M408D SPRING 2024 SEQUENCES, SERIES AND MULTI-VARIABLE CALCULUS

UNIQUE #: 53235 / 53240 T, TH 11:00 AM – 12:30 PM GSB 2.126

INSTRUCTOR: Frank T. Shirley, PhD, MM

Office: RLM 13.164 Phone: 512-471-6410

Office Hours: T, TH: 3:45-5:30 PM

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"M 408D" must be included in the Subject.

Teaching Assistant :

Hidayat Alakbarli

Office Hours:

M: 2:30 pm – 3:45 pm

TH: 1:30 pm – 3:00 pm

in PMA 12.116

e-mail: hidayat.alakbarli@utexas.edu

TEXTBOOK: CALCULUS : Early Transcendentals (9th Edition) by James Stewart.

Each student automatically has access to a digital eBook through the Longhorn Textbook Access Program (LTA) and will be charged a nominal fee unless he/she opts out of the LTA before the 12th class day.

Course Description: We will be studying the concepts and methods of Differential and Integral Calculus as they are applied to functions of two or more variables. We will also study infinite sequences and series, power series, the power series representation of functions, and Taylor series and Maclaurin series. We will also be studying Methods of Integration, Differential Equations, Partial Derivatives and Double Integrals.

GRADES: There will be 3 mid-semester tests administered during the main lecture class period. There will be quizzes given, and homework assignments given. The quizzes will be given in lecture sessions, in discussion sessions, and during Mini-Lecture Videos. **If your Final Exam grade is greater than your lowest mid-semester test grade, then your lowest mid-semester test grade will be replaced by the average of your Final Exam grade and your lowest mid-semester test grade**.

The final exam will be a comprehensive final and will be worth 24% of the final semester average.

Test 1 is worth 16%, Test 2 is worth 20%, and Test 3 is worth 20% of the final semester average.

Your Homework Average is worth 12% and your Quiz Average is worth 8% of the final semester average.

The FORMULA for calculating the FINAL SEMESTER AVERAGE:

FINAL SEMESTER AVERAGE = 0.12∗HW-AVG + 0.08*QUIZ-AVG +

0.16∗TEST1 + 0.20∗TEST2 + 0.20∗TEST3 + 0.24∗(FINAL EXAM)

Letter Grades are awarded according to the FINAL SEMESTER AVERAGE as follows:

92 - 100 : A ; 90 - 92 : A− ; 88 - 90 : B+ ; 82 - 88: B ; 80 - 82 : B− ; etc,

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The **FINAL EXAM** for this class will be given on **Friday, May 3, 1:00 PM – 3:00 PM**

The mid-semester exams are TENTATIVELY scheduled to be given as follows:

Test 1: Thursday, February 8
Test 2: Thursday, March 7
Test 3: Thursday, April 11

Attendance: Attendance at the Tuesday and Thursday classes is required. Each student is allowed four (4) unexcused absences without penalty, and every unexcused absence after the first four results in the final semester average being reduced by 1/2 point. Absences can be excused only for illness and for a religious holiday. For an absence due to illness to be excused, the student must be examined by a health professional who provides the student with a receipt or a report.

Attendance at the Monday and Wednesday discussion sessions is not required, but is strongly recommended since there will be no make-up quizzes given for a pop quiz missed due to absence that day.

Homework: Homework will be assigned frequently, collected at the beginning of class, and graded.

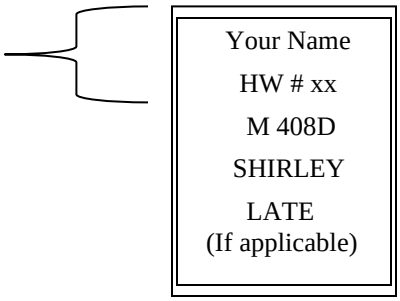
Your homework average is 12% of the final average. **The lowest homework grade will be dropped**.

Expect to spend about 2-3 hours of work on the reading and homework for each hour of lecture.

When turning in homework papers, **the papers must be stapled together**, and the solutions to the problems must be presented in the order in which the problems are assigned. Otherwise, points are deducted.

Please fold the papers along the vertical center-line and print on the top:

Note: NAME, HW #, M 408D, SHIRLEY (and LATE if applicable).
Points will be deducted if any part is omitted.



Homework Policy:
To receive full credit, a homework paper must be turned in on the day it is due and complete.
Homework solutions may be submitted **one session** late with a 10-point penalty, **as long as the word "LATE" is written on the front.**
If a homework is submitted late without the word "LATE", it will not be accepted.

Homework more than one session late will not be accepted. Also, there will be NO excused late homework due to illness. **When the homework papers are graded, NOT ALL the problems will be marked as correct or incorrect, ONLY SOME**. The unmarked problems were not graded and cannot be assumed to have been worked correctly. Solutions to the homework problems will be posted after the due date.

Graded homework papers and graded quiz papers will be returned during the class lectures. Those papers not retrieved will be placed in a box outside of Dr. Shirley's office, RLM 13.164.
If solutions you worked are not returned, please wait until the end of the semester to determine if they were lost. You will not be penalized for homework you submitted that we failed to grade.

Announcements, Handouts, Homework Assignments, and Homework Solutions will be posted in the Canvas Course,

Midterm Test Grades and Midterm Test Solutions will be posted in the Canvas Course.

Graded papers not retrieved in class can be retrieved from the box outside Dr. Shirley's office. If solutions you worked are not returned, wait until the end of the semester to determine if it was lost.

Quizzes: There will be quizzes of two types: Pop-quizzes given during discussion sessions and Mini-Lecture Video quizzes. **The four lowest grades on the discussion session quizzes will be dropped** when calculating your Quiz Average. Make-up quizzes will not be given. The Mini-Lecture Videos and the accompanying quizzes have due dates, but they can be viewed and worked after the due dates without penalty.

Calculator Policy: During exams, you are not allowed to use graphing calculators nor calculators which can store text of any kind in memory. **You may only use a basic scientific calculator when taking an exam.**

Tests:

If a student misses an exam due to illness, the student needs to inform Dr. Shirley by email of the illness on the day of the exam. Furthermore, the student should go to a health professional for an examination, and, with a record of the visit, the student may take a make-up exam.

If a student will miss an exam for the observance of a religious holiday, the student must notify Dr. Shirley one week before the exam to schedule a make-up exam.

NOTE: TEXTING OR SURFING THE INTERNET DURING CLASS IS *NOT ALLOWED.*

Other resources for help besides Office Hours and the Tuesday/Thursday Discussion Sessions:

(1) Calc-Lab: The Math Department **Calculus Lab** meets in PMA 8.136.

It is open for you to get help during the following hours:

Monday: 2 PM - 7 PM

Tuesday: 2 PM - 7 PM

Wednesday: 2 PM - 7 PM

Thursday: 2 PM - 7 PM

Friday: 2 PM - 5 PM

This is a joint TA session for **ALL** of the calculus classes which are taught at UT, and it will be staffed at all times by at least two TAs and 3 undergraduate Learning Assistants in the classroom PMA 8.136.

No matter what your question, you can always get help at Calc-Lab.

To visit their website, click on "Calclab" in the Hot Links List on the Canvas Home Page of the Canvas Course.

(2) "Learning Modules" with video lectures on most of the topics we will be studying available using the "Learning Modules" link in the Hot Links List of Home Page of the Canvas Course.

(3) Check out the **free tutoring** available at the Math/Science Lab of the SANGER LEARNING CENTER (SLC) in the JESTER CENTER. The SLC main office is in JESTER A115 and the lab is in JESTER A315. Their website is **http://www.utexas.edu/ugs/slc .**

OTHER IMPORTANT INFORMATION

Last Day to Drop:

The main drop deadline is Tuesday, March 26.

This is the last day an undergraduate student may, with the dean's approval, withdraw from the University or drop a class except for urgent and substantiated, nonacademic reasons. It is the last day an undergraduate student may change registration in a class to or from the pass/fail basis.

Academic Accommodations for Students with Disabilities:

Any student with a documented disability (physical or cognitive) who requires academic accommodations should contact the Division of Diversity and Community Engagement (DDCE), Disability and Access (D&A) at the address: http://www.utexas.edu/ugs/slc, or phone: 512-471-6259 (voice) or 512-471-4641 (TTY for users who are deaf or hard of hearing) or by fax at 512-475-7730 as soon as possible to request an official letter outlining authorized accommodations.

Resources for Counseling and Mental Health:

Counseling and Mental Health Center
Student Services Bldg (SSB), 5th Floor
Hours: M--F 8am--5pm

512 471 3515 (appointments)
512 471 CALL (crisis line)

Class Recordings:

Class recordings are reserved only for students in this class for educational purposes and are protected under FERPA. The recordings should not be shared outside the class in any form. Violation of this restriction by a student could lead to Student Misconduct proceedings.

Sharing of Course Materials is Prohibited:

No materials used in this class, including, but not limited to, lecture hand-outs, videos, assessments (quizzes, exams, papers, projects, homework assignments), in-class materials, review sheets, and additional problem sets, may be shared online or with anyone outside of the class unless you have my explicit, written permission. Unauthorized sharing of materials promotes cheating. It is a violation of the University's Student Honor Code and an act of academic dishonesty. I am well aware of the sites used for sharing materials, and any materials found online that are associated with you, or any suspected unauthorized sharing of materials, will be reported to Student Conduct and Academic Integrity in the Office of the Dean of Students. These reports can result in sanctions, including failure in the course.

Academic Integrity Policy:

Students who violate University rules on academic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on academic dishonesty will be strictly enforced. For further information, please visit the Student Conduct and Academic Integrity website at http://deanofstudents.utexas.edu/conduct (Links to an external site).

Information Concerning the Mathematics Component of the University Core Curriculum:

This course may be used to fulfill the mathematics component of the university core curriculum and addresses the following three core objectives established by the Texas Higher Education Coordinating Board:

(1) Communication Skills

(2) Critical Thinking Skills

(3) Empirical and Quantitative Skills

Tentative Course Schedule:

The following list shows the topics to be discussed in the lectures. This list represents the initial plans of these topics. During the semester, these plans may change, and the topics are only tentatively scheduled. If there is going to be any significant change in the schedule, these changes will be announced in class and in Canvas in advance.

Class Day	To be Discussed
T, Jan 16	Sec 5.5: A Review of Integration by Substitution and Sec7.1: Integration by Parts
TH, Jan 18	Sec 7.2: Integrating Products and Powers of Trig Functions
T, Jan 23	Sec 7.3: Trigonometric Substitution
TH, Jan 25	Sec 7.4: Rational Functions and Partial Fraction Decomposition and Introduction to Sec 7.8: Improper Integrals
T, Jan 30	Sec 7.8: Improper Integrals, Sec 11.1: Sequences, and Sec 11.2: Series and the Test for Divergence
TH, Feb 1	Sec 11.3: The Integral Test and the Estimation of a Level of Error. Also, the Convergence Test for p-Series.
T, Feb 6	Sec 11.4: The (Direct) Comparison Test & the Limit Comparison Test. Also, Sec 11.5: Alternating Series and the Alternating Series Test
TH, Feb 8	Test 1
T, Feb 13	Sec 11.5: Estimation of a Level of Error for Convergent Alternating Series. Then, Sec 11.6: Absolute Convergence and the Ratio Test and the Root Test. Also, an Introduction to Sec 11.8: Power Series.
TH, Feb 15	Sec 11.8: Power Series and an Introduction to Sec 11.9 Representations of Functions as Power Series (PSRs)
T, Feb 20	More on Sec 11.9 Representations of Functions as Power Series (PSRs). Then, Sec 11.10: Taylor Series and MacLaurin Series
TH, Feb 22	Sec 11.11: Taylor Polynomials and their Applications, and the Estimation of the Level of Error using Taylor's Inequality.
T, Feb 27	Sec 10.1: Curves Defined by Parametric Equations and Sec 10.2: Calculus with Parametric Equations.
TH, Feb 29	Sec 10.3: The Polar Coordinate System and Polar Graphs of Polar Equations.

Class Day	To be Discussed
T, Mar 5	Sec 10.4: The Area "Inside the Curve" of the Graph of a Polar Equation. Also, Sec 10.5: Conic Sections (Curves from the Intersection of a Plane and Double Cone)
TH, Mar 7	Test 2 (Test 2 is on Thursday. DO NOT LEAVE EARLY FOR SPRING BREAK!)
Mon, Mar 11, to Sat, Mar 16:	Spring Break
T, Mar 19	Sec 9.1: Modeling with Differential Equations and Sec 9.2: Initial Value Problems (IVPs) and the Solution Curves of a DE.
TH, Mar 21	Finding the General Solution of the DE, $P' = kP$, and Sec 9.3: Solving Separable Differential Equations
T, Mar 26	Sec 9.2: Direction Fields and Euler's Method, and Section 9.5: Solving Linear First-Order Differential Equations.
TH, Mar 28	Sec 14: Functions of Several Variables, and Sec 14.2: Limits and Continuity
T, Apr 2	Sec 14.3: Partial Derivatives, their Computations and their Interpretations. Also, Sec 14.4, (pp. 932 - 934): The Total Differential **dz**
TH, Apr 4	Sec 14.5: The Multi-variable Chain Rule
T, Apr 9	Sec 15.1: The Definition of the Double Integral of a function f(x,y) over a Rectangle R as the Limit of Double Riemann Sum Calculations. Also, using "Iterated Integrals" to Determine the Value of a Double Integral over a Rectangle R.
TH, Apr 11	Test 3
T, Apr 16	Sec 15.2: Double Integrals over General Regions
TH, Apr 18	Sec 15.3: Double Integrals in Polar Coordinates
T, Apr 23	More on Sec 15.3: Double Integrals in Polar Coordinates. Also, Sec 15.5: Surface Area Integrals
TH, Apr 25	Last Class Day: Review

GOOD LUCK AND HAVE A GREAT SEMESTER!