

MA-210 CALCULUS I (4)

Spring 2019 01/14 – 05/03/2019

MWF 9:30 – 10:20AM, CTCC 254 & T 1:00 – 1:50PM, HERN 223

INSTRUCTOR: Dr. CHOCK Y. WONG

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Office Hours: MTWTH: 11:00am – 12:00pm; or by appointments.

Course Description: This is the first course in the calculus sequence. Topics include limits, differentiation and integration of single variable functions including polynomials, rational powers, and trigonometric functions, the mean value theorem, and the fundamental theorem of calculus. Both concepts and techniques as well as application will be stressed. Fulfills Track D general education requirement in mathematics.

Prerequisites: Precalculus (MA110 or equivalent), or placement test.

Text Book: Larson/Edwards: CALCULUS Of A Single Variable (10th edition).

ISBN 0-547-20998-3.

Learning Outcomes: By taking this course, the student will

- (1) gain understanding of the concept of limits;
- (2) gain understanding of the continuity of functions;
- (3) gain understanding of the concept of the derivative, and how it is related to the behavior of a function;
- (4) develop skills to compute derivatives, and demonstrate a comprehension to use 8 basic formulas and 5 general rules for differentiation;
- (5) develop skills to use derivatives in the following applications: Critical point analysis, graph sketching, and optimization problems;
- (6) gain understanding of the concepts of indefinite integration and definite integration, and the Fundamental Theorem of Calculus;
- (7) develop skills to calculate integrals, and demonstrate a comprehension to handle the basic antidifferentiation formulas and the U-substitution method;
- (8) develop skills to solve applied problems using integrals.

These learning outcomes are directly linked to the Program Learning Outcomes, especially in terms of

- to demonstrate the understanding and skills in reading, interpreting and communicating mathematical contents which are integrated into other disciplines or appear in everyday life
- to articulate the understanding of more advanced mathematical concepts and computational skills to support the study of other disciplines, including skills with numeric, analytic and graphic methods

Standard writing format and basic algebraic skills will be emphasized throughout the course. Most assignments, quizzes and exams are not in multiple-choice format. Be ready (or learn how) to write solutions in step-by-step manner.

Topics & Tentative Schedule: [See the attached Tentative Schedule sheet for more details.]

Chapters 1 to 4 and selected sections from Chapter 7 will be covered.

- (1) Limits and continuity. (Ch.1)

Week 1 — Week 3

- (2) Differentiation. (Ch.2)

Week 3 — Week 8.

- (3) The Mean Value Theorem and applications of differentiation. (Ch.3)

Week 9 — Week 11.

- (4) Definite and indefinite integration. (Ch.4)

Week 12 — Week 14.

- (5) (Optional) Applications of the integral in geometry: Areas, volumes, and arc lengths.
(§§7.1–7.4) Week 15.

Attendance & Class Participation Each student should do his/her best to attend **every single class including the 4th hour** (be aware that the 4th hour is not something “extra” but an regular part of the class as the other 3 hours), avoid missing any class except in “special” cases (illness or other approved academic/athletic activities). Due to the fast pace and academic level of the class, one single class missing may cause you many hours to make it up on your own and drag your progress for one to two weeks (or even longer). I may withdraw you from class if you would miss classes for three weeks accumulatively.

The basic format of this class is “**less talk (by instructor), more practice (by students)**”. You need to actively participate in all class activities, but not only listening and notes-taking. Be aware that the most important part of your learning process occurs **in class**, especially for content-and-skill-rich courses such as Calculus. Thus, be ready, learn every new topic (70+% of it) **in class** — and believe you can do that!

Strongly suggest to have a binder exclusively for this class, to well organize your class notes and handout materials from class.

Homework Homework is another important component of the class. I am putting down 35% weight (yes, more than one-third) of Course Grading in Homework. You will have suggested exercise problems from textbook as basic drills, as well need to complete weekly handout homework worksheet and turn it in **on time**.

You are encouraged to seek help from math tutoring web sites (one good suggestion: www.WolframAlpha.com) and form study groups to help each other. To help each student overcome his/her own background weakness and build up good calculus skills I may ask you to **REDO** some parts of your assignment when it is necessary. In this case a temporary “R” grade will be marked on your paper and those problems that need to be redone would be circled. You need to resubmit your whole assignment with corrections within two school days.

Many of previous students had made tangible and significant progress in calculus through this special process and greatly appreciate it. (And of course, I need to spend more time for reading your homework twice!) At any rate it would be a second chance for you to work out a higher score in your assignment.

Follow the guidelines below when submitting your assignment worksheet:

- (1) Most importantly, turn in **on time**. Grading penalty applies to late papers.
- (2) Use the handout worksheet as cover page(s) and add in extra paper (regular 10.5x8 inches ruled paper) as needed, and staple all pages.
- (3) Use **pens** in black or blue ink, no red ink, **NO PENCILS** please. Leave **two blank lines between problems** — that way I can insert my corrections or comments. (I am not willing to give corrections and comments to those solutions that were sloppily written or tightly squeezed together; and in extreme cases I may just return your paper and ask for a complete “Redo”.)

Calculators/Electronic Devices A scientific calculator is required in class and is allowed in all quizzes and exams; graphic calculators are helpful but not required. **Cellular phones are not allowed to be used as calculator in quizzes and exams.** [Also, according to the CUH Student Handbook, the use of cellular, wireless and other mobile telephones while in class is prohibited; emergency calls shall be engaged in outside of the classroom; and according to the NS&M Division’s policy, use of music devices and cell phones is prohibited during all Natural Science and Mathematics classes at Chaminade.]

Quizzes and Exams:

Up to 11 quizzes will be given (refer to the Tentative Schedule sheet). The detailed requirements for each quiz will be announced in advance. Be aware that **No** make-up quiz will be allowed except for school events (sport/conference) or medical reasons with supporting documentation and timely notice (**emails** or official memos).

A mid-term exam to cover Chapter 1 and 2 will be given on Week 9. The Final Exam is going to be an accumulative one, and will be in “half-open-half-closed” format.

Grading: (subject to changes)

ATTENDANCE:	5% of the total	A:	90 – 100%
HOMEWORK:	35% of the total	B:	80 – 89%
QUIZZES:	15% of the total	C:	70 – 79%
Mid-term EXAM:	15% of the total	D:	60 – 69%
FINAL EXAM:	30% of the total	F:	below 60%

MA-210 CALCULUS I: Tentative Schedule (subject to changes)

Week	Sections	Topics	Homework	Quiz
1	1.1–1.3	Limits: Finding limits numerically, graphically, and analytically.	HW 1	
2	1.4, 1.5	More on limits; continuity.	HW 2	Quiz 1 (Limits)
3	2.1, 2.2	Definition of the derivative; tangent lines; basic differentiation rules.	HW 3 HW 4	Quiz 2 (Continuity)
4	2.3	More differentiation rules	HW 5	Quiz 3 (HW 3)
5		Higher order derivatives; simple applications of the derivative.	HW 6	Quiz 4 (HW 4 & 5)
6	2.4	Chain Rule.	HW 7 HW 8	
7	2.5, 2.6	Implicit differentiation; related rates.	HW 9	Quiz 6 (Chain Rule)
8		Review for Midterm Exam		Quiz 7 (Chain rule)
9	3.1, 3.2	Extrema on an interval; MVT.	HW 10	Midterm Exam
10	3.3, 3.4	I/D test; concavity.	HW 11	
11	3.6, 3.7	Graph sketching; Optimization problems.	HW 12, HW 13	Quiz 8 (HW10 & 11)
12	4.1, 4.5	Indefinite integration.	HW 14	
13	4.2–4.4	Definite integration.	HW 15	Quiz 9 (HW 14)
14	4.5, 4.6	Integration by substitution; Simson's rule.	HW 16	
15		Review for Final Exam		Quiz 10 (TBA)
16	FINAL EXAM	MA-210-01: Monday, 5/6, 11am – 1pm MA-210-02: Wednesday , 5/10, 8:30–10:30am		