SYSTÈMES MÉCATRONIQUES INTELLIGENTS

SMART MECATRONICS SYSTEMS

Lecturers: **Anton KORNIIENKO, Cédric MARCHAND, Manuel COLLET**

| Lecturers : 14 | TC : 2 | PW : 4 | Autonomy : 4 | Study : 8.0 | Project : 0.0 | Language : MI

Objectives

Nowadays, the mechanical systems are more and more often replaced by mechatronic systems. These "intelligent" systems combine mechanical, electronic, control theory and embedded information technologies. Initially coming from a rather high technology fields (as aerospace for example), today they take an important place in the product proposed to regular consumer market. The design of mechatronic systems requires a multidisciplinary approach between Mechanics and electrical Engineer professions. The main goal of this course is to understand this approach, the important elements of different implied fields and illustrate it on an active vibration control example.

Keywords : Mechatronics, Active control, Vibrations, Frequency based approach

Programme	1. Introduction to Mechatronics (2h) 2. Mechanical systems (4h) 3. Control of flexible mechanical systems (4h) 4. Embedded electronics for mechatronic systems (4h) 5. Active damping of structures (2h) 6. Practical implementation (2 BE 4h + TP 4h)
Learning outcomes	• Know how to identify different parts of a mechatronic system • Learn the principles and methods of design of a mechatronic system and its parts • Be able to analyze the technical constraints coupled between different parts • Be able to derive the most important elements of mechatronic system specification
Independent study	Objectifs : Promote critical thinking and develop analysis skills of a scientific article on one of the subjects of intelligent mechatronic system Méhodes : A Rapport for 2 persons 1-3 pages with critical analysis of the article is to be sent before the exam
Core texts	Robert H. Bishop, *MECHATRONICS: AN INTRODUCTION*, CRC Press, 2005 A. Preumont *ACTIVE CONTROL OF STRUCTURES*, J. Wiley & Sons, 2008
Assessment	Final mark = 50% Knowledge + 50% Know-how Knowledge = 50% final exam + 50% continuous assessment Know-how = 0% final exam + 100% continuous assessment