Fall 2013 Math 3350-10 Higher Math for Engineers & Scientists I

Instructor: Dr. Alexander Solynin	**Place:** MA 109
Office Hours: M 2:00-3:50 T 4:00-5:00 W 2:00-4:00 or by appointment	**Text:** *Advanced Engineering Math*ematics, 5th Edition by Dennis G. Zill & Warren S. Wright
Office: MA 231	**Time:** 11:00-12:20 TT
Phone: (806) 834-7280	**Prerequisites:** 2350 or 2450
Email: alex.solynin@ttu.edu	**Website:** None

About the Course: This course covers topic in ordinary differential equations. Topics to be covered include: First-order differential equations; Modeling with first-order equations; Higher-order differential equations; Laplace transform; Series solutions of linear equations.
We will cover **Chapters 1 –5**. The goal here is developing the student's analytic and geometric insights into some concepts of the theory of differential equations, and applying these concepts to problem solving and "real world application".

Calculators: Calculators are allowed and may be useful in class. **Calculators are not allowed on the Final, in-class Exams, and Quizzes.** Time will not be spent in class on calculator instruction.

Formula sheets: At least one class before the Final and in-class exams, I will provide students with a page, valid for that particular exam, where you may write (do not type!) formulas and theorems, which you are going to use in class. Students are not allowed to use their own pages as formula sheets in class.

Student Learning Outcomes: Math 3350 students will study topics of differential equations, their solutions, and applications to physical sciences and engineering. In particular the students will learn to: a) recognize a differential equation and its solution; b) compute solutions of first order differential equations; c) compute solutions of higher order differential equations; d) use the Laplace transform; e) use the fundamental properties of power series to solve linear differential equations.

Methods for Assessment of Learning Outcomes: The expected learning outcomes for the course will be assessed through graded activities and ungraded activities. The graded activities include exams, homework, and quizzes. The ungraded activities will be used to monitor your progress. A variety of these ungraded assessment techniques may be employed, including problems to be completed during class, direct questioning of students, answering students questions in class, one-minute classroom assessment techniques, and discussions during office hours.

General Policies:
In general, no missed in class exams and quizzes will be made up and no homework will be accepted after the deadline. Whether an absence is excused or unexcused is determined solely by the instructor with the exception of absences due to religious observance and officially approved trips described below.

Illness and Death Notification:
The Center for Campus Life is responsible for notifying the campus community of student illnesses, immediate family deaths and/or student death. Generally, in cases of student illness or immediate family deaths, the notification to the appropriate campus community members occur when a student is absent from class for four (4) consecutive days with appropriate verification. It is always the student's responsibility for missed class assignments and/or course work

during their absence. The student is encouraged to contact the faculty member immediately regarding the absences and to provide verification afterwards. The notification from the Center for Campus Life does not excuse a student from class, assignments, and/or any other course requirements. The notification is provided as a courtesy.

Academic Integrity: It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. There will no tolerance for cheating or plagiarism. Texas Tech University policies will be enforced in such cases.

Academic Misconduct:
"It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. The attempt of students to present as their own any work that they have not honestly performed is regarded by the faculty and administration as a serious offense and renders the offenders liable to serious consequences, possibly suspension."

Students with Disabilities:
Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405.

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. Notification must be made in writing and delivered in person no later than 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.

Important Dates:
Monday, August 26 – Classes begin.
August 29 - Last day to add a course.
Monday, September 2 – Labor Day Holiday.
September 12 - Last Day to Drop a Course without penalty.
October 28 - Last Day to Drop a Course.
November 27-December 1 – Thanksgiving Vacation.
November 26-December 5 – Period of no examinations.
Wednesday, December 4 - Last Day of classes.
Wednesday, December 11, 1:30 p.m.-4:00 p.m.   **Final Exam.**

STUDENT EVALUATION:

- Final examination – comprehensive, course wide exam written by the instructor.

- ◆ **Wednesday, December 11, 1:30 p.m.-4:00 p.m**.   **FINAL EXAMINATION**   **180 pts**
  This exam is scheduled before the semester begins.
  Students should **eliminate any conflicts NOW.**

- **IN-CLASS EXAMS:** September 26, November 7 **2×120 = 240 pts**
  Each exam consists of 8-12 problems
- 15 min **QUIZZES**: **7×20 = 140 pts**
  Each 15 minute quiz consists of 2 problems**: 2×10 = 20 pts**
- **HOMEWORK**: I will collect homework seven times and I will grade 5-10 problems of these homework assignments.
  Each homework is worth 20 pts: **7×20 = 140 pts**
- **Perfect attendance** (≤2 missed classes,
all excused absences must be supported by official notes). **30 pts**

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- **MAXIMAL TOTAL:** **730 pts**

GRADING PROCEDURE:

A - **90 - 100%**

B - **80 - 89%**

C - **70 -79%**

D - **60 - 69%**

F - **≤ 59%**

Course Calendar

Date	Textbook	Tentative Lecture Topics
Aug. 27	Section 1.1	Definitions and terminology.
Aug. 29	Section 1.2	Initial-value problems.
Sep. 3	Section 2.1	Solution curves without solution.
Sep. 5 **Q1**	Section 2.2	Separable equations.
Sep. 10	Section 2.3	Linear equations.
Sep. 12	Section 2.4	Exact equations.
Sep. 17 **Q2**	Sections 2.5&2.6	Solutions by substitutions. Numerical method.
Sep. 19	Section 2.7	Linear models.
Sep. 24	Section 2.8	Nonlinear models.
Sep. 26	**Lecture Exam #1 covered Sections 1.1 – 2.8.**	
Oct. 1	Section 3.1	Theory of linear equations.
Oct. 3	Section 3.2	Reduction of order.
Oct. 8 **Q3**	Section 3.3	Homogeneous linear equations with constant coefficients.
Oct. 10	Section 3.4	Undetermined coefficients.
Oct. 15 **Q4**	Section 3.5	Variation of parameters.
Oct. 17	Section 3.6	Cauchy-Euler equation.
Oct. 22	Section 3.8	Linear models: Initial-value problems.
Oct. 24 **Q5**	Section 4.1	Definition of the Laplace transform.
Oct. 29	Section 4.2	The inverse transform and transform of derivatives.
Oct. 31	Section 4.3	Translation theorems.
Nov. 5	Section 4.4	Additional operational properties.
Nov. 7	**Lecture Exam #2, covered Sections 3.1 – 4.4.**	
Nov. 12	Section 4.5	The Dirac delta function.
Nov. 14 **Q6**	Section 5.1	Solutions about ordinary points.

Nov. 19	Section 5.2	Solutions about singular points.
Nov. 21 **Q7**	Section 5.3	Special functions.
Nov. 26	Review of the course.	
Dec. 2	Review of the course.	
December 11	**Wednesday**	**1:30p.m. – 4:00 p.m. FINAL EXAM**

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Tentative Homework Assignments

Section	Assignment
HW1	
1.1	1,7,11,13,17,21,27,31,33
1.2	3,7,9,11,15,19,25,29,31
2.1	1,7,11,13,19,21,25
HW2	
2.2	1,5,7,17,19,21,25
2.3	1,5,9,15,21,23,25,27,29
2.4	1,3,7,11,13,17,21,23,27,29,31
HW3	
2.5	1,3,7,11,13,15,19,21,23
2.6	1,3,5,9
2.7	1,3,9,11, 13,21,23,29
2.8	1,3,5,11,15,19
HW4	
3.1	1,3,9,13,19,23,27,31,35
3.2	1,3,7,11,13,17,19
3.3	3,5,11,15,19,25,31,35,37,39
HW5	
3.4	1,3,7,13,21,27,31,37
3.5	1,5,9,13,19,21,23
3.6	1,7,9,13,21,25,31
HW6	
4.1	1,5,9,15,17,21,23,27,33,37,41
4.2	1,3,7,11,17,23,27,31,35,41
4.3	3,5,7,11,19,21,23,25,37,43,55
HW7	
4.4	1,3,9,13,21,27,31,39,41
4.5	1,3,7,9,11
5.1	3,13,15,19,21,25,29,31
5.2	1,3,5
5.3	1,3,7,11,15