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Ceng375 Numerical Computations at September 28, 2011

Dr. Cem Özdoğan Computer Engineering Department Çankaya University

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- CENG 375 Numerical Computations Fall 2011
- TUESDAY 9:40-11:30 (T1) Müh. B1 / B11

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- WEDNESDAY 14:40-16:30 (L2) Ortak Alanlar Bilgisayarlı Lab - 254
- Instructor: Cem Özdoğan Materials Science and Engineering Department, New Campus MHB3 Z-21

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- TA: Efe Ciftçi

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- WEB page: http://siber.cankaya.edu.tr/

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- Announcements: Watch this space for the latest updates.

September 28, 2011 13:47 In the first lecture, there will be first meeting and tutorial for Matlab. The lecture notes for the second week will be published soon, see Course Schedule section.

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 September 28, 2011 13:47 In the first lecture,
 there will be first meeting and tutorial for Matlab.
 The lecture notes for the second week will be
 published soon, see Course Schedule section.
- All the example m-files (for lecturing and hands-on sessions) will be accessible via <u>link</u>.

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• There are two groups for lecturing, you may attend any one of the lecture hours.

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- There are two groups for lecturing, you may attend any one of the lecture hours.
- But, "Please" attend your predefined sessions regularly.

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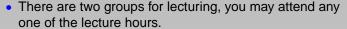
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- But, "Please" attend your predefined sessions regularly.
- You will be expected to do significant programming assignments, as well as run programs we supply and analyse the output.



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- For programming assignments, other languages will be accepted. (but no programming assistance will be given).

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- These programs will be written in MATLAB, learning MATLAB is part of the course.
- For programming assignments, other languages will be accepted. (but no programming assistance will be given).
- We require single variable calculus and a knowledge of computer programming. A knowledge of linear algebra and differential equations is also helpful.

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 You will have quizzes (10-15 minutes, may be less; but not scheduled as before) for the previous lecture/chapter's subjects.

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You will have quizzes (10-15 minutes, may be less; but not scheduled as before) for the previous lecture/chapter's subjects.

- There won't be any make-up for these quizzes.
- Important announcements will be posted to the Announcements section of the web page, so please check this page frequently.
- You are responsible for all such announcements, as well as announcements made in lecture.

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• Ceng 375 is intended to provide an understanding of

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- Ceng 375 is intended to provide an understanding of
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- · Ceng 375 is intended to provide an understanding of
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- Ceng 375 is intended to provide an understanding of
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- This course is an introduction to numerical analysis.

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 - an introduction to common computer methods for their implementation.
- This course is an introduction to numerical analysis.
- Topics include

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- Ceng 375 is intended to provide an understanding of
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 - an introduction to common computer methods for their implementation.
- This course is an introduction to numerical analysis.
- Topics include
 - the analysis of error,

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- · Topics include
 - · the analysis of error,
 - the use of computers as numerical computing devices,

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- Ceng 375 is intended to provide an understanding of
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- Topics include
 - the analysis of error,
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- Topics include
 - · the analysis of error,
 - the use of computers as numerical computing devices,
 - · programming in MATLAB,
 - direct and iterative methods for linear equations,

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 - the use of computers as numerical computing devices,
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 - · non-linear equations,

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 - · programming in MATLAB,
 - direct and iterative methods for linear equations,
 - non-linear equations,
 - interpolation and function approximation,

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 - non-linear equations,
 - · interpolation and function approximation,
 - numerical differentiation and integration.

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- Students will be able to recognise common types of numerical problems encountered in engineering practice as described in the class schedule.

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 - numerical differentiation and integration.
- Students will be able to recognise common types of numerical problems encountered in engineering practice as described in the class schedule.
- Students will be able to set up a numerical solution for these problems.

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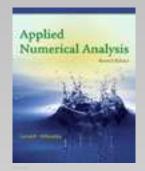
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Text Book I

 Required: Readings will be assigned in Numerical Analysis 7th Edition (International Edition)
 Curtis Gerald, Patrick Wheatley, ISBN: 032119019X Sep 2003.



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Text Book II

• Recommended: Numerical Computing with Matlab Cleve B. Moler, ISBN: 0898715601 January 1, 2004.

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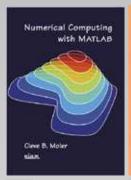
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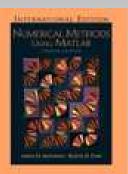
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• Recommended: Numerical Computing with Matlab Cleve B. Moler, ISBN: 0898715601 January 1, 2004.

 Recommended: Numerical Methods Using Matlab 4th Edition (International Edition) John Mathews, Kurtis Fink, ISBN: 0131911783 Jan 2004.





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 There will be a midterm and a final exam, will count 20% and 40% of your grade, respectively.

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- There will be a midterm and a final exam, will count 20% and 40% of your grade, respectively.
- Quiz: 15% (worst of the quizzes will be discarded).

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- Attendance is required and constitutes part of your course grade; 10%. Attendance is not compulsory, but you are responsible for everything said in class.

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- I encourage you to ask questions in class. You are supposed to ask questions. Don't guess, ask a question!

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- Attendance is required and constitutes part of your course grade; 10%. Attendance is not compulsory, but you are responsible for everything said in class.
- I encourage you to ask questions in class. You are supposed to ask questions. Don't guess, ask a question!
- The code you submit must be written completely by you.
 You can use anything from the textbook/notes.

1 to solve problems that may not be solvable by hand

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- 1 to solve problems that may not be solvable by hand
- 2 to solve problems (that you may have solved before) in a different way

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- 1 to solve problems that may not be solvable by hand
- 2 to solve problems (that you may have solved before) in a different way
- Many of these simplified examples can be solved analytically (by hand)

$$x^3 - x^2 - 3x + 3 = 0$$
, with solution $\sqrt{3}$

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Analysis/Computations

- 1 to solve problems that may not be solvable by hand
- 2 to solve problems (that you may have solved before) in a different way
- Many of these simplified examples can be solved analytically (by hand)

$$x^3 - x^2 - 3x + 3 = 0$$
, with solution $\sqrt{3}$

 But most of the examples can not be simplified and can not be solved analytically

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- 1 to solve problems that may not be solvable by hand
- 2 to solve problems (that you may have solved before) in a different way
- Many of these <u>simplified</u> examples can be solved analytically (by hand)

$$x^{3} - x^{2} - 3x + 3 = 0$$
, with solution $\sqrt{3}$

- But most of the examples can not be simplified and can not be solved analytically
- Mathematical relationships

 simulate some real word situations