

King Fahd University of Petroleum and Minerals
 Department of Mathematical Science
SYLLABUS
 Semester I, 2005-2006 (051)
 (Dr. M. Sarhan)

Course #: Math 101
Title: Calculus I
Textbook: Calculus (Early Transcendentals): by H. Anton, I. Bivens, and S. Davis; eighth edition (2005)
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 10-14	2.1	Limits (An Intuitive Approach)
2	Sept 17-21	2.2 2.3	Computing Limits Limits at infinity; End Behavior of a Function
3	Sept 25*-28	2.4 2.5	Limits (Discussed More Rigorously) Continuity
4	Oct 01-05	2.6 3.1	Continuity of Trigonometric and Inverse Functions Tangent Lines, Velocity and General Rates of Change
5	Oct 08-12	3.2 3.3	The Derivative Function Techniques of Differentiation
Suggested Date for Major Exam I: Sunday, October 09, 2005.			
6	Oct 15-19	3.4 3.5	The Product and Quotient Rules Derivatives of Trigonometric Functions
7	Oct 22-26	3.6 3.7	The Chain Rule Related Rates
Eid Al-Fitr Vacation			
8	Nov 12-16	3.8	Local Linear Approximation; Differentials
9	Nov 19-23	4.1 4.2	Implicit Differentiation Derivatives of Logarithmic Functions
10	Nov 26-30	4.3	Derivatives of Exponential and Inverse Trigonometric Functions
Suggested Date for Major Exam II: Tuesday, December 06, 2005.			
11	Dec 03-07	4.4	L'Hopital's Rule; Indeterminate Forms
12	Dec 10-14	5.1 5.2	Analysis of Functions I: Increase, Decrease and Concavity Analysis of Functions II: Relative Extrema; Graphing Polynomials
13	Dec 17-21	5.3 5.4	More on Curve Sketching: Rational Functions; Curves with Cusps and Vertical Tangent Lines; Using Technology Absolute Maxima and Minima
14	Dec 24-28	5.5 5.6	Applied Maximum and Minimum Problems (Optimization) Newton's Method
15	Dec 31-Jan 04	5.7 5.8	Rolle's Theorem; Mean-Value Theorem Rectilinear Motion
Eid Al-Adha Vacation			
16	Jan 21		Review

* Saturday, Sept 24 : National Day Break.

- 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, 4, 5, 8, 11	15	3, 6, 7, 10
2.2	5, 8, 10, 13, 15, 17, 20, 27, 30, 32, 33, 34, 37	---	2,12,18,19,28,29,31,35,36,38
2.3	2, 12, 20, 26, 34, 42, 47, 55, 57, 63, 66,69,71	---	3,16,19,33,43,48,56,58,64,70
2.4	9, 13, 21, 29	---	10, 14, 22, 30
2.5	5, 14, 17, 21, 23, 29	---	6, 15, 18, 22, 24, 30
2.6	2,9,12,18, 21, 24,26,27,29,33,36,47,50,55,59	<i>Example # 5(a,b)</i>	7,19,23,25,28,30,34,38,46,49
3.1	1, 8, 9, 13, 20	---	2, 5, 10, 15, 23
3.2	2, 7, 13, 15, 25, 41, 45	31	4, 8, 14, 19, 21, 23, 44, 46
3.3	10, 14, 20, 22, 24, 35, 39, 43,47,50,62	46	9, 18,23,36,41,44,48,51,65,66
3.4	8, 10, 15, 19, 21, 23, 26	---	7, 16, 20, 22, 24, 28, 36
3.5	5, 8, 14, 21, 25, 27, 35, 39(a, c, g)	---	4, 6, 18,22,26,27, 29, 36,39(h)
3.6	2, 5, 7, 10, 13, 15, 22, 25, 28, 33, 40, 43, 54	41, 42	3, 6, 11, 16, 24, 32, 39, 45, 52
3.7	3, 10, 12, 14, 16, 25, 29, 32	---	4, 13, 15, 26, 37
3.8	2, 5, 10,21,27,28,37, 41, 53	---	1, 4, 6, 19, 23, 30, 42, 54
4.1	12, 22, 25, 28, 30, 34, 35, 51	37, 39	19, 24, 26, 27, 31, 33, 36, 47
4.2	4, 7,10, 14, 16, 17,24, 26, 27, 34,35,37,39,51	---	8, 11, 20, 25, 27, 33, 38,43,52
4.3	2, 3, 5, 10, 14, 16, 26, 28, 31, 44, 47, 51,53	---	1, 4, 6, 7, 8, 15, 17,24,30,42,52
4.4	1, 8, 11, 18, 27, 32, 33, 36, 49, 51	42, 47	2, 12, 16, 23,35,39, 40, 53
5.1	3, 7, 15, 16, 18, 20, 26, 28, 29,41	46, 50	2, 6, 8, 12, 13, 17,25,32,35, 38
5.2	1, 3, 7, 9, 11,16, 19,22,23, 26,30,34,36, 42	72	5, 12,15,17,24,28,32,38,39,41
5.3	2, 5, 14, 17, 20, 24, 25, 28, 30, 44, 51, 56	---	6, 8, 18,19,22,24,32,41,48,53
5.4	9, 12, 13, 18, 23, 35, 43, 45	27, 47	1,8,11,14,16,17,24,25,36,40,41
5.5	1, 3, 6, 8, 9, 22, 29, 56	---	2, 4, 5, 19, 49, 57
5.6	3, 6, 21, 27, 31	20	2, 4, 8, 23, 24
5.7	5, 6, 9, 10, 16, 22, 33, 42	---	4, 11, 12, 27, 34
5.8	2, 3, 12, 16, 26, 29, 31	---	4, 11, 14, 18, 23, 32, 36

- 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 1.2 of the textbook for details.
- ** It is recommended to start the recitation by solving some of the **Quick Check Exercises**.