



Experimental Methods in Mechanical Vibrations

Course number	5650
Hours per week:	2
ECTS:	3
Scheduled:	Summer Term
Format:	Lecture / lab practice
Examination:	Written Exam (90 min.)
Lecturer:	Prof. Dr.-Ing. Georg Wegener
Objectives:	Having accomplished this lab course, students should ... <ul style="list-style-type: none">– have an overview of the specific challenges of measurement of mechanical vibration– be able to select suitable equipment and methods for such measurements– have some basic experience in performing and evaluating vibration measurements
Contents:	<p>Theoretical fundamentals:</p> <ul style="list-style-type: none">– working principles of vibration sensors– theory of vibration with multiple degrees of freedom– basic theory of frequency analysis– experimental modal analysis <p>Application and laboratory exercises: Complementing the theory-based part of the course, the participants will perform practical laboratory experiments illustrating the effects studied in the theoretical part in small teams. Subjects covered:</p> <ul style="list-style-type: none">– vibration excitation and vibration measurement– evaluation of vibration measurements applying up-to-date software (time domain evaluation, determination of frequency response functions, modal analysis)
Prerequisites:	Basic knowledge in electrical measurement and physics.
Recommended Reading:	<ul style="list-style-type: none">– Mechanical Vibrations: Modeling and Measurement, T.L. Schmitz, K.S. Smith, Springer (available as an eBook for Students of UAS Aschaffenburg)– Signals and Systems, Wikibooks, open books for an open world, http://en.wikibooks.org/wiki/Signals_and_Systems– Measurement and Instrumentation: Theory and Application, A. S. Morris, R. Langari (Elsevier) Theory and Design for Mechanical Measurements, R.S. Figliola, D.E. Beasley (Wiley)