COURSE OUTLINE

(1) GENERAL

SCHOOL	ENGINEERING SCHOOL		
DEPARTMENT	CIVIL ENGINEERING DEPARTMENT		
LEVEL OF STUDIES	UNDER GRADUATE		
COURSE CODE	2307577	SEMESTER	7th
COURSE TITLE	Reinforced Concrete III		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	WEEKLY TEACHING HOURS	CREDITS
Lectures	2	5
Exercises	2	
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialized Knowledge-course, skills development
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek (official)
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	http://civil.teipir.gr/web/index.php?page=alias-42

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon completion of the course, students will be able to:

1. They have acquired in-depth knowledge and critical understanding of the theory and principles of design and solution of Pretension structures, since they could use new technologies and information systems in the design of Long-span structures with Prestressed concrete.
2. Be able to perceive, design and analyze Pre- or Post-tension long span structures (Beams, Columns, Frames).
3. To have the ability to analyze and evaluate the internal forces (N, Q, M) remaining after the Pretension force losses.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

More specifically, students will be able to:

1. Search, analysis and synthesis of data, relations and information using and applying the required technologies: Study of needs for designing Pre-stressed long span structures.
2. Decision making: Choice and solution of structure suffering as much as lower internal forces with higher external loading.
3. Production of new research ideas: Ability perception problems and needs for using in sites long span Pre-stressed structures characterized by economical profit as well as safe bearing loading capacity with as much as smaller deflections.

(3) Course Content

Theory

The core modules of the course include:

1.Principles for design of Pre-stressed structures.
2.Constituent materials of Pre-stressed structures. Methods for Prestressing

structures.
3.Structural element submitted to a central Pretension force.
4.Structural element submitted to an eccentric Pretension force.
5.Design of section in serviceability limit state.
6.Evaluation of minimum cross section for a prestressed beam for safe bearing loading.
7.Evaluation of minimum Pretension force for a prestressed beam.
8.Design of Tendons profile for a prestressed beam.
9.Losses of Pretension force (long-term and short-term).
10.Evaluation of beam deflections.
11.Anchorage systems for tendons, check and reinforcement of anchorage regions in a beam.
12.Design of a beam section in bending and evaluation of reinforcement.
13.Design of a beam section in shear and evaluation of reinforcement.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Lectures and exercises, face-to-face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Teaching using ICT, Exercises with delivery of Project using ICT, Communication with students and Electronic Submission
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Theory: Final Written examination: 80%, which includes: -Descriptive Questions -Solution of Pre-stressed structure Project (Exercises) exam: 20%

Activity	*Semester workload*
Lectures	26
Exercises (Project)	26
Preparation for Homework on Project	13
Personal study	60
Total Course	**125**

(5) ATTACHED BIBLIOGRAPHY

1. Chr. Oikonomou and Chr. Karayannis, (2008), Pre-stressed Concrete (in Greek).
2. Th. Tassios, P. Giannopoulos, K.Trezos and S. Tsoukantas, (2008), Pre-stressed Concrete (in Greek).
3. Ned H., Burns, Bruce W., Russell, Tung-Yen, Lin, (2005), Design Of Prestressed Concrete Structures, John Wiley and Sons Ltd.
4. F. K. Kong and R. H. Evans, (1975), Reinforced And Prestressed Concrete, London: Nelson
5. Exercise and Lecture notes by C. Demakos (in Greek).