MAT 111 Fall 2009

Applied Calculus
Section 1, 10:00 – 10:50 MTRF

Instructor: Jonathan Duarte
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**Text:** Tan, S. T. (2009). Applied calculus for the managerial, life, and social sciences: A brief approach (8th ed.). Belmont, CA: Brooks/Cole, Cengage Learning.

**Course description:** MATH 111, 4 cr, is calculus applied to business, economics, biology, natural resources, and social sciences. Math 111 is a one-semester terminal course designed to give a brief applied overview of differential and integral calculus for students majoring in the natural or biological sciences.

**Calculators Policy**

Calculators are NOT required in this course but you may use graphing calculators during classroom instruction. It is your responsibility to learn to use the function keys. I reserve the privilege to designate some or all questions of an examination or quiz as "non-calculator". It is departmental policy that PDAs, Notebook computers, or other computing devices using keyboard or pen interfaces are not allowed to be used on examinations or quizzes without special permission. The use of cell phones or any device capable of remote networking or instant messaging is expressly prohibited during any quiz or exam taken in this course.

**Course Goals: At the end of the course you will be able to:**

- Recognize real life situations where mathematical models apply.
- Translate real life situations into mathematical models.
- Solve mathematical problems using calculus.
- Interpret the solution in the context of the real life situation.

In this course you will have the opportunity to:

- experience what it means to understand mathematics;
- engage in studying and problem solving while working with others;
- gain insight into how mathematics has been used to describe the world around us and appreciate the interdisciplinary role of mathematics;
- learn to communicate mathematics through written and oral presentations; and
- learn the connections of mathematics with real situations.

**Student responsibilities**

In order to achieve the goals for this course, you as a student are expected to be responsible for your own learning. You are expected to attend each and every class because the discussions and ideas expressed in a class are not easily communicated by reading another student's notes. It is expected that you will respect the ideas and thinking of the other students in the class by listening to their explanations and appropriately questioning their problem solving and reasoning.

Further, you are expected to be cooperative in working with others and fully contribute to the workload of each group in which you may be a member as well as contribute graciously and enthusiastically to the group. You are expected to participate in class discussions and ask the questions necessary in order to develop your own problem-solving and reasoning skills.

It is important that you work on assignments prior to class time so that you can make meaningful contributions to class discussions. Listening to the ideas of other students without having previously worked on the problems yourself will contribute little to the development of your own problem-solving and reasoning skills or your understanding of concepts. This out-of-class time may vary each week from just a few hours to many hours. Practice on communicating your thinking, and reflecting about what you are learning, will assist you to develop your skills in problem solving and reasoning with understanding. **Working with other class members outside of class time is strongly encouraged and highly recommended.**

**Grading**

During the semester you will take three-scheduled in-class examinations and a comprehensive final examination. There will also be quizzes and assignments and a course project. Your grade is determined based on the following distribution:

| **ASSESSMENT INDICATORS** | **WEIGHT** |
|---|---|
| 3 Exams | 50% |
| Quizzes and Assignments | 15% |
| Final exam (Comprehensive) | 25% |
| Group Project | 10% |
| **Total** | **100%** |

| | | | | | |
|---|---|---|---|---|---|
| A: | 94 – 100% | A– : | 90 – 93.9% | B+: | 86 – 89.9% |
| B: | 83 – 85.9% | B– : | 80 – 82.9 % | C+: | 76 – 79.9% |
| C: | 73 – 75.9% | C– : | 70 – 72.9 % | D+: | 64 – 69.9% |
| D: | 60 – 63.9% | F: | Below 60% | | |

**Attendance/Assignments:**

You are expected to attend all classes. All tests are to be taken when scheduled and homework is due when indicated. **Any exceptions must be arranged in advance.** Any major emergencies will be handled on an individual basis. Further, you are responsible for making sure that you have copies of all materials distributed in class, announcements made in class, and contents covered in class.

Normally, I will not be prepared to help you catch up with what you have missed in class through non-attendance. In general, this is a course in which you cannot afford to miss a class. If you are absent, for any reason, it is your responsibility to talk with others who were present, and get notes from them. Copies of previous handouts, worksheets, etc., will be available in my office, but not via email.

If an occasion arises when you must be absent you must notify me with proper documentation. More than four absences will affect your final grade with a penalty of up to 5% reduction in your final grade.

**Submitting Work:** All assignments must be submitted at the beginning of the class period on or before the date indicated. **Late assignments will not be accepted for unexcused absences, nor can examinations or quizzes be made up for unexcused absences**. If you have an excused absence, assignments may be turned in during next class period.

**Group Project**

You are required to cooperate with others for a "group project" with members between 5 – 7 students. Each group is expected to investigate and solve a mathematics problem of your choice and present as many elegant solutions as you can find to class. You are expected to apply the concepts you will learn from this course in working with your project.

**Academic Integrity:** **"**Students are responsible for the honest completion and representation of their work and for respect of others' academic endeavors. Students who violate these standards will be confronted and must accept the consequences of their actions." A description of your rights and responsibilities as a member of the UW-SP community can be found at: http://www.uwsp.edu/admin/stuaffairs/rightsandresponsibilities.aspx

**EXPECTATIONS:**

**Collaboration:** The ability to work together, especially in a joint intellectual effort.
**Flexibility:** The willingness to accept and adapt to change.
**Reverence for Learning:** Respect and seriousness of intent to acquire knowledge.
**Honesty/lntegrity:** The ability to demonstrate truthfulness to oneself and others; demonstrate moral excellence and trustworthiness
**Respect:** The ability to honor, value, and demonstrate consideration and regard for oneself and others
**Emotional Maturity:** The ability to adjust one's emotional state to a suitable level of intensity in order to remain engaged with one's surroundings
**Reflection:** The ability to review, analyze, and evaluate the success of past decisions in an effort to make better decisions in the future
**Responsibility:** The ability to act independently, demonstrating accountability, reliability and sound judgment.
**Conduct:** I will treat you as professionals and I expect the same in return.

**Important Concerns:**

Disabilities: If you have a disability, it is your responsibility to contact the Office of Disability Services during the first two weeks of classes and with the instructor to discuss accommodations.
http://www.uwsp.edu/admin/stuaffairs/rights/rightsADAPolicyInfo.pdf

Religious Beliefs: Students' sincerely held religious beliefs will be reasonably accommodated with respect to all examinations and other academic requirements. According to UWS 22.03, you must notify the instructor within the first three weeks of classes about specific dates which require accommodation.
http://www.uwsp.edu/admin/stuaffairs/rights/rightsChap22.pdf

**The last day to drop a 16 – week class without a "W" grade is September 14. The last day to drop a 16 – week class with a "W" grade is November 6.**

**HELP AVAILABLE**

**MATH ROOM: Drop-in help and by appointment; A113 (Science); free!**
**WRITING ASSISTANCE: Drop-in help and by appointment; TLC; Free!**
**INDIVIDUAL TUTORING: $8.50/session with 5 sessions minimum; TLC**
**STUDY GROUPS: Meet with your peers on a regular basis; Free!**

## TENTATIVE SCHEDULE

| Week Number | Coverage |
|---|---|
| Week 1 | 1.1 Pre-cal review<br>1.2 Pre-cal review |
| Week 2 | 1.3 The Cartesian coordinate system<br>1.4 Straight line models<br>2.1 Functions and their graphs |
| Week 3 | 2.2 The algebra of functions<br>2.3 Functions and mathematical models<br>2.4 Limits |
| Week 4 | 2.6 The derivative<br>3.1 The basic rules of differentiation<br>3.2 The product and quotient rules |
| Week 5 | 3.3 The chain rule<br>3.4 The marginal functions in economic |
| Week 6 | **EXAM 1**<br>4.1 Applications of the first derivative<br>4.2 Applications of the second derivative |
| Week 7 | 4.3 Curve sketching<br>4.4 Optimization 1<br>4.5 Optimization 2 |
| Week 8 | 5.1 Exponential functions<br>5.2 Logarithmic functions |
| Week 9 | **EXAM 2**<br>5.3 Compound interest<br>5.4 Differentiation of exponential functions |
| Week 10 | 5.5 Differentiation of logarithmic functions<br>5.6 Exponential functions as mathematical models |
| Week 11 | 6.1 Antiderivatives and the rules of integration<br>6.2 Integration by substitution |
| Week 12 | 6.3 Area and the definite integral<br>6.4 The fundamental theorem of calculus |
| Week 13 | **EXAM 3**<br>6.5 Evaluating definite integrals<br>6.6 Area between two curves |
| Week 14 | 7.1 Integration by parts<br>7.3 Numerical integration |
| Week 15 | ADDITIONAL TOPICS (Project presentations) |
| **FINAL EXAMINATION** | **DECEMBER 16, 2009 at 12:30 – 2:30 (WEDNESDAY)** |