
TENNESSEE TECHNOLOGICAL UNIVERSITY

MECHANICAL ENGINEERING

ME3001-001 MECHANICAL ENGINEERING ANALYSIS

SPRING 2021, 3 CREDIT HOURS

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

Lecture Section 001 (T. Hill): 3:35 PM-4:30 PM Monday, Wednesday, Friday

Final Exam: 3:30 PM - 5:30 PM Tuesday, May 4

INSTRUCTOR INFORMATION

Instructor Name: Tristan W. Hill, Lecturer

Office: BROWN 305 (I am not taking in-person meetings currently)

Telephone Number: 931-372-3732

Email: thill@tntech.edu

OFFICE HOURS

Monday, Wednesday 12:00PM-2:00PM (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-Flex)

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	200
Group Project	200
Midterm Exam I	150
Midterm Exam II	150
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.

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.

HOMEWORK ASSIGNMENTS

There will be individual homework assignments given throughout the semester and there are 200 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.

GROUP PROJECT

You will work on a group project throughout the semester and there are 200 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 150 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.

ATTENDANCE POLICY AND CLASS PARTICIPATION

You are expected to attend lecture and you are responsible for all assignments and material covered and all issues discussed during class meetings whether you are present or not. Please ask questions and participate in class discussions. Do not worry about asking stupid questions, you are not here to look cool. 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 all meeting recordings will be available, 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.

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DISABILITY ACCOMMODATION

Students with a disability requiring accommodations should contact the Office of Disability Services (ODS). An Accommodation Request (AR) should be completed as soon as possible, preferably by the end of the first week of the course. The ODS is located in the Roaden University Center, Room 112; phone 372-6119. For details, view the Tennessee Tech's Policy 340 – Services for Students with Disabilities at [Policy Central](#).

COVID – 19

1. Students must take personal responsibility in following the recommended CDC COVID-19 guidelines. Students are expected follow all COVID-19 directives published by Tennessee Tech including, but not limited to, notices on Tennessee Tech's webpage, building and facilities signage, and similar publications. The University's Return to Campus Student Handbook can be found at <https://www.tntech.edu/return/index.php>.
2. According to Tennessee Tech University's protocols, face coverings must be worn (covering the mouth and nose) by students in the classroom at all times.
3. Students must abide by predetermined social distancing guidelines and seating arrangements. Movement during class sessions should be limited as to not endanger other students or faculty. Students should be conscious and respectful of others and their health concerns.
4. Students who refuse to comply with university protocols on these matters will be reported to the Tennessee Tech Dean of Students.
5. Students should direct all requests for excused class absences related to COVID-19, regardless of where the COVID-19 testing is performed, to Tennessee Tech's Health Services. The Office of Student Affairs will provide notifications to faculty members of student absences and the expected length of the absence.