DESCRIPTION OF THE COURSE OF STUDY

Course code		**0541.6.MAT1.C.WRR**
Name of the course in	Polish	**Wstęp do równań różniczkowych**
	English	**Introduction to Differential Equations**

1. LOCATION OF THE COURSE OF STUDY WITHIN THE SYSTEM OF STUDIES

1.1. Field of study	mathematics
1.2. Mode of study	full-time studies
1.3. Level of study	Undergraduate (Bachelor)
1.4. Profile of study*	general academic profile of studies
1.5. Person/s preparing the course description	dr Hubert Przybycień
1.6. Contact	hprzybycien@ujk.edu.pl

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Language of instruction	Polish and English
2.2. Prerequisites*	Mathematical Analysis III, Linear Algebra and Geometry

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes		lectures and classes
3.2. Place of classes		classes in the UJK teaching room
3.3. Form of assessment		Exam (lecture), graded credit (classes)
3.4. Teaching methods		lecture – information lecture classes– subject exercises
3.5. Bibliography	**Required reading**	Morris Tenenbaum, Harry Pollard, Ordinary differential equations, 2nd Edition, Dover Publications, Inc., New York, 24-26. Gutowski R. Równania Różniczkowe Zwyczajne. WNT. 1971. Matwiejew N. M. Metody Całkowania Równań Różniczkowych Zwyczajnych. PWN. 1982.
	Further reading	Herbert Amann, Ordinary differential equations, De Gruyter studies in mathematic 13. (1990)

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

4.1. Course objectives *(including form of classes)*

Lecture

C1 – familiarizing students with the theory and basic methods of solving ordinary differential equations as well as with numerous applications of differential equations

C2 – presentation of the main theorems of the theory of differential equations

Classes

C1 – obtaining the ability to solve simple differential equations and systems of differential equations

C2 – introduction to modelling phenomena using differential equations.

C3 – drawing attention to the need of constantly expansion of one's own knowledge.

4.2. Detailed syllabus *(including form of classes)*

Lectures

   1. Basic notions.

   2. Separation of variables.

   3. Exact equations.

   4. Geometric interpretation of solutions of ODE.

   5. Homogenous and non-homogenous linear equations.

   6. ODE Systems with constant coefficients.

   7. Existence and uniqness theorems.

   8. Some applications of ODE.

   9. Elements of PDE.

Classes

   1. Basic notions.

   2. Separation of variables.

   3. Exact equations.

4. Geometric interpretation of solutions of ODE.
5. Homogenous and non-homogenous linear equations.
6. ODE Systems with constant coefficients.
7. Existence and uniqness theorems.
8. Some applications of ODE.
9. Elements of PDE.

4.3 Intended learning outcomes

Code	A student, who passed the course	Relation to learning outcomes
	within the scope of **KNOWLEDGE:**	
W01	can explain the basic examples illustrating the concept of the ordinary differential equation and the system of ordinary differential equations,	MAT1A_W01 MAT1A_W02 MAT1A_W03
W02	can present the main elements of the theory of differential equations	MAT1A_W01 MAT1A_W02 MAT1A_W03
W03	knows the basic algorithms for solving selected types of ordinary differential equations	MAT1A_W01 MAT1A_W02 MAT1A_W05
	within the scope of **ABILITIES:**	
U01	can construct solutions of simple differential equations and a solutions of systems of equations	MAT1A_U04 MAT1A_U09 MAT1A_U06
U02	can construct solutions of the Cauchy problem for selected equations and knows its geometric interpretation	MAT1A_U05 MAT1A_U09
U03	can use obtained knowledge to model phenomena	MAT1A_U013
	within the scope of **SOCIAL COMPETENCE:**	
K01	can formulate questions that allow him to better understand a given topic.	MAT1A_K02

4.4. Methods of assessment of the intended learning outcomes

Teaching outcomes (code)	Method of assessment (+/-)					
	Exam oral/written*			Test*		
	Form of classes			Form of classes		
	L	C	...	L	C	...
W01	+					
W02	+					
W03	+					
U01					+	
U02					+	
U03					+	
K01					+	

*delete as appropriate

4.5. Criteria of assessment of the intended learning outcomes

Form of classes	Grade	Criterion of assessment
lecture (L) (including e-learning)	3	at least 50% and no more than 60% of the total number of points possible
	3,5	more than 60% and no more than 70% of the total number of points possible
	4	more than 70% and no more than 80% of the total number of points possible
	4,5	more than 80% and no more than 90% of the total number of points possible
	5	more than 90% of the total number of points possible
classes (C)* (including e-learning)	3	at least 50% and no more than 60% of the total number of points possible
	3,5	more than 60% and no more than 70% of the total number of points possible
	4	more than 70% and no more than 80% of the total number of points possible
	4,5	more than 80% and no more than 90% of the total number of points possible
	5	more than 90% of the total number of points possible

5. BALANCE OF ECTS CREDITS – STUDENT'S WORK INPUT

Category	Student's workload	
	Full-time studies	Extramural studies
NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/	*32*	
*Participation in lectures**	15	
*Participation in classes, seminars, laboratories**	15	
*Preparation in the exam/ final test**	2	
INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/	*18*	
*Preparation for the lecture**	5	
*Preparation for the classes, seminars, laboratories**	5	
*Preparation for the exam/test**	4/4	
TOTAL NUMBER OF HOURS	*50*	
ECTS credits for the course of study	*2*	

***delete as appropriate**

Accepted for execution *(date and legible signatures of the teachers running the course in the given academic year)*

....