Calculus III MATH 3470-002  
Department of Mathematics and Statistics  
Spring 2016  

A. COURSE INFORMATION  
Course Number/Section: MATH 3470-002  
Class Meeting Time: TR 8:00 am–9:15 am  
Class Location: CI 128  
Course Website: https://bb9.tamucc.edu  

B. INSTRUCTOR INFORMATION  
Instructor: Pritha Chakraborty  
Office Location: CI 358  
Office Hours: MW 12:00 pm–2:30 pm  
E-mail: pritha.chakraborty@tamucc.edu  
Appointments: e-mail  

C. COURSE DESCRIPTION  
Catalog Course Description: Parametric equations, vectors, functions of two and three variables. Contains a laboratory component.  

Extended Course Description: Dot products, cross products, surfaces, tangent planes, partial derivatives, double and triple integration, change of variables, center of mass and first and second moments of 3D objects with variable density, vector fields, line integrals, Green’s Theorem, surface integrals, Stokes’ Theorem, Divergence Theorem.  

Serves as a prerequisite for Fluid Mechanics, Electromagnetism, Thermodynamics, Quantum Physics, Nuclear Physics, Introduction to Analysis, Partial Differential Equations, and Introduction to Mathematical Statistics. Also aids the study of Physical Chemistry.  

D. PREREQUISITES AND COREQUISITES  
Prerequisites  
MATH 2414 (Calculus II).  

Corequisites  
Enrollment in a lab section.  

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES  
Required Textbook(s)  

Optional Textbook(s) or Other References  
Will be provided as needed.  

Supplies  
None.
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 course’s student learning outcomes that describe what students are expected to learn to be successful in the course. 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.
   (i) graph a parametric curve.
   (ii) convert between rectangular and polar coordinates.

2. Calculate dot and cross products as needed for vectors and vector valued functions and gradients.
   (i) calculate and use dot products and cross products of vectors.
   (ii) give the equation of a plane in 3 dimensional space.

3. Calculate and apply derivatives and integrals for vector-valued functions.
   (i) calculate derivatives and integrals of vector-valued functions.
   (ii) calculate arc length for vector-valued functions.

4. Calculate and apply derivatives and integrals for functions of several variables.
   (i) match 3d plots and contour plots of functions in 2 variables.
   (ii) calculate and use partial derivatives.
   (iii) calculate tangent planes to the graph of a function in two variables.
   (iv) use the chain rule for functions in several variables.
   (v) take directional derivatives and determine gradient vectors.
   (vi) determine minimum and maximum values of functions in several variables with or without constraints.
   (vii) evaluate double and triple integrals over general regions.
   (viii) 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.
   (i) use the change of variable formula for multiple integrals.
   (ii) evaluate line integrals.
   (iii) state and use Green’s theorem.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations. Most class meetings will be centered around lecture.
H. MAJOR COURSE REQUIREMENTS AND GRADING

The expected learning outcomes for the course will be assessed by homework assignments, lab reports, three mid terms, and a comprehensive final exam.

Homework: Homework will be assigned weekly through WeBAssign. Students will be informed by the instructor and via email (on the @tamucc.edu address) about the homework, which should be completed before the given deadline (generally not more than a week). Clicking the WebAssign button on the top left of our Blackboard page should take you directly into WebAssign. You will either need the access code that comes with the book or will need to buy an access code online. There is an initial grace period, usually a week or two, during which you can use the system without an access code.

Final grade: Homework and tests are counted towards the final grade with weights as follows:

1. Homework - 15%,
2. Lab Reports - 15%
3. Mid Terms - 45% (15% each), and
4. Final exam - 25%.

Raw score (including all the homeworks, exams and final):

1. Grade A: 90 - 100
2. Grade B: 80 - 90
3. Grade C: 70 - 80
4. Grade D: 60 - 70
5. Grade F: Below 60

I. COURSE CONTENT/ SCHEDULE

Important Dates:

- **Mid term I**: Tuesday, February 21
- **Spring Break**: Monday–Friday, March 13–17
- **Mid term II**: Tuesday, March 21
- Last day to drop a class: Friday, April 7
- **Mid term III**: Tuesday, April 18
- Last class day: Tuesday, May 2
- **Final Exam**: Tuesday, May 04, 8 : 00 am–10 : 30 am
Tentative Schedule:

<table>
<thead>
<tr>
<th>Week of</th>
<th>TOPIC</th>
<th>Sections</th>
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<tbody>
<tr>
<td>Jan 16</td>
<td>Introduction and Coordinates in 3D</td>
<td>12.1</td>
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<tr>
<td>Jan 23</td>
<td>Vectors, Dot Product, Determinant, Cross Product</td>
<td>12.2, 12.3, 12.4</td>
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<tr>
<td>Jan 30</td>
<td>Equations of Lines and Planes, Cylinders and Quadric Surfaces, Vector Functions</td>
<td>12.5, 12.6, 13.1</td>
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<td>Feb 6</td>
<td>Calculus of Vector Functions, Arc Length, Curvature, Velocity &amp; Acceleration</td>
<td>13.2, 13.3, 13.4</td>
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<td>Feb 13</td>
<td>Functions of several variables, Limits &amp; Continuity, Partial Derivative</td>
<td>14.1, 14.2, 14.3</td>
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<tr>
<td>Feb 20</td>
<td><strong>Mid term I: Tuesday, February 21</strong>, Tangent planes, Chain Rule, Gradient Vectors</td>
<td>14.4, 14.5, 14.6</td>
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<tr>
<td>Feb 27</td>
<td>Max &amp; Min Values, Lagrange Multipliers, Double Integrals</td>
<td>14.7, 14.8, 15.1</td>
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<tr>
<td>Mar 6</td>
<td>Double Integrals, Applications</td>
<td>15.2, 15.3, 15.4</td>
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<td>Mar 13</td>
<td>Spring Break!</td>
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<td>Mar 20</td>
<td><strong>Mid term II: Tuesday, March 21</strong>, Triple Integrals, Cylindrical Coordinates</td>
<td>15.6, 15.7</td>
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<td>Mar 27</td>
<td>Spherical Coordinates, Change of Variables, Vector Fields</td>
<td>15.8, 15.9, 16.1</td>
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<td>Apr 3</td>
<td>Line Integrals / Work, Fundamental Theorem</td>
<td>16.2, 16.3</td>
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<td>Apr 10</td>
<td><strong>Mid term III: Tuesday, April 18</strong>, Green’s Theorem</td>
<td>16.4</td>
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<td>Apr 17</td>
<td>Curl and Divergence, Parametric Surfaces, Surface Integrals / Flux</td>
<td>16.5, 16.6, 16.7</td>
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<td>Apr 24</td>
<td>Stokes’ Theorem, The Divergence Theorem</td>
<td>16.8, 16.9</td>
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<tr>
<td>May 01</td>
<td>Review</td>
<td></td>
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**FINAL EXAM: Tuesday, May 04, 8:00 AM–10:30 AM**

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

This course moves very fast. If you fall behind, even by one section, you may not be able to catch up, since each section generally depends very heavily on the ones before. You must attend every class. If you miss a class, it is your responsibility to find out what you missed (announcements, assignments, notes, . . . ).

**Attendance:** Attendance is mandatory! Students with less/equal than 3 missed classes for the entire semester will receive a bonus of 3 points towards their final score in the course. Absences due to observation of religious holidays, officially approved trips and illness or death of close family will be handled separately in accordance with the university policies.

**Late Work and Make-up Exams:** Homework is not accepted after the deadline. There are no make ups for the in-class examinations, except for reasons of illness, stated in writing by the medical doctor, or observance of a religious holiday. Usually, no other reasons are accepted (events, plane tickets, weddings, etc. . . . ). 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 0 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.

**Extra Credit:** There is no extra credit in this class.
Calculator: Use of calculators and formula sheets in all the exams is not permitted. Electronic devices which can store formulas, including cell phones, should be turned off and stored during the exams.

Cell Phone Use: Cell phones and such must be turned of before class. If this happens multiple times with the same student, the student will be asked to leave the classroom.

Laptop Use: You may use a laptop to take notes during lecture. Distracting other students by surfing the web is not an acceptable behavior.

Food in Class: No food in class (except during the final).

Missed Exam: See “Late Work and Make-up Exams” above.

Grading: On mid terms and final, partial credit for correct steps will be awarded even if the final answer is wrong. Full credit will be given only if the final answer and all intermediate steps are correct. A correct final answer per se does not guarantee any credit.

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): 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 failing grade.

• 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 instructors 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.

• Statement of Civility: Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

• 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. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar at http://www.tamucc.edu/academics/calendar/ for the last day to drop a course.
Grade 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](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](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: 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 (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

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. [http://disabilityservices.tamucc.edu/](http://disabilityservices.tamucc.edu/)

Statement of Academic Continuity: In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University-Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

L. OTHER INFORMATION

Academic Advising: The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The Colleges Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

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.