COURSE DESCRIPTION
MATHEMATICAL MODELLING
MA 361/519
SUMMER 2021

DEPARTMENT OF MATHEMATICS
UNIVERSITY OF ALABAMA AT BIRMINGHAM

Course Instructor: Dr. Carmeliza Navasca
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Office Hours: TBA

Course Info

Meeting times: TuThu, 12:40–2:40 PM
Meeting location: HHB 221
Prerequisite: Grade of C or better in MA 125 or equivalent. *Any student who has not fulfilled the prerequisite will be dropped from the class.*
Credits: 3 semester hours
Required Textbook: (1) *Mathematical Models: Mechanical Vibrations, Population Dynamics and Traffic Flow, An Introduction to Applied Mathematics* by Richard Haberman. Free PDF at `https://epubs.siam.org/doi/pdf/10.1137/1.9781611971156.fm`
(2) *Mathematical Biology* by Jeffrey R. Chasnov. Free PDF at `https://www.math.ust.hk/~machas/mathematical-biology.pdf`

Important Dates

First day of our class: June 8, 2021
Last day to drop without paying full tuition: June 14, 2021
July Fourth: July 5, 2021
Last day of our class: August 5, 2021.
Midterm Exam: July 1, 2021
Project approximate due dates: Project I: Thu, June 24, 2021
Project II: Thu, July 15, 2021

Final Exam/Project: Tuesday, August 10, 2021, 10:45 AM - 1:15 PM

Course Policies

- Please make sure that you are able to receive e-mail through your Blazer-ID account. Official course announcements may be sent to that address.
- If your are contacted by the Early Alert Program, you should consider taking advantage of the services it offers.

Date: June 8, 2020.

- If you wish to request a disability accommodation please contact DSS at 934-4205 or at *dss@uab.edu*.

Course Description

Mathematical modeling using computer software; connections to calculus and systems of ordinary differential equations are emphasized. Students translate verbal descriptions into mathematical form using appropriate units and reasonable relationships, construct and interpret multiple representations of mathematical relationships, including tabular, graphical, and schematic, use quantitative evidence produced by models as a basis for reasoned argument to unambiguous conclusions, communicate the mathematical structure of models appropriately to an audience in written form, using proper grammar, usage, spelling, and mathematical modeling conventions of language.

Objectives of the Course

Upon successful completion of the course, a student

(1) develops the understanding of how the mathematical equations describe phenomena we see in engineering and science applications as well as biological applications
(2) develops mathematical tools and implements algorithms from a given mathematical modeling problem;
(3) learns the basic principles of mathematical modeling, i.e. solving differential equations and other mathematical equations and using algorithms and software tools for science, math and engineering problems

Class Management via Canvas

- Class materials like lecture slides, working matlab/python codes, and class/hw activities will be on canvas. Recorded lectures will also be available on canvas.
- Homework problems will be posted in canvas . All other materials (class announcements, codes, grades and etc.) will be posted in canvas. Students should log in to canvas at least *once* a day! (Your email is guaranteed to be answered within 36 hours of the time the email has been received.)
- Midterm take-home and final take-home exams, homework assignments, projects and other activities will only be collected on canvas.

Assessment Procedures

- Student achievement will be assessed by the following measures:
  - **Weekly homework.** Homework will be assigned on a weekly basis. There will be no extension of deadlines for any reason. Homework contributes 15% to the course average.
  - **Midterm exam.** Midterm exam problems are similar to the homework problem sets. The midterm take-home exam contributes 20% to the course average. There will be no make-ups for the midterm.
  - **Two projects.** Each project contributes 25% to the course average. This sums up to 50%.
  - **Final exam/project.** The final take-home exam/project contributes 15% to the course average.

Grading Scheme: 15 % homework, 20% midterm exam, 50 % projects, 15% final exam

- Your course performance is your course average (including the final exam score). This is a number between 0 and 100.

- Your final grade is determined according to the following table:

Course performance:	88-100	75-87	62-74	50-61	below 50
Final Grade:	A	B	C	D	F

- For graduate students, your final grade is determined according to the following table:

Course performance:	88-100	75-87	50-74	below 50
Final Grade:	A	B	C	F

Tips

- By working steadily and regularly, you will increase your chances to succeed in this course.
- Remember, being a full-time student is a full-time job.

Academic Honor Code

The University of Alabama at Birmingham expects all members of its academic community to function according to the highest ethical and professional standards. Academic misconduct undermines the purpose of education. Such behavior is a serious violation of the trust that must exist among faculty and students for a university to nurture intellectual growth and development. Academic dishonesty and misconduct includes, but is not limited to, acts of abetting, cheating, plagiarism, fabrication, and misrepresentation. Candidates are expected to honor the UAB Academic Honor Code as detailed in the most current UAB Student Catalog. Please consult this resource (`https://www.uab.edu/students/academics/honor-code`) for additional information regarding the specific procedures to be undertaken when a student violates the UAB Academic Honor Code.

Non-harassment, Hostile Work/Class Environment

The UAB College of Arts and Sciences expects students to treat fellow students, their Course Instructors, other UAB faculty members and staff as adults and with respect. No form of hostile environment or harassment will be tolerated by any student or employee.