BACHELOR OF ECONOMICS
THAMMASAT UNIVERSITY

Course Outline

MA216: CALCULUS FOR SOCIAL SCIENCE I

Semester 2/2022 (January 9 - May 6, 2023)

Number of Credit: 3

Prerequisite: -

Course Description: Limits and continuity of one variable functions, derivatives of algebraic functions and transcendental functions, implicit differentiation, higher order derivatives, Roll's theorem, the mean value theorem, applications of derivative for determining limits and maximum and minimum of functions, differentials and its applications, antiderivatives, indefinite integrals and integration, definite integrals and application of area solving, functions of several variables, limits and continuity of functions of several variables, partial derivatives, the chain rule, total differential and its applications.

No credit for students who are currently taking or have earned credits of MA111 or MA211 or MA218

Course Objectives:

- Introduce calculus and its applications
- Strengthen mathematical skills to prepare for higher-level mathematics
- Raise the appreciation for mathematics and its applications

Class Time and Logistic

Class day & Time: Section 046401:Tuesday and Thursday, **08.00AM – 09.30AM**
Section 046402:Tuesday and Thursday, **09.30AM – 11.00AM**

Class Venue: Section 046401: Room **206**, 2nd floor, Faculty of Economics
Section 046402: Room **302**, 3rd floor, Faculty of Economics

Teaching Materials Platform: Microsoft Teams
- Section 046401: **Team Code**: **TBA**
- Section 046402: **Team Code**: **TBA**

Instructor: **Name:** Assoc. Prof. Dr. Saifon Chaturantabut

Office Hours: by appointment

Email: saifon@mathstat.sci.tu.ac.th

Main Text: Stewart, James, Calculus, 8th ed., Cengage Learning, 2016.

Recommended Texts & Materials

- Anton, H., Bivens, I., and Davis, S. Calculus, 9th ed., John Wiley & Sons, Inc., 2009.
- L.J. Goldstein, D.C. Lay, and D.L. Schneider, Calculus and its Applications, 12th ed., Prentice Hall, 2010

Suggested Readings: Any calculus textbook

Grading Criteria*:

Midterm Examination 40% (Tuesday, February 28, 2023; 09.00 - 11.00 hrs.)

Final Examination 50% (Monday, May 15, 2023; 09.00 - 12.00 hrs.)

Quizzes/Assignments/Attendance/Participation 10%

**Note: Any change will be announced during the class.*

Expected Learning Outcomes: Students understand the course materials and can apply them to some related situations, as well as other related classes in the future.

Tentative Class Schedule

Week	Topic	Activities/Text & Materials/Media
1	Course Overview Limits and Continuity - Limits (An Intuitive Approach) - Computing Limits	Lecture Discussion Practice
2	Limits and Continuity - Techniques for computing limits - Limits at Infinity	Lecture Discussion Practice
3	Limits and Continuity - Limits of Trigonometric Functions - Continuity	Lecture Discussion Practice Quiz

Week	Topic	Activities/Text & Materials/Media
4	Differentiation - The Derivative - Techniques of Differentiation	Lecture Discussion Practice Quiz
5	Differentiation - The Chain Rule - Implicit Differentiation	Lecture Discussion Practice Quiz
6	Differentiation - Derivatives of Logarithmic and Exponential Functions - Higher Derivatives	Lecture Discussion Practice Quiz
7	Applications of Differentiation - Linear Approximations and Differentials - L'Hospital's Rule; Indeterminate Forms	Lecture Discussion Practice Quiz
	Midterm Exam	
8	Applications of Differentiation - Related Rates - Rolle's Theorem; Mean Value Theorem	Lecture Discussion Practice Quiz
9	Applications of Differentiation - Interval of Increase and Decrease; Concavity - Relative Extreme; First and Second Derivative Tests - Curve Sketching	Lecture Discussion Practice Quiz
10	- Maximum and Minimum Values of a Function and applications Integration - Antiderivatives; The Indefinite Integral	Lecture Discussion Practice Quiz
11	Integration - The Definite Integral - The Fundamental Theorem of Calculus - Evaluating Definite Integrals by Substitution	Lecture Discussion Practice Quiz
12	Techniques of Integration - Integration by Parts - Improper Integrals	Lecture Discussion Practice Quiz

Week	Topic	Activities/Text & Materials/Media
13	Applications of Definite Integral - Area Between Curves	Lecture Discussion Practice Quiz
14	Functions of several Variables - Function of Two or More Variable - Partial Derivatives	Lecture Discussion Practice Quiz
15	Functions of Several Variables - The Chain Rule - Total Differential and Its Applications	Lecture Discussion Practice Quiz
	Final Exam	

ACADEMIC CALENDAR & HOLIDAY
SEMESTER 2/2022

Semester 2/2022 (January 9 - May 6, 2023)	
Registration at REG TU (*ID.62-65)	November 22 – 25, 2022
Tuition Fee Payment Period (Via TU Greats App)	November 27, 2022 – January 7, 2023
Classes Begin	January 9, 2023
Add-drop period	January 9 - 22, 2023 *(from 9.00 AM of January 9 to 10.30 PM of January 22)*
Tuition Fee Payment Period (Via TU Greats App)	January 9 - 23, 2023 *(9 AM - 10.30 PM)*
Mid-term Examination Period	February 27 - 28 to March 4, 2023
*Makha Bucha Day**	*March 6, 2023*
Withdrawal period with "W" on record	January 25 – March 19, 2023 *(from 9.00 AM of March 14 to 10.30 PM of April 25)*
*Chakri Memorial Day**	*April 6, 2023*
*Songkran Festival Day**	*April 10 - 16, 2023*
*Coronation Day**	*May 4, 2023*
Last day of class for Semester 2/2022	May 6, 2023
Final exam period	May 8 – 22, 2023
*Royal Ploughing Ceremony Day**	*To be announced*
Submitting Forms for Degree Conferral	January 9 - 22, 2023

Remark * Holiday, No classes during this period