

MAT 275	MODERN DIFFERENTIAL EQUATIONS <u>LECTURE #: 22192</u>	Spring 2016
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***Important Note:** All items on this syllabus are subject to change. Any in-class announcement, verbal or written, is considered and official addendum to this syllabus. All course materials and information will be accessible through Blackboard Academic Suite (link on your “My ASU” page). Information regarding the computer labs will be accessible through the Blackboard LAB Site.

Instructor: Toby Sanders	Office: Wexler A339
SLN: 22192	Office Hour: Tuesday/ Thursday, 2:00 – 3:30pm
E-Mail: toby.sanders@asu.edu	Prerequisites: MAT 266 or MAT 271 with a C or better

Days, Time and place: M W, 4:30pm – 5:45pm in CDN 68

Course Description: Introduces differential equations, theoretical and practical solution techniques. Applications. Problem solving using MATLAB.

Textbook: *Elementary Differential Equations*, by Boyce dePrima - WileyPLUS, 10th edition.

Matlabs will be provided

Calculators: A graphing calculator (e.g. TI84 or Casio CFX-9850GB Plus) is recommended. Graphing calculators which perform symbolic manipulation (e.g. TI89, TI92, Casio FX2 or 9970G) will not be allowed for tests or quizzes.

Grading: The grade will be computed from the Final exam (30%), 2 Midterm Tests (20% each), Labs (15%), WebWork(15%) .

Grade Assignment	
A+	97% +
A	93% – 96.99%
A–	90% – 92.99%
B+	87% – 89.99%
B	83% – 86.99%
B–	80% – 82.99%
C+	77% – 79.99%
C	70% – 76.99%
D	60% – 69.99%
E	< 60%

Homework: Homework will be problems from WeBWorK, an online homework system. WeBWorK can be accessed at <http://webwork.asu.edu> . If you are not familiar with WeBWorK you should start by working out the Introduction set (the Introduction will not count towards the grade). No late assignments will be accepted. Due dates for WeBWorK are listed on the webpage. Student gets full credit for homework if his/her average Webwork score is at least 95 percent.

Suggested Problems: Textbook has answers for all problems. All problems, at least odd numbered problems are suggested for your exercise. Many of the test problems are similar to textbook problems and Webwork exercises.

ASU Video Lessons: <https://math.la.asu.edu/~surgent/video/index.html> this site contains all video lessons for the course. You are welcomed and encouraged to use this as a supplement for the lecture.

ATTENDANCE: Attendance is mandatory! Your instructor reserves the right to take attendance and to incorporate your attendance as part of your overall grade. **For classes that meet two days a week, the maximum number of absences is four. For classes that meet three days a week, the maximum number of absences is six. For classes that meet once**

a week (recitations), the maximum number of absences is two. Students who exceed the number of allowed absences will receive a grade of EN.

MATLAB Labs: There will be a total of six MATLAB computer labs. The weeks on which these labs are due are listed on the schedule in this syllabus, however, these dates may be subject to change.

You are not required to purchase MATLAB. MATLAB is installed on the computers in ECA 221. You can also use MATLAB at home and on any computer on campus through <https://citrix.asu.edu>.

Exams: Two tests will be given during the semester. *The best possible preparation for the exams is regular attendance and completion of assigned labs and homework.* All exams will be given in the Classroom on the dates indicated on the schedule shown below. **Your calculator program memory may be randomly viewed during any exam and will be cleared if anything suspicious is written therein.**

Exam	Sections	Test Dates
TEST 1	1.1-1.3, 2.1-2.7, 3.1, 3.2	2/24 in class
TEST 2	3.3-3.8, 6.1-6.4	4/6 in class
FINAL	Comprehensive	Monday, May 2, 2:30 - 4:20pm, in CDN 68

Final Exam: The final exam is **comprehensive** and will be administered in class.

Final Exam make up policies: The final exam schedule listed in the Schedule of Classes (<http://students.asu.edu/final-exam-schedule#fall>) will be strictly followed. Except to resolve those situations described below, no changes may be made in this schedule without prior approval of the Dean of the college in which the course is offered. Under this schedule, if a conflict occurs, or a student has more than three exams on one day, the instructors may be consulted about an individual schedule adjustment. If necessary, the matter may be pursued further with the appropriate dean(s). This procedure applies to conflicts among any combination of Downtown Phoenix campus, Tempe campus, Polytechnic campus, West campus, and/or off campus class. Make-up exams will NOT be given for reasons of a non-refundable airline tickets, vacation plans, work schedules, weddings, family reunions, and other such activities. Students should consult the final exam schedule before making end-of-semester travel plans.

Academic Integrity: ASU expects and requires all its students to act with honesty and integrity, and respect the rights of others in carrying out all academic assignments. For more information on academic integrity, including the policy and appeal procedures, please visit <http://provost.asu.edu/academicintegrity>

Course Policies:

- Students are responsible for assigned material whether or not it is covered in class. Students are responsible for material covered in class whether or not it is in the text. Working regularly on assigned problems and **attending class** is essential to survive. Expect to spend at least 6-10 hours weekly on homework/labs. You are expected to read the text, preferably before the material is covered in class.
- Make-up exams are at the discretion of the instructor and only in case of documented emergency. In any case, no make-up exams will be given unless the student has notified the instructor before the test is given. Messages may be left at the main office (965-3951) or through email (recommended).
- Cellular phones and pagers must be turned off during class. No texting, no ipods/ipads/laptops, etc.
- Arriving late to class will not be tolerated.

Cell phones and Electronic Devices:

Picture taking, talking or texting on your cell phone or any electronic device during class is prohibited and will be severely penalized. If you bring cell phones and/or any other electronic equipment to our classroom, make sure it/they is/are turned off before class begins. Any sounds produced by such devices are disruptive to the class and, as such, will not be tolerated and will be reported to the Office of the Dean of Students.

Tentative Lecture Schedule

Week of	Book sections covered	Observations
1/11	1.1, Some Basic Models; Direction Fields 1.2, Solutions of Some Differential Equation	
1/18	1.3, Classification of Differential Equations 2.1, Linear Equations; Method of Integrating Factors	Holiday Monday Jan 18
1/25	2.2, Separable Equations 2.3, Modeling with First Order Equations	Matlab Lab 1 due.
2/1	2.5, Autonomous Equations and Population Dynamics 2.7, Numerical Approximations: Euler's method	
2/8	8.2, Improvements on the Euler Method 2.4, Difference between linear and nonlinear equations	Matlab Lab 2 due.
2/15	3.1, Homogeneous Equations with Constant Coefficients 3.2, Solutions of Linear Homogeneous Equations; The Wronskian	
2/22	7.1, Introduction to Linear First Order Systems TEST 1 (Wed 2/24)	Matlab Lab 3 due.
2/29	3.3, Complex roots of the Characteristic Equation 3.4, Repeated Roots, Reduction of Order <u>Course Withdrawal Deadline</u> April 3, 2016	
3/7		Spring Break
3/14	3.5, Method of Undetermined Coefficients 3.7, Mechanical and Electrical Vibrations 3.8, Forced Vibrations	Matlab Lab 4 due.
3/21	6.1, Definition of the Laplace Transform 6.2, Solution of Initial Value Problem	
3/28	6.3, Step Functions 6.4, Differential equation with Discontinuous Forcing Functions	Matlab Lab 5 due.
4/4	6.5, Impulse functions TEST 2 (Wed 4/6)	
4/11	7.2, Review of Linear Algebra 7.3, Linear Algebraic Equations; Linear Independence, Eigenvalues, Eigenvectors	Matlab Lab 6 due.

4/18	7.5, Homogeneous Linear Systems with Constant Coefficients 7.6, Complex Eigenvalues	
4/25	7.8, Repeated Eigenvalues (6.6) The Convolution Integral (7.7) The Fundamental Matrices	<u>Complete Session Withdrawal Deadline</u> April 29, 2016
5/2	Final Exam	

NOTE:

- This syllabus is tentative and should not be considered definitive. The instructor reserves the right to modify it (including the dates of the tests) to meet the needs of the class. It is the student responsibility to attend class regularly and to make note of any change.
- It is a student's responsibility to verify that that they have in fact withdrawn from a class.
- Please schedule an appointment to see me during office hours if you have a disability that will require accommodations in this class.
- To qualify for disability accommodations at ASU, students must qualify for services through the Disability Resource Center (DRC), which is located on the 1st floor of the Matthews Center Building. 480.965.1234 (V), 480.965.9000 (TTY). Please complete this process as soon as possible.
- **The course withdrawal deadline is April 03, 2016.**
- It is a student's responsibility to verify that they have in fact withdrawn from a class.

Studying for the class: While diligent, timely completion of the online homework assignments is necessary to master procedural skills, this alone is usually insufficient to gain conceptual understanding. To master the concepts, you must:

- review and study your class notes and/or the textbook thoroughly with the goal to understand the connections between the concepts.

- create your own lists (or perhaps 3x5 cards) of definitions and theorems and commit them to memory like you would do with vocabulary in any language.

- take the in-class activities seriously and complete all the activities.

You must do all this continuously throughout the semester. You must have learned the definitions and theorems covered in each class session and started the corresponding section of the online homework by the time of the next class session. Failure to know the material covered in lectures will result in your inability to follow subsequent lectures, and the difference between where you are in your understanding and where you should be will be compounded with each lecture.

Relying on "just in time" cramming for exams is an ineffective study technique and will virtually guarantee failure in the class.

Tutoring is available at the **Math Tutor Center in WEXLR 116** and at the **Engineering Tutor Center, ECF 102**.

The math tutoring center located in PSA 116 is open for tutoring throughout the week. Their hours of operation are

- Monday-Thursday from 8:00 AM until 8:00 PM
- Fridays from 8:00 AM until 3:00 PM
- Sundays from 1:00 PM until 6:00 PM.

The **ASU Math Community Center** in PSA 303 is an excellent place to get help for the class. The MCC is open Monday to Friday, 10am to 7pm, starting on 1/19/2016.

ASU Learning Resource Center (LRC): The LRC, <http://asu.edu/lrc> provides counseling, tutoring in math (and many other subjects), supplemental instruction, and other types of support to students. LRC resources are

available in many residence halls and in the Memorial Union, Room 14. See the LRC web page for further information.

Classroom behavior

Classroom disturbances, including but not limited to: arriving late, talking in class and using cellular devices are not tolerated. Each student is expected to show respect for every student registered in the course.

An instructor may withdraw a student from a course when the student's behavior disrupts the educational process under USI 201-10

<http://www.asu.edu/aad/manuals/usi/usi201-10.html>

Students are required to adhere to the ABOR Student Code of Conduct:

http://www.asu.edu/studentaffairs/reslife/outreach/abor_code.htm

SoMSS and University Policies and Procedures

For semester deadlines related to enrollment, withdrawal or payments, see the academic calendar available at

<http://students.asu.edu/academic-calendar>

Attendance Policy:

- Attendance is mandatory and will be taken daily.
- For classes that meet three days a week, the maximum number of absences is 6, including the recitation section meetings.
- For classes that meet two days a week, the maximum number of absences is 4
- There are no “excused” absences other than for school-sanctioned activities or religious holidays.
- Students who exceed the maximum number of absences will receive a grade of EN.

Course Withdrawal: A student may withdraw from a course with a grade of **W** during the withdrawal period. The instructor's signature is not required. It is a student’s responsibility to verify that they have in fact withdrawn from a class.

The grade of Incomplete: A grade of “I” (incomplete) is given by the instructor only when a student doing acceptable work (that is a C or better) is unable to complete a course because of illness or other conditions beyond the student’s control. The student and instructor must complete a Request for Grade of Incomplete form if no grade has been reported. If a grade has been reported, the instructor must complete a grade change in the [Faculty Center](#).

The grade of “I” should be granted only when the student can complete the unfinished work with the same instructor. However, an “I” may be completed with an instructor designated by the department chair if the origi-

nal instructor becomes incapacitated or is not on campus. The student must arrange completion of the course requirements with the instructor.

The student has one calendar year from the date the grade of “I” is recorded to complete the course. A student does not reregister or pay fees for a course for which an “I” has been received in order to complete the course.

If the student completes the course within the calendar year, the instructor must submit the grade change using the Faculty Center, whether the student passed or failed the course.

[The form for incomplete requests mentioned in the policy is here

<https://students.asu.edu/sites/default/files/incompletegraderequest11012013.pdf>

A student seeking an incomplete is directed to this form. Once the student completes their part, they should bring it to the instructor for approval].

Instructor-Initiated Drop: At the instructor's discretion, any student who has not attended class during the first week of classes may be administratively dropped from the course. However, students should be aware that non-attendance would NOT automatically result in being dropped from the course. Thus, a student should not assume they are no longer registered for a course simply because they did not attend class during the first week. It is the student's responsibility to be aware of their registration status.

Final Exam Make-up Policy: The final exam schedule listed in the Schedule of Classes will be strictly followed. Exceptions to the schedule and requests for make-up examinations can be granted only by the Department Chair, Associate Department Chair or the Director of First Year Mathematics, and for one of the following reasons:

1. Religious conflict (e.g., the student celebrates the Sabbath on Saturday)
2. The student has more than three exams scheduled on the same day as the math final
3. There is a time conflict between the math final and another final exam.

Early Examination Requests (Reference: ACD 304–01)

Requests for early final examinations may not be granted by instructors. Requests that seem to have merit may be referred to the dean of the college in which the student is enrolled. If the dean finds that a student must leave early because of circumstances beyond the student's control, the dean may authorize arrangements whereby the student can complete the course work and take the final examination before leaving. Ordinarily, however, it will be necessary for the dean to advise the student to clear with each instructor and arrange for an “incomplete” grade in each course. Under the policy covering “incompletes,” the student must arrange to complete the course work and take the final examination within one calendar year. If the student is unable to return to the university to take a final examination for the removal of the “incomplete,” the dean may make arrangements for the student to take the final elsewhere, under reliable supervision.

Academic Integrity: Academic honesty is expected of all students in all examinations, papers, laboratory work, academic transactions and records. The possible sanctions include, but are not limited to, appropriate grade penalties, course failure (indicated on the transcript as a grade of E), course failure due to academic dishonesty (indicated on the transcript as a grade of XE), loss of registration privileges, disqualification and dismissal. For more information, see <http://provost.asu.edu/academicintegrity>.

Disability Accommodations: Qualified students with disabilities who will require disability accommodations in this class are encouraged to make their requests to me at the beginning of the semester either during office hours or by appointment. **Note:** *Prior to receiving disability accommodations, verification of eligibility from the Disability Resource Center (DRC) is required. Disability information is confidential.*

Establishing Eligibility for Disability Accommodations: Students who feel they will need disability accommodations in this class but have not registered with the Disability Resource Center (DRC) should contact DRC immediately. Their office is located on the first floor of the Matthews Center Building. DRC staff can also be reached at: [480-965-1234](tel:480-965-1234) (V), [480-965-9000](tel:480-965-9000) (TTY). For additional information, visit: www.asu.edu/studentaffairs/ed/drc. Their hours are 8:00 AM to 5:00 PM, Monday through Friday.

The grade of XE: A grade of XE is reserved for "failure for academic dishonesty." The grade goes on the student's transcript; the student needs to petition to have it removed after 1 year.

The grade of EN: A grade of EN is reserved for "failure due to excessive absences." The grade goes on the student's transcript.

Ethics: It's highly unethical to bring to your instructor's attention the possible impact of your mathematics grade on your future plans, including graduation, scholarships, jobs, etc. The instructor may exercise an option to withdraw you from the course if they think you are compromising the ability to assess your work independently of any other consideration. Students found to be involved in academic dishonesty will be removed from the class and a grade of E for the course will be submitted to the registrar. The student will be advised to repeat the course with another professor, possibly at another institution. This is the least action taken. Further, more serious actions may be taken if the situation indicated that such actions are appropriate. We will act very harshly against cheating during Quizzes or Exams.

For the university's complete policy regarding ethics, including cheating, plagiarism and other forms of academic dishonesty, see the Student Academic Integrity Policy at the following web address:

<http://provost.asu.edu/academicintegrity>

Student Conduct Statement: Students are required to adhere to the behavior standards of the Arizona Board of Regents Policy Manual [Code of Conduct](#), Academic Affairs Manual ACD 125 [Computer, Internet, and Electronic Communications](#), and the ASU Student [Academic Integrity Policy](#). Students are entitled to receive instruction free from interference by other members of the class. If a student is disruptive, an instructor may ask the student to stop the disruptive behavior and warn the student that such disruptive behavior can result in withdrawal from the course. An instructor may withdraw a student from a course when the student's behavior disrupts the educational process according to procedures of the Student Services Manual [SSM 201-10](#).

Note: The syllabus is tentative and should not be considered definitive. The instructor reserves the right to modify it (including the dates of the tests) to meet the needs of the class. It is the student responsibility to attend class regularly and to make note of any change. The Instructor also reserves the right to change class policies concerning homework due date, late assignments, etc.