Department of Civil Engineering

Course Name:

Railroad Engineering and Design

Course Number: 20-583	**Credit:** 3
Program: Graduate	**Course Type:** Technical Selective
Prerequisite: -	**Corequisite:** -

Course Description (Objectives):

The main objective of this course is to familiarize students with the principles of railway engineering and design. It also emphasizes route alignment, track systems, and railway structures.

Course Content (outline):

- Chapter 1: Introduction and Overview
- Chapter 2: Train Dynamics
- Chapter 3: Introduction to Microeconomics, Engineering Economics, and System Analysis and Evaluation
- Chapter 4: Railway Route Alignment
- Chapter 5: Railway Tracks and Structures
- Chapter 6: Electrified Railways
- Chapter 7: Track Analysis
- Chapter 8: Track Geometry, Slope, Curves, and Superelevation Issues
- Chapter 9: Signaling, Communications, and Train Control Systems
- Chapter 10: Traction Force
- Chapter 11: Rolling Stock
- Chapter 12: Operations
- Chapter 13: Supply Analysis
- Chapter 14: Route Planning
- Chapter 15: Demand Analysis
- Chapter 16: Principles of Railway Maintenance and Repair Management
- Chapter 17: High-Speed Trains
- Chapter 18: Urban Railways
- Chapter 19: Other Topics in Railways

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References:

- Armstrong, J., The Railroad: what it is, what it does, Simmons-Boardman, 1992
- Vuchic, V., Urban Transit, Systems & Technology, John Wiley & Sons, 2007.
- Hay, William W. Railroad Engineering, John Wiley & Sons, Inc, 1982.
- Practical Guide to Railway Engineering, AREMA, 2003.
- Esveld, Coenraad, Modern Railway Track, Second Edition, MRT-Productions, 2001.
- Pyrgidis, Christos N., Railway Transportation Systems: Design, Construction & Operation, CRC Press, Teylor & Francis Group, 2016.