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**Bulletin / Banner Change Transmittal Form**

**[x] Undergraduate Curriculum Council**

**[ ] Graduate Council**

Signed paper copies of proposals submitted for consideration are no longer required. Please type approver name and enter date of approval.

Email completed proposals to [curriculum@astate.edu](mailto:curriculum@astate.edu) for inclusion in curriculum committee agenda.

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| |  |  | | --- | --- | | Shubha Kher | 3/30/2018 |   **Department Curriculum Committee Chair** | |  |  | | --- | --- | | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Enter date |   **COPE Chair (if applicable)** |
| |  |  | | --- | --- | | Shubha Kher | 3/30/2018 |   **Department Chair:** | |  |  | | --- | --- | | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Enter date |   **Head of Unit (If applicable)** |
| |  |  | | --- | --- | | Jason Stewart | 3/30/2018 |   **College Curriculum Committee Chair** | |  |  | | --- | --- | | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Enter date |   **Undergraduate Curriculum Council Chair** |
| |  |  | | --- | --- | | Brandon Kemp | 3/30/2018 |   **College Dean** | |  |  | | --- | --- | | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Enter date |   **Graduate Curriculum Committee Chair** |
| |  |  | | --- | --- | | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Enter date |   **General Education Committee Chair (If applicable)** | |  |  | | --- | --- | | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Enter date |   **Vice Chancellor for Academic Affairs** |

**1.Contact Person** (Name, Email Address, Phone Number)

Brandon Kemp, [bkemp@astate.edu](mailto:bkemp@astate.edu), 870.972.2088

**2.Proposed Change**

The BSEE program and courses have a number of prerequisite inconsistencies that need to be corrected in the bulletin.

* + - EE 4353 Power Systems and EE 4323 Electrical Machinery have a prerequisite ENGR 3423 Dynamics. However, ENGR 3423 is not part of the EE curriculum. Prerequisite for EE 4353 Power Systems and EE 4323 Electrical Machinery need prerequisite ENGR 3423 Dynamics removed from UG Bulletin and Banner.
    - EE 4373 Electronics II: Remove ENGR 3443 Thermodynamics I prerequisite
    - EE 4773 Remove EE 3333 Prerequisite
    - EE 3363 Semiconductor Materials and Devices:
      * Change EE 3403 Electronics I to corequisite
      * Change PHYS 2034 University Physics I prerequisite to PHYS 2044 University Physics II
      * Remove ENGR 3443 Thermodynamics I prerequisite.

**3.Effective Date**

8/15/2018

**4.Justification –** *Please provide details as to why this change is necessary.*

Changes to the BSEE program were originally made for the 2014-15 academic year. However, not all changes found their way to the bulletin. The changes contained herein represent prerequisite structure used in practice.

**Bulletin Changes**

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| **Instructions** |
| **Please visit** [**http://www.astate.edu/a/registrar/students/bulletins/index.dot**](http://www.astate.edu/a/registrar/students/bulletins/index.dot) **and select the most recent version of the bulletin. Copy and paste all bulletin pages this proposal affects below. Follow the following guidelines for indicating necessary changes.**  **\*Please note: Courses are often listed in multiple sections of the bulletin. To ensure that all affected sections have been located, please search the bulletin (ctrl+F) for the appropriate courses before submission of this form.**  - Deleted courses/credit hours should be marked with a red strike-through (~~red strikethrough~~)  - New credit hours and text changes should be listed in blue using enlarged font (blue using enlarged font).  - Any new courses should be listed in blue bold italics using enlarged font (***blue bold italics using enlarged font***)  *You can easily apply any of these changes by selecting the example text in the instructions above, double-clicking the ‘format painter’ icon 🡪 , and selecting the text you would like to apply the change to.*  *Please visit* [*https://youtu.be/yjdL2n4lZm4*](https://youtu.be/yjdL2n4lZm4) *for more detailed instructions.* |

2017-18 Undergraduate Bulletin (Pg 428):

**ELECTRICAL ENGINEERING PROGRAM**

**Electrical Engineering (EE)**

**EE 2322. Electrical Workshop** Develop understanding and skills related to various workshop processes involved in electrical engineering. Workshop safety, electrical wiring and assembly, winding practice, domestic electrical appliances, soldering and de-soldering techniques, electronic project construction techniques, use of electronic bench equipment, preparation of reports. Prerequisite, PHYS 2034. Fall.

**EE 3313. Electric Circuits II** Transient analysis, average power, RMS values, mutual inductance, resonance, network theorems and principles, polyphase networks, complex power. Prerequisite, C or better in MATH 2214 and ENGR 2423. Spring.

**EE 3331. Digital Electronics I Laboratory** Experimentation and design with digital electronic and computer components and circuits including logic gates, flip flops, counters, and registers. Practical applications in timing and control. Logic families such as TTL, ECL, and CMOS. Prereq­uisite, C or better in ENGR 2421 and EE 3333. Demand.

**EE 3333. Digital Electronics I** Introduction to the analysis and design of digital and computer circuits, Boolean algebra, binary arithmetic, combinational logic, sequential logic, registers, counters, adders, comparators, and computer organization. Prerequisite, C or better in either CS 2114 or ENGR 2423. Fall.

**EE 3343. Engineering Fields and Waves** Study of time invariant electric and magnetic fields in free space and in materials, electrical current flow as a function of electric field, magnetic flux, interaction of magnetic fields with electrical current and voltage, electrical and magnetic potentials, time changing electric and magnetic fields, and introduction to Maxwell’s Equations. Prerequisites, C or better in MATH 3254 and EE 3313. Fall.

**EE 3353. Signals and Systems** Methods of analysis of continuous and analog systems and associated synthesis, simulation, and design, system response in the time and frequency domains, Laplace transforms, Fourier series and transforms, Z-transforms, transfer functions, and convolu­tion. Prerequisite, C or better in EE 3313. Corequisite, MATH 4403. Fall.

**EE 3363. Semiconductor Materials and Devices** Semiconductor materials and theory of solid state electronic devices. Semiconductor growth and processing techniques. Semiconductor parameters such as bandgap, mobility, carrier densities, diffusion length, carrier lifetime, and en­ergy level distribution. Pn junctions and Schottky barriers. Constraints and limitations on practical devices. Prerequisite, C or better in CHEM 1013, PHYS ~~2034~~2044~~, and C or better in EE 3403 and ENGR 3443.~~ Corequisite, EE 3403. Spring, even.

**EE 3383. Principles and Practices in Electrical Engineering** Principles of and good prac­tices in electrical engineering, professional organizations, literature, intellectual property, licensure, ethics and regulations, vendors, products, specifications, procurement, communications and human relations, resource management, product certification and manufacturability, and modern and tools and issues. Prerequisite, C or better in EE 3313. Spring.

**EE 3393. Probability and Random Signals** Application of probabilistic models and analysis techniques to engineering signals and systems with inherent randomness. Topics include prob­ability theory, probability density functions, random variables, random vectors, estimation, detec­tion, discrete and continuous processes, and power spectra. Prerequisite, C or better in EE 3353. Spring.

**EE 3401. Electronics I Laboratory** Basic laboratory experiments in electronic circuits and solid state electronic devices. Corequisite, EE 3403. Prerequisite, C or better in ENGR 2421. Fall.

**EE 3403. Electronics I** Theory, analysis, and introductory design of diode, bipolar junction transistor, operational amplifier, and field effect transistor devices and circuits. Prerequisite, C or better in ENGR 2423. Fall.

2017-18 Undergraduate Bulletin (Pg. 429):

**EE 4303. Electromagnetic Waves** Study of time harmonic electromagnetic wave interaction with materials including energy and momentum, polarization, reflection, refraction, waveguides, radiation, and scattering. Prerequisites, C or better in EE 3343 or PHYS 2044, and C or better in MATH 4403. Dual listed as EE 5303. Spring, odd.

**EE 4313. Control Systems** Analysis and design of linear feedback systems. Transfer func­tions, transient and steady state characterization, stability determination. Closed loop analysis and design using root locus and frequency domain methods. Prerequisites, C or better in EE 3403. Corequisite, EE 3353. Dual listed as EE 5313. Demand.

**EE 4333. Communications Theory** Frequency spectra of time signals. Review of Fourier series and transforms. Signal mixing, modulation, and demodulation. AM and FM broadcasting techniques and bands. Pulsed and digital communication modes. Prerequisite, C or better in EE 3353 and EE 3403. Dual listed as EE 5333. Demand.

**EE 4323. Electrical Machinery** Introduction to the analysis and design of electromechanical energy conversion systems, magnetic circuit theory, general transformer and machinery theory, and DC and AC motors and generators. Prerequisite, C or better in EE 3313 or ENGR 3473~~, and ENGR 3423~~. Dual listed as EE 5323. Demand.

**EE 4343. Digital Signal Processing** Analysis and design of discrete linear systems and processing of digital signals. Topics include: time and frequency domain approaches to discrete signals and systems, discrete Fourier transform and its computation, and design of digital filters. Prerequisites, C or better in EE 3353, EE 3403, and EE 3333. Spring.

**EE 4344. Embedded Systems** A microcomputer and programmable logic controller course for junior and senior level engineers. A survey of small computers and their engineering functions including control, sensing, and computation. The concept of using control programming languages is introduced. Prerequisites, C or better in EE 3333 and EE 3401, or consent of instructor. Dual listed as EE 5344. Demand.

**EE 4353. Power Systems** Generation, transmission, and distribution of large scale electrical power, associated energy losses and practical design problems and complications. Transmission line analysis. Three phase power networks. Load monitoring and control. Prerequisite, C or better in EE 3313 ~~and ENGR 3423~~. Corequisite, MATH 4403. Dual listed as EE 5353. Demand.

**EE 4354. Intelligent Control Systems** Introduction of fuzzy logic, fuzzy logic in control engineering, neural networks, Bayesian or belief networks, neuro-fuzzy systems, neuro-fuzzy controllers, controller design, and application problems. Prerequisite for EE majors, C or better in EE 4313; Prerequisite for ME majors, C or better in ME 3613. Dual listed as EE 5354. Spring, even.

**EE 4373. Electronics II** A continuation of EE 3403 with emphasis on the analysis, simulation, and design of feedback, operational amplifier systems, frequency response, integrated circuits, and power and waveshaping circuits. Prerequisite, C or better in EE 3313~~, ENGR 3443,~~ and EE 3403. Dual listed as EE 5373. Spring, odd.

**EE 4383. Digital Electronics II** Continuation of the study of digital circuit design with emphasis on the design of larger systems and use of LSI components. Register transfer logic, computer interfacing and design, and microcomputer based system design. Prerequisite, C or better in EE 3333. Demand. Dual listed as EE 5383.

**EE 4743. Digital Communications** Continuation of communications theory with emphasis on modulation and demodulation techniques, signal space representation of digitally modulated signals, coherent/non-coherent detection methods (and receiver structures) in AWGN channel, error performance, communication over band-limited channels with ISI and AWGN. Prerequisites, C or better in EE 3393 and EE 4333. Spring, odd.

**EE 4773. Electronics II Laboratory** Advanced design-oriented experiments in electron­ics, measurement, interfacing, and other electrical engineering topics. Corequisite, EE 4373. Prerequisites, C or better in ~~EE 3333, and~~ EE 3401. Spring.

**EE 479V. Special Problems in Electrical Engineering** Individually directed problems in electrical engineering for juniors and seniors. A course outline and project summary listing the goals and expected outcomes must be approved by the student advisor and the program director. Prerequisites are dependent on the nature of the special problem. Demand.