

MATH 266: INTRODUCTION TO DIFFERENTIAL EQUATIONS

COURSE SYLLABUS

COURSE INFORMATION

Pre-requisite: MATH 265

Course Description: Solution of elementary equations by elementary techniques, Laplace transforms, systems of equations, matrix methods, numerical techniques, and applications.

INSTRUCTOR

Amanda K.F. Davis, Stevens Hall 212C, 701-774-4504, Amanda.k.davis@willistonstate.edu

Cell: 850-902-1427

Math Lab Hours/Office Hours: M 9a-6p T 9a-4p W 9a-4p R 9a-4p F 9a-4p

TEXTBOOK & MATERIALS

A First Course in Differential Equations, 11th (10th) edition, Dennis G. Zill

11th: 978-1-337-29312-9

10th: 978-1-111-82705-2

STUDENT LEARNING OUTCOMES

INSTITUTIONAL OUTCOMES

Institutional Outcome: #2. Students will use reasoning skills to analyze and solve problems.

PROGRAM OUTCOMES

Institutional Outcome: #2. Students will use reasoning skills to analyze and solve problems.

COURSE OUTCOMES

Analyze applications and write differential equations to model the behavior.

Distinguish between different types of differential equations.

Solve differential equations and communicate the results.

See the following webpage for further discussion:

<http://www.willistonstate.edu/Documents/Instruction/Student%20Learning%20Outcomes/MATH%20266COG.pdf>

ASSESSMENT TASKS (FOR COURSE OUTCOMES)

The general education outcomes and course objectives will be assessed by using: Bookwork, Quizzes, e-Portfolio, 4 Tests, and a Final.

- Participate in classroom activities demonstrating knowledge of key differential equation concepts.
- Recall and practice key differential equation concepts and techniques by completing assigned bookwork problems.
- Complete objective tests demonstrating mastery of concepts and process skills.
- Summarize understanding by completing essay questions about mastery of concepts.
- Bookwork will be assigned over every section covered in lecture and must be ATTEMPTED prior to the next class meeting. The students may ask for clarification of any bookwork problems, or review problems during OFFICE HOURS or in the Math Lab during their scheduled hours.
- We will have a DAILY QUIZ that must be COMPLETED before the next class, 4 BOOKWORKS, 4 TESTS, and ePORTFOLIO project, and a FINAL. Test problems will be similar to those assigned from quizzes, bookwork and review problems and therefore, it will be difficult to achieve a passing grade without completing the Quizzes and Bookwork.
- **In grading, I am as interested in your work as in your answers, so show as much work as reasonable, and do not just give the answers.**

PROCESS SKILLS

- Classify differential equations
- Model a differential equation with a direction field
- Distinguish between methods of solving a differential equation
- Solve First Order Differential Equations
- Solve homogeneous equations
- Solve non-homogeneous equations
- Apply to mechanical electrical, and forced vibrations
- Define Laplace Transform
- Solve Step Functions
- Apply to discontinuous forcing functions
- Review matrices
- Solve linear algebraic equations with Eigenvalues and Eigenvectors

CONCEPTS & ISSUES

- Mathematical Models & Direction Fields
- Classification of Differential Equations
- Linear Equations with Variable Coefficients
- Separable Equations
- Autonomous Equations
- Exact Equations
- Homogeneous Equations with Constant Coefficients
- Solutions of Linear Homogeneous Equations & the Wronskian
- Fundamental Solutions
- Complex Roots of the Characteristic Equations
- Repeated Roots
- Nonhomogeneous Equations
- Variation of Parameters
- Mechanical Vibrations
- Definition of Laplace Transform
- Discontinuous Forcing Functions
- Systems of Linear Equations

ASSESSMENT PORTFOLIO

Each degree seeking student is required to maintain an assessment portfolio on Moodle for his/her time at Williston State College. For this class you should include your **syllabus**, **evidence of completing learning outcomes**, and a **reflection paper** of what you learned in this class.

GRADING POLICY

20 QUIZZES (15 POINTS EACH) = 300 POINTS
FOUR BOOKWORKS (20 POINTS EACH) = 80
FOUR TESTS (100 POINTS EACH) = 400 POINTS
E-PORTFOLIO (70 POINTS) = 70
FINAL EXAM = 150 POINTS

Grade	895-1000 A
Scale	795-895 B
	695-795 C
	595-695 D
	0-595 F

Total possible points are **One Thousand (1000)**.

DISABILITY STATEMENT

Williston State College is committed to providing equal access to students. If you have a disability which may impact your performance, attendance, or grades in this course that requires accommodations, you must first register with the WSC Accessibility Support Office. Please note that classroom accommodations cannot be provided until your instructors receive an Accommodations Form, signed by you and the Accessibility Support Office.

IMPORTANT DATES

- Last day to drop: January 18, 2018
- Last day to withdraw: April 6, 2018
- For important dates concerning holidays, last date to withdraw from class, etc., please visit the WSC catalog available on the website: www.willistonstate.edu.

ACADEMIC RESOURCES

Take advantage of academic resources available to you at Williston State College:

- Communication Lab: Supplemental instruction is provided to assist students who are either having difficulty or desiring extra help with specific subjects. The Communication Lab assists with composition, writing, communication, and public speaking. The Communication Lab is located in Stevens Hall 120. Students should make appointments at wsc.writinglab@willistonstate.edu.
- Math Lab: Supplemental instruction is provided to assist students who are either having difficulty or desiring extra help with specific subjects. The Math Lab assists with all math needs. The Math Lab is located in Stevens Hall room 120.
Mondays 9a-6p Tuesdays 9a-4p Wednesdays 9a-4p Thursdays 9a-4p Fridays 9a-4p
- Learning Commons: It's not just the Library anymore. In addition to the normal library functions (book checkout, research assistance, etc.), the Learning Commons serves a number of other functions. Get help with Blackboard and other Distance Ed questions. The "technology counter" provides an opportunity to play with some of the latest technology. Computers and printers available. If you have questions, call (701-774-4226). To contact the Office of Extended Learning please email wsc.extendedlearning@willistonstate.edu.
- SmarThinking: Web based program that offers live tutoring services in a variety of subject areas at no cost to the student. With SmarThinking you can access live tutors, ask a question and come back the next day for a response, and/or submit writing pieces to be reviewed. If you have further questions or need assistance in using this great tool, please stop in the Learning Commons in Stevens Hall or contact Katie Peterson at 701-774-4594.

STUDENT ACADEMIC INTEGRITY

Work submitted for this course must follow Student Academic Integrity as cited in the 2016-2017 Catalog, p. 20:

Integrity of the academic process requires that credit be given where credit is due. Accordingly, it is a breach of academic integrity to present as one's own work the ideas, representation, or works of another, or to permit another to present one's work without customary and proper acknowledgement of authorship. Students are expected to conduct themselves at all times within permissible limits of assistance as stated by faculty.

Students will be held responsible for any breaches of academic integrity. More common breaches of academic integrity include but are not limited to: cheating, plagiarism, forgery, fabrication, facilitation, or aiding academic dishonesty; theft of instructional materials or tests; unauthorized access or otherwise manipulating laboratory equipment or computer programs without proper authorization; alteration of grades or permanent files; misuse of research data in reporting results; use of personal relationships to gain grades or academic favors; or otherwise attempting to obtain grades or credit through fraudulent means. These breaches of academic integrity are also viewed as misconduct and are treated accordingly.

Students who violate the Student Academic Integrity guidelines may face scholastic or disciplinary consequences. Instructors that treat the case as a scholastic matter have the authority to decide how the violation will affect the student's grade in the course. If the instructor has treated the case as a scholastic matter involving the course grade and the student has a grievance related to this action, that grievance shall be processed as outlined in the WSC Student Code of Conduct. Instructors that treat the case as a disciplinary matter will refer the case to the Vice President for Student Affairs for possible resolution. If final resolution does not occur, the Vice President for Student Affairs may refer the case to the Student Review Committee. The Committee will handle the matter according to the procedure outlined in the WSC Student Code of Conduct. A written report of the incident will be placed in the student's academic file in the admission and Records Office and will be withdrawn when the file becomes inactive. A copy of the report will be provided to the faculty advisor. Students are advised to become familiar with the campus copyright policy as outlined in the WSC Student Code of Conduct.

Breach of academic integrity may result in failure of the assignment, exam, and/or class.

STUDENT RESPONSIBILITIES:

- You are expected to read the relevant materials and participate in class discussions in a timely manner.
- You are expected to respect your fellow students and the Instructor in online and on campus discussions.
- It is your responsibility to ask questions when you are uncertain about assignments or course materials.
- If you have questions concerning grades, you should contact the Instructor immediately. You are responsible for checking Blackboard in a timely fashion to ensure that the grade recorded is your correct grade.
- It is your responsibility to contact the Instructor as soon as possible if you are encountering any issues that would hinder your performance in this class.
- You are responsible for earning your grade (with the Instructor making every effort to help you learn the material).
- If you are concerned about your grade, you should speak to the Instructor NO LATER than mid-term. No consideration will be given to request to adjust your grade at the end of the semester unless there is an error in calculations.

GRIEVANCE POLICY

Occasionally, students are dissatisfied with some dimension of the course. In such cases, students should first schedule a meeting with the instructor. If the student and instructor cannot

reach a satisfactory resolution, the student should schedule a meeting with the Chair of the Department. (See page 10 of the Student Code of Conduct.)

TITLE IX

Survivors of sexual assault, domestic violence, and sexual harassment: please be aware that as an instructor, I am legally obligated to report all instances of sexual assault, domestic violence, and sexual harassment involving students. If you would like to speak to someone confidentially, please contact the WSC Counselor at (701)774-4212 (they are NOT mandated to report such instances).

FINAL EXAMS/ACTIVITIES

Students are required to take the final examination or engage in the final activity on the date and at the time presented as part of the course syllabus. Exceptions may be made only in emergency situations and in the case of scheduling conflicts with college sponsored events by promptly submitting a written request detailing the circumstances to the instructor of the course. Your meeting time for your final is: **Tuesday, May 10, 2018 from 9:30am-11:30am.**

SCOPE AND SEQUENCE OF THE COURSE (SUBJECT TO CHANGE)

Day/Week	Course Calendar/Instruction
Week 1	Syllabus Review of Integration
	1.1 Pg. 12 # 1,2,5,7,9,10,11,13,15,16,28(22),23,27,31
	1.2 Pg. 19 # 2,3,9,13,18,21,24,25,26 1.3 Pg. 30 # 5,9,10,13,14,27
Week 2	Quiz 1 Read CH 6 in the Larson Calculus Book
	2.1 Pg. 44 # 1,5,7,15a,21,25 2.2 Pg. 52 # 3,6,12,15,27,29,32,39 2.3 Pg. 62 # 3,7,16,21,25,28,38
	Quiz 2 2.4 Pg. 70 # 5,9,22,33,37 2.5 Pg. 75 # 3,9,12,21,24,30
Week 3	Quiz 3 2.6 Pg. 80 # 3,7,11
	Quiz 4 Review 1
Week 4	3.1 Pg. 91 # 3,5,13,21,22,23,25,29,45(43)
	TEST 1: Chapter 1 and Chapter 2
	3.2 Pg. 101 # 2,5,15,33 3.3 Pg. 111 # 4,7(5),8(6),9(7)
Week 5	Quiz 5
	4.1 Pg. 130 # 1,3,4,5,10,13,15,21,27,34
	Quiz 6 4.2 Pg. 134 # 1,4,10,16 4.3 Pg. 140 # 3,5,9,11,16,18,21,24,30,35
	Quiz 7

Week 6	4.4 Pg. 150 # 3,11,15,24,30 4.6 Pg. 165 # 3,9(10),11,20 Quiz 8
	Review 2
Week 7	4.7 Pg. 171 # 9,19,26,29 4.9 Pg. 187 # 3,6,9,19
	TEST TWO: Chapter 3 and 4.1-4.4 & 4.6 Quiz 9
Week 8	4.10 Pg. 192 # 2,3,9(7),15(13),18(16) 5.1.1 Pg. 209 # 5,11 Quiz 10
	5.1.2 Pg. 210 # 21(17)-24(20) 5.1.3 Pg. 211 # 34(30),41(37) Quiz 11
Week 9	Review Three
	TEST THREE: 4.7, 4.9, 4.10, 5.1.1, 5.1.2 & 5.1.3
Week 10	6.1 Pg. 242 # 2,3,5,9,12,13,15,19,23,25,35,38 Quiz 12
	6.2 Pg. 251 # 9,11,17,19 Quiz 13
Week 11	7.1 Pg. 285 # 3,6,9,12,23,27,31 7.2 Pg. 293 # 3,9,15,19,23,35,37,39 Quiz 14
	7.3 Pg. 303 # 3,7,13,16,21,25,38,41,49-55 7.4 Pg. 315 # 1,10,23(19),29(25),37(33) Quiz 15
Week 12	7.6 Pg. 325 # 1,7 Quiz 16
	8.1 Pg. 339 # 1,7,11,13,17,23
Week 13	TEST FOUR: 6.1, 6.2 & 7.1-7.4
	8.2 Pg. 352 # 1,5,10,13,21(19),35(33) Quiz 17
Week 14	8.3 Pg. 360 # 1,3,6,18(16),27(25) Quiz 18
	8.4 Pg. 365 # 1,4,9,14,19,21 Quiz 19
Week 15	9.1 Pg. 373 # 1,5,9 9.2 Pg. 377 # 3,5,7,9 Quiz 20
	ePortfolio
Week 16	9.3 Pg. 381 # 3,4,5 Final Review
	Final Review
5/9/17	Final Exam 9:30 AM – 11:30 AM