COURSE SYLLABUS

Experimentell modalanalys
Experimental Modal Analysis
7,5 ECTS credit points (7,5 högskolepoäng)

Course code: ET2544
Educational level: Advanced level
Course level: A1F
Field of education: Technology
Subject group: Electrical Engineering

1 Course title and credit points
The course is titled Experimental Modal Analysis/Experimentell modalanalys and awards 7,5 ECTS credits. One credit point (högskolepoäng) corresponds to one credit point in the European Credit Transfer System (ECTS).

2 Decision and approval
This course is established by Department for Electrical Engineering 2013-04-30. The course syllabus was revised by School of Engineering and applies from 2013-07-01.
Reg.no: BTH 4.1.1-0318-2013.
The course replaces ET2528.

3 Objectives
The course shall provide knowledge and proficiency of fundamental methods and tools for characterization of mechanical structures, including experimental modal analysis and system simulation.

4 Content
- Single and multiple degrees of freedom systems
- The modal concept in analytical and matrix formulation
- Damping models
- Modal parameters and Frequency Response Function connection
- Practical aspects on Frequency Response Function measurements
- Modal parameter extraction
- Multiple references
- Structural modification, Substructure coupling
- Correlation with Finite Element Analysis

5 Aims and learning outcomes
On completion of the course the student will be able to:
- specify an experimental modal analysis on mechanical structures.
- perform experimental modal analysis on mechanical structures, including selection and mounting of transducers, selection and mounting of an exciter, data acquisition and parameter extraction.
- perform simulations of mechanical systems using parameters from numerical models and/or experiments, for example concerning influence from applied loads and/or simple structural changes.
- use modern software for structural mechanics, including modal parameter extraction, structural modification and correlation with Finite Element Analysis.

6 Generic skills
The following generic skills are trained in the course:
- Capacity for analysis and synthesis
- Capacity for applying knowledge in practice
- Problem solving
- Academic writing

7 Learning and teaching
The teaching consists of lectures and projectwork. In order to further explain the theory and its applications there is a compulsory project task. The project work is compulsory and must be carried in groups. A written report to account for the work forms part of the project task.

8 Assessment and grading
Examination of the course

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<tr>
<th>Code Module</th>
<th>Credit</th>
<th>Grade</th>
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<tbody>
<tr>
<td>1310 Written Examination[1]</td>
<td>3 ECTS</td>
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<td>1320 Project</td>
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<tr>
<td>1330 Assignment</td>
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1 Determines the final grade for the course, which will only be issued when all components have been approved.
The course will be graded A Excellent, B Very good, C Good, D Satisfactory, E Sufficient, FX Insufficient,
supplementation required, F Fail. The examination is done through a written exam together with a report of the compulsory project work assignments. For a final grade of the course, the grade of Pass is required for the project part. The final grade will be the same as the examination grade. If grade FX are given, the student may after consultation with the course coordinator / examiner get an opportunity to within 6 weeks complement to grade E for the specific course element.

9 Course evaluation
The course coordinator is responsible for systematically gathering feedback from the students in course evaluations and making sure that the results of these feed back into the development of the course.

10 Prerequisites
Required cours for admission to this course: ET2529 Sound and Vibration Analysis, 7.5 credit points.

11 Field of education and subject area
The course is part of the field of education and is included in the subject area Electrical Engineering.

12 Restrictions regarding degree
The course cannot form part of a degree with another course, the content of which completely or partly corresponds with the contents of this course.

13 Additional information
In addition to the prerequisites for the course it is recommended to haven the course Signal Processing II, ET1303 or the equivalent. The course can also be included in the Mechanical Engineering field.

14 Course literature and other teaching material