MM3111

Study program / course: Mechanical Engineering

Type and level of study: Master academic studies

Course: Machinery Condition Monitoring

Lecturers: Jeremić, M. Branislav; Todorović, M. Petar

Status of course: Elective for module M_1, III semester

Number of ECTS: 6

Precondition: None

The objective of course

Introducing with the concept, the position and the role of machinery condition monitoring, introducing with basic methods for recognition of the state of machinery system within exploitation conditions (vibrodiagnostic, oil and wear particle analyses, infrared thermography, non-destructive testing methods, etc.) According to processed machinery condition monitoring methods, students are introduced how to perform evaluation of machinery working condition and available working recourses, as same as to be able to define certain corrective methods in order to improve working condition of machinery systems.

The outcome of course

After successfully ended obligations, each student should be able to understand the concept of machinery condition monitoring, and to know its position and significance, and to be able to apply some of basic machinery condition monitoring methods, to be able to evaluate condition of machinery systems according to measured parameters, to have the knowledge of signal and to understand some basic methods for signal processing, and also to know some basic methods for improvement of machinery system's working condition.

Syllabus

Theoretical study

Significance of machinery condition monitoring, the concept, classification and digital signal processing, Machinery system condition and the basic methods for its identification, Significance of vibrodiagnostic, identification of malfunctions according to vibration measuring and analyzing, noise as diagnostic parameter, oil and wear particle analyses, infrared thermography, observation of processing parameters, non-destructive testing methods.

Practical Studies:

Working with A/D converter, noise and vibration measuring, dynamic balancing, thermography, oil and wear particle analyses, video-scope, and ultrasound examinations. Students are capable to perform some basic examinations within the course field.

Recommended reading

1. Jeremić B., Todorović P., Mačužić I., Koković V., Machinery Condition Monitoring, Mašinski fakultet u Kragujevcu, WUS Austria, 2006.

The number of hours of active teaching:				Other classes:
Theory: 3	Practical classes: 1.4	Other forms of teaching: 0.6	Research study: 0	1

Methods of teaching

Teaching is performed through lectures, auditorium and laboratory exercises. For teaching presentation a modern teaching facilities are used. For each teaching filed a variety of different industrial field examples are taken in consideration through different case studies, and due to that students are capable to obtain a very wide range of practical technical knowledge for further independent work within the field of machinery condition monitoring. For examination performing the most modern training equipment (PULSE, Data Collector, infrared camera etc.) and software (Sentinel, PULSE FFT Analysis etc.) are used. Development of this course is supported by WUS-Austria.

Evaluation of knowledge

Pre-final exam obligations	**points**	**Final exam**	**points**
Activities during the classes:	**10**		
Practical classes:	**10**	Verbal exam	**30**
Colloquiums(s) :	**35**		
Seminar(s) :	**15**		