Academic subject: DIFFERENTIAL GEOMETRY

Degree Class: L-35-Scienze Matematiche		**Degree Course:** Mathematics	**Academic Year:** 2020/21
		Kind of class: Optional	**Year:** 3 / **Period:** 2
			ECTS: 7 divided into **ECTS lessons:** 6,5 **ECTS exe/lab/tutor:** 0,5

Time management, hours, in–class study hours, out–of–class study hours
lesson: 52 exe/lab/tutor: 8 in–class study: 60 out–of–class study: 115

Language: Italian	**Compulsory Attendance:** no		
Subject Teacher: Verroca Francesca	**Tel:** 085442694 **e-mail:** francesca.verroca@uniba.it	**Office:** Department of Mathematics Room 19, Floor III	**Office days and hours:** Wednesday 11-13, other days by appointment.

Prerequisites: Basic knowledge of abstract algebra and linear algebra. Differential calculus

Educational objectives: Knowledge of the basic notions of Differential Geometry of curves and surfaces

Expected learning outcomes (according to Dublin Descriptors)

Knowledge and understanding:
Differential calculus of curves and surfaces

Applying knowledge and understanding:
Improve ability in differential calculus of curves and surfaces using many examples

Making judgements:
Ability to prove the properties regarding the program of the course

Communication:
Students should learn to read books regarding the program of the course

Lifelong learning skills:
Acquiring a study method by fundamental examples

Course program

Curves in R^n

Basic definitions. The Frenet frame and the Frenet equations. Plane curves and space curves. Examples.

Surfaces in R^3

Basic definitions. The First and the Second Fundamental Form. Curves on surfaces. Principal curvatures, Gauss curvature and mean curvature. Normal form for a surface; special coordinates. Special surfaces. The Gauss and the Codazzi-Mainardi equations. Vector fields and covariant differentiation. Parallel translation. Geodesics. Surfaces of constant curvature. Significant examples.

Teaching methods:
Lectures and exercise sections

Auxiliary teaching:

Assessment methods:
Oral exam

Bibliography:

WILHELM KLINGENBERG
A course in Differential Geometry
Sprinter-Verlag New York Heidelberg Berlino 1978.