



**Sirindhorn International Institute of Technology  
Thammasat University at Rangsit**

**Academic Program: Department of Common and Graduate Studies**

**MAS 116: Course Syllabus**

**Semester/Year:** 3/2008

**Course Title:** MAS116 (Mathematics I)

**Instructor:** Dr. Prapun Suksompong (prapun@siit.tu.ac.th)

**Lectures:** Monday, Wednesday, Friday 13:00-16:00, Room RS 411

**Required Textbook:** Howard Anton, Irl Bivens, and Stephen Davis, *Calculus*, 8<sup>th</sup> Edition, Wiley (2005).

**Student Companion Site:**

<http://bcs.wiley.com/he-bcs/Books?action=index&itemId=0471482730&bcsId=2252>

**Grading Plan: Coursework will be weighted as follows:**

Homework	10%
Class Participation and Quizzes	20%
Midterm Examination	30%
Final Examination (comprehensive)	40%

**Course Description:** This course covers differential and integral calculus for functions of one variable and infinite series. Topics include: limits and continuity, derivatives of functions, extreme values of functions, techniques of integration, Taylor series, and power series.

**Calculator:** Calculators are **not** allowed during quizzes, midterm or final exams. So the use of calculators for your homework is not recommended.

**Quizzes and Exams:** All quizzes and exams will be closed book.

Quizzes will relate to current and previous topics. A quiz may be given at any time during any class period – immediately after a lecture, at the beginning or end of a class, etc. There will be no make-up quizzes. Quizzes will be given only to those students who are present when the quizzes are passed out.

**The instructor should be notified before missing any exam if at all possible and immediately thereafter when not possible.** The instructor will determine if the absence from an exam is legitimate. Simply not feeling well is not a reason to miss an exam. In the case of legitimate absence, an oral and/or written make-up exam could be arranged.

**Lectures:** You are very STRONGLY encouraged to attend lectures. **Students who miss more than 30% of the lectures will not be allowed to take the final exam and will automatically fail (Grade F) the course.**

**Homework: Late submission will not be accepted.** You are encouraged to work with other students on the homework; however, you must write down your own solutions in your own words. Submitted solutions that are obviously copied from one another will not be accepted and will be considered a violation of academic integrity.

Homework assignments will be graded with attention given to the method and insight rather than the final answers. Write down all the steps that you have done to obtain your answers. You won't get full credit even when your answer is correct without showing how you get your answer.

Please submit all homework in the MAS116 box in front of the CGS Department which is located on the 3<sup>rd</sup> floor of RS building.

**Expectations:** I expect you to do most of your learning outside of the classroom. You should expect to spend extra 5-8 hours per lecture studying and working on calculus outside of class. However, I do expect you to come to class and participate actively in class discussions. If you must miss a class, I expect you to find out what happened, either from your instructor or one of your classmates. You are responsible for all materials that are discussed in class.

## Course Outline and Tentative Schedule of Lectures

The following is a tentative list of topics and required readings.

### MAS 116: Mathematics I

Semester 3/2008

Lecture No.	Text Sections	Topics
<b>1</b> Apr 1	1.3 7.1 1.4	<ul style="list-style-type: none"><li>○ New Functions from Old</li><li>○ Some Elementary Functions</li><li>○ Family of Functions</li><li>● Reading: pages 1–13, 27–35, 40–48, 435–444</li></ul>
<b>2</b> Apr 2	2.1 2.2 2.3 2.5	<ul style="list-style-type: none"><li>○ Limits: Intuition and Definition</li><li>○ Computing</li><li>○ Limits at Infinity, Asymptotes</li><li>○ Continuity</li><li>● Reading: pages 84–112, 125–140</li></ul>
<b>3</b> Apr 3	3.1 3.2  3.3 3.4	<ul style="list-style-type: none"><li>○ Slopes and Rates of Change</li><li>○ Derivative</li><li>○ Derivatives of Simple Functions (e.g. constant, linear, <math>e^x</math>)</li><li>○ Techniques of Differentiation</li><li>○ Product and Quotient Rules</li><li>● Reading: pages 146–183</li></ul>
<b>4</b> Apr 8	3.5 7.2 3.6 3.7	<ul style="list-style-type: none"><li>○ Derivatives of Trigonometric Functions</li><li>○ Derivatives of Exponential and Logarithm Functions</li><li>○ Chain Rule</li><li>○ Implicit Differentiation</li><li>● Reading: pages 185–203, 447–451</li></ul>
<b>5</b> Apr 9	7.3 7.5 3.8 3.9	<ul style="list-style-type: none"><li>○ Derivatives of Inverse Functions</li><li>○ L'Hopital's Rule; Indeterminate Forms</li><li>○ Related Rates</li><li>○ Local Linear Approximation; Differentials</li><li>● Reading: pages 453–457, 467–474, 207–217</li></ul>

	4.1	○ Analysis of Functions I: Increase, Decrease, Concavity
<b>6</b>	4.2	○ Analysis of Functions II: Relative Extrema, Curve Sketching
Apr 10	4.4	○ Absolute Maxima/Minima
	4.5	○ Applied Maximum and Minimum Problems
		• Reading: pages 225–242, 254–271
<b>Apr 22</b>	<b>Midterm Examination (30 %)</b>	
	5.1	○ Area Problem
<b>7</b>	5.2	○ Indefinite Integral
Apr 24	5.3	○ Integration by Substitution
	5.5	○ Definite Integral
		• Reading: pages 303–322, 337–344
	5.6	○ The Fundamental Theorem of Calculus
<b>8</b>	5.8	○ Evaluating Definite Integrals by Substitution
Apr 27	7.2	○ Integrals Involving Logarithmic Functions
	7.8	○ Hyperbolic Functions
		• Reading: pages 347–357, 370–373, 477–451, 498–506
	6.1	○ Area Between Two Curves
<b>9</b>	6.2	○ Volumes by Slicing; Disks and Washers
Apr 29	6.3	○ Volumes by Cylindrical Shells
	8.1	○ Overview of Integration Methods
		• Reading: pages 381–401
	8.2	○ Integration by Parts
<b>10</b>	8.3	○ Trigonometric Integrals
Apr 30	8.4	○ Trigonometric Substitutions
	8.5	○ Partial Fractions
		• Reading: pages 517–547
	8.8	○ Improper Integrals
<b>11</b>	10.1	○ Sequences
May 4	10.2	○ Monotone Sequences
	10.3	○ Infinite Series
		• Reading: pages 573–579, 628–653

<b>12</b> May 6	10.8	<ul style="list-style-type: none"> <li>○ Convergence of Infinite Series</li> <li>○ Maclaurin and Taylor Series; Power Series</li> <li>● Reading: pages 656–695 (including sections 10.4–10.6)</li> </ul>
<b>13</b> May 11	10.8 10.7	<ul style="list-style-type: none"> <li>○ Maclaurin and Taylor Series; Power Series</li> <li>○ Maclaurin and Taylor Polynomials</li> </ul>
<b>14</b> May 11		<ul style="list-style-type: none"> <li>○ Misc. Topics</li> </ul>
<b>15</b> May 15		<ul style="list-style-type: none"> <li>● <b>Review: TBD</b></li> <li>○ Practice problems to be handed out</li> </ul>
<b>May 20</b>		<b>Final Examination (40%)</b>

MAS 116

Summer 2008  
April 2009

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3	4
09.00 -11.00							
13.00 -16.00				MAS 116	<b>Mk-up MAS 116</b>	MAS 116	
	5	6	7	8	9	10	11
09.00 -11.00		No class					
13.00 -16.00				MAS 116	<b>Mk-up MAS 116</b>	MAS 116	
	12	13	14	15	16	17	18
09.00 -11.00		No class	No class	No class			
13.00 -16.00							
	19	20	21	22	23	24	25
09.00 -11.00		No class	No class	Mid-term Exam.	No class		
13.00 -16.00				MAS 116		MAS 116	
	26	27	28	29	30		
09.00 -11.00							
13.00 -16.00		MAS 116		MAS 116	<b>Mk-up MAS 116</b>		

May 2009

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1	2
09.00 -11.00						No class	
13.00 -16.00							
	3	4	5	6	7	8	9
09.00 -11.00						No class	
13.00 -16.00		MAS 116		MAS 116			
	10	11	12	13	14	15	16
09.00 -11.00							
13.00 -16.00		MAS 116		MAS 116		MAS 116	
	17	18	19	20	21	22	23
09.00 -11.00				Final Exam.			
13.00 -16.00				MAS 116			
	24	25	26	27	28	29	30
09.00 -11.00							
13.00 -16.00							