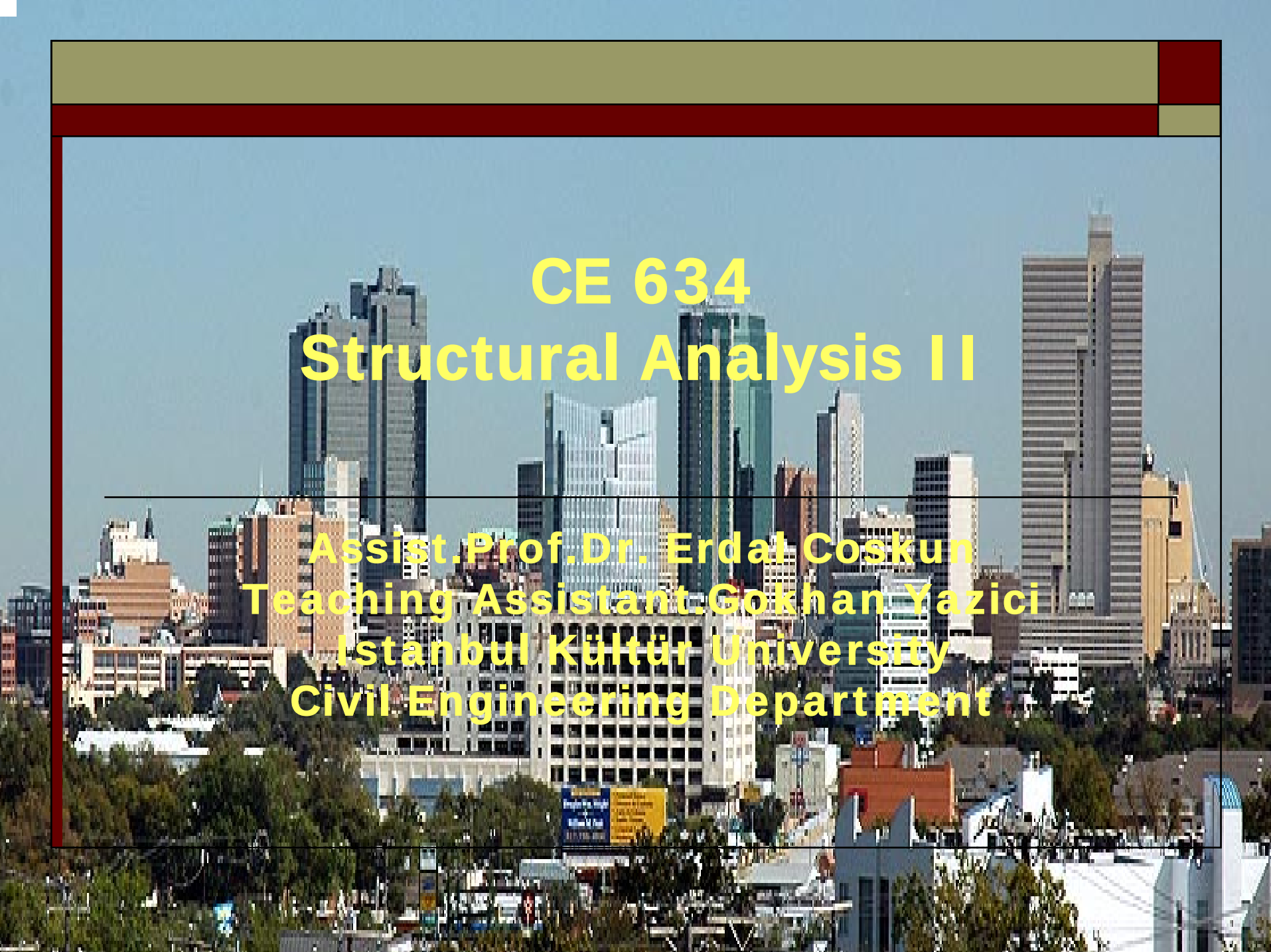

CE 634
Structural Analysis II

Assist.Prof.Dr. Erdal Coskun
Teaching Assistant Gokhan Yazici
Istanbul Kültür University
Civil Engineering Department

Objectives — Deflections

- Derive expressions that relate external virtual work to internal virtual work
- Calculate displacements and/or rotations using the “unit dummy load method” (i.e., virtual work principles)
- Evaluate virtual work integrals using a graphical procedure

Objectives — Deflections

- Calculate displacements in beams using the "unit dummy load method" (i.e., virtual work principles)
- Calculate displacements in frames using the "unit dummy load method" (i.e., virtual work principles)

Objectives — Deflections

- Calculate displacements in trusses using the "unit dummy load method" (i.e., virtual work principles)
- Compute truss displacements accounting for initial imperfections and thermal effects

Objectives — Statically Indeterminate Structures

- Advantages and Disadvantages of Statically Indeterminate Systems
- Explain why statically indeterminate structures are used for most applications
- Summarize different analysis approaches used to compute the response of statically indeterminate structures
- Apply the Flexibility (Force) Method to compute reactions and internal forces in statically indeterminate structures.

Objectives — Statically Indeterminate Structures (Flexibility Method)

- Define flexibility coefficient, redundant, primary structure
- Describe the procedure for establishing equations of compatibility

Objectives — Statically Indeterminate Structures (Flexibility Method)

- Apply the Flexibility (Force) Method to compute reactions and internal forces in statically indeterminate trusses
- Distinguish between trusses that are statically indeterminate internally versus externally

Objectives — Statically Indeterminate Structures (Flexibility Method)

- Analyze statically indeterminate structures that are subjected to support settlements
- Analyze statically indeterminate trusses that are subjected to thermal effects and/or initial imperfections (i.e., fabrication errors)

Objectives — Statically Indeterminate Structures (Moment Distribution)

- Compare/Contrast static indeterminacy and kinematic indeterminacy
- Analyze statically indeterminate structures using the method of Moment Distribution
- Define the following terms:
  - Member Stiffness Factor
  - Fixed End Moment
  - Carry-Over Factor
  - Degree of Freedom
  - Distribution Factor

Objectives — Statically Indeterminate Structures (Moment Distribution)

- Analyze statically indeterminate structures with simple supports and/or overhangs using the method of Moment Distribution
- Utilize modified stiffness coefficients to analyze structures with simple supports at their ends
- Apply the method of moment distribution to analyze frames that cannot sway

Objectives — Statically Indeterminate Structures

- Approximate Methods - Other approximate methods; Portal Method, Cantilever Method, Trusses
- Introduction to Matrix Methods
- Computer Applications: Several computer programs will be used throughout the course of this class (SAP2000, RISA-3D, etc.).

Assignments

Assignments will be given, on average, every week. Assignments are due at the beginning of the lecture on the date marked on the assignment sheet, unless modified by the instructor. Students are strongly encouraged to discuss course and homework topics among themselves, since such discussions are an important part of the learning process. However, each student must carry out assignments independently.

Your assignments should be clearly and cleanly written. I expect all to adhere to a reasonable person's presentation standards without anyone having to describe or define these standards for you.

Textbook:

- Structural Analysis by, Hibbeler,