South Plains College

MATH 2320 – Differential Equations
Section 001, M W 8 – 9:15 am
Math Bldg., Rm. 105

Instructor: Miss S. Davis
Office: 103 MATH Bldg.
Phone: (806) 894 – 9611 ext. 2699
E-mail address:sdavis@SouthPlainsCollege.edu

Office Hours:

Monday	Tuesday	Wednesday	Thursday	Friday
9:30 – 10a	4:20 – 5:20p	9:30 – 10a		9 – 12 p
2:45 – 4:15p	(Reese)	2:45 – 4:15p		

or by appointment

At these designated times, I will be in my office to help you. You **do not** need an appointment to come see me at these times. When you come, I will be doing something else, but I will stop and help you. I am available at other times, but please give me a call before coming to make sure I am there.

Text: None

Supplies: Scientific calculator (preferably a TI-85 or higher), *(at least a **3 in** ring) notebook,* hole puncher, stapler, & a staple puller.

Purpose: Math 2320 is offered to satisfy degree requirements for pre-engineering students planning to transfer to schools in Texas. Topics included are: linear differential equations and applications; solutions using Laplace transforms; systems of differential equations; power series solutions; non-linear equations.
Prerequisites: MATH 2414 (Calculus II) and, strategically, MATH 2318 (Linear Algebra)

Attendance: Attendance and effort are the most important activities for success in this course. Records of your attendance are maintained throughout the semester. *If your lack of attendance (i.e., excessive absences) is determined by the instructor to put you at risk of failing the course, you may be dropped from the class with a F as a final grade.* Excessive absences consist of two consecutive weeks or 4 cumulative days. If you unfortunately happen to incur an absence, please contact the instructor either by phone or email and refer to the website **to get and attempt the assignment** before the next class. Please read the "Drops and Withdrawals" policies in the current South Plains College catalog.

Class Attendance

Students are expected to attend all classes in order to be successful in a course. The student may be administratively withdrawn from the course when absences become excessive as defined in the course syllabus.

When an unavoidable reason for class absence arises, such as illness, an official trip authorized by the college or an official activity, the instructor may permit the student to make up work missed. It is the student's responsibility to complete work missed within a reasonable period of time as determined by the instructor. Students are officially enrolled in all courses for which they pay tuition and fees at the time of registration. Should a student, for any reason, delay in reporting to a class after official enrollment, absences will be attributed to the student from the first class meeting.

Students who enroll in a course but have "Never Attended" by the official census date, as reported by the faculty member, will be administratively dropped by the Office of Admissions and Records. A student who does not meet the attendance requirements of a class as stated in the course syllabus and does not officially withdraw from that course by the official census date of the semester, may be administratively withdrawn from that course and receive a grade of "X" or "F" as determined by the instructor. Instructors are responsible for clearly stating their administrative drop policy in the course syllabus, and it is the student's responsibility to be aware of that policy.

It is the student's responsibility to verify administrative drops for excessive absences through MySPC using his or her student online account. If it is determined that a student is awarded financial aid for a class or classes in which the student never attended or participated, the financial aid award will be adjusted in accordance with the classes in which the student did attend/participate and the student will owe any balance resulting from the adjustment.

Assignment Policy: Homework will be assigned each class meeting. You are expected to work all problems assigned in each assignment and to seek help when you do not understand. You are responsible for keeping up to date and prepared. Homework is to be completed and be kept in a notebook that must accompany you to each class session. The following procedure will be used on all the homework:

Homework #1: Separations of Fractions worksheet
problems 1, 5, 8, 10, and 15 - 20

    (1.) problem

       work for problem

            | **answer** |

    (5.) problem

       work for problem

            | **answer** |

Blackboard: A plethora of information for this class will exist on Blackboard such as syllabus, homework, etc. Please be responsible to log in to Blackboard and navigate to the appropriate site for this class.

Assessments: The notebook will be graded during each exam in which no late notebooks will be allowed. The notebook will count as a test grade.

Tests: There will be three tests (final exam exclusive) and a comprehensive final exam. See your OUTLINE for the approximate date for each test.

Make-up Policy: There is no automatic provision for making up exams. Only under extreme circumstances (e.g., death in the family, hospitalization) will make-up exams be given, and these circumstances must be documented. If at all possible, the instructor should be notified prior to missing an exam.

Lectures: Class will begin promptly as scheduled. You should be in your seat and ready to go at this time.

STUDY: You should normally spend approximately 2-3 hours outside of class in study for each hour of lecture. Some material will require more time than other material. Also, your mathematical background is a major factor in the time spent completing the homework. Try to study the assigned lesson as soon after the class meets if possible. With your greatest effort, try not to get behind on the homework! Refer to the "How to Study" sheet for further detailed studying suggestions.

Tutoring: Free tutoring is available in the Math-Engineering building (room M116). Please remember to sign in when you seek help from a tutor.

Video Tapes: Videos are available online through Blackboard. For username and password, please use *mvideos*.

Tape	Topic
	Calculus II
	Integration by Parts
	Integration by Partial Fractions
	Integration by Change of Variable
	Integration by Trig Substitution
	Taylor Series

Grading Policy: Your final grade will be based solely on major exam scores, homework (notebook), and a comprehensive final.

Grading Score:
$$\text{Final score} = \frac{\text{Test 1} + \text{Test 2} + \text{Test 3} + \text{Homework Score} + \text{Final Exam score}}{5}$$

NOTE: If the final exam score is greater than the least non-zero major exam score (excluding the Homework [Notebook] score) then the final exam score replaces the least non-zero major exam score. In other words, the major exam score will be deleted and the final exam score will count two times.

Borderline Grades: These grades will be evaluated with regard to attendance and mature conduct in class.

Critical Dates:

Jan 21	MLK, Jr.	*Feb 18*	**WEB Pre-registration for Summer & Spring Interim 2019**
March 11 – 15	SPRING Break	*April 15*	**WEB Pre-registration for Fall 2019**
April 22	Easter		**Final Exams**
April 25	Last Day to Drop	*May 6*	*(8 – 10a, Monday)*
April 12	**UIL** – No office hours		

Student Responsibilities:

- Attend class, be aware of announcements made in class, and ask questions when necessary.
- Work homework problems early enough to seek help if needed.
- Form study groups.
- Work extra problems as required to understand each topic.
- ****Please, *turn off cell phones and pagers during class!* ****
  - **If the instructor determines that activation of a cell phone, pager, PDA, or laptop interrupts the lecture or classroom discussion or impedes the progress of any student then the instructor will confiscate the cell phone, pager, PDA, or laptop until the end of the class period and/or ask the student to leave.**
  - **No technologic devices such as cell phones, PDA's, etc. are to be used during tests or in-class quizzes.**
- **Follow the classroom policy, no food or drink allowed in the classroom if posted.**
- **In addition to the No Food or Drink classroom policy and in accordance to campus policy, no tobacco products are to be permitted and consumed in class.**
- **You will obtain your final grade for the class through Texan Connect &/or Colleague.**

Cell Phone Policy: All students will, during each class period and for its duration, place and keep their cell phone in its deactivated state, provided that they are at the present time in possession of said device, face-down in the right-hand corner and on the top surface of their desk. If a student's cell phone activates and/or the student engages in text messaging during class at anytime during the semester, the student, by the instructor's discretion, could be permanently dismissed from the class for the remainder of the semester. If a student's cell is activated during class and/or the student engages in text messaging determined by the instructor, and **the student chose not to place their phone on top of their desk as mentioned above** then the student <u>will</u> be dismissed from the class by the instructor permanently.

Academic Misconduct: Complete honesty is required from students in all facets of course work including homework assignments, tests, and the final exam. See the South Plains College Catalog for more detail.

Sanctions for Cheating or Plagiarizing: A grade of "F" in the course will be assigned to any student caught cheating or plagiarizing; additional sanctions may also be considered. Students are responsible for understanding the meanings of the words <u>cheating</u> and <u>plagiarizing</u>.

Objectives: Upon completion of this course and obtaining a passing grade, the student will have mastered at least 70% of the course objectives. The course objectives provide that the student be able to:

a.) Identify, both orally and written, the type of differential equation encountered, comment on the type of solution expected, and pursue its general solution using an appropriate technique. These methods will include the use of power series and numerical methods.

b.) Find the particular solution for the equations with initial conditions by using several methods, among which will be the use of Laplace transforms.

c.) Find the solution for a system of linear differential equations using several methods, among which will be the use of matrix algebra.

d.) Analyze practical problems from various other disciplines, proposing methods of solution that require differential equations, finding a suitable differential equation with initial conditions, and then finding the solution for that equation.

Questions: I invite all your questions **except** the following:

1. I wasn't able to make it to class. Did I miss anything? (Yes.)
2. Is this going to be on the test? (Perhaps, not directly, but if the ideas were not important, I would not be discussing them in class.)
3. Do you have the tests graded? (I put forth my best effort to have the tests graded so as to return them the next class session. However, there are times due to uncontrollable factors that this may not be possible.)

Diversity: In this class, the teacher will establish and support an environment that values and nurtures individual and group differences and encourages engagement and interaction. Understanding and respecting multiple experiences and perspectives will serve to challenge and stimulate all of us to learn about others, about the larger world, and about ourselves. By promoting diversity and intellectual exchange, we will not only mirror society as it is, but also model society as it should and can be.

Disability Statement: Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should notify the Special Services Office, preferably, early in the semester so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability to the Special Services Coordinator. For more information, call or visit the Special Services Office in the Student Services Building, 894-9611 ext. 2529.

Confidentiality: As a faculty member, I am deeply invested in the well-being of each student I teach. I am here to assist you with your work in this course. If you come to me with other non-course-related concerns, I will do my best to help.

It is important for you to know that all faculty members are mandated reporters of any incidents of sexual misconduct. That means that I cannot keep information about sexual misconduct confidential if you share that information with me. Dr. Lynne Cleavinger, the Director of Health & Wellness, can advise you confidentially as can any counselor in the Health & Wellness Center. They can also help you access other resources on campus and in the local community. You can reach Dr. Cleavinger at 716-2563 or lcleavinger@southplainscollege.edu or go by the Health and Wellness Center. You can schedule an appointment with a counselor by calling 716-2529.

Sexual Misconduct

It is important for you to know that all faculty members are mandated reporters of any incidents of sexual misconduct. That means that I cannot keep information about sexual misconduct confidential if you share that information with me. Dr. Lynne Cleavinger, the Director of Health & Wellness, can advise you confidentially as can any counselor in the Health & Wellness Center. They can also help you access other resources on campus and in the local community. You can reach Dr. Cleavinger at 716-2563 or lcleavinger@southplainscollege.edu or go by the Health and Wellness Center. You can schedule an appointment with a counselor by calling 716-2529.

Campus Concealed Carry: Campus Concealed Carry - Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in South Plains College buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and South Plains College policy, license holders may not carry a concealed handgun in restricted locations. For a list of locations, please refer to the SPC policy at: (http://www.southplainscollege.edu/human_resources/policy_procedure/hhc.php)

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all South Plains College campuses. Report violations to the College Police Department at 806-716-2396 or 9-1-1.

Week	Date	Supplements	Course Outline This schedule is tentative and subjective to change. Changes will be announced in class.
			Topics and Sections Covered
Week	**Date**	**Supplements**	**Topics and Sections Covered**
1	1/14, Mon	1	Introduction, Definitions, & Solutions
	1/16, Wed	2	Elimination of const. Families and Separation of Variables
2	*1/21, Mon*		*MLK, Jr.*
	1/23, Wed	3	Homogenous Coefficients
3	1/28, Mon	4	Exact Equations
	1/30, Wed	5, 6	Linear equations, 1st Order and All types
4	2/4, Mon	7	Bernoulli Equations Substitutions Suggested by the equation
	2/6, Wed	8	Applications
5	2/11, Mon	8	Applications contd.
	2/13, Wed	9	*Linear Differential. Equations* *Linear Independence & the Wronskian*
6	**2/18, Mon**		**Test 1**
	2/20, Wed	10	Differential Operators; Distinct Roots (Linear equations w/ constant coefficients)
7	2/25, Mon	11, 12	Repeated Roots; Complex Roots (Linear equations w/ constant coefficients)
	2/27, Wed	13	Undetermined Coefficients (Non-Homogenous)
8	3/4, Mon	13	Undetermined Coefficients (Non-Homogenous) contd.
	3/6, Wed	14	Variation of Parameters
	3/11 - 3/15		*Spring Break*
9	3/18, Mon	15	Applications (Vibrations)
	3/20, Wed	16	*Laplace Transforms* *Inverse Laplace Transforms*
10	**3/25, Mon**		**Test 2**
	3/27, Wed	16.5, 17	Inverse Laplace Transforms (with Transformations) I.V.P.'s (Initial Value Problem)
11	4/1, Mon	17.5, 18	I.V.P.'s (Initial Value Problem); Discontinuous R. H. S.
	4/3, Wed	18.5	Discontinuous R. H. S.
12	4/8, Mon	M	Review Matrix algebra
	4/10, Wed	19	Eigen values & vectors – Distinct Roots
	4/12, Fri		**UIL –** No office hours
13	4/15, Mon	20	Complex Roots Repeated Roots
	4/17, Wed	21	*Non-homogeneous Systems*
14	**4/22, Mon**		*EASTER*
	4/24, Wed		**Test 3**
15	4/29, Mon	22	Solution by Power Series Recursion formula
	5/1, Wed	22	Solution at $x = 0$ Solution at $x = $ a
Finals	**5/6, Mon**		**8 – 10a**

MATH 2320 (3:3:0)

DIFFERENTIAL EQUATIONS

MATHEMATICS DEPARTMENT

Division of Arts & Sciences

South Plains College

SPRING 2019

Shirley Davis