CEE-01
Potential for Natural Brine as an Anti-Icing/De-Icing Agent
Dr. K. Jahan
(Need CEE and CHE)

- Conduct literature review on the use of salt brine as an anti-icing agent
- Compare and contrast brine usage with conventional snow and ice control means
- Identify states/countries that currently use natural brine as an anti-icing agent
- Collect accurate weather/road condition data available for sites that use natural brine application
CEE-02 Use of Recycled Waste in Construction Materials

Jahan and Mehta

- Evaluate crushed recycled concrete and sewage sludge ash in HMA
- Specimen prepared in Superpave Gyratory Compactor
- Evaluation using Creep compliance, Fracture energy in MTS
- Determine PPA in modified binder.
• Learn about fracture mechanics and fatigue
• Understand how cracks propagate
• Develop laboratory tests
• Quantify observed shapes
• Compare to models in commercial software
NISH National Scholar Award Competition
Riddell (Need CEE, and ME)

- Move starting concept to complete and usable (ergonomic) design
- Learn about adaptive design
- Help people with disabilities work
- Apply for $10,000 national design competition
Wind Power
Riddell, Everett, Bhatia, Jansson (Need CEE, ECE and ME)

• Learn to use SODAR (sonic detection and ranging) to measure wind speeds
• Raise 30 meter tall towers to collect wind data
• Compare SODAR-collected data to anemometer-collected data
• Learn about NJ’s progressive energy policy
CEE-06  Wyrick

**Dam Removal Modeling**

- Analyze morphologic changes in Musconetcong River
- Predict changes in Mantua Creek
- Build flume & model dam removals

**3 CEE**

Survey and construction skills appreciated

**SOME WEEKEND TRAVEL REQUIRED**

Dr. Josh Galster
Detention Basin Retrofits

CEE 07 Wyrick

- Model detention basins in Mantua watershed
- Design retrofits for older basins

3 CEE

AutoCAD experience
Energy audits, solar and microhydro assessments

Everett, Riddell, Wyrick, Bhatia, Jansson (Need CEE and ME)

- Audit energy use in buildings and farms
  - Identify ways to conserve energy

- Evaluate sites for potential solar and micro-hydro energy production
Engineers Without Borders: El Salvador

- CEE 09
- Profs. Everett, Wyrick & Mehta

- Bring Clean Water to La Ceiba, El Salvador & other communities
- Save a child’s life!

All Majors can apply
Hands on an Aquarium
Everett, Jansen (Need all majors)

• Develop sustainability experiments
• Create ethics module
• Help Create Video-Cam website for Adventure Aquarium in Camden
In 2006, the most recent year of statistics available, there were 87 motorcyclist fatalities in New Jersey.

Nationally, as motorcycles become increasingly popular, motorcycle deaths have increased dramatically in the U.S.

In New Jersey, motorcyclist fatalities have more than doubled since 1991.

The goal of this project is to develop a strategic plan for the reduction of New Jersey motorcycle accident rates in both fatal and non-fatal crashes.

Completed surveys – 40,000 10% response rate
Analysis of survey data

Field Inspection of Fatal Motorcycle Crash Sites.
CEE - 12 An Analysis of Cracking of Concrete Pavements at the NAPTF
3-4 CEE students
Dr. Mehta, Dr. Cleary and Dr. Sukumaran

- Evaluate load transfer efficiency
- Determine the appropriate procedures to minimize negative impact of joints on PCC pavement performance
- Collect and understand the traffic, material, mechanical response and performance data from FAA.
Self-Consolidating Concrete
CEE-13  Dr. Cleary

Try to break concrete instead of test equipment

• Develop and perform an experimental study in reinforced concrete
  • Literature review
  • Test program
  • Construction
  • Testing
  • Revision
  • Analysis and report of results
CEE-14 Assessment of Airport Structures

Dr. Dusseau

Current Work:
- Field measurement of building dimensions
- Development of line drawings of structures

Future Work:
- Computer modeling of airport structures
- Assessment of airport structures
Dr. Dusseau

Current Work:
- Review of transit and school bus accidents
- Review of transit and school bus analyses/testing

Future Work:
- Computer modeling of transit and school buses
- Assessment of transit and school bus safety
• Determine if the SGC can be used to predict pavement behavior during trafficking
• Understand and download data from the materials database available from the NAPTF
• Compare full-scale pavement data and gyratory data
• Understand airport pavement performance during trafficking of B-777, B-747, A-380 and other aircrafts
CEE-17 Appropriate technologies for the Developing world

Graduate Student: Kevin McGarvey
Dr. Sukumaran, Dr. Bhatia, Dr. Mehta, Dr. Everett

- Complete manufacturing 4 grain crushers for the pilot study
- Improve the design of the grain crusher as the need arises
- Begin work on the next device, which will be a human powered soil tiller
The goals of the project are:

- Develop familiarity with the online database of sand images from XCT and OT analysis
- Learn PFC$^{3D}$ program
- Develop discrete element models of the various sand particles
- Run Discrete Element Model simulations of various sands

Tools to be used:

- XCT
- OT microscope
- PFC$^{3D}$ program