PIERDOMENICO PEPE

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PROGRAM OF "FONDAMENTI DI AUTOMATICA" "*BASICS OF AUTOMATIC CONTROL*"		
• CODE: • TYPE OF COURSE UNIT: COMPULSORY FOR THE INDUSTRIAL ENGINEERING (WITH SPECIALISM IN MANAGEMENT) • LEVEL OF COURSE UNIT (E.G. FIRST, SECOND OR THIRD CYCLE; SUB-LEVEL IF APPLICABLE): FIRST CYCLE • YEAR OF STUDY (IF APPLICABLE):, SEMESTER: SECOND YEAR, SECOND SEMESTER		
NUMBER OF ECTS CREDITS: 9 (WORKLOAD OF 90 HOURS OF TEACHING)		
Teacher: Prof. Pierdomenico Pepe		
1	**Course objectives**	THE MAIN OBJECTIVE OF THE COURSE IS TO GIVE TO THE STUDENT THE MAIN INFORMATIONS AND TOOLS ON BASIC AUTOMATIC CONTROL. THE STUDENT SHOULD LEARN HOW TO DESIGN A CONTROLLER FOR LINEAR TIME-INVARIANT SYSTEMS, AND SHOULD BECOME ABLE TO TEST THE VALIDITY OF THE CONTROLLER BY MEANS OF MATLAB TOOLS.
2	**Course content and Learning outcomes (Dublin descriptors)**	REMARK: THE COURSE OF 9CFU INCLUDES A MODULE OF 6 CFU FOR STUDENTS OF INDUSTRIAL ENGINEERING WITH SPECIALISM DIFFERENT FROM THE ONE IN MANAGEMENT. THE PART OF THE PROGRAM AFTER * IS ONLY FOR THE 9 CFU COURSE. TOPICS OF THE MODULE INCLUDE: SYSTEMS DESCRIBED BY LINEAR ORDINARY DIFFERENTIAL EQUATIONS. LAPLACE TRANSFORM. TRANSFER FUNCTION. FEEDBACK NOTION. STABILITY. BODE DIAGRAMS. NYQUIST CRITERIUM. STEADY STATE AND TRANSIENT RESPONSE. PROPORTIONAL, INTEGRAL, DERIVATIVE CONTROL. LEAD, LAG COMPESATORS IN THE FREQUENCY DOMAIN. COMPENSATORS BY ROOT LOCUS METHODS. * STATE SPACE BASED COMPENSATORS. SPECTRUM ASSIGNMENT. OBSERVER. SEPARATION PRINCIPLE. ON SUCCESSFUL COMPLETION OF THIS MODULE, THE STUDENT SHOULD - BE ABLE TO DEAL WITH TRANSFER FUNCTIONS OF LINEAR TIME INVARIANT SYSTEMS - DESIGN CONTROLLERS BY FREQUENCY DOMAIN AND ROOT LOCUS METHODS - VALIDATE THE CONTROLLER BY MEANS OF MATLAB TOOLS - DESIGN CONTROLLERS BY MEANS OF STATE SPACE BASED METHODS - DEMONSTRATE CAPACITY FOR READING AND UNDERSTAND TEXTS ON RELATED TOPICS.
3	**Prerequisites and learning activities**	PREREQUISITES: MATHEMATICAL ANALYSIS; ALGEBRA; BASICS OF PHYSICS.
4	**Teaching methods and language**	LECTURES AND EXERCISES. LANGUAGE: ITALIAN / ENGLISH **REF. TEXT BOOKS** ALBERTO ISIDORI, SISTEMI DI CONTROLLO, SIDEREA G.F. FRANKLIN, J.D. POWELL, A. EMAMI-NAEINI, FEEDBACK CONTROL OF DYNAMIC SYSTEMS, PRENTICE-HALL
5	**Assessment methods and criteria**	WRITTEN AND ORAL EXAMINATION