

MATH 3323 - Differential Equations - 3 credit hours CRN# 30407
Spring 2016 Fugitt 131 MWF 9:30-10:20

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Office Hours: MW - 10:30-1:00 TR - 12:20-1:50 F - 10:30-12:30

Textbook: (required) *Fundamentals of Differential Equations* (Eighth Edition) by Nagle, Saff, and Snider

Course Description: Concepts and topics explored in this class include first and second order ordinary differential equations, the Laplace transform, and matrix systems of ordinary differential equations. **Prerequisite:** Math 2325

Homework: Homework will be assigned for each section covered in class. These problems will help you gauge where you stand with regard to the material that could appear on a test. If you are unable to successfully complete the homework problems, then you will likely be unable to complete test problems. Therefore, please be prepared to spend many hours outside of class completing homework problems.

Tests (250 points): There will be six mid-term tests, each worth 50 points. Although tests will not be given outside of class, only your best five (out of six) will count toward your final grade. Furthermore, if you are involved in a school-related function, then you will be permitted to take your test **early**. If you are ill or are experiencing a personal crisis, then a make-up test may be given once your circumstances have been documented (e.g., with a note from an office where you have been treated).

Final Exam (125 points): There will be a cumulative final exam worth 125 points.

Grades: The following scale will be used for assigning grades:

[335, 375]	-	A
[298, 335)	-	B
[260, 298)	-	C
[223, 260)	-	D
[0, 223)	-	F

Attendance: Excessive absenteeism will adversely impact your final grade. In particular, any student with $n > 2$ absences will have $n - 2$ points deducted from her/his final score. For example, a student with five absences who earned 337 of the 375 possible points will have a final score of 334 (yielding a final grade of B).

Student Learning Outcomes

- **Course:** Increase depth of knowledge by practicing qualitative, numerical, and analytic techniques for understanding solutions to ordinary differential equations.
- **Program/Institutional:** Application and Integration of Knowledge.

Important Dates

Last day to register or add a class: Tuesday, January 26

Spring break (no classes): Monday-Friday, March 14-18

Good Friday (no classes): Friday, March 25

Last day to drop a class or withdrawal: Friday, April 8

Final exam: Wednesday, May 11 at 8:00-10:30

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The following list is a tentative schedule for this semester.

<u>Week</u>	<u>Section</u>	<u>Problems</u>
1-3	1.1	1-13 odd
	1.2	3-13 odd, 22
	1.3	1,3,5,11,13
	1.4	1-7(odd)
	2.2	1-13odd (omit 5), 17, 19, 21, 33
	2.3	1-9odd, 13-19odd
	2.4	1-17odd, 21
	Test 1	
	2.5	1-13 odd
	3.2	1,3,9,19
4-6	3.4	1 (use " e^{-10t} is small" to find t without a calculator) 21 (limiting velocity is just the velocity as $t \rightarrow \infty$)
	3.7	1,3,5 (Do not worry about showing whether $\partial f/\partial y$ is bounded.)
	4.1	1,2
	4.2	1-25 odd
	Test 2	
	4.3	1-17odd, 21-25odd
	4.4	9-23odd, 27-32
	4.5	1,3,5,17,20,23,25,29,31 (use $10 = e^{\ln 10}$), 33 (use $\cos^3(t) = (1/4)\cos(3t) + (3/4)\cos(t)$)
	4.6	1,3,9
	Test 3	
9	Spring Break	
10-11	4.7	9,11,19,30,37,39,41
	5.2	3,7(Shortcut: If you solve for v first, then eliminate u' before substituting v back into the system), 15,31(just set up the system)
	5.3	1,3,10,13
	5.4	1,3,7(separate, and integrate by parts), 11(also, use the phase plain portrait to sketch the solutions of the original system that correspond to the trajectories that are on the line $y = -x$. Finally, compare your sketches to the exact solutions corresponding to the trajectories on $y = -x$, which you can find by separating variables after substituting $y = -x$ in the system).
	Test 4	
	7.2	1,3,5,7,13,15
	7.3	23
	7.4	1,3,5,11,13,15,21,23,25
	7.5	1,3,5,15,17,19,25
	7.6	51
	7.7	1,5,7,9,13(hint: $f(t)$ is a convolution), 31
12-14	Test 5	
	8.1	9(hint: if $1 \leq c \leq 1.5$, then $\frac{6}{1.5} \leq \frac{6}{c} \leq \frac{6}{1}$.)
	8.2	17,21,23,34,35
	8.3	11,13,15,19,21,25,29
	8.4	7,11
	Test 6	
15-16		

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Class Attendance and Student Success: The Faculty Handbook states: At Lindsey Wilson College students are responsible for regular class attendance, in-class participation, and completion of assignments. Specific expectations concerning attendance and class performance in each course are stated in the course syllabus. When a pattern of excessive absence or other unsatisfactory performance occurs, the student is subject to any (or all) of the following actions by his or her instructor:

1. Request that the student make special arrangements to improve his or her performance (e.g., meeting with a tutor);
2. Communicate unsatisfactory performance to the EWS (Early Warning System);
3. Request that the student complete an Academic Early Warning Contract; and
4. Place the student on attendance probation, whereby an additional unexcused absence would result in a grade of F for the course.

The Handbook addresses authorized activities and absence: While a student's principal responsibility is to the academic program, the living-learning nature of campus life may impose additional and sometimes conflicting expectations and demands on the individual. Participation in student government, clonal activities and athletic events are examples of authorized activities that may create conflicts for the student. This policy seeks to reduce those ambiguities:

1. Absences for authorized obligations (e.g., athletic events, choir tours, field trips in other classes, etc.) are not counted toward the maximum number of allowed absences which an instructor may have specified in a course syllabus nor may a student's grade be reduced for having an authorized absence if all work missed is made-up.
2. Students are responsible for completion of class work missed due to an authorized absence. The work must be made up within a reasonable (defined by instructor) length of time.
5. It is the student's responsibility to communicate with the instructor *prior* to the authorized absence.
6. By the end of the first week of classes, coaches are expected to communicate directly and clearly with instructors as to schedules and rosters of students involved, including subsequent follow-up as changes occur; sponsors, directors, and teachers responsible for other activities should notify faculty as far in advance as possible.
7. Faculty are encouraged to remind students that participation in extracurricular activities (intercollegiate athletics in particular) places additional demands and responsibilities on them and requires that other absences be kept to a minimum.

Make-ups: All requests for exam make-ups must be submitted in writing (via email) to the instructor. The instructor reserves the right not to grant make-ups of any kind for absences not deemed excused by College policy.

Academic Integrity: Academic integrity is essential to the existence of an academic community. Every student is responsible for fostering a culture of academic honesty, and for maintaining the integrity and academic reputation of Lindsey Wilson College. Maintaining a culture that supports learning and growth requires that each student make a commitment to the fundamental academic values: honesty, integrity, responsibility, trust, respect for self and others, fairness and justice.

To foster commitment to academic integrity, faculty are asked to require each student to place and sign the following Honor Code on tests, exams and other assignments as appropriate: On my honor as a student, I have neither given nor received any unauthorized aid on this assignment/exam.

Violations of the academic integrity policy include cheating, plagiarism or lying about academic matters. Plagiarism is defined as any use of another writer's words, concepts, or sequence of ideas without acknowledging that writer by the use of proper documentation. Not only the direct quotation of another writer's words, but also any paraphrase or summary of another writer's concepts or ideas without documentation is plagiarizing that writer's materials. Academic dishonesty is a profoundly serious offense because it involved an act of fraud that jeopardizes genuine efforts by faculty and students to teach and learn together. It is not tolerated at Lindsey Wilson College.

Students who are determined to have plagiarized an assignment or otherwise cheated in their academic work or examinations may expect an "F" for the activity in question or an "F" for the course, at the discretion of the instructor. All incidents of cheating or plagiarism are reported by the instructor to the Academic Affairs Office along with copies of all relevant materials. Each instance of cheating or plagiarism is counted separately. A student who cheats or plagiarizes in two assignments or tests during the same semester will be deemed guilty of two offenses. If the evidence is unclear, or if a second offense occurs, the VP for Academic Affairs or Associate Dean will work in cooperation with the Dean of Students to move the student before the campus Judicial Board for review. Violations will ordinarily result in disciplinary suspension or expulsion from the College, depending on the severity of the violation involved. Note: The College has purchased Turnitin.com, a web product used to detect plagiarized documents.

Questioning a Grade/Student Academic Complaint: A student, who wishes to question an assignment grade, or other academic issue, should follow the procedure below:

1. Whenever possible, the student will first go to the faculty member who has assigned the disputed grade. Complaints regarding grades should be made within seven (7) days of receipt of the disputed grade and, if possible, will be decided by the faculty member within seven (7) days of receipt. If the disputed grade is the final grade for the course, "receipt" is defined by when the final grade is posted online by the registrar. (Please refer to the next section for appealing a final grade.)
2. Unless there are extenuating circumstances, the student may, within seven (7) days request in writing a review of such decision by the Chair of the division in which the grade was assigned. Upon receipt of such request, that Chair will direct the faculty member and the student to each submit, within seven (7) days, if possible, a written account of the incident, providing specific information as to the nature of the dispute.
3. Upon receipt of these written accounts, the Chair will meet, if possible, within seven (7) days with the faculty member and the student in an effort to resolve the dispute and will render his or her decision in writing.
4. If either the student or the faculty member desired to appeal the decision of the Division Chair, the student or faculty member may, within seven (7) days by written request to the chair, ask that the matter be reviewed by a Grade Appeals Panel convened by the Academic Affairs Office.
5. If the disputed grade is assigned at the end of a fall or spring semester and the student and faculty member cannot meet to resolve the issue, the student should contact the faculty member by e-mail within seven (7) days of receipt of the disputed grade. If the issue cannot be resolved by e-mail within the time limit, steps 2, 3, and 4 of the appeal may extend into the beginning of the semester immediately following receipt of the disputed grade by following the timeline above.

A student who wishes to question a final grade should follow the procedure below:

1. Confer with the faculty member who assigned the disputed grade.
2. If the disputed cannot be resolved, a written request for a grade appeal must be submitted to the Academic Affairs Office before the first day of the semester following the one in which the grade was issued. The written request must include the specific bases for the appeal.
3. The Academic Affairs Office will convene a Grade Appeals Panel, comprised of the Vice President for Academic Affairs, the Associate Academic Dean, and the chair of the academic unit which houses the course for which the grade is appealed. If one of the members is the faculty member who issued the grade, an alternate will be appointed. The student and the faculty member may appear separately before the panel to explain their positions. The hearing is non-adversarial. Neither the faculty member nor the student may be accompanied by other individuals to the meeting of the Grade Appeals Panel. The Grade Appeals Panel will notify the student of its decision, if possible, within seven (7) days of the meeting.

Policy for Verification of Student Identity and Protection of Privacy: In compliance with United States Federal Higher Education Opportunity Act (HEOA), Public Law 110-315, all credit-bearing courses and programs offered through distance learning methods must verify that the student who registers for a distance education course or program is the same student who participates in and completes the course or program and receives academic credit. One or more of the following methods must be used:

- a) A secure login and pass code;

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- b) Proctored examinations; and/or
 c) Remote proctoring of one of more examinations using Tegrity or other technologies

Verification of student identity in distance learning must protect the privacy of student information. Personally identifiable information collected by the College may be used, at the discretion of the institution, as the basis for identity verification. For instance, a student requesting that their learning system password be reset may be asked to provide two or more pieces of information for comparison with data on file. It is a violation of College policy for a student to give his or her password to another student. Detailed information on privacy may be located at:
<http://www.lindsey.edu/media/319883/Online%20Services%20Privacy%20Policy%204.20.12.pdf>

Institutional Review Board (IRB) Policies: The Lindsey Wilson College Institutional Review Board (IRB) safeguards the rights and welfare of human participants in research and other research activities. Lindsey Wilson College faculty, staff, and students, which comprise its academic units, and facilities, are subject to the IRB policies. This includes any research for which a research agreement (e.g. MOU) identifies Lindsey Wilson College Institutional Review Board (IRB) as the IRB of record. All student-led human subject research must have a LWC faculty sponsor. All faculty members and students conducting human subject research are required to submit documentation of training on research involving human subjects that has been completed within two years of the onset of the proposed research. Online training is available at <http://php.nihtraining.com/users/login.php>.

Statement on Learning/Physical Disabilities: Lindsey Wilson College accepts students with learning disabilities and provides reasonable accommodation to help them be successful. Depending on the nature of the disability, some students may need to take a lighter course load and may need more than four years to graduate. Students needing accommodation should apply as early as possible, usually before May 15. Immediately after acceptance, students need to identify and document the nature of their disabilities. It is the responsibility of the student to provide to the College appropriate materials documenting the learning disability, usually a recent high school Individualized Education Program (IEP) and results from testing done by a psychologist, psychiatrist, or qualified, licensed person. The College does not provide assessment services for students who may be learning disabled. Although LWC provides limited personal counseling for all students, the College does not have structured programs available for students with emotional or behavioral disabilities. For more information, call Ben Martin at 270-384-7479.

Academic Success Center: The Academic Success Center, located in the Everett Building, offers peer tutoring to aid students in completing class assignments, preparing for exams and improving their understanding of content covered in a particular course. In addition, computers are available for student use.

Students are encouraged to utilize this Center as a resource for improving study strategies and reading techniques. The Center also offers assistance with other academic problems resulting from documented learning disabilities. All services are free of charge to all Lindsey Wilson College students (students with learning disabilities are responsible for providing documentation from an appropriate outside professional source such as a professional evaluation or school IEP). Please contact Maretta Garner, Tutor Coordinator at 384-8037 for further information and assistance.

Writing Center and Mathematics Center: The Writing Center (located in the Slider Humanities & Fine Arts Building), and the Mathematics Center (located in the Fugitt Science Building) are available for specialized tutoring at no charge to students. Please contact Jared Odd, Writing Center Coordinator, at 384-8209 or Linda Kessler, Math Tutor Coordinator, at 384-8115 for further information and assistance.

Final Exams: Final Exams for day classes are scheduled for the Fall 2014 semester on **December 8-12 and May 4-8** for the Spring 2015 semester. The academic calendar, which contains the schedule for finals, is in the College Catalog and course schedule listing. Please make any necessary flight arrangements after the final exam week. *Students will not be permitted to take early finals unless extenuating circumstances exist. Extenuating circumstance means illness, a verified family emergency or participation in officially sponsored travel in support of an event arranged by the College. Travel arrangements must be made in sufficient time that tickets may be obtained after final exams and the semester is officially over.* All requests for early finals must be made in person to the Academic Affairs Office.

Email Policy: All Lindsey Wilson College students are required to communicate with LWC faculty and staff via LWC (Lindsey.edu) email addresses only. Alternative email addresses should not be used when communicating with LWC faculty and staff.

Cell Phone Policy (cell phones, media players, computers, etc.): Student cell phones, media players, and computers will be off and out of sight during class time unless prior arrangement is made with the instructor. Pencils/pens, paper, textbook, and calculators are the necessary technologies for class sessions. Students who violate this policy will be dismissed from the class session and awarded an unexcused absence.

Adding/Dropping a Course: Students enrolled in the following courses cannot drop these classes during the semester: READ 0713, 0723, 0733, 0903, 1013 and 1023; STSK 1003; ENGL 0903 and 0904; and ESL 0803, 0804 and 0854.

For undergraduate classes at the Columbia campus, adding a course, dropping a course, or changing from one section of a course to another section of the same course requires the approval of the advisor and the instructor for each course involved as indicated on the Add/Drop Form. The change must be reported to the Business Office and the Registrar's Office on an Add/Drop Form, which may be obtained from the Registrar's Office. For AIM courses, adding a course, dropping a course, or changing from one section of a course to another section of the same course requires the approval of the Director of the Evening Program. For courses taught at Community sites, adding a course, dropping a course, or changing from one section of a course to another section of the same course requires the approval of the Site Coordinator for the campus. Permission to add courses will not be given after the last date for late registration. Authorization for dropping a course will not be approved after more than 75% of the instructional days for a course are completed, as outlined below:

Course	Deadline	Submitted by the Student to
Columbia undergraduate and graduate full semester courses	Not later than 30 days before the end of the semester	Registrar
AIM courses	By the sixth week of class	Registrar
Courses at Community Campuses	By the third weekend of class	Site Coordinator or the Registrar

If changes are not properly approved and officially reported as stated above, students will receive a grade of F in the courses for which they are officially registered, and they will be charged for all such courses. Students will not receive credit for changed or added courses unless they officially register for those courses.

