Instructor: Professor Ning Lin, E-Quad E328, nlin@princeton.edu

Texts:

References:

Prerequisites: Undergraduate-level Probability and Statistics (e.g., ORF 309 or CEE460), Differential Equations, and, preferably, Fluid Mechanics and Structural Dynamics.

Grading: Homework (40%) and Course project (60%)

Syllabus:
Lecture 1. Introduction to Wind Engineering
Lecture 2. Basic Meteorology
Lecture 3. Weather Systems and Storms
Lecture 4. Hurricanes
Lecture 5. Hurricane Hazards (wind, surge, rainfall)
Lecture 6. Probability
Lecture 7. Wind Climatology I
Lecture 8. Wind Climatology II – Hurricane climatology
Lecture 9. Boundary Layer Wind I – Mean wind profile
Lecture 10. Random Process
Lecture 11. Boundary Layer Wind II – Turbulence
Lecture 12. Bluff Body Aerodynamics
Lecture 13. Wind Tunnel Theory
Lecture 14. Wind Loads I – Wind-tunnel case study
Lecture 15. Wind Loads II
Lecture 16. Structural Dynamics
Lecture 17. Random Vibration (RV)
Lecture 18. RV – Single degree of freedom
Lecture 19. RV – Multi-degree of freedom
Lecture 20. RV – Multi-degree of freedom II
Lecture 21. RV – Distributed system
Lecture 22. Windborne Debris Aerodynamics
Lecture 23. Guest Lecture
Lecture 24. Project Presentations and Discussion