

Fall 2013 TAMU-Commerce

Math 597.01S – Diff. Geom. of Curves and Surfaces

This is the syllabus for Math 597, Sections 01S and 41R for the Fall 2013. Please read it carefully. You will be responsible for all information given in the syllabus, and for any modification to it that may be announced in class.

Instructor: Dr. Yelin Ou

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Office hours: MW: 3:00pm-4:00 pm,

TR: 9:30am- 11:00am, 2:00-3:00pm.

Class meetings and room: MW 6:00pm -7:15pm, BA 338.

Text and references:

1. Paul A. Blaga, Lectures on the Differential Geometry of Curves and Surfaces, Cluj-Napoca, April 2005
2. Richard Koch, Lecture Notes on Differential Geometry, 2005.
3. Barrett O'Neill, Elementary Differential Geometry, Revised 2nd Edition, 2006, Publisher: Elsevier.

Course Description: Regular curves; parametrizations; curvature and torsion; Frenet formula; fundamental theorem of curves; regular surfaces; first fundamental form; angles and areas on a surface; isometric and conformal transformations; second fundamental form; normal and geodesic curvatures; Gauss curvature and Gauss maps; mean curvature, minimal surfaces, geodesics and surfaces of constant curvature. **Prerequisite:** Math 314 and Math 335.

Learning Outcomes: Upon successful completion of this course, the students will be able to:

1. Define and compute the curvature and the torsion of a curve and use them to characterize curves like straight line, circles, planar curves, and helices.
2. Explain the fundamental theorem of curves.
3. Define and compute the First and the Second Fundamental Forms, The Gauss and the mean curvatures of a surface.
4. Use the First Fundamental Form to compute the arclength of a curve, the area of a region and the angles between two curves on a surface. Prove the characterization theorems of isometric and conformal transformations between surfaces and explain some examples of such transformations.
5. Explain the fundamental theorem of surfaces and the Gauss curvature being an intrinsic quantity.
6. Explain some examples of geodesics, minimal surfaces and surfaces of constant curvatures.

Instruction: Instruction will include lecture, demonstration and models, and some group work projects, based on time available.

Computer & supplies: Using of Mathematica (a computer algebra system available in computers in Math Lab located in 328 Binnon Hall) is helpful but not required for this course.

Attendance: Attendance will be checked and it is your responsibility to sign the daily roll sheet. It is your benefit to attend the class.

Tests: There will be two midterm and a final exams for the course. The tentative schedules for the exams are:

Test 1: Oct. 2, Wednesday 6:00pm-7:15pm.

Test 2: Nov. 13, Wednesday 6:00pm-7:15pm.

Final exam: Dec. 9th, Wednesday, 4:30-6:30pm

No makeup exam will be given unless you have verifiable evidence showing an acceptable reason to have to miss a test and, in that case, you must notify the instructor before the test or in the earliest possible time.

Homework & Quizzes: Homework will be assigned during each class period. You are strongly recommended to work out homework assignments on a regular basis since **No one can learn mathematics without doing it!** The assigned homework will be collected for grading every Thursday in the week before the test or final week. Some homework problems or their similar forms will be used as test questions. Pop quizzes are expected from time to time.

Course grades: The course grade consists of

Homework & Quizzes: 15%

Two Tests : 50%

Final exam: 35%.

The letter grades will be assigned using the following scale:

A: 90-100% B: 80-89% C: 70-79% D: 60-69% F: 0-59%

Withdrawal Policy: Concerning the deadlines and consequences of withdrawals please check on: <https://ems.tamuc.edu/MasterCalendar/MasterCalendar.aspx>

The information for students with disability: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact: Office of Student Disability Resources and Services, Texas A&M University-Commerce, Gee Library, Room 132, Phone (903) 886-5150 or (903) 886-5835, Fax (903) 468-8148, email: StudentDisabilityServices@tamuc.edu

Basic Tenets of Common Decency: “All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment.” (Student’s Guide Handbook, Policies and Procedures, Conduct.) This means that rude and/or disruptive behavior will not be tolerated.

Getting help : A better way to learn math is to keep progress and leave no gaps in one’s study. So please get help as soon as you need it. You are welcome to come to me or use email communication for help.