

APM 5442, Winter 2018

Mathematical Analysis for Engineers II

Faculty: M. Shillor

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Class Time: TuTh 7:30-9:17 PM

Room: 104 MSC (previously SEB)

CRN: 12202

Office Hours: Tuesday 4:30 - 5:45 PM, Thursday 5:00 - 6:00 PM or by appointment.

Prerequisites: APM 5441.

Text: Advanced Engineering Mathematics, by E. Kreyszig, 10th Edition (or earlier, but make sure the homework questions are the right ones).

Exams: The grade in this course will be based on two 120-point hour exams and a 160-points final exam.

Exam #1: Tuesday, February 13

Exam #2: Tuesday, March 20

Final Exam: Tuesday, April 24

In case the university is officially closed on a scheduled exam date, the exam will be held on the next class date that the university is officially open.

Grades: There is no fixed grading scale in this course; a conversion formula from your percentage score to Oakland University grades will be determined at the end of the course.

However, the following table shows the lowest possible grade that a given percentage score will earn:

95%----4.0, 75%----3.0, 60%----2.0, 50%----1.0

Homework: Homework will be assigned on a regular basis but it will not be collected or graded.

Honesty: Cheating is a serious academic crime. Anyone convicted of cheating in this course will receive a course grade of 0.0 in addition to any penalties imposed by the Academic Conduct Committee.

Important Dates:

January 4 - First Class

Winter recess - February 18 -- February 25

March 14 - Last day for official withdrawal (W grade).

April 17 - Last class.

[click here for more details](#)

MOODLE - Discussion board and chat room for the course

Please post questions or answers to other students' questions.
I will check often and put comments and info there.

Schedule: We will cover most of Chapters 4, 12-16.

A student who successfully completes the course is expected to understand and be able to solve various basic problems related to dynamical systems (Ch. 4); Basics of Partial Differential Equations (PDEs)-the vibrating string, wave propagation, heat conduction, membranes, rods and beams; and basics of Complex Analysis-the complex plane, analytic functions, Cauchy's Theorem, Cauchy's Formula, Laurent Serie, Residues Integration and applications to Potential Theory.

You are expected to read the material before the class!

During the lecture we will concentrate on examples and questions.

January 4 (Thursday): First class-Sections 4.3, 4.4

HW 4.3 (p. 147): 3-6, 8, 10, 12, 18*, 19*

HW 4.4 (p. 151): 1, 3, 5, 7, 9, 10-12, 16*, 17*

January 8: Sections 4.4, 4.5, nonlinear springs (VeCHSS)

HW 4.5 (pp. 159-60): 1,2, 4-8, 10*, 13*, 14(c)*

To download the pdf file of the VeCHSS [click here](#)

January 15: PDEs: Sections 12.1-3,

HW 12.1 (pp. 542-3): 2, 3, 5, 6, 7, 9, 10, 14 (do (a), and 2-3 from (b)-(d) to get some insight into PDEs), 15*, 16, 17, 21

HW 12.3 (pp. 551-3): 1*, 3, 5, 7, 11, 15-20 - beams

January 22: Sections 12.3-6

HW 12.4 (p. 556): 1-4, 10*

HW 12.6 (pp. 566-7): 5, 7, 9, 10*, 16*

January 29: Sections 12.6-9

HW 12.7 (p. 574): 2, 4, 5, 9*, 13*

HW 12.9 (p. 584): 4-6, 11, 12, 13, 18*

February 5: Section 12.10, Review (Thursday)

HW 12.10 (pp. 602-3): 5, 7 11*

February 12: Exam 1 (Tuesday), the heat equation - energy balance. Short intro to FEM.

The material for Exam #1 includes sections 4.3 - 4.5, nonlinear springs, and 12.1 - 12.10.

There will be 12 questions on the exam. You have to answer 8 questions out of questions 1-10, and you have to answer questions 11 and 12 (each question is worth 12 points) for a total of 120 points. You may bring ONLY ONE page freely (hand-)written on both sides.

Exam #1 Median= 88% (30 students).

Grade distribution for the exam:

95% - 100% grade 4.0	85% - 94% grade 3.5 - 3.9	75% - 84% grade 3.0 - 3.4	65% - 74% grade 2.5 - 2.9	55% - 64% grade 2.0 - 2.4	45% - 54% grade 1.0
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Highest mark for the exam: 120 (1x)

February 18 -- February 25 Winter Recess.

Have fun, but not too much!

Welcome back!

February 26: Complex Analysis- Sections 13.1-3,

HW 13.1 (p. 612-3): as many as you need!

HW 13.2 (pp. 618-9): 1-8, 9-13 (odd only), 21-29 (odd only), 33*, 35*

HW 13.3 (p. 624): 1-7 (odd), 14-17, 21, 23

March 5: Sections 13.4-6

HW 13.4 (pp. 629-30): 2-11, 13-19 (odd), 21-24, 29*

HW 13.5 (pp. 632-3): 3, 5, 7, 8*, 10, 19, 21, 22

HW 13.6 (p. 636): 1-5, 16-19

March 12: Sections 13.7, 14.1, Review (Thursday)

HW 13.7 (p. 640): 5, 6, 12, 13, 19, 23, 26

HW 14.1 (p. 651): 1-19 (odd), 11-18, 19, 21, 24, 26

March 19: Exam 2 (Tuesday), Sections: 14.2-3

HW 14.2 (pp. 659-60): 9-19 (odd), 21

HW 14.3 (p. 663): 1-4, 11-17 (odd), 18*

The material for the exam includes Sections: 13.1 - 13.7, 14.1 and the heat equation

There will be 12 questions on the exam. You have to answer 8 questions out of questions 1-8, and you have to answer questions 9 and 10

(each question is worth 12 points) for a total of 120 points. You may bring one page freely written on both sides.

Exam #2 Median=104 (87%) (33 students).

Grade distribution for the exam:

95% - 100% grade 4.0	85% - 94% grade 3.5 - 3.9	75% - 84% grade 3.0 - 3.4	65% - 74% grade 2.5 - 2.9	55% - 64% grade 2.0 - 2.4	0% - 49% grade 0.0
4	17	10	1	1	0

Highest mark for the exam: 120 (1x)

March 26: Sections 14.4, 15.1-3,
HW 14.4 (pp. 667-8): 1-13 (odd)
HW 15.1 (p. 679): 1-9 (odd), 17-25 (odd)
HW 15.2 (p. 684): 6 - 11, 13, 15, 17
HW 15.3 (pp. 689-90): 5 - 15 (odd)

April 2: Sections 15.4, 16.1-2
HW 15.4 (p. 697): 3-9 (odd), 13*, 14*, 19, 21, 23, 25
HW 16.1 (p. 714) 1-6, 9, 11, 13, 19, 21
HW 16.2 (p.719) 1, 2, 5, 6, 8

April 9: Section2 16.3, varia, Final review I (Thursday)
HW 16.3 (p. 725): 3 - 11 (odd), 15- 21 (odd)

April 16: Final review II (Tuesday)-Last class!

The final exam will be on April 24, 7-10 PM in the classroom. It will be comprehensive. The material for the final is: 4.3-4.5, 12.1-12.8, beams, 13.1-13.7, 14.1-14.4, 15.1-15.4, 16.1-16.3.

The format will be:

9 questions out of 1-12; questions 13-15 are mandatory.

You may use up to two freely written two sided A4 sheets of paper

Each of the first 9 question is worth 15 points, and the last three questions are worth 10 points each, to a total of 160 points.

If you have any questions or remarks, send them to me by clicking on shillor@oakland.edu

Winter 2017