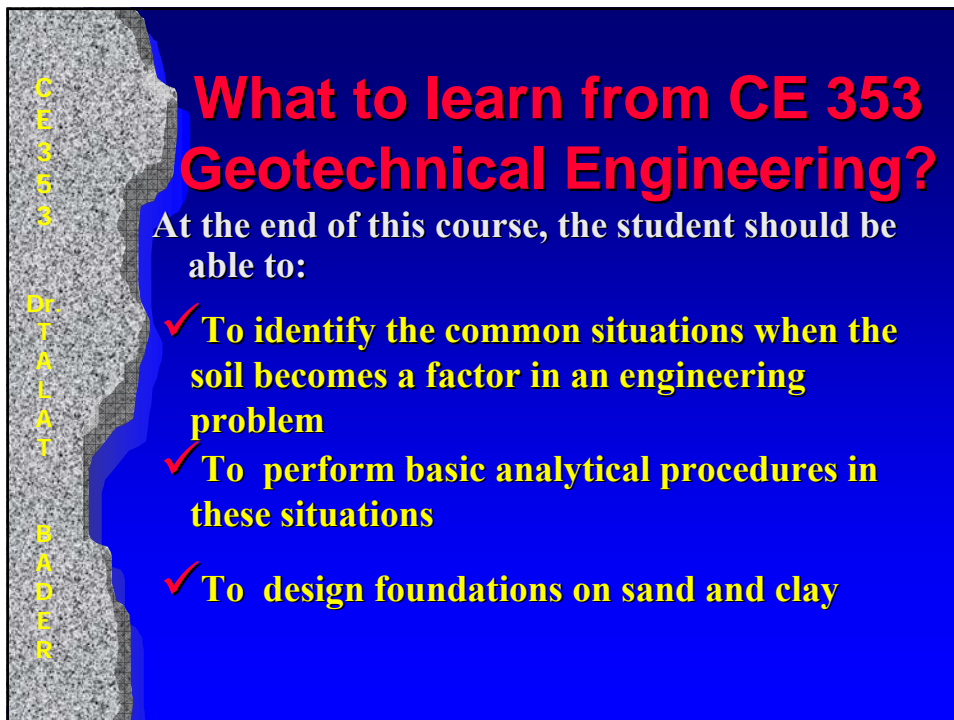
At the end of this course, the student should be able to:

- ✓ To list the salient engineering properties of soils and the major factors which control these properties
- ✓ To describe the methods of determining these properties
- ✓ To identify the common situations when the soil becomes a factor in an engineering problem

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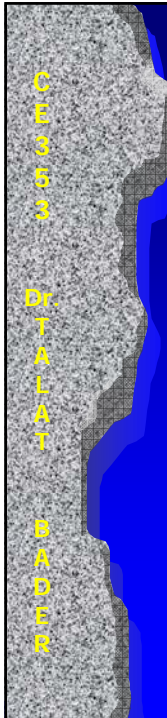
**CE 353**  
**Dr. TALAT BADER**

## What to learn from CE 353 Geotechnical Engineering?

At the end of this course, the student should be able to:


- ✓ To identify the common situations when the soil becomes a factor in an engineering problem
- ✓ To perform basic analytical procedures in these situations
- ✓ To design foundations on sand and clay





## What is Soil Mechanics?

- **Soil** : loose agglomeration of mineral and organic material extending from the ground surface down to solid rock.
- **Mechanics** : concerned with the mechanics of materials; related to properties of materials. How do materials behave? What are the patterns that we can observe?

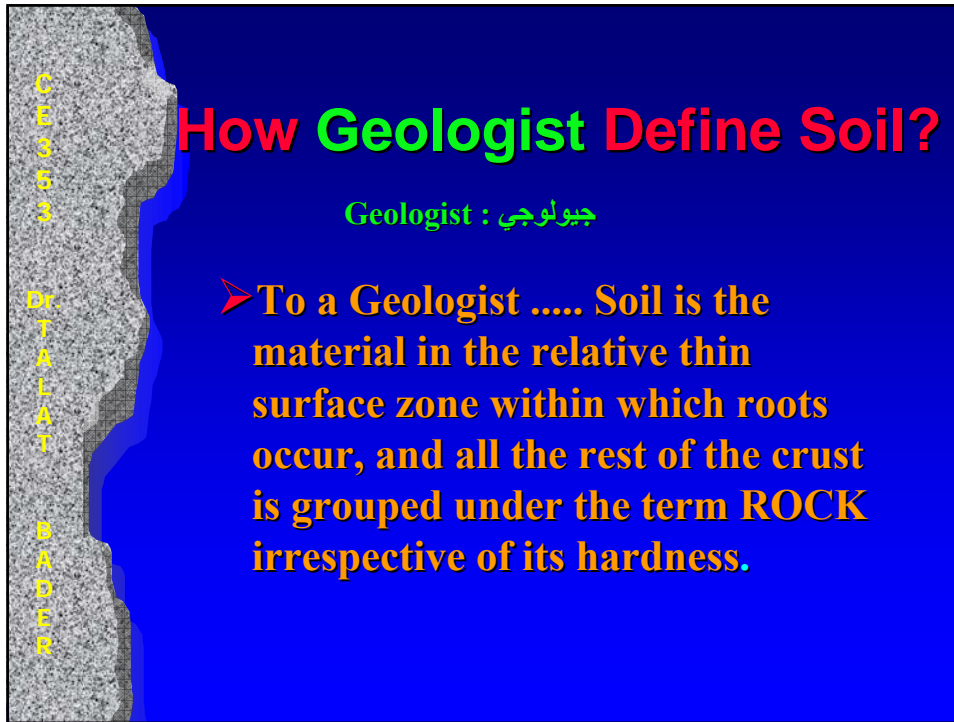


## How Pedologist Define Soil?

Pedologist : علم تربة الارض

- ❖ To a Pedologist ... Soil is the substance existing on the earth's surface, which grows and develops plant life.

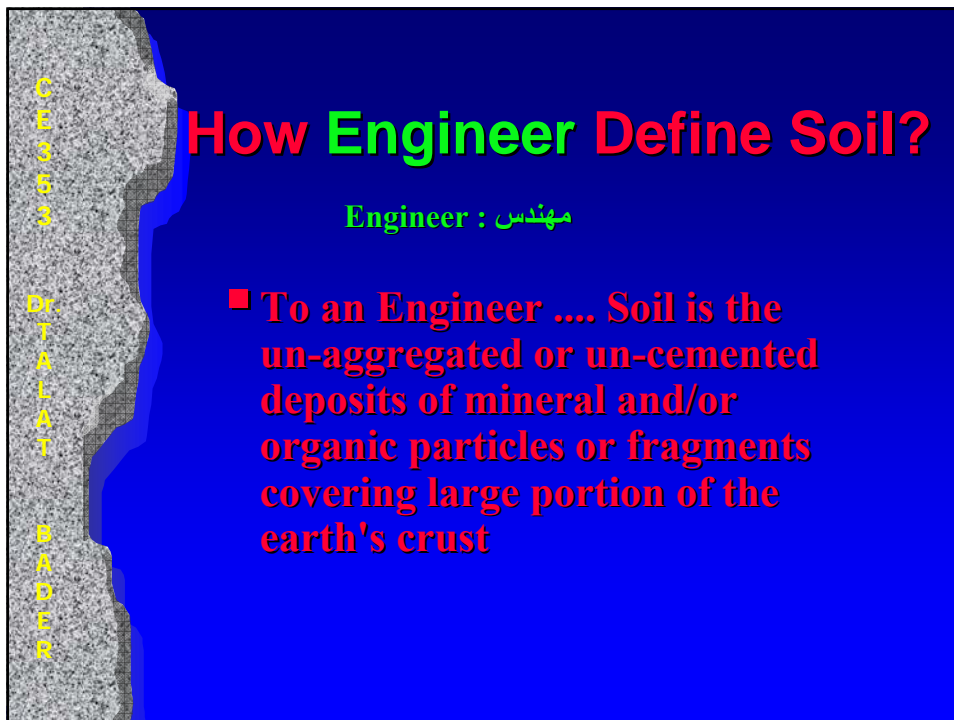




## How Geologist Define Soil?

Geologist : جيولوجي

- To a Geologist .... Soil is the material in the relative thin surface zone within which roots occur, and all the rest of the crust is grouped under the term **ROCK** irrespective of its hardness.




## How Engineer Define Soil?

Engineer : مهندس

- To an Engineer .... Soil is the un-aggregated or un-cemented deposits of mineral and/or organic particles or fragments covering large portion of the earth's crust

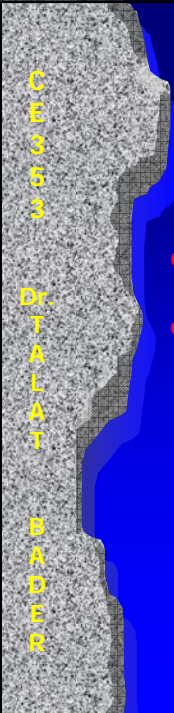







## What is Soil Mechanics?

Soil Mechanics is one of the youngest disciplines of Civil Engineering involving the study of soil, its behavior and application as an engineering material.



## The Father of Soil Mechanics



- According to Karl Terzaghi (1948):
- *"Soil Mechanics is the application of laws of mechanics and hydraulics to engineering problems dealing with sediments and other unconsolidated accumulations of solid particles produced by the mechanical and chemical disintegration of rocks regardless of whether or not they contain an admixture of organic constituent."*



## Soil Mechanics

- Soil Mechanics is a subset of **Geotechnical Engineering**.
- Geotechnical Engineering concerns the application of civil engineering technology to some aspect of the earth, including:



## Geotechnical Engineering Contains

- **Soil Mechanics** ( Soil Properties and Behavior )
- **Soil Dynamics** ( Dynamic Properties of Soils, Earthquake Engineering, Machine Foundation )
- **Foundation Engineering** ( Deep & Shallow Foundation )

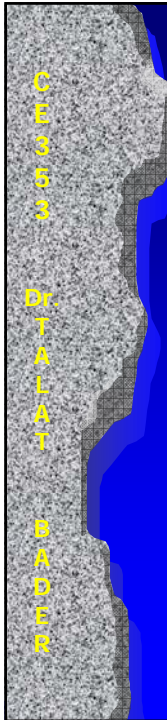


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## Geotechnical Engineering Contains

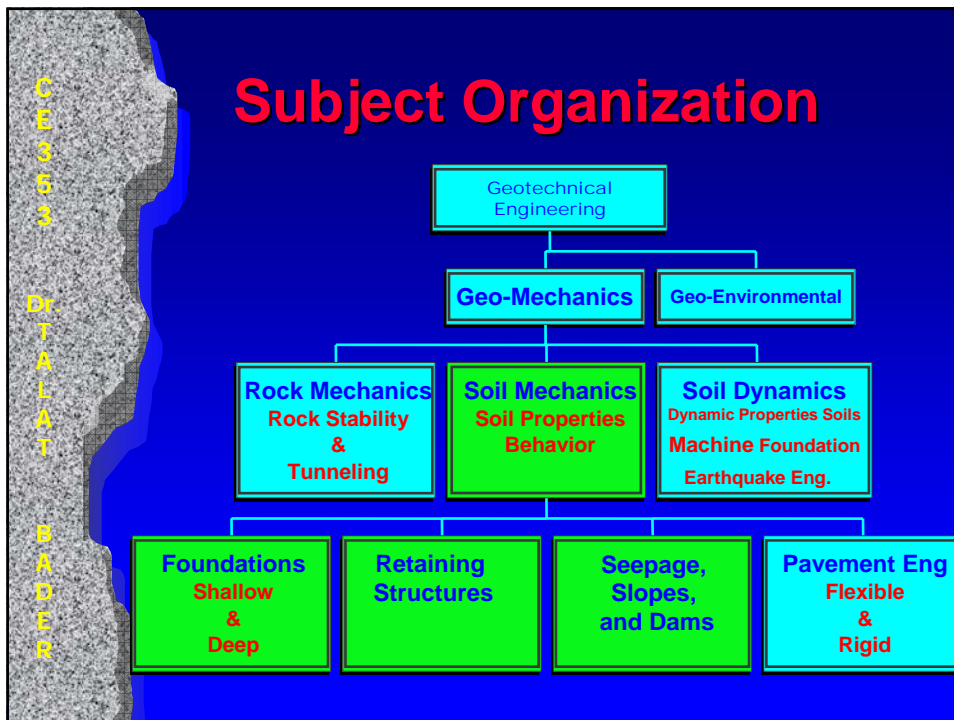
- **Pavement Engineering** ( Flexible & Rigid Pavement )
- **Rock Mechanics** ( Rock Stability and Tunneling )
- **Geo-environmental Engineering** ( Soil Improvement )

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