Ordinary Differential Equations

Math 225
Summer Session II 2014
Lecture: M W Th **1:00 – 3:05 pm** **IT 227**

Instructor: Ms. Jyoti Saraswat
Office: Math/Psych 237, phone 410–455–3785
Office hours: Monday and Thursday 12:00–1:00 pm or by appointment.
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Textbook required: Stanley J. Farlow, *An Introduction to Differential Equations and Their Applications,* ; Dover Publications, 2006.
Please bring your textbook with you to every class. A list of errata of this textbook (compiled by Dr. Rostamian) is available at http://www.math.umbc.edu/ rouben/farlow-errata.html. Print out a copy of this list of errata, for you to use as a reference throughout the semester.

Testing and grading: The usual 90% – 80% – 70% – 60% grading system will be used in this course. Your grade will be calculated as follows:

HW	total 5 , worth 50 points each	=	250 points	(31.25%)
Exams	one in-class, worth 200 points	=	200 points	(25%)
Quizzes	4 in-class, worth 25 points each	=	100 points	(12.5%
Class participation		=	50 points	(6.25%)
Final Exam		=	200 points	(25%)
TOTAL		=	800 points	(100%)

Course objectives: Topics of this course include solutions of first- and second order linear differential equations, non-linear exact and separable equations, integrating factors, homogeneous equations, higher-order linear equations, initial value problems, solutions as functions of the equation parameters, and Laplace transforms.

Attendance and makeup policy: Attendance is crucial to success in this class. We will be covering new material at a rapid rate, and if you fall behind, it will be very difficult to catch up. Make-up exams will be given **at my discretion**, in general only in situations where there is a conflict with a **sanctioned university activity** of which I have been notified **at least a week in advance**. Such activities may include things like a course conflict or an athletic event. I will excuse a missed exam due to illness only if I am notified **before the exam**, and only if you furnish a **signed doctor's note** at the earliest available opportunity. There is no excuse for being habitually late to class. It disturbs the instructor as well as the other students and it will not be tolerated.

Homework : Homework will be assigned each class but will be collected once a week, i.e. every Monday. Homework will be due at the beginning of the class. Homework turned in via my mailbox will not be graded at all. Only selected problems will be graded but you must turn in all assigned problems to get points for completion. **Late home work will not be accepted.** The problems will involve material from the lectures and from the assigned reading. You are allowed to work with each other but you are expected to write your own answers. Do not wait until the last minute to start the homework!

Exams: There will be one in-class exam given during the lecture: on **Thursday, July 24th**. Exam will be held in the same room as your usual lecture.

All exams will be **closed-notes, closed-books, and no calculators are allowed**. A missed exam will be counted as a zero. See the attendance policy, above, for the only exceptions to this rule.

Final exam: The final exam will be held in-class **on August 14th**.

Class participation: The class participation points will be awarded based on attendance, class behavior, active involvement in classroom activities, turning assignments in time etc. Playing on your phone, laptop or any other smart device may count against your class participation points. Please do not give me excuses. If you have enrolled in the class, make time for it.

Email etiquette: Please draft professional emails, when communicating with me or your peers. Emails should not be confused with text messages. Avoid sending multiple emails to me about homework problems. This will save a lot of time, yours and mine, and you will get a faster response from me. Also the best way is to come to my office hours with your questions. You should check your email at least twice daily. If you are making an appointment with me, please acknowledge the email to indicate your further course of action.

Academic integrity: By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include but is not limited to suspension or dismissal. To read the full Student Academic Conduct Policy, consult the UMBC Student Handbook, the Faculty Handbook, or the UMBC Policies section of the UMBC Directory. `http://www.umbc.edu/provost/integrity/faculty.html`

Accommodations: UMBC is committed to eliminating discriminatory obstacles that disadvantage students based on disability. Student Support Services (SSS) is the UMBC department designated to:

- receive and maintain confidential files of disability–related documentation,
- certify eligibility for services,
- determine reasonable accommodations,
- develop with each student plans for the provision of such accommodations, and
- serve as a liaison between faculty members and students regarding disability–related issues.

If you have a disability and want to request accommodations, contact SSS in the Math/Psych Bldg., room 213 or at 410–455–2459. SSS will require you to provide appropriate documentation of disability. If you require accommodations for this class, make an appointment to meet with me to discuss your SSS-approved accommodations.

Class website: Course information (including this syllabus, and homework assignments) will be available at the Blackboard website: `http://my.umbc.edu/go/blackboard`

Tentative schedule:

Week	Day	Date	Sections Covered	
1	M	7/7	1.1: Basic Definitions and Concepts	
			1.2: Some Basic Theory	
	W	7/9	2.1: First-Order Linear Equations	
			2.2: Separable Equations	
	Th	7/10	2.3: Growth and Decay	**Quiz 1**
			2.4: Mixing Phenomena	
2	M	7/14	2.5: Cooling and Heating Phenomena	**HW 1**
			2.6: More Applications	
	W	7/16	2.7: The Direction Field and Eulers Method	
			3.1: Introduction to Second-Order Linear Equations	
	Th	7/17	3.2: Fundamental Solutions of the Homogeneous Equation	**Quiz 2**
			3.3: Reduction of Order	
3	M	7/21	3.4: Homogeneous Equations with Constant	**HW 2**
			Coefficients: Real Roots	
			3.5: Homogeneous Equations with Constant	
			Coefficients: Complex Roots	
	W	7/23	3.6: Nonhomogeneous Equations	
			3.7: Method of Undetermined Coefficients	
	Th	7/24	**Exam I, Chapters 1,2, 3(section 3.1-3.4)**	
4	M	7/28	3.7 (cont.)	**HW 3**
			3.8: Variation of Parameters	
	W	7/30	3.9: Mechanical Systems and Simple Harmonic Motion	
			3.10: Unforced Damped Vibrations	
	Th	7/31	3.11: Forced Vibrations	**Quiz 3**
			5.1: Definition of the Laplace Transform	
5	M	8/4	5.1 (cont.)	**HW 4**
			5.2: Properties of the Laplace Transform	
			5.3: The Inverse Laplace Transform	
	W	8/6	5.4: Initial-Value Problems	
			5.5: Step Functions and Delayed Functions	
	Th	8/7	5.6: Differential Equations with	
			Discontinuous Forcing Functions	**Quiz 4**
			5.7: Impulse Forcing Functions	
6	M	8/11	6.1: Introduction to Linear Systems	**HW 5**
			6.2: Review of Matrices (Read p. 323-328 prior to this class)	
			6.3: Basic Theory of First-Order Linear Systems	
	W	8/13	6.4: Homogeneous Linear Systems with Real Eigenvalues	
			6.5: Homogeneous Linear Systems with Complex Eigenvalues	
	Th	8/14	**Final Exam (cumulative, 125 minutes)**	

Disclaimer:
The instructor reserves the right to modify the information given here for the class. The exam dates and the HW dates are subject to change. The changes, if any will be announced in the class and also via e-mail. It is the student's responsibility to stay informed.