

Course Outline

MA216: CALCULUS FOR SOCIAL SCIENCE I

Semester 1/2021 (August 9 – November 27, 2021)

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:

- Introduces calculus and its applications
- Strengthens mathematical skills to prepare for higher-level mathematics
- Raises 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

Teaching Materials Platform: Microsoft Teams

Meeting Platform: Microsoft Teams

- Section 046401: **Team Code:** [d2pqya2](#)
- Section 046402: **Team Code:** [v0pi7fb](#)

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% (Thursday, September 30, 2021 / 09.00-11.00 hrs.)

Final Examination 50% (Tuesday, December 7, 2021 / 09.00-11.30 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 <ul style="list-style-type: none"> - Limits (An Intuitive Approach) - Computing Limits 	Lecture Discussion Practice
2	Limits and Continuity <ul style="list-style-type: none"> - Techniques for computing limits - Limits at Infinity 	Lecture Discussion Practice
3	Limits and Continuity <ul style="list-style-type: none"> - Limits of Trigonometric Functions - Continuity 	Lecture Discussion Practice Quiz

Week	Topic	Activities/Text & Materials/Media
4	Differentiation <ul style="list-style-type: none"> - The Derivative - Techniques of Differentiation 	Lecture Discussion Practice Quiz
5	Differentiation <ul style="list-style-type: none"> - The Chain Rule - Implicit Differentiation 	Lecture Discussion Practice Quiz
6	Differentiation <ul style="list-style-type: none"> - Derivatives of Logarithmic and Exponential Functions - Higher Derivatives 	Lecture Discussion Practice Quiz
7	Applications of Differentiation <ul style="list-style-type: none"> - Linear Approximations and Differentials - L'Hospital's Rule; Indeterminate Forms 	Lecture Discussion Practice Quiz
	Midterm Exam	
8	Applications of Differentiation <ul style="list-style-type: none"> - Related Rates - Rolle's Theorem; Mean Value Theorem 	Lecture Discussion Practice Quiz
9	Applications of Differentiation <ul style="list-style-type: none"> - Interval of Increase and Decrease; Concavity - Relative Extreme; First and Second Derivative Tests - Curve Sketching 	Lecture Discussion Practice Quiz
10	<ul style="list-style-type: none"> - Maximum and Minimum Values of a Function and applications Integration <ul style="list-style-type: none"> - Antiderivatives; The Indefinite Integral 	Lecture Discussion Practice Quiz
11	Integration <ul style="list-style-type: none"> - The Definite Integral - The Fundamental Theorem of Calculus - Evaluating Definite Integrals by Substitution 	Lecture Discussion Practice Quiz
12	Techniques of Integration <ul style="list-style-type: none"> - 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 1/2021

Semester 1/2021 (August 9 - November 27, 2021)	
Classes Begin	August 9, 2021
Add-drop period	August 16 – 19, 2021
Tuition Fee Installment Plan For ID.61-63 only <i>(9 AM - 10.30 PM)</i>	#Round 1 (July 16 – 18, 2021) #Round 2 (August 20 – 22, 2021) #Round 3 (September 20 – 22, 2021)
<i>H.M. Queen Sirikit The Queen Mother's Birthday*</i>	<i>August 12, 2021</i>
Mid-term Examination Period	September 27 - October 3, 2021
Withdrawal period with "W" on record	October 11 - November 15, 2021
<i>H.M. King Bhumibol Adulyadej The Great Memorial Day*</i>	<i>October 13, 2021</i>
<i>King Chulalongkorn's Day*</i>	<i>October 23, 2021</i>
<i>Substitution for King Chulalongkorn's Day*</i>	<i>October 25, 2021</i>
Last day of class for Semester 1/2021	November 27, 2021
Final exam period	November 29-30, December 1-3, 7-9, 11-17, 2021
<i>H.M. King Bhumibol Adulyadej The Great's Birthday*</i>	<i>December 5, 2021</i>
<i>Substitution for H.M. King Bhumibol Adulyadej The Great's Birthday*</i>	<i>December 6, 2021</i>
<i>Constitution Day*</i>	<i>December 10, 2021</i>

Remark * Holiday, No classes during this period