BIOE 385 – Fall 2021

Extra Credit Assignment Description – INDIVIDUAL

The objective of this extra credit assignment is for you to extend beyond the material we covered in lab and explain how a particular electronic component or basic circuit works. As part of this assignment, you will prepare a short 5-10 minute lesson where you do a deep dive into that specific component/circuit, discussing how it works, what it's used for, common variants of the component and their advantages/disadvantages (see *Technical Content* heading below). These videos are meant to be a fun way of introducing these components to a layperson audience that may not be familiar with the technical side of electronics or complex parts. In essence, we want you to pretend you are the lecturer, explaining these concepts to a general audience. Please do not just repeat material that you read – the goal of this is that you make an effort to fully understand the material and find a way to explain it to your audience. We will grade the extra credit based on your ability to successfully do the following and give you **up to 10 points towards your lab 1 exam grade.** Have fun with the assignment, feel free to get creative with text and animation – we want you to showcase both your creativity and teaching skills during these videos.

Here are the criteria for the technical specifications. Please also review the ***Video Creation Guidelines and Grading Rubric*** document.

Technical Content

1. Clear learning objectives
2. Fundamental concepts – operational principle of a component selected from list below (**You are encouraged to use equations and some physics to explain the operational principle).**
3. Applications – in what devices and for what purposes is this component used?
4. Common variants of the component and advantages/disadvantages *(the part you selected may lend itself better to a comparison of that part to a different part altogether that achieves the same function, this is fine as well)*

Self-Assessment Questions (SAQs)

Provide 3-5 SAQs for the video that you create along with a brief solution. Questions can be short answers, multiple choice, fill in the blank, matching, etc.

Video

1. Record yourself giving the lecture (phone quality is fine or KalturaCapture) and upload it using KalturaCapture to Canvas. You can install the software from Canvas by clicking on My Media/Add New/KalturaCapture.
2. The video should be 5-10 minutes long.

Release form and survey
Please complete the following release form in case these videos are ever shared with students in the future for instructional purposes. Personal identifiers will not be shared. https://rice.app.box.com/s/tnl716h9bp2enbaclhcjppter4xuzgrt

Finally, we will be conducting research on student learning with these videos using different pedagogical strategies. For this extra credit assignment specifically, we will be collecting effectiveness data from students on their perspectives relative to the innovations implemented by their instructors. If you feel comfortable providing anonymous survey data (emails and identifiers will be deleted and not saved), please fill out the following *Video Assignment Survey* on Canvas.

SUBMISSION
By December 3rd, submit all the required deliverables via Canvas. Partial assignments will not be accepted. If you are having issues uploading to Canvas, you can use Rice Box or Google Drive and just send me an email with the link. You will need to submit:

1. Video file
2. PowerPoint (if applicable)
3. Release form (or a statement indicating that you are not signing the release form)
4. Canvas *Video Assignment* survey
5. Self-assessment questions

POTENTIAL TOPICS: (if there is a component/circuit that you're interested in that is not listed below, please send me an email to have it approved)

LEDs

Voltage Dividers

Capacitors

Photodetectors

Photoconductive Circuits

Photovoltaic Filters

Potentiometers

Active Filters

Passive Filters

Low Pass Filters

High Pass Filters

60 Hz Noise

Operational Amplifiers

Inverting Amplifiers

Differential Amplifiers

Non-inverting Amplifiers

Force Transducers

Part selection will be first-come first serve (while ALL work is to be done individually, a maximum of 2 students will be allowed to sign up for each topic).

I have set up a Google signup to help the process:
Google Component Sign-up