

## **BIWE-09: Computational dynamics (Prof. Graf)**

### **Contents**

Computer-oriented structural dynamical analysis:

- 1 Single degree of freedom system in time- and frequency domain
- 2 Multi degree of freedom system
- 3 Modal analysis, modal superposition
- 3 Damping models
- 4 Displacement method and linear dynamics
- 4.1 Element formulations, transformation relations
- 4.2 Substructuring and condensation techniques
- 4.3 Numerical simulation in time domain, central-difference-method, Newmark-method, analysis of time integration methods
- 5 Continuous systems
- 6 Applications
- 6.1 Earthquake analysis
- 6.2 Impact problems

### **Prerequisite Knowledge**

- Good knowledge from mathematics, continuum mechanics, energy and finite element methods

### **Topics of Project and Master Thesis**

- Numerical investigation of dynamical structures

### **Literature**

- Argyris, Mlejnek: Dynamics of Structures, North-Holland.
- Meskouris: Structural Dynamics, Ernst & Sohn.
- Thoft-Christensen: Reliability and optimization of structural systems, Springer.