ARCHITECTURAL STRUCTURES I:
STATICS AND STRENGTH OF MATERIALS
ENDS 231
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lecture eight

truss analysis

Paris 2002/09,
Eiffel Tower
Method of Sections

• relies on internal forces being in equilibrium on a section
• cut to expose 3 or less members
• coplanar forces → \[ \sum M = 0 \] too
Method of Sections

- **joints on or off the section are good to sum moments**
- **quick for few members**
- **not always obvious where to cut or sum**
Graphical Analysis

• lettering rules (Bow’s notation)
• draw a force polygon of known loads and reaction forces
Graphical Analysis

- **draw reference directions for members and find intersections**
- **measure and determine C or T**
- **follow steps!**
- **learn by example**
Other Trusses

• compound truss
  – simple trusses with more links
  – might have pins in middle of members

• statically indeterminate
  – too many members
  – constrained
  – diagonal tension counters
Tools – Multiframe4D

• in computer lab
Tools – Multiframe4D

• frame window
  – define truss members
    • or pre-defined truss
  – select points, assign supports
  – select members, assign section & assign pin ends

• load window
  – select points, add point load
Tools – Multiframe4D

- to run analysis choose
  - case menu
    - Analyse...
      - Linear (1st order elastic)

- plot
  - choose options

- results
  - choose options