

Introduction to Differential Geometry

Lecturer: Dr. Nasser Bin Turki, room 2A-162, Mathematical Sciences Department, College of Science, King Saud University.

Email: nassert@ksu.edu.sa.

Website: <http://fac.ksu.edu.sa/nassert>.

Office Hours: Sunday, Tuesday and Thursday at 11:00am-1:00pm.

Lectures: Sunday, Tuesday and Thursday at 1:00pm-2:00pm at 04A 110.

Attendance at lectures is expected.

Course Prerequisite: Math 202, Math 246.

Assessment:

- 10% from Class activities (in class quizzes, and homework).
- 25% from First Midterm exam.
- 25% from Second Midterm exam.
- 40% from Final exam.

My Website: Lecture notes and exercises will appear on my website before the lecture time. So, print out the lecture notes before the lecture.

Syllabus: Students are introduced to: Theory of curves in space . Regular curves and reparametrization, Serret-Frenet apparatus, existence and uniqueness theorem for space curves. Local theory of surfaces: Simple surfaces, coordinate transformations, tangent vectors and tangent spaces, first and second fundamental forms, normal and geodesic curvatures, Weingarten map, principal, Gaussian and mean curvatures. Geodesics, equations of Gauss and Codazzi-Mainardi.

Recommended texts:

- M. P. doCarmo, Differential Geometry of Curves and Surfaces, Prentice-Hall, Saddle River NJ, 1976.
- R. S. Millman and G. D. Parker, Elements of Differential Geometry, Prentice-Hall, Englewood Cliffs, NJ, 1977.
- D.J. Struik, Lectures on Classical Differential Geometry, different editions.