Advanced Technologies in Analysis and diagnostic of machinery

Academic Year: (2022 / 2023) **Review date: 04-05-2022**

Department assigned to the subject: Mechanical Engineering Department

Coordinating teacher: GOMEZ GARCIA, MARIA JESUS

Type: Compulsory ECTS Credits : 4.0

Year : 1 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Machine Mechanics
Machine Theory
Mechanical Enginering fundamentals.

OBJECTIVES

Diagnosis of mechanical mechanisms using data analysis of mechanical sensors masurements (Matlab).

The student will learn:
-Advanced techniques for mechanical vibration analysis
-Mechanical Systems identification based on data analysis

DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction to industrial maintenance and mechanical signals in time and in frequency domain.
2. Signal classification. Introduction to signal processing in Matlab.
3. Spectral Analysis
4. Fourier Methods
5. Vibration signals acquisition
6. Sampling theory.
7. Rotating machinery diagnostic applications
8. Non-linear vibrations

LEARNING ACTIVITIES AND METHODOLOGY

Classroom (65% of ETCS) + homework (30% of ETCS) + conferences and seminars (5% of ETCS).

ASSESSMENT SYSTEM

Exam (50% of final mark, with a minimum mark of 3/10 points) + group work (40% of final mark) + in-class tests (10% of final mark)

% end-of-term-examination:	50
% of continuous assessment (assigments, laboratory, practicals…):	50

BASIC BIBLIOGRAPHY

- S. BRAUN DISCOVER SIGNAL PROCESSING. An interactive guide for engineers., willey, 2008

ADDITIONAL BIBLIOGRAPHY

- John G. Proakis y Dimitris G. Manolakis Digital Signal Processing (4th Edition), Prentice Hall, 2006

- Robert B. Randall Vibration-based Condition Monitoring: Industrial, Aerospace and Automotive Applications, John Wiley & Sons, Ltd, 2010