MATH 2326–001
Calculus III
Fall 2014

Instructor: Dr. Benito Chen-Charpentier
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Office Hours: M 3:00–4:00 pm, Th 11:00 am –12:00 pm, and by appointment
Classroom: PKH 319
Class schedule: Tue-Th 12:30–1:50 pm

Course Content: Introductory course on vector functions in two or three dimensions, functions of two or more variables, their partial derivatives and extrema, the chain rules, directional derivatives, multiple integration, line integral, surface integrals, Green's theorem, Stokes' theorem, and the divergence theorem.
Prerequisite: C or better in MATH 2425 or HONR-SC 2425.

Student Learning Outcomes: Upon completion of MATH 2326:
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 parametrize 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, Greens Theorem, Stokes Theorem, and the Divergence Theorem. Applying these integrals to solve applications such as mass and work problems is also expected.

Required Textbook, Supplies, and Electronic Access: Calculus: Early Transcendentals, Custom Edition for the University of Texas at Arlington, by Soo T. Tan.

Major assignments and exams: Homework will be assigned periodically, there will be two in-class exams, and a departmental final exam. You are required to bring a scantron, form 882-E for possible multiple choice exams.

Grading Policy: Homework is worth 30%, each midterm exam is worth 20%, and the final exam will have a weight of 30%. Course grades are assigned based on the following percentages: F 0-59, D 60-69, C 70-79, B 80-89, A 90-100. Other grades such as W or X will be assigned in accordance with the guidelines in the catalog.

Attendance Policy: Regular attendance is required.

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.

Expectations for Out-of-Class Study: Between lectures, you are expected to review your notes, go through the appropriate section(s) in the book, understand all relevant examples in the book, and attempt all homework problems assigned for the section. Beyond the time required to attend each class meeting, **students enrolled in this course who intend to earn a grade of C or higher should expect to spend at least an additional 12 focused hours each week of their own time in course related activities, including reading required materials, completing assignments, and preparing for exams.**

Exam Make-up Policy: You will need a university valid excuse in order to have a make-up exam.

Exam Calculator Policy: On the midterms and final you will be allowed to use only the TI-30XA and TI-30XIIS, the latter is on the current list of calculators allowed for the professional engineering exams. ONLY TEXAS INSTRUMENTS CALCULATORS IN THE 30 SERIES WILL BE PERMITTED DURING THE EXAMS. Calculators other than TI-30XA and TI-30XIIS will be confiscated at the beginning of exams, no exceptions. Any device that has electronic communication abilities of any kind is not allowed for any reason, including child care issues, during any exam. Any student caught with such a communication device will be considered as cheating, with resulting consequences.

Exam Picture ID Policy: You will be asked to present a UTA picture ID at all exams. Bring your UTA picture ID to all exams.

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/).

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.

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: All students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlingtons 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.

Student Feedback Survey: At the end of each term, students enrolled in classes categorized as lecture, seminar, or laboratory shall be directed to complete a 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 students feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlingtons 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

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.

Math Clinic Tutoring Available: The Math Department operates the Math Clinic, a tutoring service staffed by upper level undergraduate students. You will need to show your Mav ID to use the Math Clinic. There are tables where you may study on your own or quietly with other students. Each table has a flag that you can raise to indicate that you need help from a tutor. The Math Clinic is on the 3rd floor or Pickard Hall. 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. **Private Tutoring:** The Math Dept. maintains a list of people who have expressed an interest in tutoring. These persons are **not** necessarily recommended by the Math Dept. and they set their own fees. You may obtain a copy of the tutor list in the Math Office.

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.

Grade Exclusion and Grade Replacement Policies: These policies are described in detail in the University catalog and can also be found online. Further questions should be directed to your academic advisor and not the instructor of this course.

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 Bursars Office.

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, which is located at the South-East side of the building. 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.

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.

Course Schedule: We will cover the following sections from the text:

1st and 2nd week, Sections: 11.1, 11.2, 11.3, 10.6. Vector Valued Functions with Differentiation and Integration. Curvature. Quadric Surfaces.
3rd and 4th week, Sections: 12.1, 12.2, 12.3, 12.4, 12.5. Functions of Several Variables. Partial Derivatives.
5th and 6th week, Sections: 12.6, 12.7, 12.8, 12.9. Gradient. Tangent plane. Extrema of Functions.
7th and 8th week, Sections: 13.1, 13.2, 13.3, 13.4, 13.5, 13.6. 10.7. Multiple Integrals. Polar coordinates. Cylindrical and Spherical Coordinates.
9th and 10th week, Sections: 13.7, 13.8. 14.1, 14.2. Triple Integrals in Cylindrical and Spherical Coordinates. Vector Analysis. Curl. Divergence.
11th and 12th week, Sections: 14.3, 14.4, 14.5, 14.7. Line Integrals. Greens Theorem. Surface Integrals.
13th and 14th week, Sections: 14.8, 14.9. Divergence Theorem. Stokes Theorem. Review week.

Test 1 (tentative) 11.1, 11.2, 11.3, 10.6, 12.1, 12.2, 12.3, 12.4, 12.5

Test 2 (tentative) 12.6, 12.7, 12.8, 12.9, 13.1, 13.2, 13.3, 13.4, 13.5, 13.6
Final Exam (cumulative) 10.7, 13.7, 13.8, 14.1, 14.2, 14.3, 14.4, 14.5, 14.7, 14.8, 14.9 (plus above sections)

Important Dates (Fall 2014):
August 21 First Day of Class
September 8 Census Date (Deadline for makeup requests for ALL exams)
Thursday September 25 Midterm 1, tentative
Thursday October 23 Midterm 2, tentative
October 29 Last day to drop a class
November 27-28 Thanksgiving break
December 3 Last day of classes
Saturday December 6 Final Exam, 3:30 - 6:00 pm (May change)

Homework Assignments (Suggested problems. Do not turn in)
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) 10.6 Surfaces in Space. 2, 3, 4, 9, 13-20, 22, 30, 39, 47, 49, 53
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, 72
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
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
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) 10.7 Cylindrical and Spherical Coordinates. 3, 11, 14, 22, 28, 36, 37, 43, 48, 53, 61, 64, 71
21) 13.7 Triple Integrals in Cylindrical and Spherical Coordinates.3,5,11, 13, 16, 23, 26, 31, 32, 38, 40, 41, 43
22) 13.8 Change of Variables. 3, 4, 7, 10, 12, 13, 15, 18, 23, 26, 27, 28
23) 14.1 Vector Fields. 1, 2, 3, 4, 5, 6, 8, 9, 14, 19, 21, 22, 27, 30, 31
24) 14.2 Divergence and Curl. 5, 10, 13, 14, 15, 19, 20, 27, 28
25) 14.3 Line Integrals. 3, 6, 7, 11, 18, 21, 25, 29, 30, 36
26) 14.4 Independence of Path and Conservative Vector Fields.3, 7, 11, 14, 17, 20, 21,

23, 26, 27, 31, 33, 37, 42
27) 14.5 Greens' Theorem. 2, 3, 7, 12, 15, 18, 28, 29
28) 14.7 Surface Integrals. 5, 7, 10, 15, 17, 21, 25, 28, 29
29) 14.8 the Divergence Theorem. 3, 5, 8, 10, 17, 19
30) 14.9 Stokes' Theorem. 3, 5, 9, 11, 14, 17, 24

As 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.

Suggestions: *Suggestions for improvement are welcome.*