General course information:

Course title:	Calculus II		Course code:		CE02_UM1
Credits:	5		Work load (hours):		130
Course level:	Undergraduate ☑			Graduate ☐	
Course type:	Mandatory ☑			Selective ☐	
Course category:	Basic ☑			Orientation ☐	
Semester:	2nd		Hours per week:	4	
Course objectives (capabilities pursued and learning results):					
The course content covers *Multivariable Calculus* and *Vector Analysis* focusing on applications without avoiding proofs of theorems when deemed necessary. The course objective is to build up the necessary mathematical background in order for the student to be equipped with the relevant mathematical tools and be able to apply them to tackle problems in applied and engineering mathematics, physics, computer science, and finance.					
Prerequisites:					
Linear Algebra & Calculus I					

Instructor's data:

Name:	Athanasios Fragkou
Level:	E.DI.P
Office:	
Tel. – email:	24210-74363, fthanos@civ.uth.gr
Other tutors:	---

Specific course information:

Week No.	Course contents	Hours	
		Course attendance	Preparation
1-2	Infinite series and power series (convergence tests, alternating series, absolute and conditional convergence, Taylor/Maclaurin series, binomial series)	8	6
3	Vector-valued functions and curves in space	4	3
4-6	Functions of several variables (partial derivative, directional derivative, vector fields, grad, div, curl, extreme values, constrained extrema and Lagrange multipliers, inverse functions, implicit functions, functional dependence, Taylor's formula for two variables)	12	9
7-8	Multiple integrals (double integrals over rectangles and general regions, double integrals in polar coordinates, triple integrals in rectangular,	8	6

	cylindrical and spherical coordinates, applications)		
9-11	<u>Line integrals and surface integrals</u> (line integrals of the first and second kind, path-independent line integrals, work, simply connected and multi-connected regions of R^2, elements of the theory of surfaces, surface integrals of the first and second kind, Green's theorem in the plane	12	9
12-14	<u>Vector analysis</u> (potential functions and conservative fields, theorems of Gauss and Stokes, circulation and flux, applications)	12	9

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

Suggested literature:
1. Brand, L., *Advanced Calculus*, Dover
2. Marsden J., A. Tromba A., *Vector Calculus*, 5th ed., Freeman
3. Thomas, Finney R, Weir M., Giordano F., *Calculus*, 10th ed., Addison-Wesley

Teaching method *(select and describe if necessary - **weight**)*:		
Teaching	☑ Use of Whiteboard and Projector (for notes in electronic format). Use of University of Thessaly's eclass webpage for uploading teaching material, related web links, briefing, and communication with students	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	☑	10%	☐	
Final examinations	☑	80%	☐	
Other (describe): ………………………	☐		☐	