MATHEMATICS 2326, CALCULUS III

Instructor:	**Dr. J. Epperson**		
Office:	PKH 423	e-mail:	epperson@uta.edu
Phones:	817-272-5047 (office); 817-272-3261 (Mathematics Department)	Office Hours:	M 11-11:50; T 1:00-1:50; or by appointment
Website:	http://wweb.uta.edu/faculty/epperson	Faculty Profile:	http://www.uta.edu/profiles/james-epperson

Class Meetings:	*Lecture* (2425-300): Tuesdays & Thursdays 11:00-12:20 in PKH 319
Textbook:	CALCULUS, EARLY TRANSCENDENTALS, CUSTOM EDITION FOR UT-ARLINGTON, BY SOO T. TAN Register** for WebAssign at: http://webassign.net/ NOTE that the Class Key depends upon the lab section for which you are registered: Class Key for 2326-003: **uta 3730 9693** ** If you purchased your book new, you receive an access code for WebAssign. Otherwise, you will need to purchase this. There is a 14-day trial period before action is needed regarding purchasing access.
Course Prerequisite:	A grade of C or above in Math 2425 (Calculus II) or HONR-SC 2425.
Description of Course Content:	This course is a study of calculus in multiple dimensions. We begin with a brief study of 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 and include two sections from Chapter 10.
Class Format:	I may incorporate cooperative learning activities during class as well as other active learning strategies during the semester. *You are expected to participate fully in these activities.* You will need to have 8-10 hours (or more) available weekly to study outside of class in order to succeed in this course.
Electronic Communication	UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. 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 http://www.uta.edu/oit/cs/email/mavmail.php.
UT-Arlington Department of Mathematics Learning Outcomes for M2326	Upon completion on Math 2326, the student should be able to 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. 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.

3. Students must also be able to demonstrate techniques of multiple- integration and compute 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.

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.

Details About the Course

Grades:

Midterm Exam 1	Thursday, February 19 (in class)	25%
Midterm Exam 2	Thursday, April 7 (in class)	25%
Homework/Quizze	Weekly Homework; Intermittent Quizzes; Video Assignments	20%
Final examination	Saturday, May 9, 2015, 3:30-6:00 PM Comprehensive coverage	30%

Grades will be assigned according to the following scheme (approximately):

90–100	**A**
80– 89	**B**
70– 79	**C**
60– 69	**D**
59 or below	**F**

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 provided that 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://wweb.uta.edu/aao/fao/). Any student who drops this course on or before Friday, April 3rd at 5 PM will receive a W. ***Note that drop requests must be submitted to an advisor by 4 PM on April 3rd***.

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.
➢ 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.
➢ <u>Since lecture and lab focus on interpersonal communication, students must request permission to use a laptop during class or lab time.</u>

Online Homework: Suggested homework will be assigned each day and posted on Dr. Epperson's website. A student must have access to WebAssign 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 <u>must</u> 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 WebAssign) 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://wweb.uta.edu/faculty/epperson/courses.html 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 <u>subject heading</u> "**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.

<u>*If at any time you have questions, please do not hesitate to ask.*</u>

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, or view the information at www.uta.edu/resources.

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.

Americans with Disabilities Act: The University of Texas at 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)*. 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 that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. 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 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 is committed to upholding U.S. Federal Law "Title IX" such that no member of the UT Arlington community shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity. For more information, visit 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 20	Classes begin
February 4	Census Date
February 19	Midterm 1 (during class)
March 7-15	Spring Break
April 2	Last day to drop a class (by 4 pm)
April 7	Midterm 2 (during class)
May 8	Last day of classes
Saturday, May 9	Final Exam, 3:30-6:00 pm

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[1]

Date	Section/Problems Assigned[2]
Jan 20:	11.1 Vector-Valued Functions & Space Curves. 2, 6, 9, 11, 12, 13, 16, 21, 25, 33, 35, 36, 38, 40, 41, 43, 45, 46, 53, 54; 11.2 Differentiation and Integration of Vector-Valued Functions. 3, 6, 7, 11, 14, 17, 20, 22, 25, 30, 33, 39, 49, 50
Jan 22:	11.3 Arc Length and Curvature. 3, 7, 11, 12, 14, 16, 19, 25, 27, 30, 33, 34, 35, 36, 44
Jan 27:	11.4 Velocity and Acceleration. 1-21 (odds), 23, 26 10.6 Surfaces in Space. 2, 3, 4, 9, 13-20, 22, 30, 39, 47, 49, 53
Jan 29:	12.1 Functions of Two or More Variables. 2, 3, 5, 7, 8, 13, 15, 16, 24, 26, 27, 33, 34, 35, 36, 37, 38, 43, 44, 46, 51, 53, 54, 57, 58, 59, 60, 61, 62 12.2 Limits and Continuity (Introduction)
Feb 3:	12.2 Limits and Continuity. 2, 5, 8, 11, 14, 15, 21, 27, 28, 32, 34, 35, 41
Feb 5:	12.3 Partial Derivatives. 1, 10, 17, 23, 30, 33, 35, 42, 43, 53, 61, 76 12.4 Differentials. 1, 5, 8, 23, 25, 31, 33, 37
Feb 10:	12.5 The Chain Rule. 5, 7, 10, 13, 22, 25, 27, 30, 35, 41, 43, 52
Feb 12:	12.6 Directional Derivatives and Gradient Vectors. 3, 7, 13, 16, 22, 32, 35, 37, 53, 54
Feb 17:	Review

---

[1] "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-*

[2] Your homework will be online in WebAssign. The online homework corresponds to the listed homework problems from the textbook.

Feb 19:	**Midterm 1**: In class (covers 11.1-11.4, 10.6, 12.1-12.6, tentatively)
Feb 24:	12.7 Tangent Planes and Normal Lines. 3, 6, 11, 12, 22, 32, 33, 40 12.8 Extrema of Functions of Two Variables. 4, 7, 15, 22, 33, 35, 41, 45, 49
Feb 26:	12.9 Lagrange Multipliers'. 1, 6, 10, 11, 15, 17, 19, 24, 32, 43
Mar 3:	13.1 Double Integrals. 1, 3, 7, 13, 16, 19, 25
Mar 5:	13.2 Iterated Integrals. 2, 5, 10, 13, 16, 22, 27, 31, 35, 38, 51, 54, 59, 62 13.3 Double Integrals in Polar Coordinates. 9, 12, 15, 19, 24, 29, 37, 40
Mar 17:	13.4 Applications of Double Integrals. 3, 9, 13, 25, 26 13.5 Surface Area. 3, 6, 9, 11, 14, 24
Mar 19:	13.6 Triple Integrals. 6, 9, 12, 13, 19, 27, 30, 44, 51, 57 10.7 Cylindrical and Spherical Coordinates. 3, 11, 14, 22, 28, 36, 37, 43, 48, 53, 61, 64, 71
Mar 24:	13.7 Triple Integrals in Cylindrical and Spherical Coordinates. 3, 5, 11, 13, 16, 23, 26, 31, 32, 38, 40, 41, 43
Mar 26:	13.8 Change of Variables in Multiple Integrals. 3, 4, 7, 10, 12, 13, 15, 18, 23, 26, 27, 28
Mar 31 :	Review
Apr 2:	Review
Apr 7:	**Midterm 2:** In class (covers 12.7-12.9, 13.1-13.8, 10.7, tentatively)
Apr 9:	14.1 Vector Fields. 1, 2, 3, 4, 5, 6, 8, 9, 14, 19, 21, 22, 27, 30, 31 14.2 Divergence and Curl. 5, 10, 13, 14, 15, 19, 20, 27, 28
Apr 14:	14.3 Line Integrals (Introduction)
Apr 16:	14.3 Line Integrals. 3, 6, 7, 11, 18, 21, 25, 29, 30, 36 14.4 Independence of Path and Conservative Vector Fields. (Introduction)
Apr 21:	14.4 Independence of Path and Conservative Vector Fields. 3, 7, 11, 14, 17, 20, 21, 23, 26, 27, 31, 33, 37, 42
Apr 23:	14.5 Greens' Theorem. 2, 3, 7, 12, 15, 18, 28, 29 14.7 Surface Integrals (Introduction)
Apr 28:	14.7 Surface Integrals. 5, 7, 10, 15, 17, 21, 25, 28, 29 14.8 The Divergence Theorem (Introduction)
Apr 30:	14.8 The Divergence Theorem. 3, 5, 8, 10, 17, 19 14.9 Stokes' Theorem (Introduction)
May 5:	14.9 Stokes' Theorem. 3, 5, 9, 11, 14, 17, 24
May 7:	Review
May 9:	**Final Exam** (Departmental) 3:30-6:00 p.m. (cumulative exam—covers 14.1-14.9 and all sections above)