

Course Name	Dynamics of Civil Engineering Structures		
Semester, Year	2 学期 (冬ターム)	Number of Credits	2 credits
Course level	3000	Course Number	27090
Instructor(s) (Institution)	Koji MATSUMOTO (大学院工学研究院)		
Course Objectives	As dynamics for civil engineering, the students are to learn fundamental knowledge relating to seismic effects, disaster mitigation and various vibrations of structures. For this objective, the students are to understand the bases of structural vibration and dynamic characteristics of soils and then to learn seismic design with consideration of safety and serviceability of structures as well as concept and method for vibration design.		
Course Goals	<ol style="list-style-type: none"> 1. Understand the basis of seismogenic and wave propagation. 2. Understand vibration equation for lumped mass and member. 3. Understand the fundamental aspects of time-history response analysis, response spectrum method and response displacement method. 4. Understand seismic design methodology based on the items of 1, 2 and 3. 5. Understand the basis of seismic retrofit. 		
Course Schedule	<p>Weeks 1 to 4 Dynamic problem in civil engineering structures: Learn effects of earthquake, wind and traffic on structural performances with emphasis on seismic effects. Learn seismogenic and wave propagation of earthquake, which affects structures most.</p> <p>Weeks 5 to 10 Vibration of structures: Learn the equation for vibration of lumped mass and member as well as methodologies for response analysis, such as time-history response analysis, response spectrum method and response displacement method.</p> <p>Weeks 11 to 15 Seismic design and vibration design After learning the relationship between deformation and damage of a structure and the effects of ground conditions on dynamic response of the structure, learn the design ground motions and required performances of the structure as well as the methodologies for seismic design. Additionally learn the concept and technology for seismic retrofit and other vibration design.</p> <p>Week 16 Final examination</p>		
Homework	The students are suggested to study before and after each class based on the handout circulated at class for a couple of hours. Students are asked to submit the answer of in-class exercise within class hours otherwise within the same day. Students are also asked to submit the answer for take-home exercise, which are to be given occasionally, for a couple of hours.		
Grading System	<p>[Points for Evaluation] The evaluation is conducted in terms of all of five points shown in the above Course Goal.</p> <p>[Criteria for Evaluation] The full mark is 100%. The full mark will be given to the student who satisfies all of five points in the above Course Goal with very high level, while 60% is to the student who satisfies just the minimum requirement of all of the five points.</p> <p>[Evaluation Method] The grading will be done based on the results of Final Examination as well as the Exercises given in the class. Not only the conceptual understanding but also knowledge on mechanics will be examined by giving numerical questions. The weight is 60% for the Examination and 40% for the Exercises.</p>		
Textbooks / Reading List	The handout will be distributed in the class room and through the Internet.		
Websites	http://www.eng.hokudai.ac.jp/labo/maintenance/Lecture(Ueda)/Seismic_Engineering/Seismic_Engineering.htm		
Website of Laboratory	http://www.eng.hokudai.ac.jp/labo/maintenance/team_ueda/index.html		
Additional Information	The course is taught in English but the material is prepared in both English and Japanese. The course is registered for HUSTEP and International Exchange.		