TENNESSEE TECHNOLOGICAL UNIVERSITY

MECHANICAL ENGINEERING

ME3001-002 MECHANICAL ENGINEERING ANALYSIS

SPRING 2020, 3 CREDIT HOURS

Lecture: Monday, Wednesday, Friday, 12:20-1:15PM, BRWN 236

Final Exam: Wednesday, May 6th, 3:30-5:30PM

INSTRUCTOR INFORMATION

Name: Tristan Hill
Office: BRWN 305
Telephone Number: 931-372-3732
Email: *thill@tntech.edu*

OFFICE HOURS

Monday, Wednesday, Friday 9:00AM-11:00AM (or by appointment)

COURSE INFORMATION

PREREQUISITES

ENGR 1120, MATH 2010 and MATH 2120

TEXTS AND REFERENCES

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

Course Website: ***ilearn***

Useful Websites: ***wolfram alpha***, ***wolfram mathworld***, ***math for college***

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 Solutions to Ordinary Differential Equations
- Numerical Solutions to Ordinary Differential Equations
- Laplace Transforms
- The Fourier Series
- Theoretical Solutions to Partial Differential Equations
- Numerical Solutions to 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 a total of 1000 points available and the breakdown is shown below.

Field	Points
Quizzes	100
Homework	150
Group Project	150
Midterm Exam 1	200
Midterm Exam 2	200
Final Exam	200

Letter Grade	Points Range
A	900 or above
B	800 to 899
C	700 to 799
D	600 to 699
F	599 or 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.

Group 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.

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 as a general rule there will be at least one per week typically given on Wednesday.

Attendance Policy and Class Participation

You are expected to attend lecture. 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.

Please ask questions and participate in class discussions. Do not worry about asking stupid questions, you are not here to look cool. Also feel free to come to my office and ask questions during my posted office hours or any other time. If I am free I will be happy to help. Do not use your cellphone in class. Although tempting, this is rude and you will miss material. Please silence your phones. You are encouraged to bring your computer to lecture but try not to get distracted. Please silence your and computers.

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.