Calculus III    MATH 2415.002
Department of Mathematics & Statistics
SPRING 2020

A. COURSE INFORMATION

Course number/section: MATH 2415.002
Class meeting time: MWF 09:00–09:50 AM
Class location: OCNR 258
Course Website: https://bb9.tamucc.edu/

B. INSTRUCTOR INFORMATION

Instructor: Dr. Beate Zimmer
Office location: CI 310
Office hours: MWF 11:00 AM – 12:00 noon
MW 1:00 PM to 2:00 PM
Telephone: (361) 825-2682
e-mail: beate.zimmer@tamucc.edu
Appointments: e-mail to make appointments outside the announced office hours

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 one section of the lab. Lecture and lab together count as a four-hour course. This course generalizes the material from calculus I and II to functions of several variables and vector-valued functions. It builds towards the big theorems at the end: Green’s Theorem, Stokes’ Theorem and the Divergence Theorem.

D. PREREQUISITES FOR THE COURSE

Prerequisites
MATH 2414 (Calculus II).

Corequisites
Registration for a lab section.

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)
The required textbook for the course is Stewart, Calculus, Early Transcendentals, 8th Edition together with access to WebAssign. You can access the textbook as an e-book through the homework system by only buying a WebAssign access code instead of buying a book, but access to the e-book will end at the end of the semester.
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 may be helpful for the homework class but is not permitted for the exams.
For the lab you will get a separate syllabus.
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. Homework is due the day of the next lecture at 3 PM and there are no extensions - the drop grades take care of any emergencies.
An outline of the class notes and the 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 $30 if you print the notes before class for easier note taking.

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. 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. graph a parametric curve
2. convert between rectangular and polar coordinates
3. calculate and use dot products and cross products of vectors
4. give the equation of a plane in 3 dimensional space
5. calculate derivatives and integrals of vector-valued functions
6. calculate arc length for vector-valued functions
7. match 3d plots and contour plots of functions in 2 variables
8. calculate and use partial derivatives
9. calculate tangent planes to the graph of a function in two variables
10. use the chain rule for functions in several variables
11. take directional derivatives and determine gradient vectors
12. determine minimum and maximum values of functions in several variables with or without constraints
13. evaluate double and triple integrals over general regions
14. use the change of variable formula for multiple integrals
15. change the order of integration in multiple integrals
16. evaluate line integrals
17. 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. The lab portion of the course has its own syllabus whose policies supplement this syllabus. Homework through WebAssign will be assigned every class and is due the day of the next lecture class at 3PM. At the start of each lecture I will answer homework questions for at most 10 minutes. Office hours are a great opportunity to ask more 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. The lowest three homework grades get dropped. No exam grades get dropped.
The Final exam is comprehensive.

Calculator policies and partial credit:
The three exams and the final exam are no-calculator exams. All exams do have partial credit.

<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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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>
<th>CONTENT DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 W 1/22</td>
<td>10.3</td>
<td>Polar Coordinates</td>
<td>Areas and Lengths in Polar Coordinates</td>
</tr>
<tr>
<td>2 F 1/24</td>
<td>10.4</td>
<td>Three-Dimensional Coordinate Systems</td>
<td>Vectors</td>
</tr>
<tr>
<td>3 M 1/27</td>
<td>12.1</td>
<td>The Cross Product</td>
<td>Cylinders and Quadric Surfaces</td>
</tr>
<tr>
<td>4 W 1/29</td>
<td>12.2</td>
<td>The Dot Product</td>
<td>Functions of Several Variables</td>
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<tr>
<td>5 F 1/31</td>
<td>12.3</td>
<td>The Dot Product</td>
<td>Limits and Continuity</td>
</tr>
<tr>
<td>6 M 2/3</td>
<td>12.4</td>
<td>The Cross Product</td>
<td>Partial Derivatives</td>
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<tr>
<td>7 W 2/5</td>
<td>12.5</td>
<td>The Cross Product</td>
<td>The Chain Rule</td>
</tr>
<tr>
<td>8 M 2/7</td>
<td>12.6</td>
<td>The Cross Product</td>
<td>Exam # 1 covering sections 10.3 – 14.4</td>
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<tr>
<td>9 M 2/10</td>
<td>14.1</td>
<td>Tangent Planes and Differentials</td>
<td>Directional Derivatives and The Gradient Vector</td>
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<tr>
<td>10 W 2/12</td>
<td>14.2</td>
<td>Tangent Planes and Differentials</td>
<td>Maximum and Minimum Values</td>
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<td>11 F 2/14</td>
<td>14.3</td>
<td>Tangent Planes and Differentials</td>
<td>Lagrange Multipliers</td>
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<tr>
<td>12 M 2/17</td>
<td>14.4</td>
<td>Tangent Planes and Differentials</td>
<td>Vector Functions and Space Curves</td>
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<tr>
<td>13 W 2/19</td>
<td>14.5</td>
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<td>Derivatives and Integrals of Vector Functions</td>
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<td>14 F 2/21</td>
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<td>Tangent Planes and Differentials</td>
<td>Arc Length and Curvature</td>
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<td>15 M 2/24</td>
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<td>Spring Break</td>
<td>Double Integrals over Rectangles</td>
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<td>16 W 2/262</td>
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<td>Spring Break</td>
<td>Iterated Integrals</td>
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<td>17 F 2/28</td>
<td>14.8</td>
<td>Spring Break</td>
<td>Double Integrals over General Regions</td>
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<tr>
<td>18 M 3/2</td>
<td>13.1</td>
<td>Double Integrals in Polar Coordinates</td>
<td>Double Integrals in Polar Coordinates</td>
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<tr>
<td>19 W 3/4</td>
<td>13.2</td>
<td>Double Integrals in Polar Coordinates</td>
<td>Applications of Double Integrals</td>
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<tr>
<td>20 F 3/6</td>
<td>13.3</td>
<td>Double Integrals in Polar Coordinates</td>
<td>Applications of Double Integrals</td>
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<tr>
<td>21 M 3/16</td>
<td></td>
<td>Double Integrals in Polar Coordinates</td>
<td>Exam # 2 covering sections 13.1, 13.3, 14.5 – 15.4</td>
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<tr>
<td>22 W 3/18</td>
<td>15.1</td>
<td>Surface Area</td>
<td>Surface Area</td>
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<tr>
<td>23 F 3/20</td>
<td>15.2</td>
<td>Triple Integrals</td>
<td>Triple Integrals</td>
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<tr>
<td>24 M 3/23</td>
<td>15.3</td>
<td>Triple Integrals</td>
<td>Triple Integrals in Cylindrical Coordinates</td>
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<tr>
<td>25 W 3/25</td>
<td>15.4</td>
<td>Triple Integrals in Spherical Coordinates</td>
<td>Triple Integrals in Spherical Coordinates</td>
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<tr>
<td>26 F 3/27</td>
<td>15.5</td>
<td>Change of Variables in Multiple Integrals</td>
<td>Change of Variables in Multiple Integrals</td>
</tr>
<tr>
<td>27 M 3/30</td>
<td>15.6</td>
<td>Vector Fields</td>
<td>Vector Fields</td>
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<tr>
<td>28 W 4/1</td>
<td>15.7</td>
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<tr>
<td>29 F 4/3</td>
<td>15.8</td>
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<tr>
<td>30 M 4/6</td>
<td>15.9</td>
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<tr>
<td>31 W 4/8</td>
<td>15.10</td>
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<tr>
<td>32 F 4/10</td>
<td>16.1</td>
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The comprehensive Final Exam is on Monday, May 11, 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 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. Usually the topic/technique of the day is introduced in the first few minutes of class; missing that part usually means that you will be lost all class.

Late Work and Make-up Exams
Missed homework assignments or quizzes can not be made up; the drop grades accommodate those. Make-up exams will not be given. If a student misses an exam and has a valid excuse, the final exam score will serve as the score for that exam. This rule can only be used for one exam, the second missed exam is a zero.

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)**
  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 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.

- **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)** 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 your academic advisor, the Financial Aid Office, and me, before you decide to drop this course. 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. Please consult the Academic Calendar (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, 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**

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/

- **Statement of Academic Continuity** In the event of 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 Blackboard and/or e-mail. In addition the syllabus and class activities may be modified to allow continuation of the course. University Facilities (i.e. e-mail, web sites, and Blackboard) will be operational within two days of closing the physical campus. However, students need to make certain that the course instructor has a primary and secondary way 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.