

Electrical and Computer Engineering Committee Meeting – Minutes

January 12, 2023

12:30 – 1:30 p.m.

CP 303 / Zoom

Attendance

Voting Faculty: Orlando Baiocchi, Vahid Dargahi, Debasis Dawn, Mohammed Jasim, Max Laddomada, Thillainathan Logenthiran, Mike McCourt*, Jenny Sheng*, Nafiul Siddique, Matt Tolentino

**=not present for vote*

Non-Voting Faculty and Staff: Zaide Chavez, Don McLane, Beth Jeffrey, Rachel Crook

Items

1) Approve the minutes of our ECE Curriculum meeting held on December 6, 2022

Moved: M. Tolentino

Seconded: V. Dargahi

Eligible to vote: 10 (2 voting faculty members not present for vote)

8 in favor, 0 against, 0 abstain

2) Seminar on C for EE students in Spring

Based on feedback from students who have taken this seminar in the past, they don't see the importance of C programming, and typically will register and then drop in the middle. The committee discussed whether the C seminar should continue to be offered. Since C programming is such an important skill, the advisor suggested marketing this seminar to students as a skill that will help them in their job search post-graduation. This could include having representatives from industry talking to our students and informing them the importance of knowing C programming, or by word of mouth from the advisor. The committee agreed that this seminar is important, so it may be worth it to offer it again after emphasizing the importance to current students. Since there is a push to offer more electives in the master's program (a poll was sent to MSECE students to see who needs to take 510 and other courses), the Chair will wait to see the results to make a decision of whether to offer this seminar again or not.

3) Reminder to review graduate applicants assigned by Victoria

Victoria is assigning applications for MSECE – MyGrad does not notify you when an application has been assigned, so it's important for reviewers to check it weekly to make sure there all reviews have been submitted.

4) Discussion on revised grids for EE and CENGR degrees

There is a tentative possible revision of the course offerings for CE and EE – these tentative grids were shared, and the committee discussed the proposed changes to make sure there aren't any "ripple effects" for students. It's easier to switch the year that a course is offered rather than just the quarter. Some of the possible revisions include:

- For EE
 - Move TEE 331 from fall senior year to fall junior year
 - Moving 310 from fall quarter to winter quarter junior year, and then moving 380 for EE from winter to spring quarter – this will be a good change, since we offer 380 separately for CE and EE students. This way, we could merge it.
 - Moving 341 from spring to fall of senior year
- For CENGR
 - Move 310 from fall quarter junior year to winter quarter
 - Move TCSS 321 from winter to fall
 - Move TCES 390 from fall junior year to winter

All of these changes are tentative, and have not yet been made. This will be discussed further in our next meeting.

5) Changes of Prerequisites for required courses in the BSE EE and BS CENGR

The Chair would like to streamline the process for students to apply, which could reduce the competition we have with other engineering programs if we allow students to be admitted sooner rather than later. Proposed changes included below.

Motion: to approve prerequisites as discussed in the included table

Moved: M. Tolentino

Seconded: T. Logenthiran

Eligible to vote: 10 (3 voting faculty absent for this vote)

7 in favor, 0 against, 0 abstain

Required Course -- Computer Engineering	New prerequisites
<p>TCES 203 Programming Practicum (5) Provides practical experience designing and developing a large, complex programming project. Introduces true object-oriented language like C++ and Java to build on the number of tools available to engineers for designing more complex projects. Prerequisite: minimum grade of 2.0 in either TCES 202, TCSS 143, or CSE 143.</p>	<p>Prerequisite: minimum grade of 2.0 in either TCES 202, TCSS 143 or CSE 143.</p>
<p>TCES 215 Electrical Circuits (5) Introduction to electrical engineering. Basic circuit and systems concepts. Mathematical models of components. Kirchoff's laws. Resistors, sources, capacitors, inductors, and operational amplifiers. Solution of first and second order linear differential equations associated with basic circuit forms. Prerequisite: a minimum grade of 2.0 in TMATH 126; a minimum grade of 2.0 in T PHYS 122. Offered: Sp.</p>	<p>Prerequisite: a minimum grade of 2.0 in TMATH 126; a minimum grade of 2.0 in T PHYS 122; a minimum grade of 2.0 in TMATH 207. Offered: Sp.</p>
<p>TCES 230 Introduction to Logic Design (5) RSN Examines Boolean algebra and logic simplification, design of combined logic for decoders and multiplexers, and design of sequential devices including registers, and counters. Analysis of devices for logic networks including, three-state, CMOS, programmable logic devices. Uses tools for schematic capture and circuit simulations. Introduction to state machines. Laboratory required. Prerequisite: Minimum grade of 2.0 in either TCSS 142 or TCES 201; minimum grade of 2.0 in TMATH 126. Offered: A.</p>	<p>Prerequisite: Minimum grade of 2.0 in either TCSS 142 or TCES 201; minimum grade of 2.0 in TMATH 126. Offered: A.</p>
<p>TCES 310 Signals and Systems (5) NSc Covers theoretical concepts and mathematical tools used for the design and analysis of continuous-time linear systems as well as analog signals. Topics covered in this course include linear convolution, impulse response, Laplace transform, Fourier series and Fourier transforms. Computer laboratory: Matlab is introduced for the analysis of signals and systems. Prerequisite: a minimum grade of 2.0 in TCES 215.</p>	<p>Prerequisite: a minimum grade of 2.0 in TCES 215; a minimum grade of 2.0 in TMATH 126</p>
<p>TCES 312 Electronic and Analog Circuits (5) Physics, characteristics, applications, analysis, and design of circuits using semiconductor diodes and field-effect transistors with an emphasis on large-signal behavior and digital logic circuits. Introduction to operational amplifiers, frequency analysis and response, and filters. Prerequisite: a minimum grade of 2.0 in either TCES 215 or E E 215. Offered: W.</p>	

<p>TCES 330 Digital Systems Design (5) Examines digital system design fundamentals using programmable logic devices (PLDs). Uses Verilog to analyze and design complex digital systems based on field programmable gate arrays (FPGAs). Uses testing techniques to verify design and introduces operation of digital systems. Prerequisite: a minimum grade of 2.0 in TCES 230.</p>	
<p>TCES 372 Machine Organization and Architecture for Computer Engineers (5) Covers the general features of computation systems, including an introduction to processor architecture, instruction sets, assembly programming, cache and memory architecture, debug monitors, and translation from higher level languages to machine language. Prerequisite: a minimum grade of 2.0 in TCES 230.</p>	
<p>TCES 380 Stochastic Signal Theory for Engineers (5) RSN Introduces students to fundamental principles of probability and stochastic processes used in electrical and computer engineering practice. Topics covered in this course include probability theory, discrete and continuous random variables and statistical description, statistical characterization of sequence of random variables, and stationary random processes. Prerequisite: minimum grade of 2.0 in TCES 310</p>	<p>Prerequisite: minimum grade of 2.0 in TCES 310 a minimum grade of 2.0 in TMATH 126</p>
<p>TCES 420 Principles of Operating Systems (5) Covers the fundamental principles of operating design and function for both general purpose computing and real-time application control. Includes concurrent processes, scheduling, inter-process communications, memory management, I/O, and file systems. Prerequisite: minimum grade of 2.0 in TCES 372.</p>	
<p>TCES 421 Digital Integrated Circuit Design (5) Covers digital integrated circuit manufacturing process; design rules; diodes; MOS(FET) transistors; interconnect wires; analysis and design of CMOS inverters; combinational and sequential circuits; arithmetic operators and memory; implementation strategies; timing issues; and CAD tools. Prerequisite: minimum grade of 2.0 in both TCES 230 and TCES 312.</p>	
<p>TCES 430 Microprocessor System Design (5) Introduces hardware and software design techniques for microprocessor-based systems. Gives experience designing and implementing a system using current technology and components. Provides the opportunity to interface microprocessors to external devices. Gives experience using state-of-the-art development systems and procedures. Prerequisite: either a minimum grade of 2.0 in TCES 372, or a minimum grade of 2.0 in TEE 372</p>	

<p>TCES 460 Embedded Systems Design (5) Guides integration of knowledge learned in prior courses in preparation for completion of the senior project in TCES 482. Covers the analysis, design, and prototyping of an embedded control application. Prerequisite: a minimum grade of 2.0 in TCES 420; and a minimum grade of 2.0 in TCES 430.</p>	
<p>TCES 480 Senior Project I (2) Covers the preparation for conducting the senior project systems analysis and design and implementation, testing, and delivery. Includes case studies of engineering projects. Prerequisite: a minimum grade of 2.0 in TCES 203; a minimum grade of 2.0 in TCES 310; a minimum grade of 2.0 in TCES 312; a minimum grade of 2.0 in TCES 330; and a minimum grade of 2.0 in TCES 372.</p>	

Required Course -- Electrical Engineering	New prerequisites
<p>TEE 225 Engineering Ethics (5) A&H/SSc Examines ethical theory and moral values. Explores classic and contemporary ethical theory through comparative literature analysis. Emphasizes writing, and construction of ethical arguments as applied to the field of engineering in diverse, global societies. Analyzes historical and contemporary ethical issues in engineering including privacy, security, intellectual property, and emerging technology.</p>	
<p>TEE 315 Electrical Circuits II (4) Provides further exploration techniques of advanced circuit analysis after learning materials in Electrical Circuits I. Topics include review of AC Circuits, Power and Energy, Three-phase circuits, Two-port circuits, Laplace Transform, Filters, and Ideal Transformers. Prerequisite: a minimum grade of 2.0 in TCES 215.</p>	
<p>TEE 316 Electronics and Analog Circuits II (5) Examines amplifier frequency response, feedback amplifiers and oscillators, digital electronics, and power amplifiers. Prerequisite: minimum grade of 2.0 in TCES 312.</p>	
<p>TEE 317 Electric Machines (5) Investigates fundamental principles of electromechanical energy conversion systems and rotating electrical machines. Covers the various types of the transformers, synchronous generators, induction motors, and the series, shunt, and compounded DC machines. Employs MATLAB for computer simulations, steady-state calculations, and characteristic curve extraction in AC and DC machines. Prerequisite: a minimum grade of 2.0 in TEE 315.</p>	
<p>TEE 331 Applied Electromagnetics (4) Examines concepts of Vector Analysis, Electrostatic</p>	<p>Prerequisite: minimum grade of 2.0 in both TEE 315 and TCES 310.</p>

<p>and Magnetostatic Fields, Time-Varying Electromagnetic Fields, and Maxwell Equations, plane wave propagation, guided waves, and Radiation and Antennas. Prerequisite: minimum grade of 2.0 in both TEE 315 and TCES 310.</p>	
<p>TEE 341 Communication Theory (4) Examines analog modulation including amplitude modulation (AM) and angle modulation (FM and PM), noise in communication systems, probability theory and random processes used in the design and analysis of communication systems, digital communication systems including digital pulse code modulation, and analysis and evaluation of modern communication systems. Prerequisite: a minimum grade of 2.0 in TCES 380.</p>	<p>Prerequisite: a minimum grade of 2.0 in TCES 380; minimum grade of 2.0 in TCES 310</p>
<p>TEE 372 Computer Architecture for Electrical Engineers (3) Covers instruction set design, assembly programming, CPU microarchitecture including pipelining and superscalar design, cache design and hierarchies, multi-level memory systems, and architectural performance analysis. Prerequisite: a minimum grade of 2.0 in TCES 230.</p>	
<p>TEE 431 Power Systems (5) Provides a systematic understanding of the operation of a modern electricity network, operating under balanced steady-state and fault conditions. It is designed to be of value to students who are considering a career in the electricity supply industry or any large industrial user with their own power network. Prerequisite: a minimum grade of 2.0 in TEE 315.</p>	<p>TEE 317 electric machine?</p>
<p>TEE 451 Control Systems (5) System representation, feedback characteristics, and time-domain characteristics. Classical control theories including Routh-Hurwitz stability criterion, root locus, Nyquist criterion, Bode plots and Nichols charts. Introduces controller digitization, z-transform, and state-space approach. Provides experience in using computers to implement PID controllers to control motors and other physical actuators. Reteam projects in the laboratory. Prerequisite: a minimum grade of 2.0 in TCES 310.</p>	<p>Prerequisite: a minimum grade of 2.0 in TCES 310; a minimum grade of 2.0 in TMATH 208</p>
<p>TEE 453 Digital Signal Processing (5) Discrete-time convolution, difference equations, the z-transform, and the discrete-time Fourier transform. Digital signal processor architectures. Analysis and design of digital network and finite/infinite impulse response digital filters. Implementation of the fast Fourier transform algorithm. Prerequisite: a minimum grade of 2.0 in TCES 380.</p>	<p>Prerequisite: a minimum grade of 2.0 in TCES 310.</p>

<p>TEE 480 Senior Project I (2) Covers the preparation for conducting the senior project systems analysis and design (TEE481), and implementation, testing, and delivery (TEE482). Includes case studies of engineering projects. Prerequisite: a minimum grade of 2.0 in TCES 230; a minimum grade of 2.0 in TCES 310; a minimum grade of 2.0 in TEE 315; a minimum grade of 2.0 in TEE 316; and a minimum grade of 2.0 in TEE 317.</p>	
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6) EE and CENGR ABET assessment schedule for Winter 2023

This item was not discussed

7) Updates from our ECE advisor

The advisor is requesting to offer 230 in summer – so far, we are planning to offer 215, 310, and 230 because several students failed it last quarter, which is making registration more difficult for students in the Computer Engineering track. If they don't have 230 they won't be able to take fall classes, and also can't get into the senior project. If we could offer 230 with students who failed in summer, they can stay on track to graduate. The Chair agreed that 230 should be offered, and suggested allowing students who passed 215 to enroll since they're technically in the major.

8) Updates from our faculty council representatives

This item was not discussed

9) Old business

n/a

10) New business

n/a