Syllabus

Title	Calculus III
Number	MATH 2415-101
Time	MTWR 11:30–12:20
Instructor	David Milovich
Email	david.milovich@tamiu.edu
Phone	(956) 326-2570
Office	LBV 321
Mailbox	LBV 312
Hours	TR 2:00–5:00
Department	Mathematics and Physics
College	Arts and Sciences
Institution	Texas A&M International University
Term	Fall 2016

Course description. Vector operations in $\mathbb{R}^2$, $\mathbb{R}^3$, lines, planes; vector-functions, space curves, curvature; multivariable calculus, optimization, Lagrange multipliers; multiple integrals; vector fields, theorems of Green, Gauss and Stokes. Prerequisite: MATH 2414.

Student learning outcomes. Upon successful completion of this course, the student 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;

- compute the curvature and torsion of a curve in space;

- calculate and sketch level curves and level surfaces for functions of several variables and sketch the graphs of functions of two variables;

- compute limits, determine continuity, and compute partial derivatives of multivariable functions;

- use tangent planes, directional derivatives, gradients, the second partials test, and Lagrange multipliers to approximate functions and solve optimization problems;

- demonstrate techniques of computation of multiple integral and compute iterated integrals over planar regions involving change of coordinate systems;

- apply multiple integrals to solve problems involving area, volume, surface area, center of mass, and moments of inertia;

- compute line integrals and surface integrals by applying The Fundamental Theorem for line integrals, Green's theorem, Stoke's Theorem and the Divergence Theorem, and applying these techniques to solve application problems such as work problems.

Recommended Textbook. OpenStax. *Calculus Volume 3*. Chapters 2–6. `http://cnx.org/content/col11966/latest`

Calculator. Recommended: A calculator with 3D graphing and CAS (examples: TI-89 Titanium or TI-Nspire CX CAS).

Homework. I will grade homework for completeness. If you can't complete a problem, write at least a paragraph explaining what you tried and how you got stuck. For teaching purposes, I may share copies of your solutions with the class. (To opt out, clearly label your homework as "confidential.")

Grading. Letter grades (which may include +/- modifiers) will be given for invidiual assignments and tests. These grades will be converted to GPA scores and then averaged according to the following weights: median homework score: 20%; Test 1: 11%; Test 2: 12%; Test 3: 13%; Test 4: 14%; final exam: 30%.

Tests. Unlimited notes and textbooks are allowed for tests. A calculator is strongly recommended. Phones/tablets/laptops are not allowed.

Make-ups. See the Student Handbook and the attached Policies of the College of Arts and Sciences for rules about make-ups. I promise no make-ups beyond those promised there. Generally speaking, you should have a good excuse. Also keep in mind that I am basing your overall homework grade on your *median* homework score, which implies that you can afford to miss some homeworks if you do well the majority of the time.

day	date	HW due	Ch.	tentatively scheduled topics
1	Aug 23		2	plane vectors
2	Aug 24		2	plane vectors
3	Aug 25		2	space vectors
4	Aug 29		2	space vectors
5	Aug 30		2	dot product
6	Aug 31		2	dot product
7	Sep 01	1--4	2	cross product
8	Sep 05		2	equations of lines, planes
9	Sep 06		2	equations of lines, planes
10	Sep 07		2	quadric surfaces
11	Sep 08	5--8	2	cylindrical and spherical coordinates
12	Sep 12		2	cylindrical and spherical coordinates
13	Sep 13		3	space curves
14	Sep 14		3	calculus of space curves
15	Sep 15			**test: days 1--8**
16	Sep 19		3	arc length and curvature
17	Sep 20	9--13	3	arc length and curvature
18	Sep 21		3	motion in space
19	Sep 22		4	functions of several variables
20	Sep 26		4	limits and continuity
21	Sep 27	14--18	4	partial derivatives
22	Sep 28		4	partial derivatives
23	Sep 29		4	tangent planes and linear approximations
24	Oct 03		4	chain rule
25	Oct 04			**test: days 9--18**
26	Oct 05		4	directional derivatives; gradient
27	Oct 06		4	maxima/minima problems
28	Oct 10	19--23	4	maxima/minima problems
29	Oct 11		4	lagrange multipliers
30	Oct 12		4	lagrange multipliers
31	Oct 13		5	double integrals over rectangles
32	Oct 17	24--29	5	double integrals over rectangles
33	Oct 18		5	double integrals over other regions
34	Oct 19		5	double integrals over other regions
35	Oct 20		5	polar double integrals
36	Oct 24			**test: days 19--29**
37	Oct 25		5	triple integrals
38	Oct 26		5	triple integrals
39	Oct 27	30--34	5	triple integrals in cylindrical coordinates
40	Oct 31		5	triple integrals in spherical coordinates
41	Nov 01		5	centers of mass and moments of inertia
42	Nov 02		5	change of variables in multiple integrals
43	Nov 03	35--40	5	change of variables in multiple integrals
44	Nov 07		6	vector fields
45	Nov 08		6	vector fields
46	Nov 09		6	line integrals
47	Nov 10		6	line integrals
48	Nov 14	41--45	6	conservative vector fields
49	Nov 15		6	conservative vector fields
50	Nov 16		6	Green's theorem
51	Nov 17		6	Green's theorem
52	Nov 21		6	divergence, curl
53	Nov 22			**test: days 30--45**
54	Nov 28		6	surface integrals
55	Nov 29	46--50	6	surface integrals
56	Nov 30		6	Stokes' theorem
57	Dec 01		6	Stokes' theorem
58	Dec 05	51--56	6	Divergence Theorem
	Dec 08?			comprehensive final exam (11:00--2:00?)

Policies of the College of Arts and Sciences
(Required on all COAS Syllabi / Last Revised: July 13, 2016)

Classroom Behavior
The College of Arts and Sciences encourages classroom discussion and academic debate as an essential intellectual activity. It is essential that students learn to express and defend their beliefs, but it is also essential that they learn to listen and respond respectfully to others whose beliefs they may not share. The College will always tolerate diverse, unorthodox, and unpopular points of view, but it will not tolerate condescending or insulting remarks. When students verbally abuse or ridicule and intimidate others whose views they do not agree with, they subvert the free exchange of ideas that should characterize a university classroom. If their actions are deemed by the professor to be disruptive, they will be subject to appropriate disciplinary action, which may include being involuntarily withdrawn from the class.

Plagiarism and Cheating
Plagiarism is the presentation of someone else's work as your own. It occurs when you:
1) **Borrow** someone else's facts, ideas, or opinions and put them entirely in your own words, you <u>must</u> acknowledge that these thoughts are not your own by immediately citing the source in your paper. <u>Failure to do this is plagiarism.</u>
2) **Borrow** someone else's words (short phrases, clauses, or sentences), you <u>must</u> enclose the copied words in quotation marks <u>as well</u> as citing the source. <u>Failure to do this is plagiarism.</u>
3) **Present** someone else's paper or exam (stolen, borrowed, or bought) as your own, you have committed a clearly intentional form of intellectual theft and have put your academic future in jeopardy. <u>This is the worst form of plagiarism.</u>

Here is another explanation from the 2010, sixth edition of the *Manual of The American Psychological Association* (APA):

> *Plagiarism:* Researchers do not claim the words and ideas of another as their own; they give credit where credit is due. Quotations marks should be used to indicate the exact words of another. *Each* time you paraphrase another author (i.e., summarize a passage or rearrange the order of a sentence and change some of the words), you need to credit the source in the text.
>
> The key element of this principle is that authors do not present the work of another as if it were their own words. This can extend to ideas as well as written words. If authors model a study after one done by someone else, the originating author should be given credit. If the rationale for a study was suggested in the Discussion section of someone else's article, the person should be given credit. Given the free exchange of ideas, which is very important for the health of intellectual discourse, authors may not know where an idea for a study originated. If authors do know, however, they should acknowledge the source; this includes personal communications. (pp. 15-16)

Consult the Writing Center or a recommended guide to documentation and research such as the *Manual of the APA* or the *MLA Handbook for Writers of Research Papers* for guidance on proper documentation. If you still have doubts concerning proper documentation, seek advice from your instructor prior to submitting a final draft.

Penalties for Plagiarism: Should a faculty member discover that a student has committed plagiarism, the student should receive a grade of 'F' in that course and the matter will be referred to the Honor Council for possible disciplinary action. The faculty member, however, may elect to give freshmen and sophomore students a "zero" for the assignment and to allow them to revise the assignment up to a grade of "F" (50%) <u>if they believe that the student plagiarized out of ignorance or carelessness and not out of an attempt to deceive in order to earn an unmerited grade.</u> This option should not be available to juniors, seniors, or graduate students, who cannot reasonably claim ignorance of documentation rules as an excuse.

- *Caution*: Be very careful what you upload to Turnitin or send to your professor for evaluation. Whatever you upload for evaluation will be considered your final, approved draft. If it is plagiarized, you will be held responsible. The excuse that "it was only a draft" will not be accepted.
- *Caution:* Also, do not share your electronic files with others. If you do, you are responsible for the possible consequences. If another student takes your file of a paper and changes the name to his or her name and submits it and you also submit the paper, we will hold both of you responsible for plagiarism. It

is impossible for us to know with certainty who wrote the paper and who stole it. And, of course, we cannot know if there was collusion between you and the other student in the matter.

Penalties for Cheating: Should a faculty member discover a student cheating on an exam or quiz or other class project, the student should receive a "zero" for the assignment and not be allowed to make the assignment up. The incident should be reported to the chair of the department and to the Honor Council. If the cheating is extensive, however, or if the assignment constitutes a major grade for the course (e.g., a final exam), or if the student has cheated in the past, the student should receive an "F" in the course, and the matter should be referred to the Honor Council. Under no circumstances should a student who deserves an "F" in the course be allowed to withdraw from the course with a "W."

Student Right of Appeal: Faculty will notify students immediately via the student's TAMIU e-mail account that they have submitted plagiarized work. Students have the right to appeal a faculty member's charge of academic dishonesty by notifying the TAMIU Honor Council of their intent to appeal as long as the notification of appeal comes within 10 business days of the faculty member's e-mail message to the student. The *Student Handbook* provides more details.

Use of Work in Two or More Courses
You may <u>not</u> submit work completed in one course for a grade in a second course <u>unless</u> you receive explicit permission to do so by the instructor of the second course.

UConnect, TAMIU E-Mail, and Dusty Alert
Personal Announcements sent to students through TAMIU's UConnect Portal and TAMIU E-mail are the official means of communicating course and university business with students and faculty – not the U.S. Mail and no other e-mail addresses. Students and faculty must check UConnect and their TAMIU e-mail accounts regularly, if not daily. Not having seen an important TAMIU e-mail or UConnect message from a faculty member, chair, or dean is not accepted as an excuse for failure to take important action. Students, faculty, and staff are encouraged to sign-up for *Dusty Alert* (see www.tamiu.edu). *Dusty Alert* is an instant cell phone text-messaging system allowing the university to communicate immediately with you if there is an on-campus emergency, something of immediate danger to you, or a campus closing.

Copyright Restrictions
The Copyright Act of 1976 grants to copyright owners the exclusive right to reproduce their works and distribute copies of their work. Works that receive copyright protection include published works such as a textbook. Copying a textbook without permission from the owner of the copyright may constitute copyright infringement. Civil and criminal penalties may be assessed for copyright infringement. Civil penalties include damages up to $100,000; criminal penalties include a fine up to $250,000 and imprisonment.

Copyright laws do not allow students and professors to make photocopies of copyrighted materials, but you may copy a limited portion of a work, such an article from a journal or a chapter from a book for your own personal academic use or, in the case of a professor, for personal, limited classroom use. In general, the extent of your copying should not suggest that the purpose or the effect of your copying is to avoid paying for the materials. And, of course, you may not sell these copies for a profit. Thus, students who copy textbooks to avoid buying them or professors who provide photocopies of textbooks to enable students to save money are violating the law.

Students with Disabilities
Texas A&M International University seeks to provide reasonable accommodations for all qualified persons with disabilities. This University will adhere to all applicable federal, state, and local laws, regulations and guidelines with respect to providing reasonable accommodations as required to afford equal education opportunity. It is the student's responsibility to register with the Director of Student Counseling and to contact the faculty member in a timely fashion to arrange for suitable accommodations.

Student Attendance and Leave of Absence (LOA) Policy:
As part of our efforts to assist and encourage all students towards graduation, TAMIU provides LOA's for students, including pregnant/parenting students, in accordance with the Attendance Rule (Section 3.24) and the Student LOA Rule (Section 3.25), which includes the "Leave of Absence Request" form. Both rules can be found in the TAMIU Student Handbook (URL: http://www.tamiu.edu/studentaffairs/StudentHandbook1.shtml).

Under Title IX of the Education Amendments of 1972, harassment based on sex, including harassment because of pregnancy or related conditions, is prohibited. A **pregnant/parenting student** must be granted a leave of absence (LOA) for as long as the student's physician deems the absence medically necessary. As a TAMIU faculty

member, we must:

1) Allow a pregnant/parenting student to submit work after a deadline that was missed because of a LOA due to pregnancy or childbirth,
2) If grading is based in part on class attendance or participation, allow a pregnant/parenting student to earn the credits missed so that the student can be reinstated to the status held before the LOA, and
3) At the conclusion of the LOA, allow the pregnant/parenting student to return to the same academic and extracurricular status held when the LOA began.

If we receive a request from a student for a LOA, including pregnant/parenting students, we will promptly report it to and seek guidance from the Office of Student Affairs at ext. 2282.

Incompletes
Students who are unable to complete a course should withdraw from the course before the final date for withdrawal and receive a "W." To qualify for an "incomplete" and thus have the opportunity to complete the course at a later date, a student must meet the following criteria:

1) The student must have completed 90% of the course work assigned before the final date for withdrawing from a course with a "W", and the student must be passing the course;
2) The student cannot complete the course because an accident, an illness, or a traumatic personal or family event occurred after the final date for withdrawal from a course;
3) The student must sign an "Incomplete Grade Contract" and secure signatures of approval from the professor and the college dean.
4) The student must agree to complete the missing course work before the end of the next long semester; failure to meet this deadline will cause the "I" to automatically be converted to an "F"; extensions to this deadline may be granted by the dean of the college.

This is the general policy regarding the circumstances under which an "incomplete" may be granted, but under exceptional circumstances, a student may receive an incomplete who does not meet all of the criteria above if the faculty member, department chair, and dean recommend it.

WIN Contracts
WIN Contracts are offered only under exceptional circumstances and are limited to seniors. Only courses offered by full-time TAMIU faculty or TAMIU instructors are eligible to be contracted for the WIN requirement. However, a WIN contract for a course taught by an adjunct may be approved, with special permission from the department chair and dean. Students must seek approval before beginning any work for the WIN Contract. No student will contract more than one course per semester. Summer WIN Contracts must continue through both summer sessions.

Student Responsibility for Dropping a Course
It is the responsibility of the STUDENT to drop the course before the final date for withdrawal from a course. Faculty members, in fact, may not drop a student from a course without getting the approval of their department chair and dean.

Independent Study Course
Independent Study (IS) courses are offered only under exceptional circumstances. Required courses intended to build academic skills may not be taken as IS (e.g., clinical supervision and internships). No student will take more than one IS course per semester. Moreover, IS courses are limited to seniors and graduate students. Summer IS course must continue through both summer sessions.

Grade Changes & Appeals
Faculty are authorized to change final grades only when they have committed a computational error or an error in recording a grade, and they must receive the approval of their department chairs and the dean to change the grade. As part of that approval, they must attach a detailed explanation of the reason for the mistake. Only in rare cases would another reason be entertained as legitimate for a grade change. A student who is unhappy with his or her grade on an assignment must discuss the situation with the faculty member teaching the course. If students believe that they have been graded unfairly, they have the right to appeal the grade using a grade appeal process in the *Student Handbook* and the *Faculty Handbook*.

Final Examination
Final Examination must be comprehensive and must contain a written component. The written component should comprise at least 20% of the final exam grade. Exceptions to this policy must receive the approval of the department chair and the dean at the beginning of the semester.