

COURSE SYLLABUS

Instructor: Dr. Raegan Higgins Siwatu

Preferred Instructor Name : Dr. Higgins

Office: Mathematics 214

Email: raegan.higgins@ttu.edu – **Please put “Math 3351” in the subject line.** Email without this will not receive a response.

Phone: 742-2580 ext 273

Office Hours: MWF 10:00am-11:00am and by appointment–schedule 24 hours prior

Course Number: Mathematics 3351-001

Course Title: Higher Mathematics for Engineers and Scientists II

Course Time and Location: MWF 9:00am – 9:50am MWF; Mathematics 014

Course Prerequisite: Students must have completed Math 3350 or Math 3354 (or equivalent transfer credit, according to existing university regulations) with a minimum grade of C.

Course Text: *Advanced Engineering Mathematics*, 4th Edition by Dennis G. Zill and Warren S. Wright, published by Jones & Bartlett (2011)

Course Webpage: The course webpage contains this syllabus in its most current form, course grades, and other noteworthy material for this course. All course information can be found at <http://www.blackboard.ttu.edu>; select the appropriate course in the course list. You will need your eRaider username and password to log in.

About the Course: This course covers topics in linear algebra, systems of ordinary differential equations, Fourier series and solution of boundary value problems for partial differential equations. Topics to be covered include: Linear Algebra and Matrix Theory; Systems of linear first-order differential equations; Orthogonal Functions and Fourier Series; Boundary-Value Problems in Rectangular Coordinates; Boundary-Value Problems in Other Coordinate Systems.

Expected Student Learning Outcomes: Math 3351 satisfies the university core curriculum requirement in Mathematics: “*Students graduating from Texas Tech University should be able to demonstrate the ability to apply quantitative and logical skills to solve problems.*” It meets TTU general education student learning outcomes for mathematics that student will:

- apply arithmetic, algebraic, geometric, statistical, and logical reasoning to solve problems;
- represent and evaluate basic mathematical and/or logical information numerically, graphically, and symbolically;
- and interpret mathematics and/or logical models such as formulas, graphs, tables and schematics, and draw inference from them.

In particular, students will learn:

- about the fundamental properties of linear systems and their solutions;
- how to solve partial differential equations by separation of variables or Fourier series;
- to apply these techniques to the three classical equations: the heat, wave, and Laplaces equation;
- and many examples of boundary value problems that appear in physical sciences and engineering.

Methods of Assessment of Learning Outcomes: Assessment will be achieved through homework assignments, three exams, and a final exam. Class grades will be assigned as follows:

WeBWorK	On-line exercises; at least 9 assignments Visit http://webwork.math.ttu.edu/webwork2/spr13rahigginm3351s001/ . More information is given below.	12.5%
Homework	Handwritten WeBWorK Exercises; at least 3 assignments More information is given below.	12.5%
Examinations	3 in-class exams See <i>Tentative Schedule</i> for dates.	45%
Final Exam	Comprehensive, Friday, May 7 th 7:30 am - 10:00 am	30%
Total		100%

Grading Scale

A+ 100.00%–97.00%	A 96.99%–93.00%	A- 92.99%–90.00%	
B+ 89.99%–87.00%	B 86.99%–83.00%	B- 82.99%–80.00%	
C+ 79.99%–77.00%	C 76.99%–73.00%	C- 72.99%–70.00%	
D+ 69.99%–67.00%	D 66.99%–63.00%	D- 62.99%–60.00%	F 59.99%–0%

Calculator: Calculators will not be permitted on any exam.

Preparation Outside of Class: There is a lot of content in this course, so it has a necessarily fast pace. You are expected to **read** the appropriate sections of the text BEFORE attending lecture and/or attempting the WeBWorK exercises. While reading, it is important that you make note of definitions and theorems. In effort to save time, definitions and theorems will not always be written during the lecture. In these instances, the number and/or page number will be provided.

It is strongly recommended that you spend at least 90 minutes of preparation outside of class for *every* fifty-minute lecture. That is equivalent to **at least 4 hours 30 minutes per week** for this class.

Web-based Instruction: For some students reading the book and taking notes will not be enough to prepare them to work homework problems and do well on exams. In such classes, students are encouraged to take advantage of a number of helpful resources. There are some websites that contain useful information to supplement the discussion in the book. Students are strongly encouraged to visit these websites for each block of the material covered in the book.

- Paul's Online Math Notes: <http://tutorial.math.lamar.edu/Classes/DE/DE.aspx>
- SOS Mathematics Page for Differential Equations: <http://www.sosmath.com/diffeq/diffeq.html>
- Khan Academy: <http://www.khanacademy.org/>
- MIT Open Courseware page: <http://ocw.mit.edu/courses/mathematics/>

Scheduling: A tentative schedule of assignments and exams is included in this syllabus. These details are presented as a guide. The instructor may change the dates for each WeBWorK assignment, handwritten WeBWorK assignment and exam, modify the WeBWorK exercises, and/or add WeBWorK assignments. It is your responsibility to keep track of the course details.

The necessary time to cover the sections from the textbook depend on many factors, such as: concentration level, background, major, and individual academic skills. The necessary time for homework completion, and practice tests (Chapter Review and/or external resources) is not included in this estimate. For each course, students should expect to devote the amount of time necessary to understand the material and be able to work problems based on the material.

WeBWorK: WeBWorK is an internet based method for delivering homework problems to students. **Visit the course webpage for more information on how to access WeBWorK and how to enter your solutions; see Helpful Documents.** You will need your eRaider username and student ID number with the R to log into WeBWorK.

The WeBWorK system responds by telling you whether an answer (or set of answers) is correct or incorrect and also records whether you answered the question correctly or incorrectly. You are free to try a problem as many times as you wish until the due date. See the last page for due dates; denoted by **WW # due online by 11pm**. Students are encouraged to print out **all** available assignments at once. It is estimated that the average time to complete an WeBWorK assignment is **3 hours**. Please do not wait until the day the assignment is due to begin and/or send questions. I will not answer questions about an assignment after **5pm** the day it is due.

A key educational benefit of this system is that if you get an incorrect answer, you receive immediate feedback while the problem is still fresh in your mind. You can then correct a careless mistake, review the relevant material before attacking the problem again, or seek help (frequently via e-mail) from classmates or the professor.

Homework: You must submit written solutions to a certain number of WeBWorK problems. The problems will be listed in Blackboard in the Homework and WeBWorK folder. These solutions will be graded for completeness; **all** steps must be shown – there are more steps than those shown in the Student Solutions Manual that accompanies the text. **Even if you think a step is clear or trivial, write it.** Your solutions are expected to be of collegiate quality. Each exercise should be:

- written in pencil;
- written on paper with smooth edges;
- written on one side of the page;
- contain the problem statement;
- and easy to follow.

Solutions for different problems should not be written on the same page; each problem solution should begin on a new sheet of paper. **The solutions must be stapled in the upper left-hand corner with the heading below.** Assignments that do not meet **all** the above criteria will not be graded.

There will be at least 3 homework assignments. See the *Tentative Schedule* for the due date of each written assignment; denoted by **HW # due in class**.

First Name Last Name
Math 3351-001
Roster # (to be assigned)

Homework Assignment #

Make-Up Policy: There are no make-up exams except for absence due to religious observance or absence to due officially approved trips (see Class Attendance below). The student should make arrangements to take the exam **prior** to his/her absence.

There are no make-up homework assignments except for absence due to religious observance or absence to due officially approved trips (see Class Attendance below). If a student misses a homework assignment for one of these reasons, the homework assignment will not be included in the student's course grade.

Class Attendance: Students are cautioned that active participation is necessary for success.

- Absence due to religious observance - *The Texas Tech University Catalog* states that a student who is absent from classes for the observance of a religious holy day will be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence (p.49). Notification must be made in **writing** and submitted no later than the 15th class day of the semester.
- Absence due to officially approved trips - *The Texas Tech University Catalog* states that the person responsible for a student missing class due to a trip should notify the instructor of the departure and return schedule in advance of the trip. The student may not be penalized and is responsible for the material missed.
- Whether an absence is excused or unexcused is determined solely by the professor with the exception of absences due to religious observance and officially approved trips described above.

Communication: The use of information technologies such as email and the internet have become routine learning tools. It is imperative that you learn to use email and the internet as part of your college education. Accordingly, **you must have a TTU email account** and **check it** (and Blackboard) **regularly**. I will be communicating with you via email and posting important information via Blackboard.

In the event that you need to contact me via email, please include **“Math 3351”** and the title of the email (e.g., homework question, attendance) in the subject line. For example, the subject line may read “Math 3351: WeBWorK.” I will respond to email within 24 hours during the work week (excluding holidays) and 48 hours during the weekend. Messages sent via WeBWorK have the automatically generated subject “spr13rahigginm3351s001 notice.” Only email with Math 3351 or spr13rahigginm3351s001 notice in the subject line will receive a response.

Academic Integrity (extracted from OP 34.12): It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. The attempt of students to present as their own any work not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offenders liable to serious consequences, possibly suspension.

Scholastic dishonesty includes, but it not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor) or the attempt to commit such an act.

Accommodation for Students with Disabilities (extracted from OP 34.22): Any student who, because of a disability, may require some special arrangements in order to meet course requirements should contact the instructor via email as soon as possible to make the necessary arrangements. Students should present appropriate verification from Student Disability Services via email to the instructor. Please note instructors are not allowed to provide classroom accommodations to a student until the appropriate verification from Student Disability Services has been provided. For additional information, visit <http://www.depts.ttu.edu/students/sds/> or contact the Student Disability Services office at 335 West Hall or 806-742-2405.

Campus Resources:

- Tutoring and Study Center (TSC) – a free tutoring center provided by the Mathematics & Statistics Department located at in Room 106 of the Math Building. Visit <http://www.math.ttu.edu/Undergraduate/Resources/tutor.shtml> for the most recent hours of operation.
- Learning Center – a free tutoring center located in Room 80 of Holden Hall. Online tutoring is also available. Visit <http://www.depts.ttu.edu/passcntr/PLC/> for more information.
- Tutoring List – a list of tutors student may hire can be found at <http://www.math.ttu.edu/Undergraduate/Resources/tutor.shtml> or in Room 201 of the Math Building.

Tentative Schedule

<u>Date</u>	<u>Section(s)</u>	<u>Topic</u>
Jan 16– Feb 4	8.1 – 8.6, 8.8	Introduction to Linear Algebra and Matrices including Eigenvalues
Jan 21		Martin Luther King, Jr Day – University Holiday
Jan 22		Last day to add a course
Jan 24 (R)		WW 1 due online by 11pm
Jan 31 (R)		WW 2 due online by 11pm
Feb 1 – 2		Last days to drop a course
Feb 1 (F)		HW 1 due in class
Feb 6 – 18	10.1 – 10.2	Solving Systems of Linear Differential Equations
Feb 7 (R)		WW 3 due online by 11pm
Feb 11 (M)	Exam 1	8.1 – 8.6, 8.8
Feb 13		Last day to withdraw from university
Feb 20 – March 8	12.1 – 12.4	Orthogonal Functions and Fourier Series
Feb 21 (R)		WW 4 due online by 11pm
Feb 28 (R)		WW 5 due online by 11pm
March 7 (R)		WW 6 due online by 11pm
March 8 (F)		HW 2 due in class
March 9 – 17		Spring Vacation
March 18 – April 12	13.1 – 13.6, 13.8	Boundary Value Problems in Rectangular Coordinates
March 20		Mid-semester grades due
March 22 (F)	Exam 2	10.1 – 10.2, 12.1 – 12.4
March 28 (R)		WW 7 due online by 11pm
April 4 (R)		WW 8 due online by 11pm
April 5 (F)		HW 3 due in class
April 11 (R)		WW 9 due online by 11pm
April 19 (F)	Exam 3	13.1 – 13.6, 13.8
April 12 – 26	14.1 – 14.3	Boundary Value Problems in Other Coordinate Systems
April 29 – May 3	Chapter 15 (Selected Topics)	Integral Transforms
May 2 (R)		WW 10 due online by 11pm
May 3 (F)		HW 4 due in class
May 6		Last day of this class and Review
May 7		Last day of classes
May 8		Individual study day
May 10 (F)	Final Exam	Chapters 8 – 15
May 14		Spring semester ends
May 15		Grades due for graduating students
May 20		Final grades due