Math 1830   Elementary Calculus   University of Memphis

Course Description: (3 credit hours.) Calculus of one real variable related to rational, exponential, and logarithmic functions. Topics include the limits of functions, derivatives of algebraic, exponential, and logarithmic functions and their inverses and the definite integral and its economic applications: Consumer Surplus, Producer Surplus; and applications of integrating growth and decay models. Also included are applications of the derivative including maximum and minimum problems in business and economics.

Prerequisites: At least one of the following criteria must be met to enroll in Math 1830:
> Math 1710 with a minimum grade of C-,
> Math 1730 with a minimum grade of C-,
> A score of 61 or better on the ALEKS math assessment test.

Note: only one of Math 1830 or Math 1910 may be used to satisfy degree requirements. Students who score a 3 on the AP Calculus AB series exam can obtain credit for Math 1830.

This course will **not** satisfy degree requirements for STEM major students (except for biology students). Also, it does **not** satisfy prerequisite requirements for Math 1920.

Method of Instruction: This course is taught as a guided lecture, which means notes will be given in lecture format while examples will be worked with the help of the students in the class. Questions will be asked and are expected to be answered by the students in the class.

Textbook: *Calculus and Its Applications*. UofM Custom Edition with **MyMathLab.**

Graphing calculator (if required by instructor): TI 83 Plus or TI 84 Plus or Silver Edition for classroom use. TI 89s and TI 92s are prohibited. Cell phones **cannot** be used as calculators.

Tutoring: Free tutoring is available through the University's Education Support Programs. They offer a drop-in tutoring service in the Math Learning Center in DH 341 and online assistance.

Disabilities: Any student who anticipates physical or academic barriers based on the impact of a disability should contact Disability Resources for Students (DRS) at 110 Wilder Tower, 901.678.2880 at the earliest opportunity. DRS coordinates access and accommodations for students with disabilities. You must give your instructor a copy of any accommodation memos provided by the DRS **within the first week of class.**

Attendance: Class attendance is important, every student is required to be in class, on time, and stay for the entire class period for each class session. If you miss a class, you are responsible for finding out what topics were covered and for completing any missed work.

Drop / Withdraw: Students who need to drop this class must report to the Office of the Registrar to initiate withdrawal procedures. Check http://www.memphis.edu/registrar/calendars/ for deadlines.

Email Rules: *All* email correspondence must be made through your University of Memphis email account. Check your email daily, and make sure that your "inbox" isn't so full that no new

messages will get through.

Grading Policy: Grades will be calculated based on homework, quizzes, tests, and final exam. Grading scale is determined by the instructor.

Homework: Homework will be assigned for each section of the text, and must be finished before the due date for you to get credit.

Quizzes & Tests: There will be a number of quizzes/ tests for this course. You must be present in class to take each test.

No Make-ups for a missed homework, quiz, test, or final exam. If you must miss a test because of an official school function you may schedule to take the test at a time prior to the original test date. No other rescheduling will be allowed.

Final Schedule: see http://www.memphis.edu/registrar/calendars/

Academic Integrity: I encourage you to work with your classmates on homework or to have study groups for tests; however, letting someone else do all the work while you just sit back and copy will not help you on your tests. Copying the work of others is not going to help you understand the material or pass the course.
Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students guilty of academic misconduct, either directly or indirectly, through participation or assistance will receive a zero, in addition to other possible disciplinary sanction which may be imposed through the regular institutional disciplinary procedures.

Classroom Rule: Silence cell phones and remove headphones when in the classroom. No eating or individual breaks will be allowed during the class period.

Course schedule: Any changes of this schedule will be announced in class, and in writing.

Chapter I: Differentiation (10 Hours)

- Limits: A Numerical and Graphical Approach.
- Algebraic Limits and Continuity.
- Average Rates of Change.
- Differentiation Using Limits of Difference Quotients.
- Differentiation Techniques: The Power and Sum-Difference Rules.
- Differentiation Techniques: The Product and Quotient Rules.
- The Chain Rule.
- Higher Order Derivatives.

Chapter 2: Applications of Differentiation (8 Hours)

- Using First Derivatives to Find Maximum.
- Using Second Derivatives to Find Maximum and Minimum Values and Sketch Graphs.

- Graph Sketching: Asymptotes and rational Functions.
- Using Derivatives to Find Absolute Maximum and Minimum Values.
- Maximum- Minimum Problems; Business and Economics Applications.
- Marginals and Differentials.
- Implicit Differentiation and Related Rates.

Chapter 3: Exponential and Logarithmic Functions (7 Hours)

- Exponential Functions.
- Logarithmic Functions.
- Applications: Uninhibited and Limited Growth Models.
- Applications: Decay.
- The Derivatives of a^x and $log_a x$.
- An Economics Application: Elasticity of Demand.

Chapter 4: Integration (5 Hours)

- Antidifferentiation.
- Antiderivatives as Areas.
- Integration Techniques: Substitution.

Chapter 4: Applications of Integration (6 Hours)

- An Economics Application: Consumer Surplus and Product Surplus.
- Applications of Integrating Growth and Decay Models.
- Improper Integrals.
- Probability.
- Probability: Expected Value; The Normal Distribution.