

## Wind Engineering

2 units (selection)

Fumiaki Nagao · PROFESSOR / STRUCTURAL ENGINEERING, CIVIL AND ENVIRONMENTAL ENGINEERING, INTELLIGENT STRUCTURES AND MECHANICS SYSTEMS ENGINEERING

Minoru Noda · ASSOCIATE PROFESSOR / STRUCTURAL ENGINEERING, CIVIL AND ENVIRONMENTAL ENGINEERING, INTELLIGENT STRUCTURES AND MECHANICS SYSTEMS ENGINEERING

**Target** To understand the properties of strong wind, outline of structural behavior in strong wind and wind resistant design in civil engineering

**Outline** Local strong wind; Occurrence mechanism and effect of geographic and topographic factors. Characteristics of fluctuating wind velocity. Steady and unsteady aerodynamic forces exerted on thin and bluff bodies. Aerodynamic response analyses of structures such as cables, tower-like structures, cable stayed bridges and suspension bridges. Rain-wind induced vibration. Effect of gusty wind on structural response. Wind resistant design in civil engineering; A state of the art and perspective.

**Style** Lecture

**Keyword** *properties of strong wind, structural behavior in strong wind, wind resistant design*

**Fundamental Lecture** “Advanced Structural Dynamics”(1.0), “Advanced Structural Design”(1.0)

**Goal** To understand the outline of structural behavior in strong wind and wind resistant design in civil engineering

**Schedule**

1. Introduction
2. Occurrence mechanism of Local strong wind
3. Effect of geographic and topographic factors on Local Strong wind
4. Characteristics of fluctuating wind velocity
5. Steady aerodynamic forces exerted on thin and bluff bodies
6. Unsteady aerodynamic forces exerted on thin and bluff bodies
7. Forced vibrations of structures
8. Self-excited vibrations of structures
9. Aerodynamic response analyses of cables
10. Aerodynamic response analyses of tower-like structures
11. Aerodynamic response analyses of cable stayed bridges
12. Aerodynamic response analyses of suspension bridges
13. Effect of gusty wind on structural response
14. Wind resistant design in civil engineering
15. A state of the art and perspective

**Evaluation Criteria** evaluated by attitude in class (50%) and reports (50%)

**Textbook** To be introduced in the class

**Reference** To be introduced in the class

**Contents** <http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216594>

**Contact**

⇒ Nagao (A515, +81-88-656-9443, fumi@ce.tokushima-u.ac.jp) MAIL (Office Hour: 年度ごとに学科の掲示を参照すること)

⇒ Noda (A514, +81-88-656-7323, noda@ce.tokushima-u.ac.jp) MAIL (Office Hour: 年度ごとに学科の掲示を参照すること)