

Date: 21.8.20



Calculus (with Precalculus) 2: 88732

Type of course: lecture/recitation

Hours/credits: 4.0

Academic year: תשפ"א (2019-20)

Semester: 2 (Spring)

Prerequisites: Calculus (with Precalculus) 1 or permission from the instructor

Course objectives:

- Acquiring conceptual knowledge and procedural fluidity with the chain rule and implicit differentiation, including using these tools to graph composite functions.
- Understanding the definitions and algebraic properties of logarithmic and trigonometric functions.
- Acquiring conceptual understanding and technical proficiency with the calculus of transcendental functions including graphing these categories of functions
- Modeling with composite and transcendental functions, including optimization problems and connections to COVID-19.

Overview of the two-semester sequence: In this two-semester sequence **students will learn the material typically taught in a Precalculus course followed by a Calculus 1 course for social sciences** taught sequentially. However, the material from these traditional courses is integrated.

Course Description: This course is the second in a this two-course sequence; it continues where the first semester left off. We continue with the calculus of algebraic function: the chain rule, implicit differentiation and related rates. The course continues with the algebra of logarithmic and trigonometric functions. The tools of calculus are then applied to transcendental and composite functions, including modeling applications. Time permitting, the indefinite and definite integral are introduced.

The Process of the Course:

The course consists of three hours of lecture, integrating symbolic manipulation software as needed, and a one-hour question/answer recitation.

Requirements and grade components:

- Attendance/participation (10%)
- Homework/attendance (10%)
- Quizzes (20%)
- Final Exam (60%)

Date: 21.8.20

Schedule:

Topic	Required Reading
Derivatives of composite and implicit functions <ul style="list-style-type: none">Chain rule and applicationsImplicit differentiation as an application of the chain ruleRelated Rates	Taalman Sections, 2.4, 3.5
Limits, derivatives and antiderivatives of exponential functions <ul style="list-style-type: none">Logistic growth	Taalman Section 5.2 and 5.3
Logarithmic functions <ul style="list-style-type: none">Definition as an inverse functionGraphs of logarithmic functions and transformationsThe natural logarithm function $\ln(x)$Derivatives and antiderivatives of logarithmic functionsApplications	Taalman Chapter 5 (logarithmic functions)
Trigonometric functions <ul style="list-style-type: none">Definition of $\sin \theta$, $\cos \theta$ and $\tan \theta$ in terms of right triangles ($0 < \theta < 90$)Extending definition to all real numbers via the unit circleRadiansGraphs of trigonometric functions and their transformationsDerivatives and antiderivatives of trigonometric functionsModelling with trigonometric functions	Taalman Chapter 6

Bibliography:

Required Textbook:

- Taalman, Laura, *Calculus I with integrated Precalculus First Edition*. Macmillian, 2013.

Recommended purchase/rental options:

- Purchase/rent a printed edition; purchase an electronic edition from Amazon:**
https://www.amazon.com/Calculus-integrated-Precalculus-Laura-Taalman/dp/1429240733/ref=sr_1_1?dchild=1&keywords=taalman+calculus+precalculus&qid=1598001671&sr=8-1

Renting an electronic edition through Amazon is not recommended

- Rent an electronic edition from WebAssign.net:**

Enter course key: **biu.il 7868 8360**

If you rented the textbook for the first semester, you do not have to rent it again.