Module card

I. GENERAL INFORMATION								
WITELON COLLEGIUM STATE UNIVERSITY **DEPARTMENT Faculty of Technical and Economic Sciences**								
Field of study:		Computer sciences						
Form of study:		Erasmus						
Module title:		**BI.2 Mathematics II**						
Module type:		Module of basic education						
Language of lecture:		English						
Year of study:	1	**Forms of teaching including number of teaching hours:**						
Semester (winter/summer):	summer	Lectures	Classes	Laboratory	Project	Workshop	Seminar	Other
Total number of ECTS credits:	4	15	15	-	-	-	-	-
Form of completion:		Pass with a grade						
Prerequisites:		Knowledge and skills in elements of abstract algebra, linear algebra and mathematical analysis.						

II. LEARNING OBJECTIVES

Learning objectives:

Objective 1: Introducing methods of mathematical analysis and the theory of ordinary differential equations that enable description and analysis of problems arising in computer science.
Objective 2: Identifying, describing, and interpreting concepts occurring in computer science issues.
Objective 3: Supporting design processes and their implementation.

IV. PROGRAMME CONTENT

Content of the programme (topics of classes, presented with a breakdown into individual forms of classes with the indication of the number of hours needed for their realization)

Lecture

Code	Course topics in theory	Number of hours
L01	Functional series. Power series.	2
L02	Indefinite integrals. Power series. Expansion of a function into a series.	3
L03	Definite integrals.	2
L04	Improper integrals and series.	2
L05	Riemann integral. Applications of integrals. Functions of several variables.	3
L06	Introduction to the theory of ordinary differential equations.	3

Classes

Code	Course topics in practice	Number of hours
C01	Higher-order derivatives. Taylor's formula.	3
C02	Power series. Expansion of a function into a series.	3
C03	Indefinite integral.	2
C04	Definite integral.	2
C05	Improper integral.	2
C06	Introduction to the theory of ordinary differential equations.	3

VIII. RECOMMENDED LITERATURE

Basic sources:

1. Z. Michna, *Mathematics*, Publishing House of Wrocław University of Economics, 2008.
2. T. S. Apostol, *Calculus, Volume 1: One-Variable Calculus with an Introduction to Linear Algebra*, Willey, 2007.
3. M. Tenenbaum, H. Pollard, *Ordinary differential equations,* Dover Books on Mathematics, 1985.

Additional sources:

1. OpenStax, *Calculus, Volume 1*, OpenStax / Open Textbook Library: https://open.umn.edu/opentextbooks/textbooks/252.
2. G. Nagy, *Ordinary Differential Equations*: https://users.math.msu.edu/users/gnagy/teaching/ode.pdf