Texas A&M University-Corpus Christi
Dept. of Mathematics and Statistics

MATH 3470.001  CALCULUS III
Fall Semester 2011

I. COURSE INFORMATION
1. Meeting Time & Place: T R CI-102
2. Professor: Dr. Alexey L Sadovski
3. Office Phone: 825-2477
4. Office Address: CI 338
5. e-mail Address: Alexey.sadovski@tamucc.edu

Additions or changes to this syllabus, exam results etc. and a link to the web-based homework will be posted on the Blackboard. Be sure to regularly check it.

7. Office Hours:

Others by appointment

8. Class Hours: you also need to register for a the lab. Lecture and lab together count as a four-hour course.

II. COURSE DESCRIPTION
This course covers parametric equations, vectors, functions of two and three variables. Contains a one-hour lab component. 4 credit hours.

III. PREREQUISITES FOR THE COURSE
MATH 2414 (Calculus II).

IV. TEXT and OTHER SUPPLIES REQUIRED
The required textbook for the course is University Calculus, by Hass, Weir and Thomas. A graphing calculator is helpful for this class. I will support the TI-89, but in general you can use any graphing calculator. All the class demonstrations will be done with a TI-89. No calculators are allowed for the exams.

For the lab you also need to print out parts of the lab manual. Labs 1-10 are available on the math web at http://math.tamucc.edu/MATHlabs/MATHlabs, labs 11 and 12 will be available at http://sci.tamucc.edu/_bzimmer/MATH3470001SPR11.html. From there you can print the parts you need.

V. STUDENT LEARNING OUTCOMES
At the end of the course the student should be able to

- graph a parametric curve
- convert between rectangular and polar coordinates
- calculate and use dot products and cross products of vectors
- give the equation of a plane in 3 dimensional space
- calculate derivatives and integrals of vector-valued functions
- calculate arc length for vector-valued functions
- match 3d plots and contour plots of functions in 2 variables
- calculate and use partial derivatives
- calculate tangent planes to the graph of a function in two variables
- use the chain rule for functions in several variables
- take directional derivatives and determine gradient vectors
• determine minimum and maximum values of functions in several variables with or without constraints
• evaluate double and triple integrals over general regions
• use the change of variable formula for multiple integrals
• change the order of integration in multiple integrals
• evaluate line integrals
• state and use Green’s theorem

VI. INSTRUCTIONAL METHODS AND ACTIVITIES
Methods and activities for instruction include: Lectures, calculator demonstrations and group activities.

VII. EVALUATION AND GRADE ASSIGNMENT
The methods of evaluation and the criteria for grade assignments are:
The lab part of the course is graded by the TA and counts for 20% of the course grade.
There is no gateway test.
The weights of the different parts of the course towards the final grade are:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Three exams</td>
<td>42%</td>
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<tr>
<td>Quizzes</td>
<td>20%</td>
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<tr>
<td>Homework</td>
<td>0%</td>
</tr>
<tr>
<td>Labs</td>
<td>20%</td>
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<tr>
<td>Comprehensive Final Exam</td>
<td>18%</td>
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Homework through will be assigned every class and is due at the start of the next class. At the start of each class, I will answer homework questions in class.
On-campus free tutoring in CASA is another way of getting help with the homework. Working with other students is fine, but be sure to turn in your own product in the end. Late homework receives no credit. At the end of the semester the lowest three homework grades get dropped. No exam grades get dropped.
Grading Scale: Grades will be no stricter than
A = 90.00 – 100%
B = 80.00 – 89.99%
C = 70.00 – 79.99%
D = 60.00 – 69.99%
F = below 60%

VIII. TENTATIVE COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Class Date</th>
<th>Sections Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.3</td>
<td>Areas and Lengths in Polar Coordinates</td>
</tr>
<tr>
<td>10.1</td>
<td>Three-Dimensional Coordinate Systems</td>
</tr>
<tr>
<td>10.2</td>
<td>Vectors</td>
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<tr>
<td>Lab 1 Day 1 (Matlab Intro)</td>
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<tr>
<td>10.3</td>
<td>The Dot Product</td>
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<tr>
<td>10.4</td>
<td>The Cross Product</td>
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<td>10.5</td>
<td>Lines and Planes in Space</td>
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<tr>
<td>Lab 1 Day 2 (Matlab Intro)</td>
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<tr>
<td>10.6</td>
<td>Cylinders and Quadric Surfaces</td>
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<tr>
<td>11.1</td>
<td>Vector Functions and their Derivatives</td>
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<tr>
<td>11.2</td>
<td>Integrals of Vector Functions</td>
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<tr>
<td>Lab 2 (3-D Space)</td>
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<tr>
<td>11.3</td>
<td>Arc Length in Space</td>
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<tr>
<td>11.4</td>
<td>Curvature of a Curve</td>
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<tr>
<td>9 11.5</td>
<td>Tangential and Normal Components of Acceleration</td>
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</tbody>
</table>
Lab 6 (Vectors)
12.1 Functions of Several Variables
12.2 Limits and Continuity in Higher Dimensions
12.3 Partial Derivatives
Lab 7 (Vectors - Again)
Exam 1, covering Sections 9.3 { 12.2
12.4 The Chain Rule
12.5 Directional Derivatives and Gradient Vectors
Lab 3 (Graphing Functions of Several Variables)
12.6 Tangent Planes and Differentials
12.7 Extreme Values and Saddle Points
12.8 Lagrange Multipliers
Lab 4 (Contour Plots)
12.9 Taylor’s Formula for Two Variables
12.10 Double and Iterated Integrals over Rectangles
Lab 8 (Partial Derivatives)
13.1 Area by Double Integration
13.2 Double Integrals over General Regions
Exam 2, covering Sections 12.3 { 13.3
Lab 10 (Lagrange Multipliers)
13.3 Triple Integrals in Rectangular Coordinates
13.4 Moments and Centers of Mass
13.5 Triple Integrals in Cylindrical Coordinates
Lab 9 (Local Linearity and Differentials)
13.6 Triple Integrals in Cylindrical Coordinates
13.7 Substitutions in Multiple Integrals
13.8 Triple Integrals in Cylindrical Coordinates
13.9 Triple Integrals in Cylindrical Coordinates
13.10 Substitutions in Multiple Integrals
13.11 Line Integrals
Lab 5 (Functions of 3 Variables)
13.12 Substitutions in Multiple Integrals
13.13 Vector Fields, Work, Circulation and Flux
13.14 Vector Fields, Work, Circulation and Flux
13.15 Path Independence, Potentials and Conservative Fields
Lab 11: Practice for Multiple Integrals
Lab 12: Vector Fields
14.1 Green’s Theorem in the Plane
Exam 3, covering sections 13.4 { 14.3
39 W 4/20 14.5 Surfaces and Area
Lab 12: Vector Fields
14.6 Surface Integrals and Flux
14.7 Stokes’ Theorem
14.8 Stokes’ Theorem
No lab
Review
The comprehensive Final Exam is according to University schedule.
IX. CLASS POLICIES
Attendance will not be taken in class. For most students attending class is a faster way of learning the material than trying to catch up on missed material solely from the book. Tardiness is often disruptive to the whole class and is not appreciated. If you are delayed and arrive late for class please do so quietly.
Cell phones and such must be turned off before class. Each time your phone rings during class, your course grade goes down by 1%.
If you have to miss an exam, it is your responsibility to contact me no later than the day
of the exam. One make-up exam will be scheduled for each exam. Make-up exams tend to be harder than the original exam. Failure to contact me on or before the exam day results in a grade of zero points for the exam. Only extreme emergencies or official university business are acceptable reasons to miss exams and documentation will be required. Car trouble, routine doctor’s appointments, family reunions or graduations of siblings etc are not valid reasons to miss exams. If your reason to miss the exam is not a valid one, your exam score is 0 points. Be sure to check before missing an exam whether your reason is acceptable.

X. ACADEMIC INTEGRITY/PLAGIARISM
University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a grade of zero for the assignment or test and will be reported to the appropriate authorities for further action.

XI. DROPPING A CLASS
I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with me before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Friday, April 1 is the last day to drop a class with an automatic grade of “W” this term.

XII. CLASSROOM/PROFESSIONAL BEHAVIOR
Texas A&M University-Corpus Christi, as an academic community, requires that each individual respects the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

XIII. GRADE APPEALS
As stated in University Rule 13.02.99.C2, Student Grade Appeals, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamucc.edu/provost/university rules/index.html.

For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

XIV. DISABILITIES ACCOMMODATIONS
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Driftwood 101. If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

**More class policies:**

**Official Part**

- This class is run for the mathematical development of all participants. All students must accept responsibility for participating and consequences of not participating.

- You are the only person responsible for your registration. No one will drop you for not attending class. Please make sure that you drop the class yourself if you are not able to continue coming to class. Please note that the last day to drop the class with a grade of "W," whatever that is. Note that grades of SA (stopped attending) are converted to F's by the Registrar.

- Please turn off phones and beepers before coming to class. Please limit email and chatting to breaks during the computer lab.

- Attendance is expected. It is the only way to do in-class work.

- All absences from exams, quizzes, and the final exam will be considered unexcused unless they are documented in advance as excusable with the instructor or as soon as possible in the case of emergencies. No credit will be awarded for unexcused absences.

- I will not use class roll at any time, because it is your responsibility to be in class and attend to the process of learning (see also II.2.).

- Please, print your name on all assignments and tests: your professor is not a decoding device.

- If you have questions you MUST ask, you have the right to interrupt lecture or discussion at any time (see also II.1).

- I am always open for all questions and discussions during the class and office hours. You can always arrange meeting with me at any other time suitable for both sides.

- No multi-choice tests and quizzes. All tests will consist of problems you have to solve from the beginning to the end. Partial credit will be given for any parts of problems solved. The policy is **open books and notes, no talking, no cheating.**

- **No open** books and notes during quizzes.

- **Home works must be turned on time.**
• There is **no social promotion** in my classes. **Grades** are given only for **knowledge acquired** (see also II.9.).

## II. Unofficial part

• II.1. There are no "stupid" questions, there are only bad teachers.

• II.2. All you do, you do it for yourself, not for the professor.

• II.3. Do not be concern about grades, be concern of knowledge, because grades are the steepest increasing function of knowledge (here is an example of math language).

• II.4. Do not be afraid of problems, let them be afraid of you.

• II.5. Only doing nothing may be without mistakes. If you don’t make errors, you don’t learn anything.

• II.6. Do not be nervous - it may be only worse.

• II.7. Common sense is the base of all decisions, together with knowledge they can do almost everything (even pass this course!).

• II.8. Keep your particles together.

• II.9. **The only valid excuse for not knowing** the subject is a **sudden death**.