Study Program: Mathematics

Type and level of studies: Bachelor studies, VII semester

**Course name: Basic Principles of Mathematical Modelling**

**Lecturer: Hranislav M. Milošević**

Status: compulsory

ECTS: 6

Attendance Prerequisites: none

**Course aims**

Enabling mathematics students to apply the acquired knowledge in higher mathematics: series, sequences, field theory, recognition and analysis of physical and natural phenomena and calculating them using mathematical formulas on modern information systems.

**Course outcome**

The students have gained knowledge of higher mathematics: functions, probabilities, predictions with applications, mathematical models of physical and natural phenomena. Mathematical modelling in social sciences. Mathematical modelling in human biological sciences.

**Course content**

*Theoretical part*

Matrices and determinants, solution and discussion. Statistics and probability. Series, application, discussion. Mathematical formulas adaptable to computers. The Navier-Stokes equation system. Second order equations and network modelling, characteristics and their application. Impulse and continuous phenomena.

Representation of natural and physical phenomena through mathematical formulas – solving and discussion. Singular structures. Homogenization of singular structures.

Dynamic structures, waves and fluids, their representation and modeling. Lopital rule, mean value theorems. Limits and limit points with practical application.

Polynomials concept and significance for mathematical model. Lagrange, Hermit, Newton and Chebyshev forms of polynomials. Cauchy problems.

Surface modeling, simple and complex. Human modelling.

*Practical part*

Solving tasks in the aforementioned areas.

**Literature**


1. **Математички модели и моделирање,** Хранислав М. Милошевић, ПМФ Косовска Митровица, 2012-2013 ( у изради)
2. **Нумеричке методе,** аутор др ДесанкаРадуновић, Академска мисао, Београд, 2005


| **Number of active classes** | | | | Other classes |
|---|---|---|---|---|
| Lectures: 3 | Practical classes: 2 | Other forms of teaching: | Students' research work | |

**Teaching methods**

Lectures, work on computers.

**Assessment (maximum 100 points)**

| **Course assignments** | **поена** | Final exam | *поена* |
|---|---|---|---|
| activity during lectures | **20** | written exam | **30** |
| practical classes | **20** | oral exam | **10** |
| term test(s) | **20** | | |
| seminar(s) | | | |
| **Total** | **60** | | **40** |