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| Course Name | Maintenance Engineering | | |
| Semester, Year | First Semester, 2019 (Spring Term) | Number of Credits | 2 credits |
| Course level | 3000 | Course Number | 027022 |
| Instructor(s) (Institution) | Tamon UEDA 大学院工学研究院 | | |
| Course Objectives | The course outlines the basis of maintenance engineering for infrastructures. The role of maintenance for infrastructure in the complete system of structural design, construction and maintenance is shown, followed by the various issues on technology for inspection and assessment of structures, deterioration mechanism in structures and technology for repair and strengthening, technology for demolishing/recycling, and life cycle cost (LCC). | | |
| Course Goals | <ol style="list-style-type: none"> 1. Understand the significance of repair and maintenance (conservation) and its flow. 2. Understand the objectives and technology for inspection. 3. Understand the fundamentals of varieties of deterioration, assessment of existing structures and service life prediction. 4. Understand the basis of intervention technology for extending service life. 5. Understand technologies for dismantlement and recycle/reuse. | | |
| Course Schedule | <ol style="list-style-type: none"> 1 Introduction: Necessity of maintenance 2 Basis of Maintenance Engineering: Role of maintenance, flow for maintenance works, example of maintenance and management system (bridge management system or BMS), LCC 3 Inspection: Types of inspection, items and technologies for inspection 4 Deterioration Factors and Assessment: Deterioration factors, deterioration mechanism, technology for investigation, prediction of deterioration 5 Technology for Repair and Strengthening: Types of repair and strengthening, technologies for repair and strengthening, evaluation of structural performance after repair and strengthening 6 Technical Visit Visit for maintenance works (inspection, assessment and remedial actions) 7 Mid-term and Final Examination | | |
| 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 a report on the technical visit. | | |
| 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 Mid-term and Final Examinations 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 80% for the Examinations and 20% for the Exercises.</p> | | |
| Textbooks / Reading List | 教材を授業中に配布 (インターネットからのダウンロードも可能) The handout will be distributed in the classroom and through the Internet. | | |
| Websites | http://www.eng.hokudai.ac.jp/labo/maintenance/Lecture(Ueda)/MaintenanceEngineering/MaintenanceEngineering.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. | | |