UNIVERSITÀ DEGLI STUDI DI PALERMO

SCHOOL	POLYTECHNIC SCHOOL
ACADEMIC YEAR	2016/2017
SECOND CYCLE (7TH LEVEL) COURSE	BUILDING ENGINEERING
INTEGRATED COURSE	EXPERIMENTAL DYNAMICS AND MONITORING - INTEGRATED COURSE
CODE	17514
MODULES	Yes
NUMBER OF MODULES	2
SCIENTIFIC SECTOR(S)	ICAR/08, ICAR/06
HEAD PROFESSOR(S)	PIRROTTA ANTONINA Professore Ordinario Univ. di PALERMO
OTHER PROFESSOR(S)	PIRROTTA ANTONINA Professore Ordinario Univ. di PALERMO
CREDITS	12
PROPAEDEUTICAL SUBJECTS	
YEAR	2
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**PIRROTTA ANTONINA** Monday 14:00 15:30

DOCENTE: Prof.ssa ANTONINA PIRROTTA

TEACHING METHODS	54 hours lesson 1st module + 54 hours lesson 2nd module
ASSESSMENT METHODS	Oral exam and presentation of a Case study. There will be also a mid-term multiple choice test for the attending students. The vote is expressed in thirtieths with possible praise, according to the scheme reported at the bottom of the degree program homepage, i.e. "Metodi di valutazione".
LEARNING OUTCOMES	Knowledge and understanding The student, at the end of the course, will have acquired knowledge and methods to address and solve in an original way problems related to the monitoring of structural vibrations in both civil, mechanical and aerospace field. Applying knowledge and understanding The student at the end of the course will be able to independently develop vibration monitoring projects together with methodologies for the study of the effects induced by vibrations. Making judgments The student will be able to critically analyze and evaluate effectively the risk of any records of structural vibrations Communication The student will be able to communicate competently and with appropriate terms complex problems of mechanical language of vibrations even in highly specialized settings. Learning skills -The student will be able to deal autonomously issues related to the dynamics of structures. -The student will be able to analyze complex issues such as: the dynamic response of structures even with non-linear behavior, the dynamic stability of complex systems, the dangerous effect induced by vibration to operators using some machines.
PREREQUISITES	Dynamics of multi degree of freedom systems Dynamics of continuous systems Frequency domain analysis Stochastic dynamics

MODULE
MODULE 2 - INTEGRATED COURSE EXPERIMENTAL DYNAMICS AND MONITORING

SUGGESTED BIBLIOGRAPHY	
Materiale didattico fornito dal docente: Dispense, Articoli riviste	
AMBIT	20562-A scelta dello studente
INDIVIDUAL STUDY (Hrs)	96
COURSE ACTIVITY (Hrs)	54
EDUCATIONAL OBJECTIVES OF THE MODULE	
Surveying and modeling, in CAD-BIM environment, the building, with particular regard to the structure, the modeling of types of sensors in the same environment, the graphical presentation of the model and the results.	

SYLLABUS

Hrs	Frontal teaching
3	Techniques for surveying of structures.
4	Instruments for surveying of structures
4	3D Restitution and representation of 3D models of structures.
4	2D and 3D modelling of building system.
4	Types of sensors (i.e. total stations, levels, inclinometers, accelerometers, GNSS receivers).
4	Data acquisition through sensors.
4	Wireless and network systems.
4	Protocols for sharing sensor data over the network.
6	Publishng of data, text and graphical interfaces.
5	Examples of static, dynamic and real-time monitoring.

Hrs	Practice
12	Development of case study: Steri building.

MODULE
MODULE 1 - INTEGRATED COURSE EXPERIMENTAL DYNAMICS AND MONITORING

Prof.ssa ANTONINA PIRROTTA

SUGGESTED BIBLIOGRAPHY	
Vibration Monitoring, Testing, and Instrumentation Edited by Clarence W. de Silva The University of British Columbia Vancouver, Canada Ltfi) CRC Press VV^ J Taylor & Francis Group Boca Raton London New York CRC Press is an imprint of the Taylor & Francis Group, an informa business© 2007	
AMBIT	20562-A scelta dello studente
INDIVIDUAL STUDY (Hrs)	96
COURSE ACTIVITY (Hrs)	54
EDUCATIONAL OBJECTIVES OF THE MODULE	
The course aims at providing the criteria and methods for the design of any structural monitoring system, even from remote.	

SYLLABUS

Hrs	Frontal teaching
3	Vibration Instrumentation
6	Signal Analysis

Hrs	Practice
6	Vibration Testing
6	Experimental Modal Analysis
6	Monitoring
4	Vibration-Based Tool for remote monitoring and control
4	Seismic Base Isolation and Vibration Control
4	Human Response to Vibration
6	Case study: Palazzo Steri
9	Guided tour via Skype of natioan and international experimental dynamic laboratories