

## Teaching Practice for Lecturing and Presenting in Engineering

This course will offer you an intense opportunity to practice teaching and to get detailed feedback on your teaching. The practice will come in the form of 5 short lessons on specific topics. On Days 1-4, you will teach to a group of 4-5 other students and on Day 5, you will have a group of about 10 participants.

The feedback you receive on your teaching will be more valuable to you if you are well prepared.

A lesson is a short teaching sequence, like solving an exercise session or introducing a lab experiment. See the guidelines below about topics and duration for each day. Choose a subject which is important or interesting to you, but please do keep in mind the varied backgrounds of the other participants.

While it can be useful to already have a topic in mind for each day, we suggest that you prepare only first day's teaching sequence now. For each lesson, you should incorporate ideas and strategies seen previous day or from the readings, as well as the feedback you received and your personal reflections.

Ultimately what you get out of this class, far exceeding the importance of your grade, will come from teaching practice and your peers' feedback on these short lessons.

Day	Duration	Topic	Requirements ***Use lesson planners
1	5 minutes	Motivation + potential outcomes of your thesis project	Be sure to include a lead-in, key message and summary.
2	10 minutes	Resolution of an exercise, problem solving activity, etc.	Use of the board or flipchart (no PowerPoint or slides). Use of questions/interactivity, plus lead-in + summary
3	15 minutes	Cutting edge experimental technique or procedure, which is cognitively challenging to understand (ie difficult concept, rather than overwhelmingly detailed)	LOAFS structure
4	15 minutes	Quantitative data FOR A GENERAL PUBLIC AUDIENCE	Use of visualisation/diagram + LOAFS structure
5	15 minutes	RE-DO your lesson from Day 2, 3 or 4 - Incorporate peer feedback and self-reflection - For an INTRODUCTORY ENGINEERING AUDIENCE	LOAFS structure

See the following pages for the Day 1 lesson planner and 2 sample lesson plans




# Day 1: lesson plan

Topic:

Time	Phase	Description, instructions, content...	Material
	Lead-In		
	Key message		
	Summary		
	<i>Total time</i>		

# model Day 1: lesson plan

Topic: **FOOD SAFETY → EGGS**

Time	Phase	Description, instructions, content...	Material
1 min	<b>Lead-In</b>  Serves as your « hook » to pull students' attention and makes the connection with what your students know, value or find interesting.	Draw big egg on the board Q: Where do you store your eggs at home? Why?	chalk board
3 min	<b>Key message</b>  Imagine that someone who attended your mini lesson meets up with a friend that evening – what 1-2 sentences would you like them to use to explain what you taught?	lecture: Key to storage is minimising bacterial growth <ul style="list-style-type: none"> <li>- moisture</li> <li>- surface area</li> <li>- temperature</li> <li>- use air pocket to keep yolk from touching shell</li> </ul>	" } * keep it shut!
1 min	<b>Summary</b>  Consolidates and integrates the lesson. Broadens the perspective and helps students make links to other concepts and contexts to facilitate transfer.	- in <u>or</u> out of the fridge doesn't matter - <u>but</u> don't take them in + out → condensation on the shell & moisture	"
5	<b>Total time</b>		α bacterial growth.

make connection

# Day 1: lesson plan

Topic: Neural Plasticity

author: Salif Komi, 2020

Time	Phase	Description, instructions, content...	Material
1	Lead-In	<p>Draw a brain and 2 neurons with an arrow around and ask : "How does your brain learn?"</p> <p>What is the neural substrate of learning? What mechanisms are involved?</p>	White Board, Black, Red, Blue, Green markers
3	Key message	<p>Key to learning is <b>neural plasticity and structural adaptation of the brain networks responsible of the task you train:</b></p> <ul style="list-style-type: none"> <li>- Ask: How to elicit these changes?                             <ul style="list-style-type: none"> <li>- Through training and repetition: Hebbian Rule (1 Minute Explanation)</li> <li>- <b>"Cells that fire together wire together"</b></li> <li>- Give example:                                     <ul style="list-style-type: none"> <li>- Associative Memory (1minute example: )</li> <li>-</li> </ul> </li> </ul> </li> <li>- Multiple mechanisms (Structural and functional plasticity)                             <ul style="list-style-type: none"> <li>- With first color draw structural plasticity (30s)</li> <li>- With Second color draw functional plasticity (30s)</li> </ul> </li> </ul>	
1	Summary	<p>Plasticity through repetition is key to learning.</p> <p>That's the basis of recent engineering approach of machine learning such as Deep Learning using repetitive training of artificial neural networks.</p>	
	<i>Total time</i>		