**King Fahd University of Petroleum and Minerals**
**Department of Mathematics & Statistics**
# Math 101 – Syllabus
**2007-2008 (072)**
**Coordinator: Dr. Ibrahim Al-Rasasi**

---

**Title**:       Math 101: Calculus I
**Credit**:      4-0-4
**Textbook**:    Calculus (Early Transcendentals), by J. Stewart, 5$^{th}$ edition, Thomson, 2003

**Objectives:**   To introduce the student to the basic concepts and methods of Calculus. Topics include: Limits and continuity of functions of a single variable. Differentiability. Techniques of differentiation. Implicit differentiation. Local Extrema. Concavity and inflection points. Applications: Related rates, Local linear approximation, Differentials, Curve sketching and optimization problems.

**Grading Policy**

1. Exam I: 25% (100 points), a **common written exam**. It will be held on **Monday, March 17, 2008.**
2. Exam II: 25% (100 points), a **common multiple choice exam**. It will be held on **Monday**, **April 28, 2008.**
3. Class Work: 15% (60 points). It is based on quizzes (about 5 quizzes), homework, or other class activities determined by the instructor. Any quiz or test under class activity should be of written type and not of multiple choice type.
4. Final Exam: 35% (140 points), a **comprehensive common multiple choice exam.**

**Class Work Average:** The section average ( X ) of the Class Work out of 60 should satisfy

$$X \in [36,45].$$

**Exam Questions**: The questions of the common exams are based on the examples, homework problems, recitation problems and the exercises of the textbook.

**Missing an Exam**: No makeup exam will be given under any circumstance. When a student misses Exam I or Exam II for a legitimate reason (such as medical emergencies), his grade for this exam will be determined based on his average performance. Further, the student must provide an official excuse within one week of the missed exam.

**Attendance**: A DN grade will be awarded to any student who accumulates 12 unexcused absences (lecture and recitation).

**Academic Integrity**: All KFUPM policies regarding ethics apply to this course.

# Math 101 Syllabus
## 2007-2008 (072)
## Coordinator: Dr. Ibrahim Al-Rasasi

| Week | Date | Sec. | Topics (28 sections) |
|------|------|------|----------------------|
| 1 | Feb. 16-20 | 2.1 | The Tangent Problem: **Example1**. |
|   |            | 2.2 | The Limit of a Function |
| 2 | Feb. 23-27 | 2.3 | Calculating Limits Using the Limit Laws |
|   |            | 2.4 | The Precise Definition of a Limit: Examples 1,2, and 3 |
| 3 | March 1-5 | 2.5 | Continuity |
|   |           | 2.6 | Limits at Infinity; Horizontal Asymptotes |
| 4 | March 8-12 | 2.7 | Tangents, Velocities, and Other Rates of Change |
|   |            | 2.8 | Derivatives |
| 5 | March 15-19 | 2.9 | The Derivative as a Function + Exercise # 46 |
|   |             | 3.1 | Derivatives of Polynomials and Exponential Functions |
| Exam I: Monday, March 17, 2008.// Materials: 2.1 to 2.7 (A Written Exam) | | |
| 6 | March 22-26 | 3.2 | The Product and Quotient Rules |
|   |             | 3.3 | Rate of Change in Physics: **Example 1**. |
|   |             | 3.4 | Derivatives of Trigonometric Functions |
| 7 | March 29- April 2 | 3.4 | Continued |
|   |                   | 3.5 | The Chain Rule |
| 8 | April 5-9 | 3.6 | Implicit Differentiation |
|   |           | 3.7 | Higher Derivatives |
| Midterm Break: April 10-18, 2008. | | |
| 9 | April 19-23 | 3.8 | Derivatives of Logarithmic Functions |
|   |             | 3.9 | Hyperbolic Functions |
| 10 | April 26-30 | 3.9 | Hyperbolic Functions |
|    |             | 3.10 | Related Rates |
| Exam II: Monday, April 28, 2008 // Materials: 2.8 to 3.8 (An MCQ Exam) | | |
| 11 | May 3-7 | 3.11 | Linear Approximations and Differentials |
|    |         | 4.1 | Maximum and Minimum Values |
| 12 | May 10-14 | 4.1 | Continued |
|    |           | 4.2 | The Mean Value Theorem |
| 13 | May 17-21 | 4.3 | How Derivatives Affect the Shape of a Graph |
|    |           | 4.4 | Indeterminate Forms and L'Hospital's Rule |
| 14 | May 24-28 | 4.5 | Summary of Curve Sketching |
|    |           | 4.7 | Optimization Problems |
| 15 | May 31- June 4 | 4.9 | Newton's Method |
|    |                | 4.10 | Antiderivatives |
| Final Exam: A Comprehensive Multiple Choice Exam, Date is to be announced | | |

### King Fahd University of Petroleum and Minerals
### Department of Mathematics & Statistics
# Math 101 (072)
# Homework and Recitation Problems

| Section | Homework | Recitation | CAS* |
|---|---|---|---|
| 2.2 | 1, 6, 9, 14, 17, 27, 30 | 4, 13, 28, 32 | - |
| 2.3 | 2, 8, 18, 19, 22, 26, 36, 37, 42, 48, 49, 58 | 10, 14, 29, 38, 51 | - |
| 2.4 | 3, 5, 17, 25 | 4, 6, 20 | - |
| 2.5 | 3, 10, 17, 18, 24, 27, 34, 38, 41, 47, 50 | 15, 28, 43, 49 | 30 |
| 2.6 | 3, 6, 19, 25, 29, 32, 33, 40, 42, 48, 49 | 4, 18, 22, 46, 53 | - |
| 2.7 | 6, 9, 15, 18, 19 | 10, 12, 25 | - |
| 2.8 | 3, 4, 7, 14, 17, 20, 22, 25, 29 | 6, 16, 21, 28 | - |
| 2.9 | 2, 4, 6, 9, 12, 26, 30, 45 | 3, 11, 18, 33, 43 | - |
| | | | |
| 3.1 | 23, 30, 36, 40, 41, 46, 47, 50, 56 | 33, 45, 52, 55 | 1(b) |
| 3.2 | 5, 10, 15, 17, 20, 26, 32, 36, 37 | 31, 38, 42 | - |
| 3.3 | 4, 7, 8 | 9 | |
| 3.4 | 3, 10, 15, 18, 24, 25,30,41, 44 | 7, 23, 26, 42 | - |
| 3.5 | 3, 9, 11, 18, 27, 31, 39, 40, 46, 49, 52, 55(a), 63(a) | 42,45,54,63(d) | 74 |
| 3.6 | 1, 11, 14, 18, 20, 22, 25, 43, 46, 55 | 15, 21, 28, 59 | - |
| 3.7 | 2, 10,15, 26, 32, 33,37, 40, 44, 54, 60 | 3, 31, 34, 38, 61 | - |
| 3.8 | 3, 4, 6, 8, 17, 22, 25, 30, 31, 37, 41, 48, 50 | 20, 24, 28, 32, 46, 49 | - |
| 3.9 | 3, 4, 14, 17, 20, 23, 29(d), 34, 37, 43, 53 | 6, 19, 46, 49, 52 | - |
| 3.10 | 5, 8, 9, 12, 18, 21, 25, 37 | 1, 6, 11, 15, | - |
| 3.11 | 6, 8, 17, 26, 28, 35, 38, 43, 49 | 7, 36, 42, 50 | 40 |
| | | | |
| 4.1 | 4, 8, 10, 25, 30, 42, 44, 50, 58, 69 | 14, 38, 40, 70 | - |
| 4.2 | 4, 6, 12, 14, 18, 24, 30 | 2, 5, 16, 20, 29 | - |
| 4.3 | 1, 6, 8, 16, 18, 20, 44, 46, 74 | 36, 50, 64 | 58 |
| 4.4 | 2, 4, 14, 22, 24, 29, 48, 58, 68 | 13, 30, 42, 50, 63 | - |
| 4.5 | 19, 26, 28, 34, 37, 47, 50, 56, 64 | 18, 36, 65 | - |
| 4.7 | 3, 6,10, 12, 27, 35, 44, 52, 55 | 17, 22, 46, 57, | - |
| 4.9 | 5, 11, 35(a) | 7, 12, 31 | - |
| 4.10 | 8, 14, 27, 38, 42, 46, 61 | 40, 45, 62 | - |

\*    CAS problems require the use of a technology tool (e.g., graphing calculators or computers). You are encouraged to do these problems in order to enhance your understanding of the concepts involved.

**Tips on how to enhance your problem-solving abilities:**

1. Please do all the homework assignments on time.
2. You are urged to practice (but not memorize) more problems than the above lists.
3. You should always try to solve a problem on your own before reading the solution or asking for help.
4. If you find it difficult to handle a certain type of problems, you should try more problems of that type.
5. You should try the recitation problems before coming to class.
6. You are encouraged to solve some of the review problems at the end of each chapter.
7. The practice you get doing homework and reviewing the class lectures and recitations will make exam problems easier to tackle.
8. Try to make good use of the office hours of your instructor.