INTRODUCTION TO RAILROAD ENGINEERING
CIEG-418/618-010
Fall 2015

Objective: This course introduces railroad track structures and their major components; including functions and modes of degradation and failure. It addresses static and dynamic load environments and engineering design to effectively distribute loads throughout a structure. Additionally, the program provides both theoretical and practical approaches to track design as well as useful design, optimization and maintenance recommendations for key track components.

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Time: Thursday 3:30-6:15 pm
Location: 350 DuPont Hall (also available on-line via UDCapture)


Suggested References:
Coenraad Esveld, Modern Railroad Track, MRT Publications, Zaltbommel, The Netherlands, 2001
Allan M. Zarembski, The Art and Science of Rail Grinding, Simmons Boardman Press, Omaha, 2005

Course Outline:
- Introduction to railroad operations
  o Railroad alignment and its effects
- Overview of the track structure
- Load Environment
  o Vehicle dynamic loading
    ▪ Vertical
    ▪ Lateral
    ▪ Longitudinal
  o Environmental loading
Beam of Elastic foundation theory
Distribution of loading through the track structure
Rail
Ties and fasteners
Ballast and subballast
Subgrade
Turnouts and Special trackwork
Design of track section for
Heavy axle load freight
High speed passenger
Transit
Track Buckling
Track Standards
High Speed Passenger
Passenger
Freight