



# B.E. International Program

## Faculty of Economics, Thammasat University



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### Course Syllabus

#### MA 216 Calculus for Social Science I

Semester 1/2017 (August 15 – December 9, 2017)

<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>	Tuesday and Thursday, 09.30AM – 11.00AM 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, October 3, 2017; 08.00-09.30 hrs.)
Final Examination	50%	(Friday, December 15, 2017; 09.00-12.00 hrs.)
Quizzes	10%	

## Course 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 - Limits at Infinity - Limits of Trigonometric Functions - Continuity	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, October 3, 2017; 08.00-09.30 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 (Friday, December 15, 2017; 09.00-12.00 hrs.)</b>	

## Remarks:

- ◆ First semester begins August 15, 2017
- ◆ Period of withdrawal without “W” August 15 - 28, 2017
- ◆ **Mid-Term Examination Period** **October 2 - 7, 2017**  
(Tuesday, October 3, 2017; 08.00-09.30 hrs.)
  
- ◆ His Majesty the late King Bhumibol Adulyadej Memorial Day \* October 13, 2017
- ◆ Course withdrawal with “W” October 18 - 24, 2017
- ◆ The royal cremation ceremonies of HM the late King Bhumibol Adulyadej \* October 23 - 29, 2017
- ◆ **Final Examination Period** **December 12 - 24, 2017**  
(Friday, December 15, 2017; 09.00-12.00 hrs.)

\* No classes during this period

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