Calculus III MATH-3470.002
Department of Mathematics & Statistics
Spring 2015

A. COURSE INFORMATION

Course number/section: MATH-3470.002
Class meeting time: TR 08:00-09:15 AM
Class location: CS-112
Course Website: https://bb9.tamucc.edu/

B. INSTRUCTOR INFORMATION

Instructor: Dr. Beate Zimmer
Office location: CI 310
Office hours: MW 10:00 – 11:30 AM
TR 9:30 – 10:30 AM
Telephone: 825-2682
e-mail: beate.zimmer@tamucc.edu
Appointments: e-mail

C. COURSE DESCRIPTION

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

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

This course completes the calculus sequence. It generalizes concepts from calculus 1 and 2 and gives you the tools to apply calculus to various physics/engineering/probability problems.

D. PREREQUISITES FOR THE COURSE

Prerequisites
MATH 2414 (Calculus II).

Corequisites
none

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)
The required textbook for the course is Stewart, Calculus, Early Transcendentals, 7th Edition together with access to WebAssign.
Optional Textbook(s) or Other References
The solution manual for the textbook is available, but not needed at all, since the homework system offers help.

Supplies
A graphing calculator might be 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 on BlackBoard. From there you can print the parts you need.
The homework is in WebAssign, accessed by logging into BlackBoard https://bb9.tamucc.edu/. Clicking the WebAssign button on the top left should take you directly into WebAssign. You will need the access code that comes with the book or you can buy an access code online. There is an initial grace period where you can use the system without an access code, so “I don’t have the textbook yet” is not a valid excuse not to do homework right away. To not make the homework assignments too long, they will be broken into three assignments per week, due Tuesday, Thursday and Saturday. You may print out the online homework and class notes, but don’t have to do so. Exam solutions will be available on BlackBoard, you may print them, but don’t have to print them. Costs for required printouts should not exceed $10, or if you print the notes for class $30.

F. **STUDENT LEARNING OUTCOMES AND ASSESSMENT**

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the courses student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Use and convert among Cartesian, parametric, polar, and cylindrical coordinate systems.
   a. graph a parametric curve
   b. convert between rectangular and polar coordinates
2. Calculate dot and cross products as needed for vectors and vector valued functions and gradients.
   a. calculate and use dot products and cross products of vectors
   b. give the equation of a plane in 3 dimensional space
3. Calculate and apply derivatives and integrals for vector-valued functions.
   a. calculate derivatives and integrals of vector-valued functions
   b. calculate arc length for vector-valued functions
4. Calculate and apply derivatives and integrals for functions of several variables.
   a. match 3d plots and contour plots of functions in 2 variables
   b. calculate and use partial derivatives
   c. calculate tangent planes to the graph of a function in two variables
   d. use the chain rule for functions in several variables
   e. take directional derivatives and determine gradient vectors
   f. determine minimum and maximum values of functions in several variables with or without constraints
   g. evaluate double and triple integrals over general regions
   h. change the order of integration in multiple integrals
5. Represent integrals in various forms using transformations (substitutions) and Green’s, Stokes and the Divergence Theorems.
   a. use the change of variable formula for multiple integrals
   b. evaluate line integrals
   c. state and use Green’s theorem

G. INSTRUCTIONAL METHODS AND ACTIVITIES

Methods and activities for instruction include: Lectures, calculator demonstrations and group activities.

H. MAJOR COURSE REQUIREMENTS AND GRADING

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.

Homework through WebAssign 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 for at most 10 minutes. Office hours are a great opportunity to ask more detailed questions about homework. 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.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Three exams</td>
<td>50%</td>
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<tr>
<td>Homework</td>
<td>10%</td>
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<tr>
<td>Labs</td>
<td>20%</td>
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<tr>
<td>Final Exam</td>
<td>20%</td>
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</table>
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%

I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>DATE</th>
<th>TOPIC</th>
<th>CHAPTER</th>
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<tbody>
<tr>
<td>1 R 1/22</td>
<td>Polar Coordinates</td>
<td>10.3</td>
</tr>
<tr>
<td></td>
<td>Areas and Lengths in Polar Coordinates</td>
<td>10.4</td>
</tr>
<tr>
<td>2 T 1/27</td>
<td>Three-Dimensional Coordinate Systems</td>
<td>12.1</td>
</tr>
<tr>
<td></td>
<td>Vectors</td>
<td>12.2</td>
</tr>
<tr>
<td>3 R 1/29</td>
<td>The Dot Product</td>
<td>12.3</td>
</tr>
<tr>
<td>4 T 2/3</td>
<td>The Cross Product</td>
<td>12.4</td>
</tr>
<tr>
<td></td>
<td>Equations of Lines and Planes</td>
<td>12.5</td>
</tr>
<tr>
<td>5 R 2/5</td>
<td>Cylinders and Quadric Surfaces</td>
<td>12.6</td>
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<tr>
<td>6 T 2/10</td>
<td>Functions of Several Variables</td>
<td>14.1</td>
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<tr>
<td></td>
<td>Limits and Continuity</td>
<td>14.2</td>
</tr>
<tr>
<td>7 R 2/12</td>
<td>Partial Derivatives</td>
<td>14.3</td>
</tr>
<tr>
<td>8 T 2/17</td>
<td>Tangent Planes and Differentials</td>
<td>14.4</td>
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<td></td>
<td>The Chain Rule</td>
<td>14.5</td>
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<tr>
<td>9 R 2/19</td>
<td><strong>Exam # 1 covering sections 10.3 – 14.3</strong></td>
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<tr>
<td>10 T 2/24</td>
<td>Directional Derivatives and The Gradient Vector</td>
<td>14.6</td>
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<td>Maximum and Minimum Values</td>
<td>14.7</td>
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<tr>
<td>11 R 2/26</td>
<td>Lagrange Multipliers</td>
<td>14.8</td>
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<tr>
<td>12 T 3/3</td>
<td>Vector Functions and Space Curves</td>
<td>13.1</td>
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<td></td>
<td>Arc Length and Curvature</td>
<td>13.3</td>
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<tr>
<td>13 R 3/5</td>
<td>Double Integrals over Rectangles</td>
<td>15.1</td>
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<tr>
<td>14 T 3/10</td>
<td>Iterated Integrals</td>
<td>15.2</td>
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<td></td>
<td>Double Integrals over General Regions</td>
<td>15.3</td>
</tr>
<tr>
<td>15 R 3/12</td>
<td>Double Integrals in Polar Coordinates</td>
<td>15.4</td>
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<td><strong>Spring Break</strong></td>
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<tr>
<td>16 T 3/24</td>
<td>Applications of Double Integrals</td>
<td>15.5</td>
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<td></td>
<td>Surface Area</td>
<td>15.6</td>
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<tr>
<td>17 R 3/26</td>
<td><strong>Exam # 2 covering sections 13.1, 13.3, 14.4 – 15.4</strong></td>
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<td>18 T 3/31</td>
<td>Triple Integrals</td>
<td>15.7</td>
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<td>Triple Integrals in Cylindrical Coordinates</td>
<td>15.8</td>
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<tr>
<td>19 R 4/2</td>
<td>Triple Integrals in Spherical Coordinates</td>
<td>15.9</td>
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The comprehensive Final Exam is on Tuesday, May 12, 8:00 AM – 10:30 AM in the usual classroom.

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

J. COURSE POLICIES

Attendance/Tardiness
Attendance will be taken each 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.

Late Work and Make-up Exams
Missed homework assignments can not be made up; the drop grades accommodate those. At most one make-up exam will be scheduled for each exam. Make-up exams tend to be harder than the original exam.

Extra Credit
There is no extra credit in this class.

Cell Phone Use
Cell phones and such must be turned off before class. Each time your phone rings during class, your course grade goes down by 1%

Laptop Use
You may use a laptop to take notes during lecture. Distracting other students by surfing the web is not acceptable behaviour.
Food in Class
No food in class (except during the final, where non-noisy foods are OK).

Missed Exam
If you have to miss an exam, it is your responsibility to contact me no later than the day of the exam. Failure to contact me on or before the exam day results in a grade of zero points for the exam. This also applies to the final exam. For missed final exams due to an acceptable excuse the university rules about I (Incomplete) grades apply and the make-up is at the instructor’s convenience early in the next long semester. 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.

Participation
Participation is not part of the grade, but you learn more by interacting, than by watching passively.

K. COLLEGE AND UNIVERSITY POLICIES

- **Academic Integrity (University)**
  It is expected that university students will demonstrate a high level of maturity, self-direction, and ability to manage their own affairs. Students are viewed as individuals who possess the qualities of worth, dignity, and the capacity for self-direction in personal behavior.
  See Full University Policy at  
  http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity

- **Classroom/Professional Behavior** Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect 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.

- **Deadline for Dropping a Course with a Grade of W (University)** The grade of W will be assigned to any student officially dropping a course by Friday, April 10, 2015. No student is eligible to receive a W without completing the official drop process by this deadline. Visit the Office of the University Registrar for the Course Drop Form that must be submitted. After April 10, 2015 a student will not be allowed to drop a course.
Grade Appeals Appeals (College of Science and Engineering) As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, 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 Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at

http://www.tamucc.edu/provost/university_rules/index.html,

and the College of Science and Engineering Grade Appeals webpage at

http://sci.tamucc.edu/students/GradeAppeal.html

For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

Disability Services
Disability Services (DS) is the hub for coordinating services and accommodations to ensure accessibility and utilization of all programs for all Texas A&M University-Corpus Christi students with disabilities. Our services are designed to meet the unique educational needs of enrolled students with documented permanent or temporary disabilities. DS provides intake and consultation services to students seeking to register with our office. DS reviews an individuals documentation of disability and assesses eligibility for services and the determination of reasonable accommodations. For more information visit the Disability Services Office at 116 Corpus Christi Hall or go to http://disabilityservices.tamucc.edu/

GENERAL DISCLAIMER
I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.