Università degli Studi della Basilicata
Scuola di Ingegneria

COURSE: Ultrasound devices and systems

TEACHER: IULA ANTONIO

e-mail: antonio.iula@unibas.it | website:

Language IT

ECTS: 9	n. of hours:55	Academic year: 2015/2016	Campus: Potenza	Semester: annual

TOPICS

The aim of the course is to describe the working principle of some physical sensors, including piezoelectric transducers, sensors and actuators. Some application fields, where such sensors are employed, are investigated as well.

TEACHING METHODS (please tick one or more options)

□ xTheoretical lessons
□ Tutorials in classroom
□ xTutorials in laboratory
□ Pxroject works
□ Technical visits
Other activities (please specify) _____

TEXTBOOKS

L. Kinsler, A. R. Frey, A. B. Coppens, Fundamentals of Acoustics, John Wiley & Sons. 1999.

ON-LINE EDUCATIONAL MATERIAL

web address:

LEARNING OUTCOMES

Both methodological and practical approaches are followed. The methodological part is dedicated to the study of the working principle of the devices through simplified analytical models. Knowledges acquired will be applied through numerical exercises with the use of commercial software (ANSYS, MATLAB) to allow students design and simulation of devices and systems.

REQUIREMENTS

Courses of Electronics, Numerical Models for Fields and Circuits.

EVALUATION METHODS (please tick one or more options)

□ Intermediate verifications
□ Written examination
□ xDiscussion of a project work
□ Practical test
□ xOral examination
Other methods (please specify) _____

DETAILED CONTENT

Devices for ultrasound generation. Fundamental of Acustics. Propagation of acoustic waves. Acoustic impedance. Piezoelectricity. Piezoelectric transducers. Main application of Ultrasounds. Analytical and Finite Element MOdelling of ultrasound transducers.

Systems for Ultrasound Imaging. Basic principles for acoustical image generation. AScan, BScan and CScan images. CScan mapping. Example of a biometric ultrasound system.

EXAMINATION SESSIONS (FORECAST)

13/7/2016, 27/7/2016, 14/9/2016, 28/9/2016, 8/2/2017, 22/2/2017

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SEMINARS BY EXTERNAL EXPERTS	YES x	NO □

FURTHER INFORMATION