Continuous Mathematical Modeling

MATH 5000/6000 Summer 2021

(Tentative Syllabus)

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Class Web Site: http://www.auburn.edu/~smith01/math5000Su21/

Office Hours: via zoom immediately after class and by appointment.

Text: Elementary Differential Equations and Boundary Value Problems, expanded 11th edition, Boyce, Diprima, Meade; the edition with 11 chapters.

Textbook sections: Review sections from chapters 1-3; selected sections from chapters 7, 9 and 10.

Software: Students are expected to use some software to numerically solve some of the problems and present the solutions in graphical form. **A printout of the computer codes used should be included in all hand-in work.** I suggest MatLab or Maple which will be made available for the student.

For information regarding getting ready for remote Zoom lectures go to the following site at the Biggio Center: http://wp.auburn.edu/biggio/zoom/ .As much as possible, the zoom experience should model the classroom; so this means that you should have your video on so that we can see each other -but it would be polite to turn off your microphone unless you have a question or comment relevant to the discussion at hand.

The Daily Meetings

The daily virtual classroom process is the similar to my daily on-campus classroom process. For fairness, I will create a pseudo-randomized list of students from which I will pick students to present solutions to assigned homework. I will start with the first name on the list and go in the listed order and cycle through the list during the semester. Students are expected to attend zoom sessions held during the scheduled class meeting time. Before each class, either by email or verbally at the end of the previous class, I will use my student list to assign student presentations for the next class. Once assigned, the student is responsible for preparing the homework assignment for the next class meeting. Typically this will be to prepare solutions to assigned exercises. The student's work should be emailed to me before the due date/time in a single pdf document (jpeg's are also acceptable in the case when the student cannot provide a pdf document); the name of the file should begin with your last name plus whatever identifier suits you: e.g.

smithOct20homework.pdf. A scan or photo of your handwritten work (converted into a pdf document) is fine-but it must be readable in order to receive full credit. Grades for assignments turned in late (or unreadable) will be prorated according to how late; zero credit will be assigned if the assignment is not received by the time it is reviewed in lecture. I will review the homework before class. Then during our class meeting I will go through the list of the students who are scheduled for presentation for that class and ask each to present a portion of their homework through zoom. (My custom is to allow the student to dictate their work verbally while I write it on the clipboard/document camera setup.) Other students should be prepared to critique solutions and to ask questions if the presentation is not understood. Read my document Participation/Presentation Component which adds details to the process.

Class Participation and Working in Groups

Students will be expected to present solutions to problems and homework exercises on the blackboard. An integral part of the learning process for any mathematics course is solving mathematics problems. You will be challenged to solve problems and do exercises that you have not seen; my purpose is to develop analytical problem-solving techniques that can be applied to a broad range of real world problems. Though idealized, the problems assigned for the course mirror problems encountered in science and engineering disciplines. The techniques of mathematics are retained much more firmly if students can discover their own solutions to problems. Students will be expected to critique other student presentations for understanding and correctness; this is to be done respectfully. Alternate methods of solving problems also add to one's repertoire of problem solving techniques; I encourage students to offer presentations of different techniques for problem-solving. Working in groups is not discouraged (and in fact is often encouraged); students are expected to present their own work on the blackboard and to give credit to other students (or any other outside resource) who (that) have contributed to the solution of the problem they are presenting.

Parameters for Working in Groups

It is unethical to use someone else's work as your own. In working together, each person should start working on a problem or exercise themselves; if you get stuck at some point you might ask "did anyone figure this out?" and accept someone's help (and not a completed solution) in getting over a difficulty. Typically, a new type of problem often needs a "trick" (or more correctly, a new technique) for solution and not everyone will figure out what's needed at the same time. To those who figure out the "trick" - I encourage you to offer hints (this is my own method of helping students) at first rather than offer a complete solution. If one has figured out most of the underlying work then the new technique - whatever gets us over the hurdle - is more firmly remembered. Finally, as mathematicians do, one should properly give credit to one's collaborators for their contributions. When presenting a collaborative solution, credit for the discovery of a new technique should be given to the individual who figured it out. When term projects are handed in, include the names of members of the study group and, where possible, give credit to those who figured out critical techniques or steps.

Grade Calculation

Item		Total
Participation grade (includes: attention to zoom presentation, attendance)	05%	U
Oral Presentation and Homework	15%	V
Projects	10 pts each	W
Quizzes	10 pts each	X
Tests	20 pts each	Y
Final Exam	40 pts	Z

The standard 10 percentage point scale will be used: 90 to 100 =A; 80 to <90 = B; 70 to < 80 =C; 60 to <70 = D; <60=F.

Calculation of the final grade:

G = (U+V) 20% + (W+X+Y+Z) *80% ÷ (Total Points possible)

ACCADEMIC HONESTY: Plagiarism (work presented as your own that is not your own) and giving or receiving aid on exams in whatever form will result in action by the University Honesty Committee. Refer to the Tiger Cub for more specific details.

ABSENCE FROM EXAMS: Refer to the Tiger Cub for a list of acceptable reasons for being absent from an exam, quiz or class. Any absence from the final exam must be cleared with your Dean's office.

Accommodations for Disabilities: Students who require such considerations should make an appointment with me during the first week of classes. Please bring your memo from the Office of Accessibility. If you do not have a memo, it is recommended that you make an appointment with a member of the professional staff in the Office of Accessibility, 1244 Haley Center (844-2096).

Attendance Requirement. Attendance and class participation are a critical part of this course. Students are permitted one unexcused absence. More than one unexcused absence (an excused absence is any University excused absence) will result in percentage points taken off the final grade as follows:

1 missed class results in a total of zero points subtracted,
2 missed classes results in a total of 2 point subtracted,
3 missed classes results in a total of 5 points subtracted,
4 missed classes results in a total of 10 points subtracted,
More than 4 missed classes will result in a grade of "F" assigned for the class.