

DESCRIPTION OF THE COURSE OF STUDY

Course code	0541.6.MAT2.C.RR	
Name of the course in	Polish	Równania różniczkowe
	English	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	Graduate (Master)
1.4. Profile of study*	general academic profile of studies
1.5. Person/s preparing the course description	dr Hubert Przybycień
1.6. Contact	hubert.przybycien@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 (lectures), graded credit (classes)	
3.4. Teaching methods	Lectures – information lecture Classes - discussions, solving problems	
3.5. Bibliography	Required reading	William F. Trench; <i>Elementary Differential Equations</i> ; Brooks/Cole Thomson Learning, 2001.
	Further reading	William E. Boyce, Richard C. DiPrima; <i>Elementary differential equations and boundary value problems</i> ; John Wiley & Sons, Inc., 2001.

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

<p>4.1. Course objectives (including form of classes)</p> <p><i>Lectures</i></p> <p>C1 – theory and basic methods of solving ordinary differential equations and partial differential equations of the first order and their applications</p> <p>C2 – presentation of main theorems of the theory of differential equations</p> <p><i>Classes</i></p> <p>C1 – learning skills of solving ordinary differential equations and their systems</p> <p>C2 – preparation to modeling physical phenomena by differential equations</p> <p>C3 – sensitize the need to continuously complete the knowledge</p>
<p>4.2. Detailed syllabus (including form of classes)</p> <p><i>Lectures:</i></p> <p>Systems of differential equations. Theorems on local existence and uniqueness of solutions, on continuity and smooth dependence on initial values and parameters. Euler method and other numerical methods. First integrals. Linear systems of first order equations and linear higher order equations. Elements of quantitative theory of differential equations: stability theory and bifurcations. Partial differential equations of the first order. Second order partial differential equations and their motivations.</p> <p><i>Classes:</i></p> <p>Basic methods of solving first order equations. Systems of differential equations. Euler method and other numerical methods. First integrals. Linear systems of first order equations and linear higher order equations. Constant coefficients systems of equations. Autonomic equations: Newton equation. Elements of quantitative theory of differential equations: stability theory. Partial differential equations of the first order.</p>

4.3. Intended learning outcomes

Code	A student, who passed the course	Relation to learning outcomes
within the scope of KNOWLEDGE:		
W01	Presents examples of ordinary differential equations and their systems	MAT2A_W02
W02	Presents main elements of the theory of differential equations	MAT2A_W02
W03	Presents main numerical algorithms for solving ordinary differential equations	MAT2A_W04
within the scope of ABILITIES:		
U01	Constructs solutions of simple differential equations and systems	MAT2A_U05 MAT2A_U01
U02	Finds stationary points of a planar vector field and describes their stability	MAT2A_U04 MAT2A_U05

U03	Constructs solutions to the Cauchy problem for a semilinear partial differential equation of the first order	MAT2A_U04 MAT2A_U05
U04	Uses the knowledge for modeling physical phenomena	MAT2A_U05
within the scope of SOCIAL COMPETENCE:		
K01	Formulates questions helpful to deep understanding a subject	MAT2A_K02

4.4. Methods of assessment of the intended learning outcomes

Teaching outcomes (code)	Method of assessment (+/-)								
	Exam oral/written*			Test*			Effort in class*		
	Form of classes			Form of classes			Form of classes		
	L	C	...	L	C	...	L	C	...
W01	+								
W02	+								
W03	+				+				
U01	+				+				
U02	+				+				
U03	+				+				
U04					+				
K01					+			+	

* delete as appropriate

4.5. Criteria of assessment of the intended learning outcomes

Form of classes	Grade	Criterion of assessment
lectures (L)	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)*	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/	64	
Participation in lectures*	30	
Participation in classes, <i>seminars, laboratories</i> *	30	
Preparation in the exam/ final test*	4	
INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/	36	
Preparation for the lecture*	6	
Preparation for the classes, <i>seminars, laboratories</i> *	10	
Preparation for the exam/test*	10/10	
TOTAL NUMBER OF HOURS	100	
ECTS credits for the course of study	4	

* delete as appropriate

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