

MATH 3B — CALCULUS II

Laney College, Fall 2019

Fred Bourgoin

Class code: 48459

Days & times: MW 7:30–9:45 p.m. in F-201

Prerequisite: Math 3A (Calculus I)

Textbook: Stewart, *Calculus: Early Transcendentals*, 6E/7E/8E
(not required, but recommended)

Instructor: Fred Bourgoin

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Office hours: MW 10–11 a.m. & 5–6 p.m., TTh 10:30–11:30 a.m. in G-201

Canvas: learn.peralta.edu

Course Description

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

Student Learning Outcomes

These are the skills that you will have acquired upon completing the course.

- Construct antiderivatives of many different types of functions and solve mathematical models using the integral.
- Reframe functions as power series and test these series for convergence.
- Generate solutions to problems using parametric and polar representations of functions.

Course Requirements

- *Homework.* There will be one homework assignment every week. Homework is worth 20% of your grade. No late homework will be accepted. Your homework should be legible, stapled, and free of “fringes.”
- *Quizzes.* There will be one quiz every week, making up 10% of your grade. These will be short (10–15 min.) and will be given at the beginning of class. No make-up quizzes.
- *Midterms.* There will be three midterms, each worth 15% of your grade. I do not give make-up tests.
- *Final Exam.* It will be comprehensive and count for 25% of your grade.

Grades

Your grade will be decided according to the usual scale: 90–100 is an A; 80–89 is a B; 70–79 is a C; 60–69 is a D; and 0–59 is an F.

Policies

- *Attendance.* You must attend each class session. If you must be absent, please let me know *in advance*.
- *Student Conduct.* Be on time, and be polite. Turn off cell phones, pagers, and other beeping devices. If you are disruptive you will be asked to leave. Take a few minutes to read the section titled “Five Principles of Student Academic Integrity” on pages 50–51 in the Laney College 2019–2020 Catalog.
- *Adding & Dropping.* It is **your responsibility** to add or drop the class. Don’t assume that if you don’t show up for some time I will automatically drop you. If you stop attending but don’t officially drop the class you will receive an F.
- *Cheating.* Are considered to be cheating: submitting work that is not your own; communicating with others (for any reason) during an exam; looking at someone else’s paper during an exam; consulting disallowed materials (notes, books, cheat sheets, etc.) during an exam; helping someone do any of these things. If you are caught cheating, you will receive 0 points for that assignment; more than one instance of cheating will earn you an appointment with the dean.

Calculators

A graphing calculator is not required for this class, but it would be very helpful.

Resources

I encourage you to form study groups. Fellow classmates can help. You can also come see me during office hours; I’ll be glad to help. The Math Lab (G-201) is open Monday–Thursday 9–7 and Friday 9–1. It is staffed with tutors chosen by the Math Department. Take full advantage of it; it’s a good place to do your homework and prepare for quizzes and exams.

Important Dates

- August 19: First day of instruction
- August 25: Last day to add without a permission number
- September 2: Labor Day (no classes)
Last day to add, or drop without a W
- September 23: **Exam #1**
- October 18: Last day to file for AA/AS
- October 22: Professional Development Day (no classes)
- October 28: **Exam #2**
- November 6: No class
- November 11: Veterans’ Day (no classes)
- November 15: Last day to drop with a W
- November 28–29: Thanksgiving holiday (no classes)
- December 2: **Exam #3**
- December 11: **Final Exam (7:30–9:30 p.m.)**

Detailed Schedule (Tentative)

Date	Lecture	HW Due	Quizzes/Exams
8/19	Intro; review		
8/21	Section 7.1		
8/25	<i>Last day to add without a permission number</i>		
8/26	Section 7.2	HW #1 (7.1)	
8/28	Section 7.3		Quiz #1 (7.1)
9/2	<i>Labor Day (no classes)</i>		
9/4	Section 7.4	HW #2 (7.2–3)	Quiz #2 (7.2–3)
9/9	Sections 7.5–6	HW #3 (7.4)	
9/11	Section 7.7		Quiz #3 (7.4)
9/16	Section 7.8	HW #4 (7.7)	
9/18	Sections 6.1–2		Quiz #4 (7.5, 7.7)
9/23		HW #5 (7.8, 6.1)	Exam #1 (up to section 6.1)
9/25	Sections 6.2–3		
9/30	Section 8.1	HW #6 (6.2–3)	
10/2	Section 8.2		Quiz #5 (6.2–3)
10/7	Section 11.1	HW #7 (8.1–2)	
10/9	Section 11.2		Quiz #6 (8.1–2)
10/14	Section 11.3	HW #8 (11.1–2)	
10/16	Section 11.4		Quiz #7 (11.1–2)
10/18	<i>Last day to file for AA/AS</i>		
10/21	Sections 11.5–6	HW #9 (11.3–4)	
10/22	<i>Professional Development Day (no classes)</i>		
10/23	Sections 10.6–7		Quiz #8 (11.3–4)
10/28		HW #10 (11.5–7)	Exam #2 (up to section 11.7)
10/30	Section 11.8		
11/4	Section 11.9	HW #11 (11.8)	
11/6	<i>No class</i>		
11/11	<i>Veterans' Day (no classes)</i>		
11/13	Section 11.10		Quiz #9 (11.8–9)
11/15	<i>Last day to drop with a W</i>		
11/18	Section 11.11	HW #12 (11.10)	
11/20	Sections 10.1–2		Quiz #10 (11.10)
11/25	Sections 10.2–3	HW #13 (11.11, 10.1)	
11/27	Section 10.4		Quiz #11 (11.11, 10.1)
11/28–29	<i>Thanksgiving holiday (no classes)</i>		
12/2		HW #14 (10.2–3)	Exam #3 (up to section 10.4)
12/4	Review		
12/11			Final Exam (7:30–9:30 p.m.)

Stuff You Already Know

Basic integrals:

$$\int x^n dx = \frac{x^{n+1}}{n+1} + C \quad (n \neq -1)$$

$$\int \frac{1}{x} dx = \ln|x| + C$$

$$\int e^x dx = e^x + C$$

$$\int b^x dx = \frac{b^x}{\ln b} + C$$

$$\int \sin x dx = -\cos x + C$$

$$\int \cos x dx = \sin x + C$$

$$\int \sec^2 x dx = \tan x + C$$

$$\int \csc^2 x dx = -\cot x + C$$

$$\int \sec x \tan x dx = \sec x + C$$

$$\int \csc x \cot x dx = -\csc x + C$$

$$\int \sinh x dx = \cosh x + C$$

$$\int \cosh x dx = \sinh x + C$$

$$\int \tan x dx = \ln|\sec x| + C$$

$$\int \cot x dx = \ln|\sin x| + C$$

$$\int \frac{1}{x^2 + a^2} dx = \frac{1}{a} \tan^{-1}\left(\frac{x}{a}\right) + C$$

$$\int \frac{1}{\sqrt{a^2 - x^2}} dx = \sin^{-1}\left(\frac{x}{a}\right) + C, \quad a > 0$$

Trigonometric identities:

$$\sin^2 x + \cos^2 x = 1$$

$$1 + \tan^2 x = \sec^2 x$$

$$1 + \cot^2 x = \csc^2 x$$

$$\sin 2x = 2 \sin x \cos x$$

$$\cos 2x = \cos^2 x - \sin^2 x$$

$$= 2 \cos^2 x - 1$$

$$= 1 - 2 \sin^2 x$$

$$\sin^2 x = \frac{1}{2}(1 - \cos 2x)$$

$$\cos^2 x = \frac{1}{2}(1 + \cos 2x)$$

Values of the trigonometric functions of common angles:

