Department of Civil Engineering

**Course Name:**

Endurance Time Method

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| **Course Number:** - | **Credit:** 3 |
| **Program:** Graduate | **Course Type:** Technical Selective |
| **Prerequisite**: - | **Corequisite:** - |

**Course Description (Objectives):**

This course familiarizes students with the principles and fundamentals of dynamic seismic assessment methods, especially response history analysis and incremental dynamic analysis (IDA). The aim is to enhance students' understanding and skills in analyzing the dynamic behavior and seismic performance of structures.

**Course Content (outline):**

- Chapter 1: Introduction to the fundamentals of the Incremental Dynamic Analysis (IDA) method
- Chapter 2: Review of basic concepts in structural dynamics and principles of seismic design
- Chapter 3: Introduction to the dynamic characteristics of IDA ground motion records
- Chapter 4: Methods for generating IDA ground motion records
- Chapter 5: Analysis of single-degree-of-freedom (SDOF) systems using the IDA method
- Chapter 6: Analysis of multi-degree-of-freedom (MDOF) systems using the IDA method
- Chapter 7: Performance-based design using the IDA method
- Chapter 8: Value-based design using the IDA method
- Chapter 9: Engineering applications of the IDA method
- Chapter 10: Advanced topics

**References:**


- Estekanchi, H. and Vafai, H. (2018) Seismic Analysis and Design Using the Endurance Time Method, Volume I: Concepts and Development. Momentum Press. ISBN 9781947083042
- Estekanchi, H. and Vafai, H. (2018) Seismic Analysis and Design Using the Endurance Time Method, Volume II: Advanced Topics and Application. Momentum Press. ISBN 9781947083264Bathe J.K., Finite Element Procedures