

Course Syllabus

1. **Faculty/Institute/College** Department of Mathematics,
Faculty of Science, Mahidol University
2. **Course Code** SCMA 101
Course Title Mathematics I
3. **Number of Credits** 2 (2-0-4) credits
4. **Prerequisite** None
5. **Type of Course** Specific Courses
6. **Session/Academic year** First semester, 2021
7. **Course Conditions** -
8. **Course Description**

Functions; limits; continuity; derivatives of algebraic functions, logarithmic functions, exponential functions and trigonometric functions; implicit differentiation; higher-order derivatives; differentials; applications of differentiation; indeterminate forms and l' Hospital's rule; functions of several variables and partial derivatives; total differentials and total derivatives; antiderivatives and integration; techniques of integration; applications of integration

9. Course Objectives

Instructor expects students to acquire skills and knowledge as follows. Students should:

- 1) Demonstrate understanding of fundamental knowledge of calculus
- 2) Be able to calculate and use derivatives and integrals to solve assigned problems
- 3) Know various applications of the derivative and the integration.

Course-level learning outcomes: CLOs

After successful completion of this course, students should be able to:

- 1) CLO1 Explain fundamental knowledge of calculus such as limits, continuity, derivatives and integration.
- 2) CLO2 Evaluate limits, derivatives, and integrals by multiple methods.
- 3) CLO3 Apply calculus to real-world problems.
- 4) CLO4 Demonstrate abilities to study and work both independently and collaboratively.

10. Course Outline

Week	Date	Topics	Number of hours		Instructors
			In-class activity	Lab	
1	10 Aug	Functions and limits	2	0	WJ
2	17 Aug	Continuity and derivatives	2	0	
3	24 Aug	Differentiation formulas	2	0	
4	31 Aug	Chain rule and power rule	2	0	
5	7 Sep	Derivatives of transcendental functions	2	0	
6	14 Sep	Implicit differentiation, higher-order derivatives, differentials	2	0	
7	21 Sep	applications of differentiation	2	0	
8	28 Sep	Indeterminate forms and l' Hospital's rule	2	0	
9	4-8 Oct	Midterm examination			
10	12 Oct	Functions of several variables, partial derivatives, total differentials, total derivatives	2	0	WJ
11	19 Oct	Antiderivatives and indefinite integration	2	0	
12	26 Oct	Integrations	2	0	
13	2 Nov	Integration by parts	2	0	
14	9 Nov	Integrating rational functions	2	0	
15	16 Nov	Definite integrals	2	0	
16	23 Nov	Applications of integration	2	0	
17	29 Nov-10 Dec	Final examination			
		Total	30	0	

11. Summative assessment

(1) Evaluation methods and weight

Course learning outcomes	Evaluation methods					Weight
	Assignments	Quizzes	Q&A	Group Project	Exams	
CLO1	3%	2%	-	-	5%	10%
CLO2	10%	8%	-	-	37%	55%
CLO3	2%	-	-	10%	8%	20%
CLO4	-	-	10%	5%	-	15%
Total	15%	10%	10%	15%	50%	100%

(2) Grading system

After completion of the evaluation process each student is assigned a criterion-referenced grade (as shown in the table below). Evaluation and achievement will be justify according to Faculty and University code, conducted by grading system of A, B+, B, C+, C, D+, D and F.

Total percentage of evaluation	Grade
80– 100	A
75 – 79	B+
70 – 74	B
65 – 69	C+
60 – 64	C
55 – 59	D+
50 – 54	D
0 – 49	F

To pass this course, student must earn a grade of at least D.

12. References

12.1 Textbooks and required documents

- 1) Anton H, Bivens I, Davis S. Calculus. 10th ed., New York: Wiley; 2012.
- 2) Lecture Note

12.2 Suggested Materials

- 1) James Stewart, Calculus: Early Transcendentals. 8th ed., Brooks Cole; 2015

13. Instructor

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14. Time table: Tuesday 13.30-15.30
