

COURSE SYLLABUS

MAK 210E - ENGINEERING MATHEMATICS - CRN: 12754

FALL 2019

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|---------------------------------|---|-------------|------------|
| Instructor | Dr. Hakan ÖKSÜZOĞLU | | |
| Office | MKB 435 | | |
| Office Hours | Open-door policy | | |
| Phone | +90 212 293 13 00 / 2464 | | |
| E - mail | hoksuzoglu@itu.edu.tr | | |
| Web Page | http://web.itu.edu.tr/hoksuzoglu/ | | |
| Course Schedule | Wednesday | 13:30-15:30 | MKB – A501 |
| | Thursday | 13:30-15:30 | MKB – A501 |
| Prerequisites | MIN DD from MAT 102 or MAT 102E or MAT 104 or MAT 104E | | |
| Course Web Page | http://ninovaltu.edu.tr/ | | |
| Course Description | First Order Differential Equations, Second Order Linear Equations, Higher Order Linear Equations, The Laplace Transform, Systems of Linear Equations | | |
| Course Objectives | <ul style="list-style-type: none">○ To introduce the basic concepts required to understand, construct, solve and interpret differential equations.○ To teach methods to solve differential equations of various types.○ To give an ability to apply knowledge of mathematics to engineering problems. | | |
| Course Learning Outcomes | Student, who passed the course satisfactorily can: <ul style="list-style-type: none">○ Classify differential equations according to certain features.○ Solve first order linear equations and nonlinear equations of certain types and interpret the solutions.○ Understand the conditions for the existence and uniqueness of solutions for linear differential equations.○ Solve second and higher order linear differential equations with constant coefficients and construct all solutions from the linearly independent solutions.○ Solve initial value problems using the Laplace transform.○ Solve systems of linear differential equations using linear algebra. | | |
| Reference Books | <p>Cengel, Y. A., & Palm, W. J. (2013). <i>Differential Equations for Engineers and Scientists</i>. New York: McGraw-Hill Education. (Turkish version can also be found.)</p> <p>Zill, D. G., & Zill, D. G. (2001). <i>A first course in differential equations with modeling applications</i>. Pacific Grove, CA: Brooks/Cole Thomson Learning.</p> <p>Boyce, William E & DiPrima, Richard C (2005). <i>Elementary differential equations and boundary value problems (7th ed)</i>. Wiley, Hoboken, NJ.</p> <p>Kreyszig, E. (2006). <i>Advanced Engineering Mathematics</i>. John Wiley & Sons, Inc. New York, 9th Edition.</p> <p>Xie, W. (2010). <i>Differential equations for engineers</i>. New York: Cambridge U. Press.</p> <p>Bronson, R., & Bronson, R. (1993). <i>Schaum's outline of theory and problems of differential equations</i>. New York: McGraw-Hill.</p> | | |

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Attendance You are required to attend 70% of the lectures in order to be allowed to take the final exam. Those who do not meet the attendance requirement will fail the course with a grade of VF (Article 23, ITU Undergraduate Education Regulations*). However, please remember that students who attend class meetings and keep their own notes, on average, learn better and perform significantly better in exams. You are required to attend only the section that you are registered to.

Examinations (tentative) Dates of the midterm exams are determined as follows. Official date of the final exam will be announced by the Department. They all will be classical type with closed books & closed notes. The use of any kind of calculators or computers is not allowed. Make-up exams may be given to those who have valid excuses, which are approved by the department (Article 20-d, ITU Undergraduate Education Regulations*). If you believe that you are entitled to take a make-up exam, you must contact with the course instructor within one week following the regular exam date. If you need any special accommodation during exams or courses regarding your disability please contact the course instructor.

| | Midterm Exam I | Midterm Exam II | Final Exam |
|--------------|-----------------|-----------------|--------------------------------------|
| Date | Oct 31, 2018 | Dec 12, 2018 | to be announced by the University |
| Time | 13:30-15:30 | 13:30-15:30 | |
| Place | to be announced | to be announced | |

Grading The distribution of percentages for the course grade will be as follows:

| Midterm Exam I | Midterm Exam II | Final Exam |
|----------------|-----------------|------------|
| 25% | 25% | 50% |

In addition to meeting the attendance requirement, students must meet the following criteria to take the final exam:

“Any student whose average midterm grade is lower than **35/100** will fail the course with a grade of VF and not be allowed to take the final exam.”

Overall grade should be at least **40/100** in order to pass the class.

Communication and Announcements Try to keep all communication channels open with the teaching staff - we are willing to help you learn the course material in the best way you can. Try to visit the staff during their office hours for a face-to-face discussion. Do not hesitate to use e-mail to reach them. You are expected to check the ITU e-Learning system *Ninova* and your ITU e-mail for homework and announcements. Additionally, you are responsible for all announcements that may be made on the course web site and in class (that may or may not be included in this syllabus).

E-mail etiquette Your full name must appear in the e-mail. The e-mail subject must be “MAK 210E”. Do not send the same e-mail repeatedly. Your e-mails may be in English or Turkish. Regardless of which language you use, use proper grammar, lowercase/uppercase letters, and punctuation. Your e-mails should not look like chat messages.

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Academic honesty You are expected to read the Undergraduate Education Regulations* and ITU Academic Honesty Pledge** and behave accordingly. All written work turned in for grading must be an independent and individual effort. This includes all homework assignments, exams and any other submitted material that will be graded. Academic dishonesty, including any form of cheating and plagiarism will not be tolerated and will be punished in the most severe manner, resulting in failure of the course with a grade of VF and/or formal disciplinary proceedings that may lead to suspension or dismissal.

Cheating includes but is not limited to such acts as offering or receiving unpermitted assistance in the exams, using any type of unauthorized written material during the exams, handing in any part or all of someone else's work as your own, copying from the Internet. Plagiarism is a specific form of cheating. It means using someone else's work without giving credit; it is a literary theft. Do not share your work with anyone else.

Additional Remarks The use of cell phones are not permitted in the exam rooms. Cell phones brought into the exam room must be switched off.

Calculator, pencil, eraser, etc. exchange between students is not allowed during the exam.

Weekly Course Outline (tentative)

| Week | Subject |
|--------------|--|
| 1 | Introduction to Differential Equations |
| 2 | First Order Differential Equations |
| 3 | First Order Differential Equations |
| 4 | Second Order Linear Differential Equations |
| 5 | Second Order Linear Differential Equations |
| 6 | Applications to Engineering Problems |
| 7 | Higher Order Linear Differential Equations |
| | Midterm Exam I |
| Break | |
| 8 | Higher Order Linear Differential Equations |
| 9 | The Laplace Transform |
| 10 | The Laplace Transform |
| 11 | Systems of First Order Linear Differential Equations |
| 12 | Systems of First Order Linear Differential Equations |
| | Midterm Exam II |
| 13 | Applications to Engineering Problems |
| 14 | Applications to Engineering Problems |
| | Final Exam |

* <http://www.sis.itu.edu.tr/tr/yonetmelik/lisansyonetmelik.html>

** <http://www.sis.itu.edu.tr/tr/yonetmelik/AkademikOnurSozuEsaslar.html>