**ME 362 Stress Analysis:**

Course Content:

* Mechanics of internal forces (stress)
* Geometry of deformation (displacements + strains)
* Material response (stress-strain relations)
* Beams
* Energy Methods: strain-energy, principle of minimum potential energy, Rayliegh-Ritz
* Finite Element Method – Ansys
* Rods, Beams on elastic foundations, Plates

**Traditional course format:**  (Restrict class size to 34)

* 3 lectures per week (MWF, 11-11.50)
* Homework (15%)
* Mid-term (15%)
* Small project (student defined after mid-term; groups of 2-3) (20%)
* Computer lab (10%)
* Final. (40%)

 Static web notes by SK.

**Asynchronous course format:**  (Restrict class size to 16)

Pre-reqs: same as regular AND consent of instructor

- Class divided into four teams A, B, C, D (max 4 students per team)

 Course anchored around impractical (?!) projects [involving structural analysis + FEM].

- Project choices: choose from…

* The Orbital Tower (earth, mars, moon)
* A bridge across Lake Michigan from Chicago to Michigan (bypassing Indiana!)
* A large-scale project that the students themselves define

Structure:

One 80 minute in-class session per week.

Static web notes by SK.

**Dynamic web lecture notes by SK** (not just a video tape of me lecturing)

Unit-end online quizzes (10 points in all);

Three 30 minute in-class quizzes (10 points each, 30 points in all);

team project updates and final presentations (10 points)

team project final report (30 points);

final exam (same as for the regular section; but only 20 points)

Async session: Students come to the in-class session having viewed/read dynamic/static content and having submitted the unit-end online quizzes about the material.

In-class session: (Th 11-12.20)

* 20-30 minute in-class quiz in weeks 4, 6, 8
* 10-15 minutes: overview lecture by SK outlining the why’s and how’s of the stuff they are learning.
* 15-20 minutes: student update presentations on projects: weeks 3,4,5,6,7,8
* 15-30 minutes discussion time: Students work through assignments in groups of three/ discuss project progress.
* 20 minute final project presentation by each team: week 10.

**Assessment of Course:**

1. The traditional\_class final exam scores will serve as a control to compare against the final exam scores of the async\_class.

2. A CTEC+ survey of the async\_class regarding the structure of the async format.

3. Independent faculty review of the quality of team projects from the traditional and async formats?