COURSE SYLLABUS

Instructor: Dr. Raegan Higgins Siwatu

Preferred Instructor Name : Dr. Higgins

Email: raegan.higgins@ttu.edu – **Please put "Math 3351" in the subject line.**

Virtual Office Hours: Via email, WeBWorK, and Blackboard

Course Number: Mathematics 3351-D01 or Mathematics 3351-D02

Course Title: Higher Mathematics for Engineers and Scientists II

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 Materials:

- **Text**: *Advanced Engineering Mathematics*, 4th Edition by Dennis G. Zill and Warren S. Wright, published by Jones & Bartlett (2011)
- **Notes**: Available on Blackboard – see Course Webpage below for more information
- **Videos**: Available on Mediasite – see Mediasite below for more information

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

Mediasite: The videos for this course can be found at `http://mediacast.ttu.edu/mediasite/Catalog`. To access the videos, you will need your eRaider username and password. Search the catalog on the left as follows: Mathematics & Statistics $\rightarrow$ Courses $\rightarrow$ Math 3351 $\rightarrow$ 2012-Fall$\rightarrow$ Chapter #. The videos contain a verbal explanation of some of the problems found in the lectures notes in Blackboard labelled as Section #.pdf. A copy of the notes generated in Mediasite are found in Blackboard labelled as Section # Commented.pdf.

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;
- about Frobenius Theorem and its applications;
- 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; 9 assignments Visit `http://webwork.math.ttu.edu/webwork2/f12rahigginm3351sD01sD02`. More information is given below.	10%
Homework	Handwritten WeBWorK Exercises; 5 assignments More information is given below.	10%
Examinations	3 exams on WeBWorK See *Tentative Schedule* for dates.	45%
Final Exam	Comprehensive, Friday, December 7th 10:30 a.m. - 1:00 p.m. If this date is problematic, please let me know by Friday, September 7th.	35%

Total	100%

Grading Scale

A+ 100.00%–95.00%	A 94.99%–91.00%	A- 90.99%–88.00%	
B+ 87.99%–85.00%	B 84.99%–81.00%	B- 80.99%–78.00%	
C+ 77.99%–75.00%	C 74.99%–71.00%	C- 70.99%–68.00%	
D+ 67.99%–65.00%	D 64.99%–59.00%	D- 58.99%–55.00%	F 54.99%–0%

Examinations: There will be **three** exams administered via WeBWorK with a time limit of at most 90 minutes. It is possible that students will be asked to submit a written solution of at least one exam problem within 1 hour of submitting the exam on WeBWorK. The written solution must be **submitted as a PDF file via email** to the professor at raegan.higgins@ttu.edu. The timestamp for submission of the exam can be checked via the professor so late submissions of the written solution will not be accepted.

Final Exam: The final exam will be given on Friday, December 7th at 10:30am. **In order to pass this course, students must pass the final exam. That is, a student must earn at least a 55% of the possible points on the final.**

The final exam will be given in a **supervised environment**. Students will be expected to take the final as scheduled. Students who live within 150 miles of Lubbock will be **required** to take the final exam at Texas Tech University in a room specified by the professor or Academic Testing Services (806-742-3671) at TTU. If students have a conflict in schedule or are farther than 150 miles from Lubbock, they need to provide necessary documentation and arrange a different examination date and time **no later than two weeks prior to Friday, December 7th.**

All students who cannnot take the final exam at Texas Tech University in a room specified by the professor or Academic Testing Services will be required to take the final exam at an official university or college testing center. Depending on their geographic location, each student and the instructor should make arrangements with a certified testing service. The student is responsible for the testing fee (most US-based universities charge $15 – $30 fees for any distance exam administered in their testing center). In case no agreeable solution can be found, the Academic Testing Services at TTU will be designated to administer the final exam and the student is responsible for the fee and travel expenses. The professor is responsible for providing the final exam to the proctor. Visit the folder labelled Helpful Documents in Blackboard for the proctor form that must be **submitted at least one week prior to the exam.**

Calculator: A graphing calculator is a useful tool for this course. However, only scientific calculators will be permitted on the final exam.

Reading: 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 reading the notes or attempting the WeBWorK exercises.

Computer Software & Web-based Instruction: For some students "just reading the book" 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. Once such resource is the the CD in the back of the textbook. 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, hand-written WeBWorK assignment and/or 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 and web resources depend on many factors, such as: concentration level, background, major, and individual academic skills. The necessary time for homework completion, practice tests (Chapter Review and/or external resources) and test-taking is not included in this estimate. For each semester-based 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 8pm**. The WeBWorK assignments that cover a specific chapter will all be available on the same day. Students are encouraged to print out **all** assignments as soon as they are available. It is estimated that **each** WeBWorK assignment will take **at least 3 hours**. The tentative schedule specifies the **sections each WeBWorK assignment covers; use this information to pace yourself**. 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 **4pm** 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 of **at most 3** WeBWorK problems. The problems will be listed in Blackboard. These solutions will be graded for completeness; all steps must be shown – there are more steps than those shown in the Student Solutions manual. Your solutions are expected to be of collegiate quality. Each exercise should be:

- written in pencil;
- written on loose-leaf paper;
- written vertically with equal signs lined up;
- written on one side of the page;
- numbered in accordance with the WeBWorK numbering;
- 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 list of problems from WeBWorK as the FIRST page.** Assignments that do not meet all the above criteria will not be graded.

There will be 5 homework assignments. Students must submit **at most 3** written problems specified by the professor for **at least 4** of the 5 assignments. See the *Tentative Schedule* for the due date of each written assignment; denoted by **HW # due to MA 214 by 4pm**.

The written problems are to be submitted to my office MA 214 by 4pm on specified due date. There will be an envelope on my office door labelled "Homework Submissions" with your course number and section number for assignments; please put your work in the correct folder. The assignments will returned via my office door when the next assignment is due; there will be an envelope on my office door labelled "Graded Homework Assignments." This submission-return schedule is designed to minimize the trips you must make to my office.

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. Since we do not meet physically, absence means missed/late submission of homework and/or exam.

- 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 delivering lecture notes 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).

In the event that a student submits a question via email that contains mathematical calculations, **the calculations must be submitted via a PDF file**. Submitting problems this way decreases the probability of misunderstanding the work and increases the response time. It is challenging to communicate mathematics in writing without using proper language. So an actual written question will help alleviate misunderstanding.

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

Date	Section(s)	Topic
Aug 27 – Sept 14	8.1 – 8.6, 8.8	Introduction to Linear Algebra and Matrices including Eigenvalues
Sept 3		**WW 1 due online by 8pm** covers 8.1 – 8.2
Sept 9		**WW 2 due online by 8pm** covers 8.3 – 8.4
Sept 10		**HW 1 due to MA 214 by 4pm**
Sept 12		Last day to drop a course with no fee
Sept 16		**WW 3 due online by 8pm** covers 8.5 – 8.6, 8.8
Sept 17 – 26	10.1 – 10.2	Solving Systems of Linear Differential Equations
Sept 23	**Exam 1**	8.1 – 8.6, 8.8
Sept 24		Last day to withdraw
Sept 26 – Oct 15	12.1 – 12.4	Orthogonal Functions and Fourier Series
Sept 30		**WW 4 due online by 8pm** covers 10.1 – 10.2
Oct 1		**HW 2 due to MA 214 by 4pm**
Oct 7		**WW 5 due online by 8pm** covers 12.1 – 12.2
Oct 13		Homecoming vs W Virginia
Oct 14		**WW 6 due online by 8pm** covers 12.3
Oct 15		**HW 3 due to MA 214 by 4pm**
Oct 17 – Nov 9	13.1 – 13.6, 13.8	Boundary Value Problems in Rectangular Coordinates
Oct 22		Mid-semester grades due
Oct 28	**Exam 2**	10.1 – 10.2, 12.1 – 12.4
Nov 4		**WW 7 due online by 8pm** covers 13.1, 13.3
Nov 5		**HW 4 due to MA 214 by 4pm**
Nov 11		**WW 8 due online by 8pm** covers 13.4 – 13.5
Nov 18	**Exam 3**	13.1 – 13.6, 13.8
Nov 12 – 26	14.1 – 14.3	Boundary Value Problems in Other Coordinate Systems
Nov 28 – Dec 3	Chapter 15 (Selected Topics)	Integral Transforms
Nov 29		**WW 9 due online by 8pm** covers 14.1
Nov 30		**HW 5 due to MA 214 by 4pm**
Dec 5		Last day of classes and Review
Dec 6		Individual study day
Dec 7	**Final Exam**	Chapters 8 – 15
Dec 12		Fall semester ends
Dec 13		Grades due for graduating students
Dec 17		Final grades due