
TENNESSEE TECHNOLOGICAL UNIVERSITY

MECHANICAL ENGINEERING

ME3001-003 MECHANICAL ENGINEERING ANALYSIS

FALL 2020, 3 CREDIT HOURS

All meetings will be held through MS Teams. Classroom space will be available for meeting by reservation.

Lecture Section 003 (T. Hill): 12:20 AM-1:15 AM Monday, Wednesday, Friday

Final Exam: 3:30 PM - 5:30 PM Wednesday, December 9th

INSTRUCTOR INFORMATION

Instructor Name: Tristan W. Hill, Lecturer

Office: BROWN 305 (working from home Fall 2020)

Telephone Number: 931-372-3732

Email: thill@tntech.edu

OFFICE HOURS

Monday, Wednesday 1:30PM-3:30PM (or by appointment)

I will be available during the times above on MS Teams to answer your questions about the course material. We can discuss using audio, video, or the chat, and we can work problems through a shared screen. We can also use short private meetings to discuss grades. I am not taking in-person meetings currently.

Synchronous/Asynchronous Online (Modality: Tech-Direct)

This course will be delivered in a synchronous/asynchronous online format. Online lectures will be held using Microsoft Teams each Monday and Wednesday following the university schedule, and Fridays will be used for online class discussions and group project work time. All lectures and discussions will be recorded and made available for later viewing. In person attendance is not required, however the classroom will be used by reservation as a location to attend online meetings and complete group work in accordance with the current CDC COVID-19 guidelines for Colleges and Universities.

COURSE INFORMATION

PREREQUISITES

ENGR 1120, MATH 2010 and MATH 2120

TEXTS AND REFERENCES

Recommended Text: Zill and Cullen, *Differential Equations with Boundary-Value Problems*, 7th Edition

Required Text: *Scientific Computing with MATLAB and Octave*, Fourth Edition by Quarteroni, Saleri, Gervasio

Course Website: [ilearn](#)

Meeting Platform: *Microsoft Teams*

COURSE DESCRIPTION

The goal of this course is to develop and implement analytical and numerical techniques for typical mechanical engineering problems and applications in various topics using the MATLAB programming language.

COURSE OBJECTIVES/STUDENT LEARNING OUTCOMES

Practical methods for solving engineering applications in the areas of dynamics, mechanics, heat transfer, and fluids will be investigated with modern numerical computing tools such as the MATLAB programming language.

Analytical and numerical methods for computation and engineering problem solving will include:

- Root Finding and Solutions to Non-Linear Equations
- Systems of Linear Equations
- The Eigenvalue Problem
- Theoretical and Numerical Solutions to Ordinary Differential Equations
- Laplace Transforms
- The Fourier Series
- Theoretical and Numerical Solutions Partial Differential Equations

GRADING AND EVALUATION PROCEDURES

A total point system will be used. Throughout the semester you have opportunity to earn points towards your final grade. There are 1000 total points available across your different assignments. The breakdown is shown below.

| Field | Available Points |
|-----------------|------------------|
| Weekly Quizzes | 100 |
| Homework | 150 |
| Group Project | 150 |
| Midterm Exam I | 200 |
| Midterm Exam II | 200 |
| Final Exam | 200 |

| Letter Grade | Grade Range |
|--------------|---------------|
| A | 900 and above |
| B | 800 to 899 |
| C | 700 to 799 |
| D | 600-699 |
| F | 599 and below |

COURSE POLICIES

STUDENT ACADEMIC MISCONDUCT POLICY

Maintaining high standards of academic integrity in every class at Tennessee Tech is critical to the reputation of Tennessee Tech, its students, alumni, and the employers of Tennessee Tech graduates. The Student Academic Misconduct Policy describes the definitions of academic misconduct and policies and procedures for addressing Academic Misconduct at Tennessee Tech. For details, view the Tennessee Tech's Policy 217 – Student Academic Misconduct at [Policy Central](#). Students are encouraged to obtain limited help and/or ideas from one another. However, sharing files or code in any way is strictly forbidden. Similarly there is a zero tolerance policy for cheating on quizzes or exams. While completing the exams, students may only use the allowed materials detailed above. If a student is observed using a restricted device or material, or is found to have copied any part of the exam answers from another student, the student (or students) will be reported to the Student Affairs office for Academic Misconduct. Violation of this policy will result in an 'F' for the course.

ONLINE GRADEBOOK

You will be able to see your assignment grades as soon as they are available on the course website, ilearn. Please check the gradebook periodically. If you believe your grade is incorrect or missing please send me an email describing the issue. If needed your grade will be changed. Please request no later than 2 weeks after the grade has been posted. After 2 weeks the grade will be considered final. This is particularly important towards the end of the semester as it can affect final grades.

HOMEWORK ASSIGNMENTS

There will be individual homework assignments given throughout the semester and there are 150 available points from these assignments. Homework will be submitted digitally in the specified format and a formal printed report may be required. The homework will be done in groups of two and each group will turn in a single homework assignment with all names attached, and each member will receive the same grade for the assignment. Any software or code that is used must be submitted digitally and documented properly.

PROJECT

You will work on a group project throughout the semester and there are 150 available points from this assignment. The project will involve the mathematically modelling a computer simulation of a mechanical system of your choosing using the techniques from class. You will work in groups of two.

EXAMS

You will have 2 midterm exams and 1 final exam. You have the opportunity to earn up to 200 points on each midterm exam and 200 points on the final exam. The exam dates are shown on the course schedule, and the final exam schedule is posted on this syllabus. You are allowed to use a calculator and single two-sided handwritten note sheet on the exams but this is subject to change. Some exams may allow the use of personal computers.

QUIZZES

Quizzes will be held weekly and may include example problems, derivations, software and/or hardware exercises, and more. There are 100 available points for participating in the quizzes and most weeks there will be one quiz that is due at the end of the day on Friday.

ATTENDANCE POLICY AND CLASS PARTICIPATION

You are expected to attend lecture discussions and you are responsible for all assignments and material covered and all issues discussed during class meetings whether you are present or not. Makeups will not be given unless exceptional circumstances are present and you have official documentation. Assignment due dates are posted on ilearn but they are subject to change.

I know that your daily schedules are hectic due to the fact that you will be meeting in Brown Hall for some classes on some days and at home on other days. There will be days that you cannot attend the teams meeting, but I will make and post recording of all meetings and I am asking that you attend at least one discussion per week. After the first week we can re-assess the scheduling if there are significant needs.