Railroad Geotechnical
Engineering (CIEG667-019)

Railway geotechnology is a relatively new field of study into the engineering behavior of track substructure. The performance and failure modes of the geotechnical layers under track are very distinct from those of the layers under a highway pavement, giving railway geotechnology a unique place in transportation engineering. The course will address the challenges associated with designing, constructing and maintaining a well-performing and long-lasting railway track from the ground up. The student will learn the methodologies and technologies needed to develop a state-of-art railway track substructure including aspects of materials, mechanics, drainage, loading, slopes, design, maintenance, measurements and management and case studies. The course will cover track substructure issues related to both heavy axle load freight and high speed passenger rail traffic.

Dates & Times
Spring 2015: February 9th – May 18th (+ final)
Mondays, 6-9 p.m. (lectures will also be available on-line)

Instructor
Steven Chrismer, PhD, P.E.
Steven.chrismer@amtrak.com

Prerequisites
MATH351 & 353; CIEG212 or MEEG215;
CIEG301 – or equivalent engineering math including calculus through ordinary differential equations and linear algebra; u/g structural analysis and solid mechanics

Extra Benefit
This is one of three courses needed for UD’s Graduate Certificate in Railroad Engineering

Course Costs
3 graduate credits: $4,734 tuition + $30 reg fee; DelDOT & DoD reduced rate: $2,448

Registration/ Administrative Contact
Kathy Werrell
Engineering Outreach
werrell@udel.edu; 302/831-4863

About the Instructor
Dr. Steven Chrismer has worked for 32 years in track and rail vehicle engineering and has specialized in track geotechnology, having studied this at the PhD level. He is a co-author of the forthcoming book, Railway Geotechnics, and has devoted many years to the investigation of track substructure behavior and remedial needs under the loading demands ranging from heavy axle load freight to high speed passenger rail traffic. Chrismer is Chair of AREMA Committee 17 – High Speed Rail Systems, and works at Amtrak in the capacity of Principal Engineering, Track Geometry and Roadbed Improvement.

Topics Covered
- Intro to Railroad Geotechnology
- Track Substructure Layers
- Ballast and Sub-ballast
- Subgrade
- Track Substructure Loading
- Track Substructure Mechanics
- Track Analysis
  - GEOTRACK
  - Others
- Track Slopes
- Track Substructure Measurements and Management
- Case Studies