Berkeley City College Fall 2014
Mathematics 3B Calculus II Code: 42850, 5 units
Syllabus (v1.0)

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

Class Meeting Days/Times: Monday and Wednesday, 3:30pm – 5:45pm **Location:** Room 33

Prerequisites: Math 3A or placement through assessment

Textbook: *Single Variable 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 for the work we do with exponential and logarithmic functions. Graph paper will also be needed. If you do not want to buy graph paper there are free websites where you can download and print out your own.

Catalog Description
Applications of the definite integral: Methods of integration, polar coordinates, parametric equations, infinite and power series.

Class format
Our typical class will be a mix of lectures clarifying and expanding upon the points raised in the book, hands-on problem solving sessions, examples and open discussion. 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) learn how to put the ideas in your own words.

On average, every week we will cover about 2 sections from the book. Bring your book to class as we will be using it a lot.

Every day you are expected to come to class having *already read* the sections to be covered in class that day. You are *not* expected to understand everything you read the very first time--that is the point of coming to class and doing the HW!--but you will understand the lectures much better if you come to class with initial ideas and questions about the material.

Grading Allotment
Homework 25%
Quizzes 35%
Final Exam 25%
Participation (Connections+Moodle Check-ins) 10%
Projects 5%

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

Homework
To be successful in this course, students should typically spend about 15 hours per week outside of class studying the material and completing assignments. Some may need more or less time do well. Please determine what type of math learner you are and study accordingly.

Homework (HW) will be due almost every day. **There are no make-up or late HWs.** There are some "free passes": out of about 29 HWs I will count only your best 25.

I will typically collect HW at the beginning of class. I will generally assign the next day's HW in class. If you miss class and need to know the assignment, I encourage you to ask for help from another student. If you need to turn in HW but can't come to class, I encourage you to have a colleague drop it off for you or to scan it and email it to me before the start of class. I encourage you to collaborate with each other on the HW assignments. Still, you must write up your own solutions.

Make sure your HW is *well-organized*--i.e. legible with your name, course (e.g. Math 2), sections of the book covered in the HW, and with sheets stapled (or clipped, or tied) together. HW that is not well-organized will not will not receive credit. Show your work on the problems, as appropriate. If the answers are simply copied down without appropriate work, they will not be counted.

Each HW will be graded according to completeness, on the following scale:
1 point--75% or more of the problems done
0 points--less than 75% the problems done

Each HW is worth 1% of the total points in the course. Therefore, the 25 graded HW assignments will altogether be worth 25% of the course total.

Moodle Check-ins
In general, before every class (from Week 2 until Week 15) students will write a Moodle Check-in. The purpose of the check-in is to 1) encourage you to discuss the material outside of class, 2) remind you to do the reading before class, and 3) let me know which HW problems I need to go over in class.

The Moodle Check-in can be any of the following:

- a *good question* about a specific problem from the HW
  - good question: "On problem X in section Y I tried to find the slope using the formula m = change in x/change in y but got the wrong answer. What am I missing?"
  - not-so-good question: "I don't get problem X in section Y."
- a good question or *interesting comment* about an example or a concept from the reading
  - interesting comment: "I wonder how people decide when to fit a line and when to fit a polynomial to a given set of data."
  - not-so-interesting comment: "Curve fitting is cool!"
- a *substantive response* to someone else's question or comment.
  - 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."
  - not-so-substantive response: "Me too!"

The Check-ins are to be posted in the appropriate forum on our Moodle site, and are **due by midnight** the day before class. (Among other reasons, this will ensure I can adequately go over the important HW questions in class.) Each Check-in is worth 0.25% of the course total. As there will be about 26 class meetings during that time, there is some flexibility: students only need to do 20 check-ins to get full credit (20 x 0.25% = 5%) for this assignment.

Quizzes
There will be a quiz every two weeks, always on Wednesday. (If there needs to be a change in scheduling I will let you know well in advance.) There will be 7 quizzes altogether. I will drop your lowest 2 quiz scores, so your top 5 quizzes will be counted. Altogether, the quizzes are worth 5 x 7 points = 35% of the course total. There are no make-up quizzes.

Final Exam
The final exam is scheduled for Monday, December 8th in class. It will cover all the material of the course. The Final will be worth 25% of the course total.

Weekly Schedule

Week of Monday...	Sections to be covered (tentative)	Wednesday quizzes + notes
8/18	6.1-2	
8/25	6.3, 6.5	Quiz 1
9/1	7.1	no class Monday 9/1
9/8	7.2-3	Quiz 2
9/15	7.4, 7.7	
9/22	7.8,8.1-2	Quiz 3
9/29	8.5, 9.1-2	
10/6	9.3-4	Quiz 4
10/13	9.5-6, 10.1-2	
10/20	10.3-4, 11.1	Quiz 5
10/27	11.2	
11/3	11.3-4	Quiz 6
11/10	11.5-6	
11/17	11.7-9	Quiz 7
11/24	11.10-11	
12/1	Projects + Final Review	
12/8 Final Exam		

Important Dates (cf. BCC Fall 2014 Academic Calendar)
Aug. 31 – Last day to add regular session classes.
Aug. 31 – Last day to drop regular session classes and receive a refund.
Sep. 8 – Last day to file for P/NP grading option for regular session classes.
Nov. 15 – Attendance Verification Day. Last day to drop with "W".

Self-intros
Every day for the first few weeks of the course, 3-4 students will get a chance to briefly introduce themselves to the class. "Briefly" meaning like 30 seconds. This will allow all of us to get to know a bit about each other. Include something answering one of the following "questions":

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

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 phones during class.

Please make sure your preferred email address is listed on Passport and Moodle. For Moodle see http://eperalta.org/fall2014/

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: It's easier to answer a question once rather than 5 or 10 times.) To help you get your questions answered quickly by other students and/or me, and to help students share ideas and build community with each other, I have set up a Moodle site for our class. Also, on Moodle you will be able to review your grades throughout the semester.

Student Learning Outcomes
1. differentiate inverse trigonometric, hyperbolic and inverse hyperbolic functions
2. evaluate definite integrals using a variety of integration formulas and techniques
3. find indefinite integrals using a variety of integration formulas and techniques
4. apply integration to finding areas, volumes, surface areas and lengths of curves (arc length) and to solving work problems
5. evaluate improper integrals
6. apply convergence tests to sequences and series
7. express functions as power series
8. use power series representations to integrate and differentiate functions
9. graph, differentiate and integrate functions in polar and parametric forms

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, such as Physics. 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.

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 5 Connections assignments, spaced a week apart. The first is due Wednesday 8/27. The others are due on successive Wednesdays: 9/3, 9/10, 9/17, and 9/24. Each should take 15-30 minutes to complete.

- Each week students will buddy-up with 1 or 2 others, forming pairs or triples.
- Students choose who they will buddy-up with every week.
- Each team will submit a roughly 2-3 paragraph write-up. Either paper or electronic is fine. (See Connections Form for the required info.)
- There will be 5 Connections assignments altogether. Each is worth 1 percent of the course total.
- In order to get credit for N assignments, each student must buddy-up with at least N different people.
- On each team, there are 2 roles: Initiator and Responder. Students choose who plays what role.
    - The Initiator makes the initial remark to start the conversation. The Responder responds.
    - For pairs there is 1 Initiator and 1 Responder. For triples there is 1 Initiator and 2 Responders.

<u>Menu of options</u>

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
6. an idea for improving things in the school or in the community
7. 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)
8. 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:...

Projects

Beginning in Week 7, students will form teams and choose topics to do mini-research projects on. In the last week of class, teams will present their results in a "gallery walk", attended by their peers and by some special guest judges. The Projects will be worth 5% of the course total. (I use the prefix "mini" above because the expected time spent doing the research is only about 2-3 hours.)

The purpose of the Projects is 1) for you to learn excellent examples of how mathematical thinking applies to real world issues outside the classroom, 2) help you gain valuable skills in interpreting, visualizing, and presenting data, and 3) help break down the barriers between knowledge "in the classroom" and knowledge "in the community".

Project themes (Note: These are only suggestions/examples; others may be chosen)

1. income distribution (e.g. over time, CEO pay, by career, gender, race, education level)
2. wealth distribution (e.g. current, by country, over time)
3. education by race and/or gender
4. student success rates
5. education costs over time
6. geologic time scales
7. stars and/or galaxies
8. astronomical distances
9. probability of earth-like planets
10. sizes of natural objects: micro to macro
11. light frequencies--infrared to ultraviolet and beyond
12. life expectancy (by country, income, race, over time)
13. mortality and/or injury rates by profession
14. incarceration rates (over time, by country, by race)
15. crime rates (over time, by state)
16. energy usage/carbon footprint (e.g. by sector, by country)
17. cells in the body (e.g. human vs. bacteria)
18. the brain: neurons and synapses
19. housing costs vs. income over time
20. medical costs (over time, by country)
21. public transit (usage, costs)
22. marriage/divorce rates over time

Project timeline

1. form teams of 2-4 in Week 7 ("W7")
2. choose theme W7
3. explore possibilities W7 [Shawn will give some links to online sources, as needed]
4. formulate research question W8 [get approval from Shawn]
5. research W9-10 [some class time in W9, maybe W10]
6. create brief survey to engage public around issue W11 [some class time, approval from Shawn]
7. conduct survey with 5-10 people W12-13
8. write up results W14-15
9. present results--mini-talk or poster in gallery walk W16

A more detailed timeline and guidelines for the Project will be provided later.