

## MATHEMATICS 2326, CALCULUS III

<b>Instructor:</b>	<b>Dr. J. Epperson</b>		
<b>Office:</b>	PKH 404	<b>e-mail:</b>	<a href="mailto:epperson@uta.edu">epperson@uta.edu</a>
<b>Phones:</b>	817-272-5047 (office); 817-272-3261 (Mathematics Department)	<b>Office Hours:</b>	M 11-11:50; T 3:00-3:50; or by appointment
<b>Website:</b>	<a href="http://www.uta.edu/faculty/epperson">http://www.uta.edu/faculty/epperson</a>	<b>Faculty Profile:</b>	<a href="http://www.uta.edu/profiles/james-epperson">http://www.uta.edu/profiles/james-epperson</a>

<b>Class Meetings:</b>	Lecture (2326-400): Tuesdays & Thursdays 12:30-1:50 in PKH 319
<b>Textbook:</b>	<p><i>CALCULUS, EARLY TRANSCENDENTALS, (2<sup>ND</sup> EDITION), BY BRIGGS, COCHRAN, &amp; GILLET</i></p> <p>We will use <a href="http://uta.mymathlabs.com">uta.mymathlabs.com</a>** for required online homework. Use the directions found at <a href="http://tinyurl.com/MLPsteps">http://tinyurl.com/MLPsteps</a> to set up your <a href="http://uta.mymathlabs.com">uta.mymathlabs.com</a> account.</p> <p>** If you purchased your book new, you received an access code. Otherwise, you will need to purchase this. There is a 14-day trial period before action is needed regarding purchasing access.</p>
<b>Course Prerequisite:</b>	A grade of C or above in Math 2425 (Calculus II) or HONR-SC 2425.
<b>Description of Course Content:</b>	This course is a study of calculus in multiple dimensions. We begin with a brief study of vectors and vector-valued functions. Then, we study partial differentiation and multiple integration of functions of several variables. The course will end with a study of vector analysis which is a useful mathematical tool for scientific and engineering applications. We will focus on Chapters 11-14 in your textbook.
<b>Class Format:</b>	<p>I may incorporate cooperative learning activities during class as well as other active learning strategies during the semester. <i>You are expected to participate fully in these activities.</i></p> <p>You will need to have 8-10 hours (or more) available weekly to study outside of class to succeed in this course.</p>
<b>Electronic Communication</b>	UT Arlington has adopted MavMail as <u>its official means to communicate with students</u> about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. <u>All students are assigned a MavMail account and are responsible for checking the inbox regularly.</u> There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <a href="http://www.uta.edu/oit/cs/email/mavmail.php">http://www.uta.edu/oit/cs/email/mavmail.php</a> .
<b>UT-Arlington Department of Mathematics Learning Outcomes for M2326</b>	<p>Upon completion on Math 2326, the student should be able to</p> <ol style="list-style-type: none"> <li>1. Students will be able to use and understand the concepts of continuity, differentiation and integration of vector-valued functions to determine unit tangent and unit normal vectors in three dimensions. Students will also be able to parameterize piecewise-smooth curves and compute curvature of a space curve.</li> <li>2. Students will be able to compute and sketch level curves and level surfaces for multivariable functions and sketch the graphs of functions of two variables. Analyzing limits, determining continuity and computation of partial derivatives is also expected. Understanding and use of the Chain Rule for multivariable functions will be required. Students will also be expected to use tangent planes, directional derivatives, gradients, the second partials test and Lagrange multipliers to solve optimization problems.</li> <li>3. Students must also be able to demonstrate techniques of multiple- integration and compute</li> </ol>

	<p>iterated integrals over rectangular and non-rectangular regions, as well as in other coordinate systems, including cylindrical and spherical. Application of multiple integrals in problems involving area, volume, surface area, center of mass, moments of inertia, etc. will also be expected.</p> <p>4. Students will also be expected to understand and compute line and surface integrals by application of The Fundamental Theorem for line integrals, Green's Theorem, Stokes' Theorem and the Divergence Theorem. It is also hoped that the student will come to understand the physical interpretation of these theorems, and the potential applications in various fields of study.</p>
--	---

### Details About the Course

#### Grades:

Midterm Exam 1	Thursday, February 9 (in class)	25%
Midterm Exam 2	Thursday, March 23 (in class)	25%
Homework/Quizzes	Weekly Homework; Intermittent Quizzes; Video Assignments	20%
Final examination	Saturday, May 6, 2017, 3:30-6:00 PM Comprehensive coverage	30%

Grades will be assigned according to the following scheme (approximately):	90–100	<b>A</b>
	80– 89	<b>B</b>
	70– 79	<b>C</b>
	60– 69	<b>D</b>
	59 or below	<b>F</b>

#### Midterms and Finals:

Midterms are administered during regular class time. The final exam is departmental. This means that all sections of Math 2326 take the same final exam and that the weight of the final exam (30%) is the same for all sections. The final exam is comprehensive. The format of each exam will be a mix of multiple-choice problems and free-response problems.

#### Make-up Exam Policy and Calculation of Final Course Grade:

There *will be no make-up exams*. You have the option of replacing your lowest midterm exam grade with your grade on the final examination if your grade on the final examination is higher than your lowest midterm exam grade. Also, if your final examination grade is higher than your homework average, it will be used in lieu of your homework average (in this case, your final exam grade will count 50% of your final course grade).

**Calculators:** The only calculators allowed for the midterms and final are TI-30XA and TI-30XIIS.

#### Notecard Policy

One 3"x5" notecard, front and back, will be allowed on midterms and the final examination.

**Drop Policy:** Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, **students must see their academic advisor to drop a class or withdraw**. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance**. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/aao/fao/>). Any student who drops this course on or before Friday, March 31<sup>st</sup> at 5 PM will receive a W. **Note that drop requests must be submitted to an advisor by 4 PM on March 31st.**

**Drop for Non-Payment of Tuition:** If you are dropped from this class for non-payment of tuition, you may secure an Enrollment Loan through the Bursar's Office.

**Cell Phone, Laptops, Beeper, & Chiming Watch Etiquette:**

- Cellular phones should be either switched off or set to "silent" mode during all classes. Cellular-phone use will not be permitted in class. If you must take an important call, please leave the classroom.
- Cellular phones are prohibited during exams. Also, SMART watches cannot be worn or used during exams.
- Beepers should be either switched off or set to "silent" mode during all classes and during tests.
- You should assure that watches with alarms and chirps will not sound during class.
- Since lecture and lab focus on interpersonal communication, students must request permission to use a laptop during class or lab time.

**Online Homework:** Suggested homework will be assigned each day and is posted on Dr. Epperson's website. A student must have access to [uta.mylabsplus.com](http://uta.mylabsplus.com) for this course *since* part of your grade will be based on the completion of homework assignments online. The problems will be similar to *textbook problems from the departmental assignment sheet*. *Whereas* your homework grade is based *solely* on the online homework, you are *also* responsible for *other text problems assigned*.

On occasion, I may ask that you submit a written assignment or quiz to me. Please follow these instructions.

**Instructions for solutions submitted:**

- ☐ Work should be done in pencil and erasures should be clean and complete.
- ☐ Problems should be written in order and include the page number and the problem number, i.e. p26 # 5, if appropriate.
- ☐ Write on one side of the paper only.
- ☐ If you tear the page from a spiral notebook, trim the curly edges.
- ☐ Papers must be stapled together (upper left hand corner) and folded in half lengthwise.
- ☐ On the outside write your name, date and assigned problems.

If these guidelines are not followed, your paper will not be graded and you will receive 0 points on that work.

**Intermittent Quizzes:** You may be given in-class (usually unannounced) or online (via mylabsplus) quizzes which assume your having completed and mastered the suggested homework. Although attendance is required, if you miss a class please see Dr. Epperson's website <http://web.uta.edu/faculty/epperson/courses.html> or <https://elearn.uta.edu> (Blackboard) for assignments.

**Attendance:**

At The University of Texas at Arlington, taking attendance is not required. Rather, each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, I will take attendance. Attendance for this course is required. Excellent attendance records will help your grade in that borderline course-grade decisions will be influenced by these records. Arrive on time to class (when given, quizzes take place during the first 10 minutes of class).

**Help Outside of Class Time:** My office hours are given above. These are times when I will be available in my office to discuss the material/homework/tests. No appointment is necessary for those times. If, however, those times are inconvenient for you, then make an appointment with me for another time (e.g., e-mail me stating the times you prefer). *Please use the subject heading "Math 2326 Student Question" when sending Dr. Epperson e-mail and identify yourself (full name) in the communication.*

My web page will list the homework as the term progresses as well as other miscellaneous information pertinent to this course. My web-page address is above.

**Student Support Services:** UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to [resources@uta.edu](mailto:resources@uta.edu), or view the information at [www.uta.edu/resources](http://www.uta.edu/resources).

The Math Department operates the **Math Clinic**, a tutoring service staffed by upper level undergraduate students. The Math Clinic is on the 3<sup>rd</sup> floor of Pickard Hall; the phone number is 817-272-5674; and the hours of operation for fall and spring are Monday – Thursday 8am to 9pm; Friday 8am to 1pm; Saturday 1pm to 6pm; Sunday 1pm to 9pm

Go to the Math Clinic webpage <http://www.uta.edu/math/clinic/> to get more information or to access assignment sheets for the courses for which tutoring is offered.

The Math Department maintains a list of people who have expressed an interest in tutoring. These persons are not necessarily recommended by the Math Department and they set their own fees. You may obtain a copy of the tutor list in the Math Office, 478 PKH.

**Final Review Week:** A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

**Emergency Exit Procedures:** Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist handicapped individuals.

**Disability Accommodations:** UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including The Americans with Disabilities Act (ADA), The Americans with Disabilities Amendments Act (ADAAA), and Section 504 of the Rehabilitation Act. All instructors at UT Arlington are required by law to provide “reasonable accommodations” to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of a letter certified by the **Office for Students with Disabilities (OSD)**. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

**The Office for Students with Disabilities, (OSD)** [www.uta.edu/disability](http://www.uta.edu/disability) or calling 817-272-3364.

**Counseling and Psychological Services, (CAPS)** [www.uta.edu/caps/](http://www.uta.edu/caps/) or calling 817-272-3671.

Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at [www.uta.edu/disability](http://www.uta.edu/disability) or by calling the Office for Students with Disabilities at (817) 272-3364.

Student responsibility primarily rests with informing faculty **at the beginning of the semester and in providing authorized documentation through designated administrative channels.**

If you require an accommodation based on disability, I would like to meet with you in the privacy of my office, during the first week of the semester, to make sure you are appropriately accommodated.

**Title IX:** *The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit [uta.edu/eos](http://uta.edu/eos). For information regarding Title IX, visit [www.uta.edu/titleIX](http://www.uta.edu/titleIX).*

**Academic Integrity:** Students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

*I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.*

*I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.*

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

**Student Disruption:** The University reserves the right to impose disciplinary action for an infraction of University policies. For example, engagement in conduct, alone or with others, intended to obstruct, disrupt, or interfere with, or which in fact obstructs, disrupts, or interferes with, any function or activity sponsored, authorized by or participated in by the University.

**Important Dates:**

January 17	Classes begin
February 1	Census Date
February 9	Midterm 1 (during class)
March 13-18	Spring Break
March 23	Midterm 2 (during class)
March 31	Last day to drop a class (by 4 pm)
May 4	Last day of classes
Saturday, May 6	Final Exam, 3:30-6:00 pm

**Campus Carry:** Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit <http://www.uta.edu/news/info/campus-carry/>

**Student Feedback Survey:** At the end of each term, students enrolled in classes categorized as "lecture," "seminar," or "laboratory" shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

Tentative Course Schedule/Assignment Sheet<sup>1</sup>

Date	Section/Problems Assigned <sup>2</sup>
Jan 17:	11.1 Vectors in the Plane. 11, 23, 49, 57, 65, 71, 75, 76, 78, 83
Jan 19:	11.2 Vectors in Three Dimensions. 7, 25, 32, 33, 41, 47, 53, 65, 72, 74 11.3 Dot Products. 5, 13, 33, 42, 45, 49, 59, 73, 79, 87 11.4 Cross Products. 5, 13, 19, 23, 27, 31, 41, 51, 65, 73
Jan 24:	11.5 Lines and Curves in Space. 5, 9, 23, 28, 33, 41, 45, 51, 60, 66 11.6 Calculus of Vector-Valued Functions. 11, 24, 37, 43, 50, 55, 63, 71, 81, 84
Jan 26:	11.7 Motion in Space. 7, 21, 25, 33, 37, 43, 47, 56, 65, 67 11.8 Length of Curves. 1, 9, 13, 15, 23, 31, 35, 43, 48, 56
Jan 31:	11.9 Curvature and Normal Vectors. 11, 15, 27, 37, 42, 48, 54, 57, 69, 72
Feb 2:	12.1 Planes and Surfaces. 11, 15, 25, 35, 41, 47, 52, 59, 63, 91 12.2 Graphs and Level Curves. 22, 24, 30, 32, 34, 35, 50, 40, 66
Feb 7:	Review
Feb 9:	<b>Midterm 1:</b> In class (covers 11.1-11.9, 12.1-12.2, tentatively)
Feb 14:	12.3 Limits and Continuity. 13, 18, 27, 32, 37, 39, 45, 51, 56, 59 12.4 Partial Derivatives. 13, 26, 33, 37, 41, 47, 49, 56, 80, 88
Feb 16:	12.5 The Chain Rule. 4, 9, 16, 21, 23, 33, 36, 40, 64, 68
Feb 21:	12.6 Directional Derivatives and the Gradient. 9, 15, 21, 25, 27, 31, 33, 44, 53, 55
Feb 23:	12.7 Tangent Planes and Linear Approximations. 11, 14, 19, 24, 25, 31, 40, 47, 51
Feb 28:	12.8 Maximum and Minimum Problems. 12, 17, 22, 27, 40, 47, 50, 53, 65
Mar 2:	12.9 Lagrange Multipliers. 3, 7, 11, 15, 21, 26, 30, 31, 35
Mar 7:	13.1 Double Integrals over Rectangular Regions. 1, 5, 8, 17, 22, 23, 28, 31, 47 13.2 Double Integrals over General Regions. 10, 13, 17, 21, 49, 54, 63, 66, 69, 75
Mar 9:	13.3 Double Integrals in Polar Coordinates. 7, 13, 21, 24, 27, 40, 43, 53, 65 13.4 Triple Integrals. 7, 13, 15, 20, 28, 31, 32, 39, 41
Mar 21:	Review
Mar 23:	<b>Midterm 2:</b> In class (covers 12.3-12.9, 13.1-13.4, tentatively)
Mar 28:	13.5 Triple Integrals in Cylindrical and Spherical Coordinates. 15, 18, 23, 30, 33, 39, 42, 47, 49, 66
Mar 30:	13.6 Integrals for Mass Calculations. 9, 13, 19, 21, 25, 33, 36, 43 13.7 Change of Variables in Multiple Integrals (Introduction) 5, 19, 27, 29 (cont.)
Apr 4:	13.7 Change of Variables in Multiple Integrals. 31, 33, 37, 41 14.1 Vector Fields. 9, 10, 17, 19, 25, 50

<sup>1</sup> "As the instructor of this course, I reserve the right to adjust this schedule as needed in any way that serves the educational needs of the students enrolled in this course." —Dr. James A. M. Epperson—

<sup>2</sup> Your homework will be online at [uta.mylabsplus.com](http://uta.mylabsplus.com). The online homework corresponds to the listed homework from the textbook.

Date	Section/Problems Assigned <sup>2</sup>
Apr 6:	14.2 Line Integrals. 11, 13, 27, 31, 33, 37, 39, 44, 45
Apr 11:	14.3 Conservative Vector Fields. 9, 17, 27, 31, 33, 35, 41, 45
Apr 13:	14.4 Green's Theorem. 11, 13, 14, 17, 21, 23, 29, 32, 35
Apr 18:	14.5 Divergence and Curl. 9, 17, 23, 27, 31, 41 14.6 Surface Integrals (Introduction). 12, 17, 27, 29
Apr 20:	14.6 Surface Integrals. 31, 35, 38, 43, 53
Apr 25:	14.7 Stokes' Theorem. 5, 7, 11, 14, 17, 20, 41
Apr 27:	14.8 The Divergence Theorem. 9, 11, 13, 17, 20, 23, 25
May 2:	Review
May 4:	Review
May 6:	<b>Final Exam</b> (Departmental) 3:30-6:00 p.m. (cumulative exam—covers 13.5-14.8 and all sections above)