Syllabus

(UTA) Math 2326 Summer 2015
Calculus Three

1. Instructor/Course Information

1.1. **Instructor.** David A. Smith

1.2. **Email.** davidsmith@uta.edu

1.3. **Office.** Pickard Hall 443

1.4. **Office Hours.** Mondays: noon-1 pm. Wednesdays and Fridays: 1-2 pm. Please have your questions prepared *before you arrive* in my office. If you are not able to see me at that time, please send an email to me to schedule an appointment.

1.5. **Office Phone.** 817-272-7203

1.6. **Webpage/Profile.** `http://www.uta.edu/faculty/dsmith/`

1.7. **Course Name.** Math 2326, Calculus III

1.8. **Section Number.** Section 001

1.9. **Course Location.** UTA, Pickard Hall. Room 319

1.10. **Course Meetings Times.** MoWeFr 9:00AM - 9:50AM

1.11. **Prerequisites.** C or better in MATH 2425.

1.12. **Required Text.** Calculus, Early Transcendentals, Custom Edition for University of Texas Arlington by Soo T. Tan

1.13. **Course Content.** Vector functions and motion in space, functions of two or more variables and their partial derivatives, applications of partial derivatives (including Lagrange multipliers), multiple integration (including Jacobian), line integrals, Green's Theorem, vector analysis, surface integrals, and Stokes' Theorem.

1.14. **Calculator Policy.** The only calculators allowed for quizzes, midterms, and the final are TI-30XA and TI-30XIIS.

1.15. **Notecard Policy.** One 3×5 notecard will be allowed on each exam.

1.16. **Emergency Phone Numbers.** In case of an on-campus emergency, call the UT Arlington Police Department at 817-272-3003 (non-campus phone), 2-3003 (campus phone). You may also dial 911.

1.17. **Learning Outcomes.** Upon completing this course students should be able to:

(1) Students will be able to use the concepts of continuity, differentiation, and integration of vector-valued functions to determine unit tangent and unit normal vectors in the process of modeling objects in three dimensions. Students will be able to parameterize piecewise-smooth curves using arc length. They will be able to compute the curvature of a space curve.
(2) Students will be able to compute and sketch level curves and level surfaces for functions of several variables and sketch the graphs of functions of two variables. Analyzing limits, determining continuity, and computing partial derivatives of multivariate functions is also expected. Students will be able to use tangent planes, directional derivatives, gradients, the second partials test, and Lagrange multipliers to approximate and solve optimization problems.
(3) Students will be able to demonstrate techniques of multiple integration and compute iterated integrals over rectangular regions, non-rectangular regions, and in other coordinate systems. They will be able to apply multiple integrals in problem situations involving area, volume, surface area, center of mass, moments of inertia, etc.
(4) Students will be able to compute line integrals and surface integrals by applying The Fundamental Theorem for line integrals, Green's theorem, Stoke's Theorem and the Divergence Theorem. Applying these integrals to solve applications such as mass and work problems is also expected.

2. Student Evaluation

I anticipate that a student passing this course will spend at least 12 focused hours each week outside the classroom.

2.1. **Classroom Performance/Attendance Policy.** Attendance is required. You are expected to be on time for all class meetings. You are responsible for any and all announcements I make in class. You are responsible for any material missed during missed classes.

2.2. **Homework.** It is your responsibility to make sure your homework is finished, on time, checked for correctness and rigor, and reviewed.

2.3. **Quizzes.** Throughout the semester quizzes will be given routinely in the form of multiple choice. Quizzes are cumulative and are unannounced.

No makeups for quizzes for any reason.

The lowest quiz score will be dropped. You must bring a scantron form to every class in case of a multiple choice quiz. The scantron form is 882-E.

2.4. **Exams.** You are expected to review all quizzes, homework assignments, textbook reading notes, class lecture notes, and previous exams before taking an exam. Every exam will be cumulative. Exams during the semester will measure your progress in mastering the learning outcomes.

2.5. **Grade Components.**

- Quiz Average is 20% of final grade.
- Exam 1 is 25% of final grade.
- Exam 2 is 25% of final grade.
- Final Exam is 30% of final grade.

2.6. **Grading Scale.** A cumulative score of 90% or above guarantees an A, 80% or above, at least a B, 70% or above, at least a C, and 60% or above, at least a D.

2.7. **Make-up Policy.** If you have a conflict with either midterm or final, you must contact me no later than Census Date, by email. Do not assume that your e-mail has been received if there is no response from me. *There is no makeup for a quiz.*

3. Student Information

3.1. **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/).

3.2. **Electronic Communication.** You should have an activated MyMav account and check it regularly during the semester. You are responsible for all the information I will be sending out to your MyMav account and the announcements I make on my Web Page.

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.

3.3. **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.

3.4. **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.

3.5. **Academic Integrity.** Students enrolled all UT Arlington courses 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.

3.6. **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.

3.7. **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.

3.8. **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, which is located at the front of the classroom. 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 individuals with disabilities.

3.9. **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.

3.10. **Grade Replacement and Grade Exclusion Policies.** These policies are described in detail in the University catalog and can also be founded online at `wweb.uta.edu/catalog/content/general/academic_regulations.aspx`. The deadline for filing a grade replacement request is the Census Date.

3.11. **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.

4. Important Dates

- Jan 20: First Day of Classes
- Feb 4: Census Date
- Mar 9-14: Spring Break
- Feb 13: Midterm 1
- Mar 27: Midterm 2
- Apr 3: Last Day to Drop Classes
- May 8: Last Day of Classes
- May 9: Final Exam 3:30-6:00 p.m.

4.1. **Assignment Sheet & Course Schedule.**

(1) §11.1 Vector-Valued Functions and Space Curves. 2, 6, 9, 11, 12, 13, 16, 21, 25, 33, 35, 36, 38, 40, 41, 43, 45, 46, 53, 54

(2) §11.2 Differentiation and Integration of Vector-Valued Functions. 3, 6, 7, 11, 14, 17, 20, 22, 25, 30, 33, 39, 49, 50

(3) §11.3 Arc Length and Curvature. 3, 7, 11, 12, 14, 16, 19, 25, 27, 30, 33, 34, 35, 36, 44

(4) §11.4 Velocity and Acceleration. 1-21 (odds), 23, 26

(5) §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

(6) §12.2 Limits and Continuity. 2, 5, 8, 11, 14, 15, 21, 27, 28, 32, 34, 35, 41

(7) §12.3 Partial Derivatives. 1, 10, 17, 23, 30, 33, 35, 42, 43, 53, 61, 76

Feb 13: Midterm 1

(8) §12.4 Differentials. 1, 5, 8, 23, 25, 31, 33, 37

(9) §12.5 The Chain Rule. 5, 7, 10, 13, 22, 25, 27, 30, 35, 41, 43, 52

(10) §12.6 Directional Derivatives and Gradient Vectors. 3, 7, 13, 16, 22, 32, 35, 37, 53, 54

(11) §12.7 Tangent Planes and Normal Lines. 3, 6, 11, 12, 22, 32, 33, 40

(12) §12.8 Extrema of Functions of Two Variables. 4, 7, 15, 22, 33, 35, 41, 45, 49

(13) §12.9 Lagrange Multipliers. 1, 6, 10, 11, 15, 17, 19, 24, 32, 43

(14) §13.1 Double Integrals. 1, 3, 7, 13, 16, 19, 25

(15) §13.2 Iterated Integrals. 2, 5, 10, 13, 16, 22, 27, 31, 35, 38, 51, 54, 59, 62

(16) §13.3 Double Integrals in Polar Coordinates. 9, 12, 15, 19, 24, 29, 37, 40

(17) §13.4 Applications of Double Integrals. 3, 9, 13, 25, 26

Mar 27: Midterm 2

(18) §13.5 Surface Area. 3, 6, 9, 11, 14, 24

(19) §13.6 Triple Integrals. 6, 9, 12, 13, 19, 27, 30, 44, 51, 57

(20) §13.7 Triple Integrals in Cylindrical and Spherical Coordinates. 3, 5, 11, 13, 16, 23, 26, 31, 32, 38, 40, 41, 43

(21) §13.8 Change of Variables in Multiple Integrals. 3, 4, 7, 10, 12, 13, 15, 18, 23, 26, 27, 28

(22) §14.1 Vector Fields. 1, 2, 3, 4, 5, 6, 8, 9, 14, 19, 21, 22, 27, 30, 31

(23) §14.2 Divergence and Curl. 5, 10, 13, 14, 15, 19, 20, 27, 28

(24) §14.3 Line Integrals. 3, 6, 7, 11, 18, 21, 25, 29, 30, 36

(25) §14.4 Independence of Path and Conservative Vector Fields. 3, 7, 11, 14, 17, 20, 21, 23, 26, 27, 31, 33, 37, 42

(26) §14.5 Greens Theorem. 2, 3, 7, 12, 15, 18, 28, 29

(27) §14.7 Surface Integrals. 5, 7, 10, 15, 17, 21, 25, 28, 29

(28) §14.8 The Divergence Theorem. 3, 5, 8, 10, 17, 19

(29) §14.9 Stokes Theorem. 3, 5, 9, 11, 14, 17, 24

May 9: Final Exam 3:30-6:00 p.m.

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. – *D.A. Smith*