Calculus III MATH 2415.002
Department of Mathematics & Statistics
Spring 2018

A. COURSE INFORMATION

Course number/section: MATH 2415.002
Class meeting time: TR 8:00-9:15 AM
Class location: CS-103
Course Website: https://bb9.tamucc.edu/

B. INSTRUCTOR INFORMATION

Instructor: Dr. Baohua Chen
Office location: CI 306
Office hours: WF 12:00 – 2:30 PM
Telephone: (361) 825-6019
e-mail: baohua.chen@tamucc.edu
Appointments: e-mail to make appointments outside of office hours

C. COURSE DESCRIPTION

Catalog Course Description
This course covers parametric equations, vectors, functions of two and three variables. It 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
Enrolment in a lab section.

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)
Calculus: Early Transcendentals, 8th Edition by James Stewart. You can read e-book by buying a WebAssign access code instead of buying a book, but access to the e-book will be expired at the end of the semester.

Software
WebAssign access is for homework assignment. Access code may be purchased through the WebAssign linked with the Blackboard. No class key is needed since instructor has uploaded the roster to put students in the registered class.
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 3-D 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, participation by students solving problems in class and group activities.

Homework: Homework will be given each class period through WebAssign. Any homework question will be answered at the start of each lecture for at most 10 minutes. Office
hours are valuable to ask more questions about homework. On-campus free tutoring in CASA is another way of getting help with homework. Working with other students is fine, but be sure to turn in your own product in the end.

**Test:** There will be three in-class tests.

**Labs:** One lab per week. You will practice lecture-related questions; work on computer-based labs (Matlab) to learn programming the mathematics taught during lecture.

**H. MAJOR COURSE REQUIREMENTS AND GRADING**

Grades will be calculated by homework, tests, labs and final exam, according to the following percentages:

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three exams</td>
<td>45%</td>
</tr>
<tr>
<td>Homework</td>
<td>10%</td>
</tr>
<tr>
<td>Labs</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
</tr>
</tbody>
</table>

Grading Scale:

A = 90.00 – 100%; B = 80.00 – 89.99%; C = 70.00 – 79.99%

D = 60.00 – 69.99%; F = below 60%

**Note:**

- No homework grades and no test grades get dropped.
- Labs are graded by the TA. Lab has its own syllabus whose policies supplement this syllabus.
- Final exam score will replace one of lower scores in tests (unless the final score is lower than three test scores)

**I. COURSE CONTENT/SCHEDULE**

- **Important Dates:**
  - January 15  Martin Luther King, Jr. Holiday, No Class
  - January 16  First Day of Class
  - January 23  Last day to register or add a class
  - March 12 - 16  Spring Break
  - April 6     Last Day to Drop a Class
  - May 2       Last Day of Classes
  - May 3       Reading Day
  - May 7       Final Exam 12:00-2:30 PM
Course Schedule:

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Topics</th>
<th>Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. 15</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>Jan. 22</td>
<td>Three-Dimensional Coordinate Systems and Vector</td>
<td>12.1, 12.2</td>
</tr>
<tr>
<td></td>
<td>The Dot Product; The Cross Product</td>
<td>12.3, 12.4</td>
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<tr>
<td>Jan. 29</td>
<td>Equations of Lines and Planes; Cylinders and Quadric Surfaces</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>Functions of Several Variables</td>
<td>12.6</td>
</tr>
<tr>
<td>Feb. 5</td>
<td>Limits and Continuity</td>
<td>14.2</td>
</tr>
<tr>
<td></td>
<td>Partial Derivatives</td>
<td>14.3</td>
</tr>
<tr>
<td></td>
<td>Tangent Planes and Differentials</td>
<td>14.4</td>
</tr>
<tr>
<td>Feb. 12</td>
<td>The Chain Rule</td>
<td>14.5</td>
</tr>
<tr>
<td></td>
<td>Directional Derivatives and The Gradient Vector</td>
<td>14.6</td>
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<td></td>
<td>Test 1 (10.3 - 14.6)</td>
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<td>Feb. 19</td>
<td>Maximum and Minimum Values</td>
<td>14.7</td>
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<td></td>
<td>Lagrange Multipliers</td>
<td>14.8</td>
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<td></td>
<td>Vector Functions and Space Curves</td>
<td>13.1</td>
</tr>
<tr>
<td>Feb. 26</td>
<td>Arc Length and Curvature</td>
<td>13.3</td>
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<tr>
<td></td>
<td>Double Integrals over Rectangles</td>
<td>15.1</td>
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<tr>
<td></td>
<td>Integrated Integrals</td>
<td>15.2</td>
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<tr>
<td>Mar. 5</td>
<td>Double Integrals over General Regions</td>
<td>15.3</td>
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<tr>
<td></td>
<td>Double Integrals in Polar Coordinates</td>
<td>15.4</td>
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<td></td>
<td>Test 2 (13.1, 13.3, 14.5-15.4)</td>
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<tr>
<td>Mar. 12</td>
<td>No Classes</td>
<td></td>
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<td>Mar. 19</td>
<td>Surface Area</td>
<td>15.6</td>
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<tr>
<td></td>
<td>Triple Integrals</td>
<td>15.7</td>
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<td>Triple Integral in Cylindrical Coordinates</td>
<td>15.8</td>
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<tr>
<td>Mar. 26</td>
<td>Triple Integral in Spherical Coordinates</td>
<td>15.9</td>
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<td></td>
<td>Change of Variables in Multiple Integrals</td>
<td>15.10</td>
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<td></td>
<td>Vector Fields</td>
<td>16.1</td>
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<td>April 2</td>
<td>Line Integrals</td>
<td>16.2</td>
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<td>The Fundamental Theorem for Line Integrals</td>
<td>16.3</td>
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<td></td>
<td>Green’s Theorem</td>
<td>16.4</td>
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<td>April 9</td>
<td>Test 3 (15.6 - 16.4)</td>
<td>16.5</td>
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<td>Curl and Divergence</td>
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<tr>
<td>April 16</td>
<td>Parametric Surfaces and Their Areas</td>
<td>16.6</td>
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<tr>
<td></td>
<td>Surface Integrals</td>
<td>16.7</td>
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<tr>
<td>April 23</td>
<td>Stokes’ Theorem</td>
<td>16.8</td>
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<tr>
<td></td>
<td>Divergence Theorem</td>
<td>16.9</td>
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<tr>
<td>April 30</td>
<td>Review and Final Exam</td>
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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 is mandatory. Attendance will be checked in each class. All absences will be considered unexcused unless you have an exceptional situation (e.g., documented illness, family situation), and you email the instructor about it within 24 hours. Excellent attendance records will help your grade in that borderline course-grade decisions will be influenced by these records.

- **Late Work Assignments**
  Homework will be given each class period through WebAssign, and is due in the following week (Sunday, 11:59 PM). In general, late homework will not be accepted, unless exceptional circumstances prevent you from completing them. Late assignments may result in partial or total loss of credit. Extension of deadlines will be at the instructor’s discretion.

- **Make-up Exams**
  There is no make-up for any tests, and final exam unless you could provide proper documentation from either medical doctors or any court orders. For an absence to be considered excused, student must notify his or her instructor in writing (acknowledged e-mail message is acceptable) prior to the date of absence if such notification is feasible. In cases where advance notification is not feasible (e.g. accident or emergency) the student must provide notification by the end of the second working day after the absence. Without taking final exam, it will be an $F$ for the semester grade regardless.

  **Make-up test will be given once per student** with appropriate documentation provided. Please save the opportunity for the emergencies.

- **Extra Credit**
  There is no extra credit in this class.

- **Laptop/Cell Phone Use**
  Cell phone using is prohibited in any circumstances. Laptops, or any form of a new technology device is NOT allowed in the classroom during lecture and exam. Any use of cell phone or wireless device during a test carries the presumption of cheating. A grade of ZERO will be awarded for that assignment for using, touching or clanking at a cell phone or wireless device.

- **Food in Class**
  No food in class. This can distract others from learning, and part of my job is to provide a class atmosphere that aids student learning.

- **Missed Exam**
  See "Late Homework Assignments" and "Make-up Exams"
• **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 Behaviour**
  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 behaviour 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. Behaviours 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 College’s 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.