

Berkeley City College Spring 2016
Mathematics 3C Calculus III Code: 24679, 5 units
Syllabus (draft)

Instructor: Shawn McDougal **E-mail:** smcdougal@peralta.edu
Office Hours: MTWTh 2:15-3:15pm (plus 1 hr by appointment)
Office Location: Room 353 **Phone:** (510) 981-5018

Class Meeting Days/Times: TTh 6:30-8:45pm **Location:** Room 518

Prerequisites: Math 3B (Calculus II), or placement through assessment

Textbook: *Calculus: Early Transcendentals* by James Stewart. 7th edition

The textbook is available for purchase in the bookstore (Room 517). The text is also on reserve in the BCC library (Room 131).

Materials: You should obtain a scientific calculator. Access to a graphing utility for some of homework problems is encouraged but not required.

Catalog Description

Partial differentiation: Jacobians, transformations, multiple integrals, theorems of Green and Stokes, differential forms, vectors and vector functions, geometric coordinates, and vector calculus.

Class format

Our typical class will be a mix of lectures clarifying and expanding upon the points raised in the book and the videos, hands-on problem solving sessions, solution presentations (from students as well as me), and open discussion. A portion of the class will be "workshop"—you will be working on problems individually or in groups as I go around helping as needed. In addition to providing feedback and guidance, I will often ask you to talk through the problems or ideas with other students. Talking through your ideas with others is a good way to 1) test and refine your ideas, 2) learn multiple ways of thinking about a concept or solving a problem, and 3) practice putting the ideas in your own words.

Every day your main homework is to *prepare for class*: you should come to class having already read the section(s) to be covered in class that day, as well as having watched any designated videos. (There will be usually be one to three short—5 to 10 min.—videos for you to watch.) You should take notes on the examples you see in the videos, get a basic idea of the key concepts and theorems in the book, and know where to find things. You are *not* expected to understand everything you read or see the very first time—that is the point of coming to class and doing the follow-up exercises!—but you will be get the most out of class—and you will not be lost—if you come prepared. In class I will give a list suggested "homework" problems to guide your follow-up study, but I will not collect or grade them.

Self-intros

Every day for the first few weeks of the course, 2-3 students will get a chance to briefly introduce themselves to the class. "Briefly" meaning 30 sec. to 1 min. This will allow all of us to get to know a bit about each other. Include an answer to *one* of the following "questions":

- One experience you had after age 13 that really shaped who you are or how you think.
- Something a lot of people who meet you wouldn't guess about you.
- If you could, what is one thing you would change about society?

Grading Allotment (400 points = 100% for course)

	points each	total points	total percent	notes
Quizzes (4)	40	160	40%	5 drop lowest 1
Final Exam	100	100	25%	
Solution Share	20	20	5%	
Daily Preps (20)	3	60	15%	~28 drop lowest 8
Moodle Check-ins (20)	2	40	10%	~28 drop lowest 8
Connections (4)	5	20	5%	

Grading Scale A: 90% - 100 %, B: 75% - 89%, C: 65% - 74%, D: 55% - 64%. F: Below 55%

Daily Preps

Twice a week (usually) there will a *Daily Prep*—a brief (< 5 min.), open notes (and sometimes open book) "quiz". I use quotes because anyone who comes prepared to class—i.e. watches the assigned videos, does the reading, and takes notes on the key points—will easily get full credit. Each *Daily Prep* is worth 4 points (i.e. 1% of the grade). There are no make-ups. To account for the fact that life happens and sometimes folk can't come to class prepared, there are many free passes: out of about 28 *Daily Preps* I will count only your best 20.

Solution Share

I encourage students to learn from each other, take time to really think through challenging problems, and improve their presentation skills. Once during the term, you will prepare and present your solution to a problem selected from the suggested HW. The *Solution Share* is worth 20 points (i.e. 5% of the course total). You will choose which problem to present in advance, from a list of options I provide. The presentations will typically last 3-8 min., with another couple of minutes for questions. Grading will be based on clarity, correctness, and timing. (A rubric will be provided.)

Quizzes

There will be a quiz every three weeks, starting Tuesday 2/9. There will be 5 quizzes altogether. Each quiz is worth 40 points (i.e. 10%). I will drop your lowest quiz score, so only your best 4 quiz scores will count. The quizzes will be mostly based on the suggested HW problems. There are no make-ups.

Final Exam

The Final Exam is scheduled for Tuesday, 5/24 in class. It will cover all of the material of the course. Many (even most) of the problems will be taken from the quizzes. It's worth 100 points.

Moodle Check-ins

Almost every week (W1–W16) you are asked to write two Moodle *Check-ins*. The purpose of the *Check-ins* is to 1) encourage folk to discuss the material outside of class, 2) let me know which concepts I should clarify in class, and 3) build community among students. For credit, the check-ins must be posted before the end of the week (Sunday midnight) in the appropriate weekly forum.

In order to receive credit, a *Check-in* must be one of the following:

- a *good question* about a problem or concept or example in the book or in a video
 - e.g. of good question: "On problem X in section Y I tried to find the slope using the formula $m = \text{change in } x / \text{change in } y$ but got the wrong answer. What am I missing?"
 - e.g. of not-so-good question: "I just don't get problem X."

- an *interesting comment* about a problem or concept or example in the book or in a video
 - e.g. of interesting comment: "I wonder how people decide when to fit a line and when to fit a polynomial to a given set of data."
 - e.g. of not-so-interesting comment: "Curve fitting is cool!"
- a *substantive response* to someone else's question or comment.
 - e.g. of substantive response: "Seems there should be some sort of convention or standard around how much error there is when you try to fit a line."
 - e.g. of not-so-substantive response: "Me too!"

You are welcome and encouraged to participate frequently in the Moodle discussions, though you will receive credit for at most two *Check-ins* per week. Each *Check-in* is worth 2 points. Out of about 28 *Check-ins*, I will count your highest 20. So, altogether the *Check-ins* are worth 40 points (i.e. 10%).

Weekly Schedule (tentative)

Week of...	Sections	Notes
J25	12.1-3	
F1	12.4-6	
F8	13.1-3	Q1 (all quizzes on Tuesdays)
F15	13.4, 14.1	
F22	14.2-4a	
F29	14.4b-6a	Q2
M7	14.6b-14.8	
M14	15.1-3	
Spring Break		
M28	15.4	Q3; no school Thursday
A4	15.5-6	
A11	15.10,16.1-2a	
A18	16.2b-4	Q4
A25	16.5-6	
M2	16.7-8	
M9	15.7-9	Q5
M16	16.9 + review	
Final Exam Tuesday 5/24		

Important Dates (cf. BCC Spring 2016 Academic Calendar)

Feb. 6 – Last day to add regular session classes.

Feb. 6 – Last day to drop regular session classes (without a "W") and receive a refund.

Feb. 11 – Last day to file for P/NP grading option for regular session classes.

Mar. 18 – Last Day to File Petitions for AA or AS Degree/Certificate

Apr. 23 – Last day to drop with "W". Attendance Verification Day.

Connections Assignments

Connections is an opportunity for students to connect with diverse colleagues outside of class while reflecting on issues relating to math, personal interest, or community interest.

There will be 4 *Connections* assignments, spaced a week apart. The first is due Thursday 2/4 (during Week 2, aka "W2"). The others are due on successive Thursdays. Each should take roughly 15-30 minutes to complete.

- Each week (from W2 to W5) students will form teams of 2 or 3 people.
- Each team will discuss one of the topics and submit a roughly 2-3 paragraph write-up.
- Either hardcopy or electronic submission (pdf, rtf, or plaintext format) via Moodle "dropbox" is fine. They are due at the beginning of class. (See *Connections Form* for the required info.)
- Each *Connections* assignment is worth 5 points (i.e. 1.25%).
- In order to get credit for N assignments, each student must team up with at least N different people. (So I suggest you don't team up with the same person every week ;^)
- On each team, there are 2 roles: Initiator and Responder. Students choose who plays what role.
 - The Initiator makes the initial remarks to get the conversation started. The Responder (or Responders) responds to or follows up on the comment.

Menu of options

1. a recent experience that has really impacted you
2. something you're confused, curious, or excited about in class
3. news story with (interesting, confusing, problematic) use of math
4. example of how (lack of) math knowledge is used to trick people
5. an issue in the school or community that really bothers you and/or an idea for improving things in the school or in the community
6. interview a "community expert" on how math impacts their work or the way they think ("community expert" meaning someone who works at BCC or in the local community)
7. attend and comment on a school or community event related to math, science, or social justice

Connections Form (template)

Initiator Name:

Responder Name(s):

Date:

Topic: (or Name and Job of Community Expert or Name of Community Event)

Write up:...

Suggested Homework Problems

I will provide a list of suggested HW problems based on the material we cover. If you master the problems you will learn a lot and be well-prepared for the quizzes.

Attendance

Students who miss more than 2 consecutive classes without contacting me to explain their absences may be dropped from the course. Anyone who misses the first 2 class meetings may be dropped. Still, do not assume that I will automatically drop you if you merely stop attending class. Anyone whose name appears on the final grade roster who has not been attending class will receive an F.

Academic Honesty

Any evidence of cheating on an exam or quiz will result in a score of zero (0), and may incur further penalties. Cheating includes but is not limited to bringing notes or written or electronic materials into an exam or quiz, copying off of another person's exam or quiz, allowing someone to copy off of your exam or quiz, and having someone take an exam or quiz for you.

General Information/Expectations

Please turn off your cell phone ringers/alarms during class.

Make sure your preferred email address is listed on Passport and Moodle. For Moodle see <http://eperalta.org/Spring2016/>

I usually don't answer questions about the course material over email. (Reason #1: I don't want to be swamped with emails. Reason #2: I prefer to answer a question once rather than multiple times.) To help you get your questions answered quickly by me and/or other students, and to help students share ideas and build community with each other, you should use the *forums* on Moodle (*not* the messages, which I rarely see.). Also, on Moodle you will be able to review your grades throughout the semester.

Student Learning Outcomes

1. Execute and apply differentiation to functions of several variables: Perform vector operations, determine equations of lines and planes, find the limit of a function of several variables at a given point, evaluate derivatives of vector functions and real-valued functions in several variables, find the equation of a tangent plane at a point, determine the differentiability of a function, test for saddle points and find local and global extrema, find the curl and divergence of a vector field, use Lagrange multipliers to solve constraint problems. 2. Execute and apply integration to functions of several variables: compute arc length, compute multiple (two- and three-dimensional) integrals, use multiple integrals to find area, volume, density, center of mass, moments of inertia, expected values. 3. Understand and apply Green's Theorem, Stokes' Theorem and the Divergence Theorem.

Justification for Course

Satisfies the General Education and Analytical Thinking requirement for Associate Degrees. Provides foundation for more advanced study in mathematics and related fields. Satisfies the Quantitative Reasoning component required for transfer to UC, CSUC, and some independent four-year institutions. Acceptable for credit: CSU, UC. AA/AS area 4b, CSU area B4, IGETC area 2A.

Disabilities Statement

Berkeley City College is committed to providing reasonable accommodations for all individuals with disabilities. Any student with a documented disability needing academic accommodations is requested to speak with Programs & Services for Students with Disabilities (PSSD), located in Room 261 and the instructor as early in the semester as possible. I encourage any student who suspect they may have a learning disability to contact PSSD for assistance. They can be reached by phone at (510) 981-2812 or

2813. All conversations will remain confidential. The syllabus and course material are available in alternate formats upon request.