ECTS

(B) Course information in english

General course information:

Course title:	Partial Differential Equations	**Course code:**	ΓΚ0406
Credits:	5	**Work load(hours):**	130
Course level:	Undergraduate ☐	Graduate ☐	
Course type:	Mandatory ☐	Selective ☐	
Course category:	Basic ☐	Orientation ☐	
Semester:	4th	**Hours per week:**	4
Course objectives (capabilities pursued and learning results): The course covers differential equations with partial derivatives focusing on the mathematical essence of the basic ideas, the analytical solution methods, and their application in mathematical modeling of classical physical problems in the context of engineering science.			
Prerequisites: (1) Ordinary Differential Equations, (2) Calculus II			

Instructor's data:

Name:	Theophanes Grammenos
Level:	Ass. Professor
Office:	Civil Engineering Building, University of Thessaly, Pedion Areos, 38334 Volos
Tel.– email:	24210-74152,thgramme@civ.uth.gr
Other tutors:	-

Specific course information:

Week No.	**Course contents**	**Hours**	
		Course attendance	**Preparation**
1-2	Fourier series	8	
3-4	Boundary value problems and Sturm-Liouville theory	8	
5-6	Basic concepts and PDEs of 1st order. Classification of PDEs of 2nd order. Canonical form.	8	

7-8	One-dimensional problems: method of separation of variables, boundary conditions, wave equation and vibrating string, the method of D'Alembert, heat equation, transverse vibrations of a rectangular beam.	8	
9-10	Two-dimensional problems: orthogonal vibrating membrane, heat transfer in an orthogonal plate, Laplace equation for an orthogonal plate, circular vibrating membrane, Laplace equation for a circular plate, Dirichlet andNeumann problems.	8	
11-12	Inhomogeneous problems: expansion in eigenfunctions, Helmholtz equation, Poisson equation.	8	
13-14	Three-dimensional problems: wave equation and heat equation in a rectangular parallelepiped, Dirichlet problem for a cube and a cylinder.	8	

Additional hours for:			
Class project	**Examinations**	**Preparation for examinations**	**Educational visit**
	3	15	

Suggested literature:

Author	Title	Code in ΕΥΔΟΞΟΣ
Akrivis G.-Alikakos N.	Partial Differential Equations (in Greek)	68372463
Ioakimidis N.	Applied Mathematics III for Civil Engineers (in Greek)	22712615
Kravaritis D.	Matters of Applied Mathematics (in Greek)	33134034
Stavrakakis N.	Partial Differential Equations and Complex Variables (in Greek)	68382133
Trahanas S.	Partial Differential Equations (in Greek)	228
Hatzikonstantinou P.	Partial Differential Equations, Fourier Series (in Greek)	68379884
Haberman R.	Applied Partial Differential Equations (in Greek)	41956311
Strauss W.A.	Partial Differential Equations (in Greek)	68387914

Teaching method (*select and describe if necessary*-**weight**)*:*		
Teaching	☐	…….80%
Seminars	☐	…….%
Demonstrations	☐	…….%
Laboratory	☐	…….%
Exercises	☐	…….20%
Visits at facilities	☐	…….%
Other*(describe):* ……..	☐	…….%
Total		100%

Evaluation method*(select)*-**weight:**				
	written	*%*	*Oral*	*%*
Homework	☐	10%	☐	

Class project	☐	-	☐	
Interim examination	☐	20%	☐	
Final examinations	☐	80%	☐	
Other*(describe):* ……	☐	-	☐	
Total		100%		