

King Fahd University of Petroleum and Minerals  
 Department of Mathematical Science  
**SYLLABUS**  
 Semester I, 2004-2005 (041)  
 (Dr. M. Sarhan)

**Course #:** Math 101  
**Title:** Calculus I  
**Textbook:** Calculus (Early Transcendentals): by H. Anton, I. Bivens, and S. Davis; seventh edition (2002)  
**Objectives:** To introduce the student to basic concepts and methods of Calculus. Topics include: Limits and continuity. The Derivative. Exponential, logarithmic and inverse trigonometric functions. Applications: Related rates, Local linear approximation, Differentials, Graphing and Applied optimization problems.

Weeks	Dates	Secs.	Topics
1	Sept 11-15	2.1	Limits (An Intuitive Approach)
2	Sept 18-22	2.2 2.3	Computing Limits Computing Limits (End Behavior)
3	Sept 25-29	2.4 2.5	Limits (Discussed More Rigorously) Continuity
4	Oct 02-06	2.6 3.1	Limits and Continuity of Trigonometric Functions Slopes and Rates of Change
5	Oct 09-13	3.2	The Derivative
<b>Suggested Date for Major Exam I: Tuesday, October 12, 2004.</b>			
6	Oct 16-20	3.3 3.4	Techniques of Differentiation Derivatives of Trigonometric Functions
7	Oct 23-27	3.5 3.6	The Chain Rule Implicit Differentiation
8	Oct 30-Nov 03	3.7 3.8	Related Rates Local Linear Approximation; Differentials
<b>Eid Al-Fitr Vacation</b>			
9	Nov 20-24	4.1 4.2	Inverse Functions Exponential and Logarithmic Functions
10	Nov 27-Dec 01	4.3	Derivatives of Logarithmic and Exponential Functions
<b>Suggested Date for Major Exam II: Tuesday, November 30, 2004.</b>			
11	Dec 04-08	4.4 4.5	Inverse Trigonometric Functions and Their Derivatives L'Hopital's Rule; Indeterminate Forms
12	Dec 11-15	5.1 5.2	Analysis of Functions I: Increase, Decrease and Concavity Analysis of Functions II: Relative Extrema; First and Second Derivative Tests
13	Dec 18-22	5.3 5.4	Analysis of Functions III: Applying Technology and the Tools of Calculus Rectilinear Motion (Motion Along a Line)
14	Dec 25-29	5.5 5.6	Absolute Maxima and Minima Applied Maximum and Minimum Problems (Optimization)
15	Jan 01-05	5.7 5.8	Newton's Method Rolle's Theorem; Mean-Value Theorem

- The Suggested dates for Major Exams I and II are set by the College of Sciences to avoid conflicts with other exams.
- The date, time and the place of the Final Examination will be announced by the Registrar. The Final Exam is Comprehensive.
- Attendance is compulsory. KFUPM policy with respect to attendance will be strictly enforced.
- For details about Homework and Recitation Problems and CAS Assignments, see the following page.

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**Homework and Recitation Problems and CAS Assignments**

Secs.	Homework Problems	*CAS Assignments	Recitation Problems
2.1	2, 10, 14, 15, 31	29	6, 12, 13, 32,
2.2	2, 7, 10, 15, 20, 36, 38	---	1, 3, 8, 16, 17, 34, 40
2.3	16, 18, 26, 27, 32	---	2, 6, 8, 11, 20, 29, 31
2.4	11, 21, 48	---	12, 22, 72
2.5	20, 22, 24, 27, 29, 43	31	19, 23, 26, 30, 42
2.6	9, 10, 23, 24, 26, 30, 35, 40	<i>Example # 3(a,b)</i>	2, 8, 14, 18, 21, 28, 42
3.1	1, 8, 11, 18	---	2, 6, 13, 20
3.2	1, 3, 10, 16, 25, 28, 45, 46	31	2, 4, 5, 11, 14, 23, 41, 43, 47
3.3	6, 8, 12, 18, 20, 22, 40, 44, 51, 61	56	14, 24, 26, 43, 49, 60, 65
3.4	6, 17, 22, 25(b), 27(a), 37(i)	---	8, 10, 23, 29(b), 37(g)
3.5	4, 10, 22, 32, 43, 55, 72	41, 42	2, 13, 16, 25, 38, 47, 54, 70
3.6	12, 22, 25, 28, 30, 36, 47	33, 35	19, 24, 31, 40, 46
3.7	3, 8, 10, 13, 14, 25, 29, 40	---	12, 17, 26, 32, 37
3.8	2, 5, 10, 21, 27, 28, 37, 41, 53,	---	4, 6, 19, 23, 30, 42, 54
4.1	1(a,b), 8, 12, 16, 18, 26, 46	---	5, 11, 24, 40, 45
4.2	6, 18, 21, 22, 30, 34, 57	38, 39	12, 15, 16, 24, 33, 35, 58
4.3	7, 14, 18, 29, 31, 34, 35, 42, 45, 48, 50, 57	---	3, 4, 8, 30, 32, 33, 38, 40, 47
4.4	8, 11, 12, 27, 29, 32	--	2, 5, 7, 13, 24, 28, 31
4.5	1, 8, 11, 18, 27, 32, 33, 49, 51	42, 47	2, 12, 16, 23, 35, 39, 40
5.1	4, 7, 15, 18, 22, 26	42	2, 6, 8, 17, 25, 35
5.2	8, 9, 19, 22, 34, 36, 53	54	5, 12, 15, 17, 23, 32, 36
5.3	3, 14, 23, 34, 44, 53, 58, 67	---	4, 18, 24, 38, 50, 68
5.4	2, 3, 12, 20	---	4, 14, 18, 38
5.5	7, 12, 21, 25, 38, 43	---	5, 14, 20, 31, 41
5.6	3, 4, 6, 9, 22, 29, 51	---	2, 8, 19, 49, 55
5.7	3, 6, 27, 31	20	2, 4, 8, 24
5.8	7, 8, 13, 20, 26, 37, 46	---	6, 16, 31, 38

- Homework and recitation problems may be extended or adjusted by the instructor as appropriate. CAS assignments are at the discretion of the instructor. In any case, the students are strongly urged to solve much more problems than indicated here.
- \* Computer Algebra Systems (CAS): Mathematica, Matlab, Maple, ..., etc. See Section 1.3 of the textbook for details. Also refer to pages vii and xi for details about the *Calculus Resource CD* packaged with the textbook.