

**Subject:** ECE 1111: HW #01 - declaring your concentration  
**From:** Joseph Picone <joseph.picone@gmail.com>  
**Date:** 5/12/23, 6:33 AM  
**To:** ECE 1111 <temple\_engineering\_ece1111@googlegroups.com>

Please review the message below about degrees and concentrations. For this assignment, I need you to do the following:

- meet with your academic advisor
- declare your concentration
- verify that it appears in Banner
- send me a screenshot of the attached display from Banner showing your concentration is set

For those of you who are not ECE students, or not in our College, send me the equivalent for your degree program.

If you have any questions, let me know.

This assignment is worth 50 points of extra credit on your quiz scores. Trust me - that is a lot because students often get zeroes on the quizzes in this class.

We are in the process of rebranding the degree name and concentration to better reflect contemporary trends in ECE. More about that later. The point of this exercise is to make sure each ECE student understands the concentration options available and to declare one of these. These can be changed at any time, though once you get into 3rd year, the choice does significantly influence the classes you take. Talk with your academic advisor about the details.

I need this completed before the fall semester begins.

Thanks,

-Joe

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Subject: EE vs. CpE vs. BioE (\*\* live cockroaches \*\* you really have to see this to believe it \*\* billions of them \*\*)

Date: Wed, 15 Mar 2023 18:18:51 -0400

From: Joseph Picone <joseph.picone@gmail.com>

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<https://media.giphy.com/media/w8t89p4VBJytG/giphy.gif>

Okay, hopefully that got your attention!

Let me summarize today's impromptu classroom discussion, which was very important, with this statement:

The Temple Department of Electrical and Computer Engineering offers one BS degree - a BS in Electrical Engineering - with three options:

- Electrical Engineering (EE)
- Computer Engineering (CpE)
- Bioelectrical Engineering (BioE)

When an employer asks in what discipline is your degree, you should respond one of three ways, as listed above (EE, CpE, BioE). Do not say ECE if you are a CpE - that is very confusing to employers and will likely send your resume to the bottom of the pile.

For example, those of you who pursue a computer engineering option, should refer to their degree as a CpE degree, and should say I have a Bachelor's in Computer Engineering.

The only reason we don't list it this way on your diploma, and in university documents such as The Bulletin, relates to accreditation issues. Having three options under one degree program means we only have to go through one accreditation rather than three separate accreditations. For our department, which is small, this is huge. Next fall we will go through accreditation, and trust me, all of you will be involved. It is like your dentist drilling out a cavity... with no painkillers!

An EE degree is valuable because you learn about electronics, which are abundant in today's world, and you learn topics such as circuit analysis and signal processing, that are used to model physical systems in many disciplines (e.g., acoustics, fluids, linguistics). Traditional employers in the U.S. for EE degrees include power companies, military contractors, consumer electronics, manufacturing, etc.

A CpE degree is one of the most sought after degrees in the world right now. Everything is an embedded system, and CpE grads know how to build these. Someone has to design and program that smart refrigerator or voice-enabled light controller that you are so fond of. Traditional employers for CpE degrees include high-tech companies like Apple. My CpE colleagues at Apple design watches, phones, smart speakers, smart rings... all sorts of cool things! But they all involve a mixture of hardware and software – what we used to call co-design.

A BioE degree allows you to design medical devices (e.g., pacemakers, glucose monitors) – a huge and growing market for this rapidly aging society we are part of. The healthcare sector is enormous, quite diverse, and will become increasingly important in your lifetimes because human life as we know it will probably evolve based on the availability of synthetic body parts. Who knows... I might be able to torment you about learning emacs for the next 100 years with my synthetic body parts keeping me alive... (and hopefully fully debugged software!).

In my opinion, all students should take the embedded systems course (ECE 3622). Like circuits, signals and software, it is what engineers in the U.S. do – they build embedded systems. It is a requirement for CpE's for obvious reasons, but EE's and BioE's should take this course also. It is hugely important. So many jobs in the U.S. involve systems – not component design. Component design and manufacturing is often done in third world countries where labor is cheap. Systems involve sophisticated software and board-level integration of chips. Smart speakers such as Google Home and Amazon Echo.

If you aspire to have a job focused on software, AND MANY OF YOU WILL!, you need to consider Engineering Computation III (ECE 3824). It teaches you about full stack development and devOps – two of the hottest areas in engineering/computer science today. Too many students waste electives on "easy courses" when they could be greatly enhancing their knowledge base with these kinds of courses.

At the very least, please understand that the three options above are equivalent to a BS in Electrical Engineering, Computer Engineering, and Bioelectrical Engineering respectively. The latter is a program somewhat unique to ECE at Temple – we are proud of that distinction. It is not equivalent to a Bachelor's in Bioengineering, and that is a good thing – device companies want to hire hardcore electrical engineers who understand anatomy and physiology! That is why BioE exists.

Finally, CpE enrollment at Temple, for reasons I will never understand, is too low. 50% or more of our students should be CpE. It is where the good jobs are today. That isn't to say EE isn't important, but it is very difficult to find good CpE engineers. Too many students come to Temple ECE and say things like "I don't like software." This is why I teach ECE 1111. I am trying to make you appreciate the great opportunities that lie ahead for electrical engineers – we make excellent software developers and embedded systems engineers. But you have to know hardware and software to be competitive in these fields.

If you have any questions about these things, don't hesitate to stop by my office to talk. Of course, I might also teach you a little emacs in the process 😊

–Joe

– Attachments: \_\_\_\_\_

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