

King Fahd University of Petroleum and Minerals
Department of Mathematics & Statistics
Math 102 – Syllabus
2008-2009 (083)
Coordinator: Dr. Ibrahim Al-Rasasi

Title: Calculus II
Credit: 4-0-4
Textbook: Calculus (Early Transcendentals), by J. Stewart, 5th edition, Thomson, 2003
Description: Definite and indefinite integrals of functions of a single variable. Fundamental Theorem of Calculus. Techniques of integration. Application of the definite integral to area, volume, arc length and surface of revolution. Improper integrals. Sequences and series: convergence tests, integral, comparison, ratio and root tests. Alternating series. Absolute and conditional convergence. Power series. Taylor and Maclaurin series.

Grading Policy

1. Exam I: 25% (100 points), a common multiple choice exam. It will be on **Tuesday, July 28, 2009.**
2. Exam II: 25% (100 points), a common written exam. It will be on **Tuesday, August 18, 2009.**
3. Class Work: 15% (60 points). It is based on quizzes (around 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 a multiple choice type.
4. Final Exam: 35% (140 points), a comprehensive common multiple choice exam. It will be on **Thursday, September 3, 2009.**

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 Department policy. 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 10 unexcused absences (lecture and recitation).

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

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| Week | Date | Sec. | Topics (28 sections) |
|---|------------------|------------------------------|---|
| 1 | July 11-15, 2009 | 5.1 5.2* 5.3 5.4 | Areas and Distances The Definite Integral The Fundamental Theorem of Calculus Indefinite Integrals and the Net Change Theorem |
| 2 | July 18-22 | 5.5 5.6 6.1 6.2 | The Substitution Rule The Logarithm Defined as an Integral Areas between Curves Volumes |
| 3 | July 25-29 | 6.2 6.3 6.4 7.1 | Volumes (Continued) Volumes by Cylindrical Shells Average Value of a Function Integration by Parts |
| Exam 1: Tuesday, July 28, 2009; Material 5.1-6.2 | | | |
| 4 | Aug 1-5 | 7.2 7.3 7.4 7.5 | Trigonometric Integrals Trigonometric Substitution Integration of Rational Functions by Partial Fractions + Exc. # 55 Strategy for integration |
| 5 | Aug 8-12 | 7.8 11.1 11.2 11.3 | Improper Integrals (up to page 536 only; end of Example 8) Sequences (up to page 708 only; end of Example 11) Series The Integral Test and Estimates of Sums |
| 6 | Aug 15-19 | 11.4 11.5 11.6 11.7 | The Comparison Tests Alternating Series Absolute Convergence and the Ratio and Root Tests Strategy for Testing Series |
| Exam 2: Tuesday, August 18, 2009; Material 6.3-11.3 | | | |
| 7 | Aug 22-26 | 11.8 11.9 11.10** | Power Series Representations of Functions as Power Series Taylor and Maclaurin Series (The Remainder Theorem is not included) |
| 8 | Aug 29-31 | 8.1 8.2 | Arc Length Area of a Surface of Revolution |
| Final Exam: Thursday, September 3, 2009 at 9:00 pm.(COMPREHENSIVE) | | | |

* Students must know formulas 4, 5, 6 & 7 in page 383.

** Students must know the Maclaurin Series listed in the Table of page 767.

King Fahd University of Petroleum and Minerals
Department of Mathematical Sciences

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Homework and Recitation Problems

| Section | Homework Problems | Recitation Problems | CAS* |
|--------------|---|--------------------------|------|
| 5.1 | 3, 12, 18, 20 | 2, 21,22 | 9 |
| 5.2 | 1, 5(b), 12, 18, 21, 33, 36, 48, 50, 53, 61 | 6(a), 24, 37, 47, 52, 62 | - |
| 5.3 | 2, 8, 27, 42, 50, 53, 61 | 48, 52, 55, 62 | - |
| 5.4 | 8, 13, 34, 35, 54 | 25, 40, 45, 56 | - |
| 5.5 | 12, 22, 36, 43, 60, 65, 80 | 38, 44, 57, 73 | 71 |
| 5.6 | 1(a), 3 | 4 | - |
| | | | |
| 6.1 | 4, 14, 18, 24, 29, 47 | 10, 26, 46 | 33 |
| 6.2 | 4, 12, 36, 43, 49, 58 | 6, 16, 35, 57 | 40 |
| 6.3 | 5, 11, 16, 23, 37 | 12, 19, 26, 38 | 36 |
| 6.5 | 7, 10, 14 | 4, 13 | 11 |
| | | | |
| 7.1 | 8, 12, 16, 28, 35, 46, 52, 58, 63 | 10, 22, 29, 34, 48 | 38 |
| 7.2 | 3, 15, 30, 42, 56, 61 | 10, 38, 45, 48 | - |
| 7.3 | 8, 21, 26, 30, 41 | 5, 12, 28, 34 | 37 |
| 7.4 | 6, 9, 20, 28, 46, 54, 58 | 22, 37, 40, 50, 57 | 52 |
| 7.5 | 14, 23, 32, 52, 59, 69, 70 | 31, 44, 65, 68, 78 | - |
| 7.8 | 2(a, c), 8, 23, 28, 30, 40 | 2(b, d), 22, 37, 59 | - |
| | | | |
| 11.1 | 4, 9, 12, 18, 22, 27, 36, 43, 60 | 10, 25, 34, 58 | 43 |
| 11.2 | 9, 12, 20, 21, 27, 30, 37, 44, 50 | 23, 34, 38, 45, 53 | 5 |
| 11.3 | 7, 10, 13, 24, 26, 33 | 12, 20, 27, 34 | - |
| 11.4 | 4, 12, 24, 27, 32 | 6, 15, 28, 37 | - |
| 11.5 | 4, 10, 14, 24, 27, 32 | 16, 17, 28, 34 | 22 |
| 11.6 | 5, 11, 16, 21, 28, 30, 33 | 4, 9, 24, 26 | - |
| 11.7 | 5, 6, 14, 17, 22, 29, 35, 38 | 8, 18, 23, 31 | - |
| 11.8 | 6, 17, 24, 27, 30 | 8, 20, 29 | - |
| 11.9 | 4, 9, 11, 14, 18, 25, 38(a, b) | 8, 16, 30, 38(c) | - |
| 11.10 | 1, 10, 14, 28, 40, 46, 51, 56 | 18, 30, 48, 52, 60 | - |
| | | | |
| 8.1 | 6, 8, 16, 31, 37 | 12, 20, 29 | 3 |
| 8.2 | 10, 11, 14, 15, 26 | 25, 29 | 24 |

* CAS problems require the use of a technology tool (e.g., graphing calculators or a computer). 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.