



# B.E. International Program

## Faculty of Economics, Thammasat University



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### Course Syllabus

#### MA 216 Calculus for Social Science I

Semester 2/2017 (January 8 – May 20, 2018)

<b>Number of credits:</b>	3 credits
<b>Lecture Time:</b>	Tuesday and Thursday, 08.00AM – 09.30AM (Section 046401)
<b>Lecture Venue:</b>	Room # 303 Faculty of Economics Thammasat University, Tha Prachan Campus
<b>Instructor:</b>	Assistant Professor Dr. Supranee Lisawadi
<b>E-Mail:</b>	supranee@mathstat.sci.tu.ac.th
<b>Office Hours:</b>	Thursday, 09.30AM – 12.30PM or by appointment

#### 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.

Note : There is no credit for students who are currently taking or have earned credits of MA111 or MA211 or MA218

**Prerequisites:** -

## Course Objectives:

Introduces calculus and its applications

Strengthens mathematical skills to prepare for higher-level mathematics

Raises the appreciation for mathematics and its applications

## Recommended Text and Materials:

1. Stewart, James, *Calculus*, 8<sup>th</sup> ed., Cengage Learning, 2016.
2. Anton, H., Bivens, I., and Davis, S. *Calculus*, 9<sup>th</sup> ed., John Wiley & Sons, Inc., 2009.
3. L.J. Goldstein, D.C. Lay, and D.L. Schneider, *Calculus and its Applications*, 12<sup>th</sup> ed., Prentice Hall, 2010

## Course Evaluation:

Midterm Examination	40%	(Tuesday, March 13, 2018; 09.00-11.00 hrs.)
Final Examination	50%	(Wednesday, May 23, 2018; 13.30-16.30 hrs.)
Quizzes	10%	

## Course Schedule:

Week	Topic	Activities/Text & Materials/Media
1	Course Overview Limits and Continuity <ul style="list-style-type: none"><li>- Limits (An Intuitive Approach)</li><li>- Computing Limits</li></ul>	Lecture Discussion Practice
2	Limits and Continuity <ul style="list-style-type: none"><li>- Limits at Infinity</li><li>- Limits of Trigonometric Functions</li><li>- Continuity</li></ul>	Lecture Discussion Practice Quiz

<b>Week</b>	<b>Topic</b>	<b>Activities/Text &amp; Materials/Media</b>
3	Differentiation <ul style="list-style-type: none"> <li>- The Derivative</li> <li>- Techniques of Differentiation</li> <li>- The Chain Rule</li> </ul>	Lecture Discussion Practice Quiz
4	Differentiation <ul style="list-style-type: none"> <li>- The Chain Rule</li> <li>- Implicit Differentiation</li> </ul>	Lecture Discussion Practice Quiz
5	Differentiation <ul style="list-style-type: none"> <li>- Derivatives of Logarithmic and Exponential Functions</li> <li>- Higher Derivatives</li> <li>- Linear Approximations and Differentials</li> </ul>	Lecture Discussion Practice Quiz
6	Applications of Differentiation <ul style="list-style-type: none"> <li>- L'Hospital's Rule; Indeterminate Forms</li> <li>- Related Rates</li> <li>- Interval of Increase and Decrease; Concavity</li> </ul>	Lecture Discussion Practice Quiz
7	Applications of Differentiation <ul style="list-style-type: none"> <li>- Relative Extreme; First and Second Derivative Tests</li> <li>- Graphs of Polynomials and Rational Functions</li> <li>- Maximum and Minimum Values of a Function</li> </ul>	Lecture Discussion Practice Quiz
<b>Midterm Exam (Tuesday, March 13, 2018; 09.00-11.00 hrs.)</b>		
8	Applications of Differentiation <ul style="list-style-type: none"> <li>- Applied Maximum and Minimum Problems</li> <li>- Rolle's Theorem; Mean Value Theorem</li> </ul>	Lecture Discussion Practice Quiz
9	Integration <ul style="list-style-type: none"> <li>- Antiderivatives; The Indefinite Integral</li> <li>- Integration by Substitution</li> </ul>	Lecture Discussion Practice Quiz

Week	Topic	Activities/Text & Materials/Media
10	Integration <ul style="list-style-type: none"> <li>- The Definite Integral</li> <li>- The Fundamental Theorem of Calculus</li> </ul>	Lecture Discussion Practice Quiz
11	Integration <ul style="list-style-type: none"> <li>- Evaluating Definite Integrals by Substitution</li> </ul> Applications of Definite Integral <ul style="list-style-type: none"> <li>- Area Between Two Curves</li> </ul>	Lecture Discussion Practice Quiz
12	Techniques of Integration <ul style="list-style-type: none"> <li>- Integration by Parts</li> <li>- Integrating Rational Functions by Partial Fraction</li> </ul>	Lecture Discussion Practice Quiz
13	Techniques of Integration <ul style="list-style-type: none"> <li>- Integrating Rational Functions by Partial Fraction</li> <li>- Improper Integrals</li> </ul>	Lecture Discussion Practice Quiz
14	Functions of several Variables <ul style="list-style-type: none"> <li>- Function of Two or More Variable</li> <li>- Partial Derivatives</li> </ul>	Lecture Discussion Practice Quiz
15	Functions of Several Variables <ul style="list-style-type: none"> <li>- The Chain Rule</li> <li>- Total Differential and Its Applications</li> </ul>	Lecture Discussion Practice Quiz
	<b>Final Exam (Wednesday, May 23, 2018; 13.30-16.30 hrs.)</b>	



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## ACADEMIC CALENDAR & HOLIDAY

Semester 2/2017  
(January 8 – May 20, 2018)

Activities	Time Period
Pre- Registration period (Via BE Portal)	November 7 - 10, 2017
Registration period (www.reg.tu.ac.th)	November 27 – 30, 2017
Tuition payment period	November 27 – December 4, 2017
Classes Begin	January 8, 2018
Adding and Dropping Courses W/O Record	January 8 - 22, 2018
Payment	January 8 - 23, 2018
The University Sports of Thailand*	January 22 - February 3, 2018
Makha Bucha Day*	March 1, 2018
Mid-term Examination Period	March 12 – 17, 2018
Course Withdrawal With "W"	March 28 – April 2, 2018
Chakri Memorial Day*	April 6, 2018
Songkran Festival Day*	April 11 - 17, 2018
Royal Ploughing Ceremony Day*	May 14, 2018
Last Day of Classes	May 20, 2018
Final Examination Period	May 21 – June 2, 2018

\* Holiday, No classes during this period