

**Lesson Plan: [Topic]**

(3-5 pages)

- 1) Module-based (thanks to C117)
- 2) Challenge
- 3) Project

**Teaching Plan:**

A general breakdown of the mentoring session, including an agenda and the approximate times for each activity. This should also include the goal(s) of the lesson next to each activity in the agenda. How are you planning to engage different types of learners in the classroom? For more info refer to the Learning Style handout at the end of this document.

**Mentors Scientific Background**

Detailed explanation of the science behind the project. (Working principle, governing equation, etc.) How would an engineering book explain the topic? The purpose of this section is to give mentors sufficient background/understanding of the science so they can explain it adequately to the mentees. Remember that Mentors are college students. :)

**Introduction for the Mentees.**

This section should detail the approach to engage mentees, and introduce the concepts. Make the topic relevant and tangible to the students. This can include demos, questions, or physical activities to introduce the subject as a whole. How are you planning to introduce the topic to a non-technical audience.

**Modules/Demos, or Project**

Each lesson plan should include three or more activities that help the students understand the concept, the goal of the demos is to help students and mentors break down entire lesson into more manageable sections. (Look at the ME/BioE c117 examples in the *Google folder* for more clarification).

**Closing Activity and Discussion.**

This is an activity that ties together the different concepts that the three modules have covered. Review the concepts that were covered in the lesson plan. An easy thing to do is to ask questions from the worksheets.

Expand on the topic--what are problems engineers are trying to solve today? What are the some problems that engineers are trying to solve in the future? How is this relevant to the mentees' daily/future lives? How is it relevant to the lesson topic? Can use a socratic discussion method to address these questions.

**Worksheet**

Can be any format as long as it recapitulates the ideas/concepts taught via the activities. This is like the C117 worksheet that were made for the students. They can be fill-in-the blank, multiple

choice, etc.

## Materials

List of disposable materials for any demos and project (note quantity and sources)

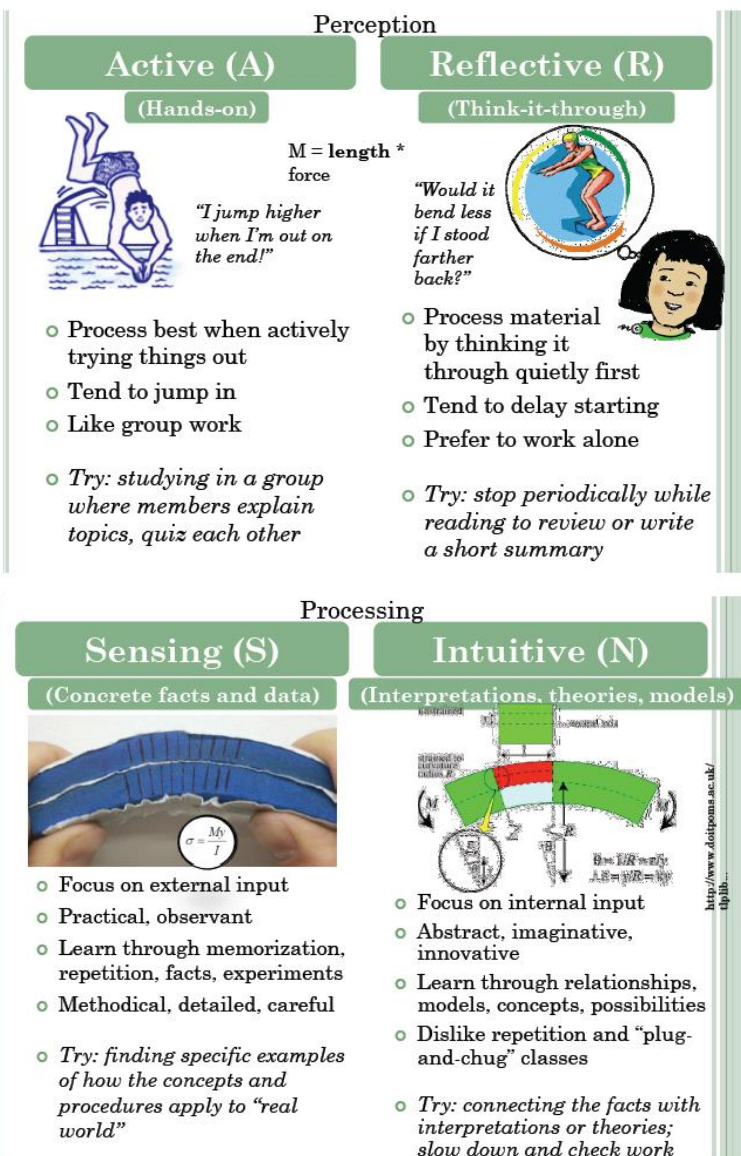
List of any non-conventional materials that mentors might need and where and how you would get them. (Specially in case of large demonstrations, i.e. graft implant, microscope, etc.)

## References/Citations

List any resources and citations for the lesson plan

## Reference Section - Learning Styles (Pedagogy)

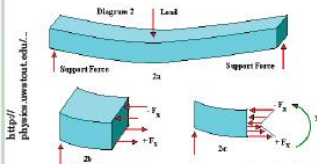
This is a list of different the learning styles. Keep this in mind while developing your lesson plan. Make sure not to leave any out.



## Input

### Visual (Vs)

(Show me)



- Best remember what they see
- Pictures, sketches, schematics, diagrams, plots, Demonstrations
- Try: looking for diagrams or photos in other reference books or online; prepare concept maps or color-code notes

### Verbal (Vb)

(Explain in to me)

"The beam is in compression on the top half, but the bottom is in tension, which results in a net internal moment..."

- Best remember what they read/hear
- Spoken words
- Written words
- Try: writing summaries/outline in your own words; work in groups and explain it to each other

## Understanding

### Sequential (Sq)

(step-by-step - TREES)

From a FBD of a beam, we can see:

$$\sum F_{x(i)} = \sum F_{x(i)} \Rightarrow \int \sigma dA = 0$$

$$\sum M_{z(i)} = \sum M_{z(i)} \Rightarrow -\int y \sigma dA = M$$

Rewriting, we have  $M = -\int y \sigma dA$

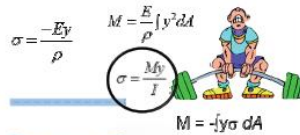
Substituting  $\sigma = \frac{-E y}{\rho}$  shows that:

$$M = -\int y \frac{-E y}{\rho} dA \rightarrow M = \frac{E}{\rho} \int y^2 dA$$

- Learn by logical, sequential steps
- Make steady progress
- Try: outlining the material in logical order, fill in skipped steps of derivations

### Global (G)

(Holistic - THE FOREST)



- Absorb information randomly, then suddenly "get it"
- Need the big picture, how it relates to what you know
- Large leaps in progress
- Try: skim entire chapter (or book) first