Math 2860-006 Elementary Differential Equations Syllabus Spring 2014

Time and Location: MWF 12:00-12:50 PL 3050
Instructor: Seung-Moon Hong, UH2030J, (419)530-2804, seungmoon.hong@utoledo.edu
Office hours: M 3:30-5:00, T 11:00-2:00, W 11:00-11:30

Textbook: *Elementary Differential Equations*, Tenth edition, by Boyce and Diprima
Catalog Description: An introduction to the analysis and solution of ordinary differential equations with emphasis on the fundamental techniques for solving linear differential equations.
Prerequisites: Passing grade in Math 2850 or math 2950. Students who enroll in Math 2860 but have not passed either prerequisite may be administratively dropped from the class.
Resources: There are resources available for students who need extra help outside my office hours. For this course the most reliable source of tutorial help can be found at the Mathematics Learning and Resource Center, B0200, located in the basement of Carlson Library-phone ext. 2176. It operates on a walk-in basis. LEC Tutoring Hours: Monday/Thusday 9 am–8 pm, Tuesday/Wednesday 9 am–9pm, Friday 9 am–2 pm.

Learning objectives: Below is the list of learning objectives. At least 70% of the course time will be devoted to these essential outcomes. These objectives are listed again in the chronological list of topics at eh end of this syllabus.

- **Slope fields**: Understand the relationship between slope fields and solution curves for differential equations. Use a slope field and an initial condition to estimate a solution curve to a differential equation.
- **Standard equations**: Solve first-order differential equations that are separable, linear or exact.
- **Other equations**: Solve first-order differential equations by making the appropriate substitutions, including homogeneous and Bernoulli equations.
- **Applications**: Use linear or non-linear first-order differential equations to solve application problems such as exponential growth and decay, falling objects and solution mixtures.
- **Homogeneous equations**: Solve higher-order homogeneous linear equations with constant coefficients.
- **Undetermined Coefficients**: Solve higher-order nonhomogeneous linear equations with constant coefficients by the method of undetermined coefficients.
- **Variation of parameters**: Solve higher-order nonhomogeneous linear equations by the method of Variation of parameters.
- **Applications**: Use linear second-order differential equations to solve application problems such as spring/mass system motion problems and three component series circuits.
- **Laplace transform**: Perform operations with Laplace and inverse Laplace transforms to solve higher-order differential equations.

Homework: It will be assigned and graded weekly. Late homework will not be accepted for any reason.
Quizzes: There will be a quiz weekly. Some will be announced and some will not. No late quiz is accepted.
Exams: There will be two in class exams and a comprehensive final exam given during scheduled final exam period for the section.

Calculator: No calculators with symbolic or graphing capabilities are allowed on quizzes and exams. Cell Phones/Smart Phones are not allowed during quizzes and exams.
Cell Phones and Laptop Computer Usage: Please turn off your cell phone and keep it stored away. You can use a laptop computer to take notes, but it cannot be used for any other purpose.

Attendance: Your attendance to all classes is strongly encouraged. Any announcements made in class regarding the schedule of future classes, exams or other information takes precedence over this outline.
Missed Quizzes and Exams: If you miss a class you are responsible for obtaining the material, notes, etc. Absence for quizzes and exams can only be excused if covered by the University's missed class policy. The policy specifically mentions absences from class may be excused for personal emergencies, religious observances, participation in certain UT sponsored activities, and government required activities. For more information see http://www.utoledo.edu/facsenate/missed_class_policy.html. The student must contact me in advance by phone, e-mail or in person, provide official documentation to back up his or her absence, and arrange to make up the missed item as soon as possible.

Drop/Withdrawal: The last day to drop or add this course is the Friday of the second week of classes. The last day to withdraw from this class with a grade of W is the Friday of the tenth week of classes.
Academic Honesty:Successful completion of this course requires personal integrity and honest academic effort. Any dishonest activities will not be tolerated in this course. Any student who engages in dishonest behavior will, at the instructor's discretion, fail the exam, fail the course, or more serious consequences. See the University's "Policy Statement on Academic Dishonesty".
Non-Discrimination Policy: The University of Toledo is committed to a policy of equal opportunity in education, affirms the values and goals of diversity.
Students with Disabilities: The University will make reasonable academic accommodations for students with documented disabilities. Students should contact the Office of Accessibility (Rocket Hall 1820; 419.530.4981; officeofaccessibility@utoledo.edu) as soon as possible for more information and/or to initiate the process for accessing academic accommodations. For the full policy see: http://www.utoledo.edu/success/academicaccess/sam/index.html
Students Privacy: Federal law and university policy prohibits instructors from discussing a student's grades or class performance with anyone outside of university faculty/staff without the student's written and signed consent. This includes parents and spouses. For details, see the "Confidentiality of student records (FERPA)" section of the University Policy Page at http://www.utoledo.edu/policies/academic/undergraduate/index.html.

Grading: The following percentages are assigned to the components of the student's grade. Homework 15%, Quizzes 15%, Exam I 20%, Exam II 20%, Final Exam 30%.

The final letter grade will be based on your total average as follows:

Total average	below 60%	60% – 69%	70% – 79%	80% – 89%	90% – 100%
Grade	F	D	C	B	A

Important Dates:

Last day to add/drop	Jan 17
Exam I	Feb 07
Exam II	Mar 14
Last day to withdraw	Mar 21
Final Exam	Apr 28, 12:30-2:30

Schedule:

Week	Subject	Sections
1	Direction fields, Linear equations	1.1, 1.2, 1.3
2	Integrating factors, Separable equations, Modeling	2.1, 2.2, 2.3
3	Uniqueness, Stability, Integrating factors	2.4, 2.6 (not 2.5)
4	Existence, Second order equations	2.8, 3.1
5	Fundamental solutions, Independence, Exam I	3.2, 3.3
6	Complex roots, Repeated roots	3.4, 3.5
7	Nonhomogeneous equations, Applications	3.6, 3.7
8	Higher order equations, Homogeneous equations	4.1, 4.2
9	Nonhomogeneous equations, Exam 2	4.3, 4.4
10	Laplace transform	6.1, 6.2
11	Step functions, Impulse functions	6.3, 6.4, 6.5
12	Convolution integral	6.6
13	Linear algebraic equations	7.1, 7.2, 7.3
14	Homogeneous linear system	7.4, 7.5, 7.6
15	Repeated eigenvalues, Nonhomogeneous linear system	7.7, 7.8, 7.9