King Fahd University of Petroleum and Minerals

Department of Mathematics

Math 451 Syllabus, Term 241

Instructor: Dr. Jaecheon Joo

The Course Code and Name: Math 451, Differential Geometry

The Course Credit Hours: 3-0-3

The Course Objective: The objective of the course is to introduce students to the concepts of curvatures of curves and surfaces and their applications.

The Course Content:

1. Curvature and torsion of curves
2. Frenet-Serret equation
3. Normal curvatures of surfaces,
4. First and Second Fundamental forms, Gauss curvature
5. Gauss Theorema Egregium, Isometry
6. Geodsics

7(*). Discrete approximation of curvatures (optional)

The Course Prerequisite: Calculus III, Linear Algebra

The Grading Policy: Homeworks (35%), Midterm Exam (30%), Final Exam (35%)

Dates of Exams: Will be discussed in the class.

Textbook(s)

J. Oprea, "Differential geometry and its applications" 2nd ed.

References

1. M. do Carmo, "Differential geometry of curves and surfaces" 2nd ed.
2. R. Milman and G. Parker, "Elements of differential geometry", 1st ed.