



Course title: **INTRODUCTION TO DIFFERENTIAL GEOMETRY**

ECTS credit allocation (and other scores): **4**

Semester: autumn

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Natural sciences

Language: English /Polish

Number of hours per semester: 30 lectures + 30 classes = 60 hours

Course coordinator/ Department and e-mail: Erasmus coordinator Anna Szczepkowska/ WMil,  
erasmuswmil.uwm.edu.pl

Type of classes: classes and lectures

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Substantive content

CLASSES: Solving problems illustrating main theorems proved in the course.

LECTURES:

Theory of curves. Frenet formulas, curvature and torsion of curves. Surfaces. Operator operator and Gaussian curvature. Fundamental forms. Gauss Theorema Egregium. Isometries. Geodesics. Abstract surfaces, Poincare plane. Applications of differential geometry in mechanics and engineering.

LEARNING PURPOSE

Understanding basic concepts of elementary differential geometry and their role in applications.

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On completion of the study programme the graduate will gain:

Knowledge:

The student knows the most important concepts and theorems of the theory of curves and surfaces. He/she understands the role and the importance of assumptions of proof in geometry. The student knows situations when geometric reasoning helps in understanding various problems of real life.

Skills:

The student knows how to solve basic types of problems using geometric language.

Social Competencies:

The student knows the limits of his own knowledge and understands the need for further education. He works independently and in a team. Can formulate questions for understanding the subject or filling in the gaps in the reasoning.

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**BASIC LITERATURE**

1) J. Oprea, Differential geometry and its applications. Prentice Hall, 1997

**SUPPLEMENTARY LITERATURE**

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The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 2,14 ECTS points,

Student's independent work: 1,86 ECTS points,