

University Undergraduate Council

February 9, 2024 1:00 - 3:00 PM

Zoom

Minute Attendance

Committee - Voting Members					
✓	Ladrica Menson-Furr (CAS)	✓	Trent Harper (CSD)	✓	Brad Harrell (NURS)
✓	Denis Grélé (CAS)	✓	Nichelle Robinson (COE)	✓	Candace McGowen (NURS)
✓	Kendra Murphy (CAS)	✓	Sandra Cooley-Nichols (COE)	✓	Joanne Gikas (CPLS)
✓	Andrew Mickelson (CAS)	✓	Russell Deaton (HERFF)	✓	Lorraine Meiners-Lovel (CPLS)
✓	Greg Boller (FCBE)	proxy	Claudio Meier (HERFF)	✓	Marian Levy (SPH)
✓	Caitlin Porter (FCBE)	✓	Larry Weiss (CHS)		Jennifer Turchi (PUBH)
proxy	Rahul Pandey (FCBE)	✓	Melissa Puppa (CHS)	✓	Eli Jones (Faculty Senate)
proxy	Jenna Thompson (CCFA)	✓	Brandt Pence (CHS)		
✓	Sonin Lee (CCFA)	✓	Michael Hutchison (KWS)		
✓	Christina Moss (CCFA)	proxy	Carol Silkes (HPRM)		
Committee - Non-Voting Members					
✓	Carol Danehower (Chair)	✓	Karen Weddle-West (SAS)	✓	Sofiya Dahman (Library)
	Alletha Davis (Registrar)	✓	Dale Williams (ACC)	✓	Stormey Warren (CAS)
	Darla Keel (Registrar)		Trellis Morgan (AAN)		Michelle Coffee (Lambuth)
✓	Keri Kerr (Registrar)	✓	Sean Holden (OIR)		
✓	Victoria Tardugno (Registrar)	✓	Bailey Sanders (SGA - Student Rep)		
✓	Tara Buchannon (Disabilbility Services)	✓	Melinda Jones (Un. Honors)		
Guests					
✓	Firouzeh Sabri (PHYS)	✓	Ali Fatemi (MECH)	✓	Eric Bailey
✓	Sanja Mishra (PHYS)	✓	Vanessa Brocks (AAC)		
✓	Xiao Shen (PHYS)	✓	Shawn Pollard (CAS, DPMS)		
Proxies					
✓	Jeffrey Marchetta for Claudio Meier				

University Undergraduate Council

Meeting Minutes

February 9, 2024

1:00 p.m. Teams

I. Call to Order –Carol Danehower, Chair

- Meeting called to order at 1:03pm.

II. Old Business

- We will vote on Minutes from November, December, January and February at a later meeting.

III. New Business – Curriculum Proposals (submitted in Curriculog)

All proposals were approved.

College of Arts and Sciences (2 votes) – Ladrice Menson-Furr

- Physics – New course PHYS 4621 Device Physics and Microfabrication II
- Academic Program Modification (APM) to add a BS Psychology major to the already established BA Psychology (goes to THEC for final approval)

Herff College of Engineering (3 votes) – Russ Deaton

- 2 New Certificates
 - Pathway to Engineering and Technology
 - Regulatory Affairs in Medical Devices
- BS Mechanical Engineering – New concentration. Proposal in Curriculog titled Materials Engineering. As moved and seconded, the concentration name was amended to be **Materials for Engineering Applications** (curriculum was left unchanged.)

IV. Updates/Announcements/Reminders

- The Academic Nomenclature will be discussed in March.
- THEC and TTPs (Tennessee Transfer Pathways): THEC is currently conducting the College of Fine Arts and Communications TTP. This is a 5-year review cycle.
- The Micro Credentials Workshop will be on April 18th at 9:00am – 12:00pm in the FIT Fishbowl.

Upcoming Meetings

Meeting Dates Curriculog Deadline

4/12 **3/29**

5/10 **4/26**

V. Adjourn

- Moved to adjourn, seconded, and passed. The meeting adjourned at 1:45 PM.

Materials Engineering

The Department of Mechanical Engineering is proposing a concentration in Materials Engineering, in which students choose 4 courses from 7 alternatives. The purpose is to provide an interesting and important choice for specialization of their education and subsequent careers to Mechanical Engineering majors, as well as to provide attractive options for growing the program and trained undergraduates to participate in faculty research. Several faculty have good research programs in Materials Engineering.

The US Bureau of Labor Statistics defines that materials engineers “**Evaluate materials and develop machinery and processes to manufacture materials for use in products that must meet specialized design and performance specifications.** Develop new uses for known materials. Includes those engineers working with **composite materials** or specializing in one type of material, such as graphite, **metal and metal alloys**, ceramics and glass, plastics and polymers, and naturally occurring materials.” The proposed concentration covers the areas in **BOLD**, thus offering specialization in those specific materials, and justifying the choice of its name.

Mechanical engineering and Physics are distinct disciplines, which overlap in the area of materials. The norm is that Materials Science and Engineering Departments are housed in Colleges of Engineering and offer BS Degrees in Materials Engineering, of which there are 74 programs accredited by the Engineering Accreditation Commission of ABET. According to USNews, all the top Materials Engineering programs are housed in Colleges of Engineering. We have found related concentrations at the universities of Washington, UPenn, Brown, Michigan State, and Northwestern. The programs that Physics examined are also in colleges of engineering.

The issue before the council has arisen because materials expertise and education is split on our campus between two departments and two colleges, with a consequence that turf becomes a hindrance to academic innovation and better service to our students and that neither program has the resources to offer a full degree program. The fact is that neither the concentration in Mechanical Engineering nor Materials Science in Physics provides sufficient breadth and depth to perhaps, justify their “names.” The College of Engineering has offered to work with Physics to design and implement either a Minor in Materials Science and Engineering or a BS degree program. This would enhance both programs and better serve our students, and it is hoped will be the emphasis going forward.

Standalone degrees in Materials Science and concentrations in Materials Science are relatively rare. I only found a couple of concentrations in Physics and a couple in Chemistry. Predominantly, Materials Engineering degrees are housed in a college of engineering. Granted the Mechanical Engineering concentration does not provide the depth and breadth of a degree program, but neither does the Materials Science Concentration in Physics. In some sense, for a degree, they each lack what the other provides.

Engineering does not think that the name and curriculum of a Materials Engineering concentration should be determined by faculty in another college. When Physics proposed their name change and concentration in Materials Science, the concern in engineering was that the claim could then be made that they owned “Materials.” Nevertheless, engineering supported the change so that they would have the opportunity to grow their program and better serve their students. Engineering is only asking for the same consideration.

Materials Engineering is a broad term that covers many aspects of materials far beyond the domain of Mechanical Engineering (ME). The boundary between Materials Engineering and Materials Science is not presented in a distinct manner. The term “materials engineer” and “material scientist” is often used interchangeably and can lead to confusions and misunderstandings among students, and impact our enrollment. The fact that Materials Science and Engineering often appear together in one department demonstrates this exact point. The fact that the National Science Foundation (NSF) does not have separate Materials Science and Materials Engineering program is another indicator that it is not possible to discern the two from one another and there is a significant overlap between Materials Science and Materials Engineering. The use of the broad title “Material Engineering,” for the proposed concentration will likely harm the existing Materials Science concentration. Therefore, the Department of Physics and Materials Science (DPMS) is suggesting a **name change and retitling of the proposed concentration. We do not have objections to the usage of the word *materials*, but the title Materials Engineering does not accurately reflect the content taught, and the fact that it is housed in the ME department.** We have suggested alternative names (based on extensive search of other programs housed in a ME Department, with similar course content) such as “Solid Mechanics”, “Mechanics of Materials”, “Manufacturing Engineering” or “Materials Processing”. This compromise has not been entertained by colleagues in the ME Department. While we are open to discussions, partnerships, and future programs that connect across the two colleges, the discussion today focuses on the proposed concentration and all other potential partnerships should be evaluated as they are proposed. We welcome those opportunities.

Under the current concentration design, a student could obtain a Materials Engineering concentration without taking a single materials specific course, as MECH4340 (Manufacturing Processes), 4343 (Metallurgical Aspects of Manufacturing), 4341 (Introduction to Additive Engineering), and 4360 (Selection of Engr Materials) are all more relevant towards manufacturing. This is evidenced by their simultaneous listing in the proposed Advanced Manufacturing concentration.

The Justification provided for this concentration says, “*A thorough understanding of materials, empowers **mechanical engineers** to make informed choices when selecting materials or addressing challenges related to in-application materials.*” Providing materials training to mechanical engineers is not the same as training materials engineers. In other universities, materials training for mechanical engineers is provided through concentrations such as “Mechanics of Materials” and “Solid Mechanics.” In fact, the proposed concentration content is very similar to these concentrations under the mechanical engineering programs in other universities. While listed examples of mechanical engineering departments, as well as many others throughout the US, have concentrations that are similar in terms of course offering, the titles of these concentrations are distinctly different from “Materials Engineering”, with “mechanics” often included in their name to further link them to their ME home. These include “Engineering Mechanics of Materials and Structures (Northwestern),” “Engineering Mechanics (Michigan State),” and “Mechanics of Materials, Structures and Design (U. Penn).” Of note, the other listed examples do not have a distinct materials concentration, with Brown offering a specialization (a Sc. B. degree, equivalent to a B. Sc.) housed in Materials Science and Engineering, and U. Washington offering a degree specialization titled “Bachelor of Science in Mechanical Engineering degree: Nanoscience and Molecular Engineering.” ***These are not concentrations but unique degree program offerings with names distinctly reflecting content related to Mechanical Engineering.***

The DPMS has suggested to the ME Department to adopt a name that is more in line with other universities within the scope of Mechanical Engineering to avoid harming the Materials Science concentration. *We emphasise that the concerns and objections raised here are not associated with the use of the word *materials*-rather the misrepresentation of the concentration goals and offerings.* It is quite clear that the new concentration is intended to claim the name, but not to provide materials training to mechanical engineers as written in the justification.