Syllabus
MAE384 Advanced Mathematical Methods for Engineers - Spring 2020

Lecture (Course ID 22553): M/W 12:15-1:30 PM, Classroom: CPCOM212
Recitation:
      Course ID 22555: W 10:45 AM-12:00 PM, USE 104
      Course ID 22554: W 3:05-4:20 PM, ECG 218
      Course ID 18325: W 6:00-7:15 PM, ECG 236
Instructor: Huei-Ping Huang, ERC 359, Email: hp.huang@asu.edu
Office Hours: Monday 3:00-5:00 PM, Tuesday 3:00-5:00 PM, or by appointment
Course website http://www.public.asu.edu/~hhuang38/MAE384.html

Note: Items 4-10 in this syllabus are modified from a template provided by FSE to aid compliance with the syllabus requirements of ACD 304-10.

1. Course Objectives and Expected Learning Outcomes

Methods for numerical solutions to engineering problems. Nonlinear equations, quadrature, ordinary differential equations. Analytical and numerical solutions to partial differential equations.

2. Readings, Assignments, Examinations, Special Materials, Required Activities

Textbook: Advanced Mathematical Methods for Engineers (multiple authors, custom-made for this course), Wiley, Required

Course Outline

Part I Numerical Methods
- Overview
- Numerical solution of nonlinear equation
- Solution of system of linear equations
- Curve fitting and interpolation
- Numerical differentiation
- Numerical integration
- Numerical solution of ordinary differential equation - initial value problem
- Numerical solution of ordinary differential equation - boundary value problem

Part II Additional topics
- Fourier analysis
- Introduction to partial differential equation; Analytic and numerical solution

Seven homework assignments and two exams (midterm and final) are expected. The techniques for solving homework and exam problems will be covered in the lectures.

Requirement of programming using Matlab or equivalent: Many homework assignments will require programming using Matlab. Uses of other programming languages/tools such as Fortran, C++, R, Python, and Java are acceptable. A beginner's guide for Matlab will be posted to the class website. A survey of Matlab programming will be given in the recitations.

3. Grading Policies

Grade will be based on performances in six homework assignments and two exams (midterm and final), weighted as following: Homework 50%, Midterm 20%, Final exam 30%

Specific rules for collaboration on homework will be released in the beginning of the semester. A violation of the rule(s) may lead to lowering of the score for the assignment, in addition to consequences of a violation of ASU's Academic Integrity Policy.

A general guideline for the minimum requirement (expected course outcome) for a C grade can be found in the First Day Form which will be distributed separately.

The typical thresholds for letter grades are: A = 90%, B = 80%, C = 70%, and D = 60%. These thresholds are subject to adjustments depending on the distribution of the total scores for the class.

4. Absence & Make-Up Policies

Instructor will arrange make-up exams, extension of deadline for projects, and/or assignment of alternative projects for students who are excused from class with proper reasons. This policy will accommodate students who have (a) Excused absences due to an emergency, illness, or other unforeseeable events that prevent students from attending class or completing a project within the regularly allocated time ; (b) Excused absences related to religious observance/practices that are in accord with ACD 304-04, "Accommodation for Religious Practices"; (c) Excused absences related to university sanctioned events/activities that are in accord with ACD 304-02, "Missed Classes Due to University-Sanctioned Activities"

Students who expect to miss class due to officially university-sanctioned activities should inform the instructor early in the semester. Alternative arrangements will generally be made for any examinations and other graded in-class work affected by such absences. The preceding policies are based on ACD 304–04, "Accommodation for Religious Practices" and ACD 304–02, "Missed Classes Due to University-Sanctioned Activities."

5. Classroom Behavior

Note-taking using electronic devices such as laptops is permitted as long as the activity does not cause disruption to the lecture or disturbance to other participants in the class. Cellphone and similar communication devices should be turned off or set to silent mode when class is in session. Any violent or threatening conduct by an ASU student in this class will be reported to the ASU Police Department and the Office of the Dean of Students.

6. Academic Integrity

All Students in this class must adhere to ASU's academic integrity policy, which can be found at https://provost.asu.edu/academic-integrity/policy). Students are responsible for reviewing this policy and understanding each of the areas in which academic dishonesty can occur. In addition, all engineering students are expected to adhere to both the ASU Academic Integrity Honor Code (https://provost.asu.edu/academic-integrity/honor-code/) and the Fulton Schools of Engineering Honor Code (https://engineering.asu.edu/ira-a-fulton-schools-of-engineering-honor-code/). All academic integrity violations will be reported to the Fulton Schools of Engineering Academic Integrity Office (AIO). The AIO maintains record of all violations and has access to academic integrity violations committed in all other ASU college/schools.

Specific to this class, limited collaboration is allowed for homework assignments. Specific rules for collaboration on homework will be given in the individual assignments.

7. Copyright

Course content, including lectures, are copyrighted materials and students may not share outside the class, upload to online websites not approved by the instructor, sell, or distribute course content or notes taken during the conduct of the course (see ACD 304–06, "Commercial Note Taking Services" and ABOR Policy 5-308 F.14 for more information).

You must refrain from uploading to any course shell, discussion board, or website used by the course instructor or other course forum, material that is not the student's original work, unless the students first comply with all applicable copyright laws; faculty members reserve the right to delete materials on the grounds of suspected copyright infringement.

8. Disability Accommodations

Suitable accommodations will be made for students having disabilities and students should notify the instructor as early as possible if they will require same. Such students must be registered with the Disability Resource Center and provide documentation to that effect.

9. Offensive Materials

Participants of this course who find any course material objectionable may consult with the instructor or MAE Program Chair to identify appropriate accommodations.

10. Sexual Discrimination

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on

the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at https://sexualviolenceprevention.asu.edu/faqs. As a mandated reporter, the instructor is obligated to report any information upon becoming aware of alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, https://eoss.asu.edu/counseling, is available for students who wish to discuss any concerns confidentially and privately.

Notice: Any information in this syllabus may be subject to change with reasonable advance notice.