

Curricular Revisions since Fall 1997

The following courses have been revised and changed based on our ongoing outcomes since the fall 1997 semester.

EEE 185 – (Modern Communication Systems) – Revision of content – Fall 1997

Updated catalog description to conform to program change implemented fall 1997. The co-requisite for the course was changed from ENGR 115 (Statistics for Engineers) to ENGR 120 (Probability and Random Variables).

EEE 196P – (Power Electronics Lab) – New course (subsequently renumbered to EEE 148) – Fall 1997

Responding to demand from industry, we introduced a new elective laboratory course in Power Electronics. This course focuses on solid state applications in power control. The faculty members who developed this course attended an NSF sponsored workshop on Power Electronics and used material from the workshop to create the course.

EEE 192 A/B – (Electrical Senior Design Project I and II) – Revision of content, prerequisites and renumbering of sequence – Spring 1998

EEE 193 A/B – (Product Design I and II) - Revision of content, prerequisites and renumbering of sequence – Spring 1998

These changes were instituted to ensure that all students entering the senior design sequence (Power Engineering or Electronics) are well prepared and that they have successfully completed all required junior level prerequisite courses. The electronics sequence was strengthened with the addition of EEE 109 (Electronics II), and the power sequence was strengthened with the addition of EEE 141 (Power Systems Analysis) and EEE 143 (Power Systems Analysis Lab), as required courses.

EEE 196B – (Digital Signal Processing Lab) - New Laboratory Course (subsequently renumbered to EEE 182 and made a permanent course after 4 consecutive offerings) – Spring 1998

Responding to feedback from faculty, alumni, and industry; the Department submitted a proposal to the HP University Grants Program to establish a dedicated signal processing lab. This lab augments the existing theoretical DSP course (EEE 181) and has been very well received.

EEE 64W – (Introduction to Logic Design Workshop) – New Course – Fall 1998
ENGR 17W – (Circuits Workshop) – New Course (offered four times as an experimental course, ENGR 096C) – Fall 1999

ENGR 117W – (Networks Workshop) – New Course (offered four times as an experimental course, ENGR 196C) – Fall 1999

The workshop courses were created as a direct consequence of course embedded assessment in ENGR 17 (Circuit Analysis), EEE 117 (Network Analysis) and EEE 64 (Introduction to Logic Design). These courses are offered on a Credit/No Credit basis (not for a letter grade). Course embedded assessment results are used to advise students who need additional help or who may be under prepared to enroll in the corresponding workshop classes.

EEE 142 – (Energy Systems Control and Optimization) – Revision of content and prerequisite – Spring 1999

This course covers energy systems and ecology, load flow studies, sensitivity; optimum allocation and dispatching; optimal dynamic system control. MATLAB was explicitly added as a prerequisite to allow students to perform modern stability studies

EEE 180 – (Signals and Systems) – ENGR 120 added as a co-requisite – Fall 2000

As a result of this change, Probability and Random Processes (ENGR 120) is required before students enroll in the required communications engineering course (EEE 185). This allows topics in EEE 185 to be covered in greater depth and emphasize the applications of probability in communication systems.

EEE 108/108L – (Electronics I and Laboratory) – Prerequisite changes, Revision of content in the laboratory – Spring 2002

EEE 117L – (Electric Networks Laboratory) – Revision of content – Spring 2002

EEE 166 – (Physical Electronics) – Prerequisite changes – Spring 2002

EEE 193A – (Product Design I) – Prerequisite changes – Spring 2002

The curriculum pattern that existed between the fall 1997 semester and the fall 2001 semester in the junior and senior years is depicted in the table below. During this time, students were allowed to take EEE 108 (Electronics I) and EEE 117 (Electric Networks) concurrently. This also meant that there had to be very close coordination between the two associated laboratory courses in EEE 108 and EEE 117. As originally planned in fall 1997, this allowed students to complete EEE 109 (Electronics II) in the second semester of the junior year, prior to entering the senior design project sequence. However, course embedded assessment, especially in EEE 108, demonstrated that students need additional experience in Circuit Analysis before enrolling in Electronics I and would benefit if EEE 117 and EEE 166 (Physical Electronics) were required as prerequisites to the course. Similar conclusions emerged from an evaluation of student performance in the EEE 108 laboratory course. Hence, EEE 109 (Electronics II) was moved to the first semester of the senior year where it is now a co-requisite to

the culminating Product Design I course (EEE 193A). Topics in EEE 109 have been rearranged to ensure that it meets the needs of students in EEE 193A.

Assessment results in EEE 108L showed that students considered the EEE 117L laboratory to be somewhat superfluous. Many of the same topics in instrumentation and measurements were covered in both EEE 117L and EEE 108L. Usually the topics were considered first in EEE 108L since they were needed for a particular experiment. In addition, assessment results in the EEE 108 lecture showed that the students would benefit from a full semester of network analysis before beginning the electronic sequence. Hence, the decision was made to make EEE 117 a prerequisite to EEE 108. (Note that in the early 90's this was the curriculum order, but EEE 108 was moved to an earlier semester to allow the students to take an additional electronics course before the senior project.)

Previously, when EEE 108L, Electronics I Laboratory, and EEE 117L, Networks Analysis Laboratory, could be taken concurrently, there was always a lot of duplication and redundancy. Since EEE 117L was made a prerequisite to EEE 108L, the EEE 117L laboratory can focus on instrumentation and measurements while continuing to clarify the concepts being presented in the EEE 117 lecture. The EEE 108L laboratories can assume that the students are able to use the laboratory instruments and, hence, can now totally focus on reinforcing the concepts being presented in the EEE 108 lecture.

There were several changes made to the EEE 117L experiments. The most important change was moving the introduction to computer controlled instrumentation (GPIB) back to EEE 117L from EEE 108L. This changed the approach to experiments performed in the second half of the semester. The diode experiment, which had been used mostly to demonstrate Fourier series, was eliminated since it didn't seem appropriate for a course in linear circuits. It was replaced with a first order filter experiment which considers Bode diagrams and frequency response as well as time domain response and the Fourier series of square waves. A two part experiment on X10 attenuators (oscilloscope probes) was inserted. It considers and compares the design of the probe from the time domain approach and the frequency domain approach.

With the necessary instrumentation and measurements covered in EEE 117L, the EEE 108 L laboratories can start right out with meaningful experiments. The filter experiment was expanded out to include a second order Butterworth filter. The timing between the EEE 108 lecture and laboratory had always been a problem. Many semesters the laboratory got too far ahead of the lecture. Previously the last experiment (3 or 4 weeks) in EEE 108L was a project which could be selected from a list including op-amps, BJTs and FETs. This project has been moved ahead to the beginning of the semester. It has also been changed to include only op-amps, which have been covered

somewhat in EEE 117 and are usually the first topics considered in EEE 108. This gives about a three-week cushion for the lecture to cover topics before they are needed in the laboratory.

Curriculum Pattern from Fall 1997 – Fall 2001:

First Semester Junior Year	Second Semester Junior Year
EEE 117(3) EEE 117L(1) EEE 108(3) EEE 108L(1) EEE 161(4) EEE 166(3) ENGR 120(3)	EEE 109(4) EEE 174(4) EEE 130(3) ENGR 140(2) EEE 180(3)
Total (18)	Total (16)
First Semester Senior Year	Second Semester Senior Year
EEE 184(3) EEE 185(3) EEE 193A(2) Depth Elective Lecture(3) Depth Elective Lab(1) General Education (3)	EEE 193B(2) Breadth Elective Lecture(6) Depth Elective Lecture(3) General Education(6)
Total (15)	Total (17)

Curriculum pattern effective with the Spring 2002 semester:

First Semester Junior Year	Second Semester Junior Year
EEE 117(3) EEE 117L(1) EEE 161(4) EEE 166(3) ENGR 140(2) General Education(3)	EEE 108(3) EEE 108L(1) EEE 174(4) EEE 130(3) ENGR 120(3) EEE 180(3)
Total (16)	Total (17)
First Semester Senior Year	Second Semester Senior Year
EEE 109(4) EEE 184(3) EEE 185(3) EEE 193A(2) Depth Elective Lecture(3) Depth Elective Lab(1)	EEE 193B(2) Breadth Elective Lecture(6) Depth Elective Lecture(3) General Education(6)
Total (16)	Total (17)

EEE 143 – (Power Systems Analysis Lab) – Prerequisite changes – Spring 2002
EEE 147 – (Power Electronics) – Course deleted – Spring 2002

The Power subcommittee reviewed course outlines for the following courses and no changes were recommended: EEE 135, EEE 141, EEE 142, EEE 144, EEE 146, and EEE 148.

The course outlines for the following courses were updated: EEE 143.

The following courses were recommended for deletion: EEE 147.

The power sub-committee will also discuss the possibility of EEE 117 being a co-requisite to EEE 130.

EEE 154 – (Communication Circuit Design) – Revision of content – Spring 2002

EEE 185 – (Modern Communication Systems) – Prerequisite changes – Spring 2002

EEE 162 – (Applied Wave Propagation) – Revision of content – Spring 2003

The Communications subcommittee reviewed the entire sequence of courses in communication engineering and suggested several changes. The changes resulted in a change to the course descriptions.

The prerequisites to EEE 185 were modified to explicitly require ENGR 120, Probability and Random Processes as a prerequisite.

EEE 154, Communications Circuit Design, was modified to include transitions from low to high frequency, distributed parameters in coaxial lines and micro strip lines; characteristic impedances and reflection coefficients and impedance matching with lumped and distributed elements. The course now includes the characterization of high frequency transistors by scattering coefficients, transistor stability and gain circles and noise circle design. It also offers expanded coverage of basic antenna characteristics, directivity and transmission between two or more antennas. The course now requires EEE 161 (Transmission Lines and Fields) and EEE 109 (Electronics II) as prerequisites.

EEE 162, Applied Wave Propagation, was modified to provide the fundamentals for wireless communication systems. The course consists of a review of distributed circuit theory and the Smith chart. Impedance matching using series or shunt lumped and distributed circuits or near-quarter wave-matching sections are covered. Other topics that are included are noise temperature noise figure, scattering coefficient characterization of two-ports, stability circles for high frequency transistors, constant gain and noise figure circles and basic antenna theory. These topics are illustrated by their use for cell phones and other wireless systems.

EEE 135 – (Power Systems Relay and Protection) – Prerequisite changes – Fall 2002

The Power subcommittee approved changes to EEE 135, requiring EEE 130 (Electromechanical Energy Conversion) and EEE 141 (Power Systems Analysis) as prerequisites to the course.

EEE 188 – (Digital Control Systems) – Prerequisite changes – Fall 2002
EEE 189 – (Control Systems lab) – Content revised – Fall 2002

Feedback from alumni surveys indicates a problem with the controls area in that the prerequisites prevent several students from enrolling in the control elective courses. The control subcommittee reviewed the courses in the controls area and recommended that EEE 180 (Signals and Systems) rather than EEE184 (Feedback Control Systems), a required core course, should be a prerequisite to EEE 188. The concern is that students do not get to EEE 184 until their last term at CSUS and cannot take EEE 188. The committee approved this request and developed a weekly course outline for EEE 184 and EEE 188 to ensure that there is no duplication of materials.

The content for EEE 189 (Control Systems Lab) was revised to reflect extensive application of MATLAB and Simulink, the role of digital control systems, and practical examples of analysis and compensation for closed loop systems.

EEE 196W – Applied Wireless Systems – New course – Fall 2002

This course was created as a service course for Computer Engineering majors seeking an overview of wireless communications. It includes an introduction to wireless radio frequency and microwave communication systems. Several illustrative examples of how such components fit together and achieve their objectives are analyzed. Some performance data on devices and components is included. IEEE standards for wireless communication systems are introduced. The course cannot be taken for credit by E&EE majors.

EEE 183 – (Digital Communications) – Revision of content – Spring 2003

Feedback from industry and alumni indicates that there is a need to cover the concepts of wireless communications at the undergraduate level. The course change proposal for EEE 183, Digital and Wireless Communication Systems, was approved by the Curriculum Committee with minor changes. The Committee suggested that EEE 185, Modern Communication Systems, should be a prerequisite for the new EEE 183, wireless communication course. This led to the discussion that most students take EEE 185 in the final year of undergraduate study which leaves them little scope to take other communications or control electives.