

Course Title	Experimental and Statistical Analysis				
Course Code	MME 105				
Course Type	Compulsory				
Level	Undergraduate				
Year / Semester	1 st year / 1 st Semester				
Teacher's Name	Theodora Krasia-Christoforou				
ECTS	5	Lectures / week	1 hour	Laboratories / week	3 hours
Course Purpose and Objectives	This experimental course aims to introduce the students to basic experimental techniques, statistical data analysis and technical (laboratory) report writing. Moreover, one of its primary objectives is to enable the students to make the transition from the physical principles they have been taught, to engineering notions.				
Learning Outcomes	<ul style="list-style-type: none"> • Comprehend basic engineering principles. • Perform laboratory experiments with accuracy and report accurately their observations during an experiment. • Analyze primary experimental data and perform statistical data analysis. • Develop the ability to evaluate the experimental results and appraise the quality of an experiment. • Demonstrate the ability to prepare and submit well-structured written laboratory reports. • Understand the significance of complying with health and safety regulations in laboratories. • Be able to compare the experimental results with bibliographic data. 				
Prerequisites	None	Required	None		
Course Content	This experimental course aims to introduce the students to basic experimental techniques employed for the determination of physical parameters, to the statistical analysis of experimental data, graphical methods for data presentation and to the preparation of laboratory reports. Moreover, one of its primary objectives is to enable the students to make the transition from the physical principles they have been taught, to engineering notions. In addition, during this course the students attend a series of seminars including health and safety regulations in laboratories, technical report writing, introduction to library services, training on the use of the electronic library catalogue, information resources, and reference tools and a seminar related to plagiarism.				

	<p>Laboratory Exercises</p> <ul style="list-style-type: none"> • Law of conservation of linear momentum (Newton's 2nd Law) and dynamics of rotation - gyroscope • Determination of friction coefficient • Spring Constitutive Law: Statics and Dynamics • Conservation of Energy: Torque – Work • Torque of Parallel and non-parallel forces • Moment of inertia • Thermal expansion and specific heat capacity • Gas Laws: Boyle's Law and Charles' Law • Determination of viscosity by falling sphere method • Measuring electrical quantities – Ohm's Law • DC motor and electric circuit • Study of flows around bodies (drag and lift measurements) • Buoyancy effects in immersed objects and density of a fluid - Archimede's principle
Teaching Methodology	<ul style="list-style-type: none"> • Introductory lectures "Introduction in experimental and statistical analysis" (PowerPoint presentations) (6 hours in total, during the first 2 weeks) • Lectures: Health and safety regulations in laboratories (PowerPoint presentations). • Introductory lectures on Technical report writing (PowerPoint presentations) • Library seminar series: (PowerPoint presentations) • Laboratory exercises (13 in total) carried out in small groups (3 students/group). • During the first week of the semester the students receive the course syllabus, which includes the course content, bibliography, learning outcomes, assessment and office hours.
Bibliography	<ul style="list-style-type: none"> • Laboratory Guide: MME 105: Experimental and Statistical Analysis (http://www.eng.ucy.ac.cy/krasia/)
Assessment	<ul style="list-style-type: none"> • Weekly laboratory reports 30% • Quizzes 10% • Midterm exam 20% • Final exam 40%
Language	Greek