STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Partial differential equations		**1010342631010347254**
Field of study: **Mathematics**	Profile of study (general academic, practical): **(brak)**	Year /Semester: **2 / 3**
Elective path/specialty: **-**	Subject offered in: **Polish**	Course (compulsory, elective): **obligatory**
Cycle of study: **Second-cycle studies**	Form of study (full-time,part-time): **full-time**	
No. of hours: Lecture: **30** Classes: **30** Laboratory: **-** Project/seminars: **-**		No. of credits: **4**
Status of the course in the study program (Basic, major, other): **(brak)**	(university-wide, from another field): **(brak)**	
Education areas and fields of science and art: **technical sciences**		ECTS distribution (number and %): **4 100%**

Responsible for subject / lecturer:

dr hab. Jan Milewski
email: jan.milewski@put.poznan.pl
tel. 616652346
Wydział Elektryczny
ul. Piotrowo 3A 60-965 Poznań

Responsible for subject / lecturer:

dr hab. Jan Milewski
email: jan.milewski@put.poznan.pl
tel. 616652346
Wydział Elektryczny
ul. Piotrowo 3A 60-965 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	K_W01: student knows the basic concepts of mathematical analysis K_W02: student knows the basic problem of the theory of ordinary differential equations
2	**Skills**	K_U01: student freely uses the tools of mathematical analysis, in particular the differential and integral calculus K_U02: studentis familiar with methods of solving classical differential equations
3	**Social competencies**	K_K01: student knows the limitations of his knowledge and understands the need for further education

Assumptions and objectives of the course:

Assimilation and fixation of examples of basic concepts and the ability to use methods of partial differential equations.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. As a result of the course the student will be able to - [-]
2. K_W03: classify selected partial differential equations - [X21A_W01]
3. K_W04: to know the relation of the theory of partial differential equations with other branches of science - [X2A_W02]

Skills:

1. K_U03: student is familiar with methods of solving classical differential equations, he can apply them in typical practical problems - [X2A_U01]
2. K_U04: student can formulate selected physical problems in terms of partial differential equations - [X2A_U02]

Social competencies:

1. K_K01:student knows the limitations of his knowledge and understands the need for further learning zna ograniczenia swojej wiedzy i rozumie potrzebę dalszego uczenia się - [X2K01]

Assessment methods of study outcomes

Colloquiums, oral question, homework

Course description

Actualisation 2017/2018

Applied methods of education:
1) Lectures:
- lecture with multimedia presentation supplemented with examples given on the blackboard
- interactive lecture with questions to students or specific students
- theory presented in connection with the current knowledge of students
- presenting a new topic preceded by a reminder of related content known to students from other subjects
- taking into account various aspects of the issues presented
- student activity is taken into account during the course of the assessment
2) Classes:
- solving sample tasks on the blackboard
- initiate discussion on solutions
- sets of tasks to do homework

Particular attention is paid to the application of mathematics in technical sciences.

Issues:

1. Definition of a partial differential equation, basic notions. Boundary and initial conditions.
2. First order linear and quasilinear partial differential equations,characteristic method, general solution.
3. Hamilton Jacobi equation and its complete integral.
4. Classification of quasilinear second order partial differential equations.
5. String equation.
7. Poisson equation
8. Wave equation.
9. Diffusion equation.
10. Schrödinger equation.

Basic bibliography:

1. I. Foltyńska, Z. Ratajczak, Z. Szafrański, Matematyka dla studentów uczelni technicznych 3, Wydawnictwo Politechniki Poznańskiej, 2000.
2. W. Żakowski, W. Leksiński, Matematyka IV, WNT, 1984

Additional bibliography:

1. M. Smirnow, Zadania z równań różniczkowych cząstkowych, PWN, 1970.
2. W. Pogorzelski, Analiza Matematyczna IV, PWN, 1956.

Result of average student's workload

Activity	Time (working hours)
1. Lectures	30
2. Exercices	30
3. Consultations	10
4. Homework	10
5. Preparation for colloquium	10
6. Preparation for exame	10

Student's workload

Source of workload	hours	ECTS
Total workload	100	4
Contact hours	70	3
Practical activities	30	1