

THE UNIVERSITY OF TEXAS AT EL PASO
COLLEGE OF SCIENCE
DEPARTMENT OF Mathematical Sciences

Course #: 21538
Course Title: Differential Equations (Math 2326)
Credit Hrs: 3
Term: Spring 2016
Course Meetings & Location: MW, 10:30-11:50 AM
LART 307
Prerequisite Courses: Calculus I and II. In particular, students should be familiar with the quadratic equation, techniques of integration and the method of partial fractions.

Course Fee: (if applicable)

Instructor: Dr. B. D. Rouhani
Office Location: Bell Hall 327
Contact Info: Phone # 747-6767
E-mail address: behzad@utep.edu
Fax # 747-6502
Emergency Contact

Office Hrs: MW, 3:00-4:00 PM, and by appointment.

Textbook(s), Materials: Required: P. Blanchard, R. L. Devaney and G. R. Hall, Differential Equations, Boston, Fourth Edition, 2012.
The textbook is required at all class meetings, and is intended to be read in full.
Graphing calculator with capabilities equivalent at least to the TI-85.

Suggested: (for more advanced and motivated students)

- 1) S. Ahmad and A. Ambrosetti, A textbook on Ordinary Differential Equations, Springer, 2014.
- 2) D. S. Jones, M. J. Plank & B. D. Sleeman, Differential Equations and Mathematical Biology, 2nd Edition, CRC Press (2010).
- 3) J. Cronin, Ordinary Differential equations, Introduction and Qualitative Theory, 3rd Edition, CRC Press (2008).
- 4) F. Brauer and J. A. Nohel, The qualitative theory of ordinary differential equations: An introduction, Dover publications, 1989.

Course Objectives (Learning Outcomes): The main objectives of this course include showing the students how differential equations appear in real life and physical phenomena, and teach them the main three methods, namely analytic, geometric and numerical methods, for studying differential equations. By the end of the course, the students should be able to make mathematical models involving differential equations for problems encountered in engineering, social and physical sciences, and to solve them by using one or a combination of the methods mentioned above. They should therefore be prepared to successfully continue their studies towards more advanced and specialized courses in their field.

Course The class is a student run class. Therefore besides the core lecture, as well as the computer demonstrations, the instructor will regularly ask questions to students who are expected and strongly encouraged to actively participate in the group discussions that will follow.

Activities/Assignments: The instructor will regularly assign homework. It is essential for your success in this class that you diligently work all the homework problems. Homework will include reading assignments, as well as group projects.

Homework for each section is due the next class after we finish that section. Late homework is not accepted. Homework should be stapled at home.

It is expected that you spend an absolute minimum of six hours a week outside of class on solving homework problems, working on the lab assignments, reading the textbook and reviewing your class notes.

List of Homework problems:

| Section Number | Problem Numbers |
|----------------|---|
| 1.1 | 3-5, 6,7, 12, 13, 14, 17, 18, 21-23. |
| 1.2 | 2, 3, 6, 9, 10, 11, 19, 20, 22, 23, 30, 32-35, 43. Group Project: # 40 |
| 1.3 | 2, 5, 7-10, 11-18. |
| 1.4 | 1, 4, 7, 8, 13, 15, 16. |
| 1.5 | 1, 3, 5-8, 9, 11-17 |
| 1.6 | 3, 4, 7, 8, 11, 12, 14, 17, 21, 22, 27, 28, 31, 32, 34-37, 41, 43. |
| 1.7 | 1, 2, 3, 18, 22, 23. Group Project: # 19-21. |
| 1.8 | 29, 30, 31 |
| 1.9 | 1, 2, 4, 9, 13, 14, 15-20 |
| 2.1 | 1-6, 8, 16, 19, 20, 22, 23 |
| 2.2 | 2, 5, 7, 9, 11, 12, 16-18, 20, 21, 23-26 |
| 2.4 | 1-4, 5-12 |
| 2.5 | 1, 3, 6. |
| 2.6 | 3-5, 8, 9, 11. |
| 3.1 | 6, 7, 9, 14, 15, 16, 17, 24, 27, 30, 31, 32-35 |
| 3.2 | 2, 4, 5, 8, 10, 13, 14, 15, 16-19, 22, 24, 25 |
| 3.3 | 2, 5, 8, 11, 12, 15, 16, 19, 20, 21, 27 |
| 3.4 | 1, 3, 6, 8, 9, 12, 14, 15, 16-18, 23-26 |
| 3.5 | 1, 3, 4, 5, 7, 8, 9, 11-13, 17, 19, 20, 22, 23 |
| 3.6 | 3, 5, 6, 8, 10, 12, 13, 16, 19-21, 24, 26, 28, 32 |
| 5.1 | 1, 3, 4-7, 15, 17, 18, 20 |
| 5.2 | 1, 3-5, 7, 8, 10, 12, 14 |
| 6.1 | 1, 4, 5-7, 10, 12, 14, 15, 17, 18, 20, 24, 25 |
| 6.2 | 1, 3, 7, 8, 11, 13, 14-16, 17, 18, 19(a), 20(a) |
| 6.3 | 1, 4, 5, 6, 8, 9, 11, 12, 17, 18, 27, 29, 30, 34, 35 |

Assessment of Course

Objectives:

Besides the group class discussions and the homework assignments that were mentioned above, quizzes will regularly be given in class on almost every section that will be covered in class, and will count towards your final grade as explained below in the grading policy. Although the group class discussions do not affect directly your final grade, however, actively participating in them will be considered when deciding about the final grades for the students on the border line (i.e. between C or D).

In addition, there will be a final comprehensive exam for this course.

Course Schedule: We will cover the following material according to the following tentative (subject to change) timeline:

| Week of | Sections covered | Events |
|-------------|----------------------|---|
| January 18 | 1.1, 1.2, 1.3 | No class on 1/18, Martin Luther King, Jr. Birthday |
| January 25 | 1.4, and review | |
| February 1 | 1.5, 1.6 | Wednesday 2/3 is the last day to drop without "W"(Census Day). |
| February 8 | 1.7, 1.8 | |
| February 15 | 1.9, and review | No class on 2/17, Pope Francis' visit to Ciudad Juarez |
| February 22 | 2.1, 2.2 | |
| February 29 | 2.4, and review | |
| March 7 | | No class from March 7-13, Spring Break |
| March 14 | 2.5, 2.6 | |
| March 21 | 3.1, and review | Friday, March 25 is the Cesar Chavez Birthday Observance, and the Spring Study Day, No classes. |
| March 28 | 3.2, 3.3 | Friday, April 1, is the last day to drop with an automatic "W". |
| April 4 | 3.4 and review | |
| April 11 | 3.5, 3.6 | |
| April 18 | 6.1, 6.2, and review | |
| April 25 | 6.3, 5.1 | |
| May 2 | 5.2, and review | No class on 5/6 (Dead Day) |
| May 9 | Finals week | Comprehensive Final exam is on Friday, May 13, at 10:00 AM, in LART 307 |

(NOTE: Final exams must be given at the scheduled time; any/all exceptions must be approved by both the department chair and the dean.)

Notes: 1) The instructor will NOT assign a "W" for students dropping the course after the deadline.

2) Help: There is plenty of help available to you provided you are willing to take advantage of it. The Tutoring and Learning Center, located on the third floor of the UTEP Library, tel. 747-5366, offers free tutoring. Also, besides my office hours I will gladly meet with you on a drop in basis any time I am free to do so. Talk to me before or after class or by phone or by email to set up an appointment.

Grading Policy: The usual grading scale will be used for this course (90 or above corresponds to an A, 80 to 89 is a B, 70 to 79 is a C, 60 to 69 is a D, below 60 is an F).

The final grade G will be calculated according to the following formula: $G = \text{Max}\{(0.9) Q + (0.1) H, F\}$

Where Q is the average grade of all quizzes, H is the homework grade, and F is the final exam's grade.

Make-up Policy: Make-up tests will only be given under extraordinary circumstances (as determined only by the instructor), and only if you notify the instructor prior to the exam date.

Attendance Policy:

- Attendance to all classes is required; late arrivals are not allowed; more than three consecutive absences without prior notice or justification will result in the student's drop from the class list with an "F".

Academic Integrity Policy: See UTEP's policy cited in <http://academics.utep.edu/Default.aspx?tabid=23785>

Civility Statement: Active participation and teamwork is strongly encouraged; use of cell phone and talking during class, which results in the disruption of other students, are not allowed.

Disability Statement: **If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass.**

Military Statement: If you are a military student with the potential of being called to military service and /or training during the course of the semester, you are encouraged to contact me as soon as possible.

t

- ***General remark:***

If you have problems with the course material, need to be absent for a test, or have any other circumstance that may affect your performance in the course, contact me as soon as possible. I will do everything I can to enable you to succeed in this course and I expect you to be as diligent in your efforts as I am in mine.

If you have any question, please send it to Dr. B.D. Rouhani via e-mail at behzad@utep.edu