1. OVERVIEW OF THE ELECTRICAL ENGINEERING MAJOR

Electrical engineering is the application of scientific and mathematical principles to the design, manufacture, and control of structures, machines, processes, and systems. In $-\check{S}\ddagger f \bullet - \check{a} - \check{S}\ddagger f \circ - \check{a} - \check{S} \circ - \check{a} - \check{S} \circ - \check{a} - \check{S} \circ - \check{a} -$

The electrical engineering program, accredited by the Engineering Accreditation Commission of ABET (Accreditation Board for Engineering and Technology, Inc.) http://www.abet.org, spans the disciplines of electronics, computers, circuits, electromagnetic fields, power systems, controls, communications, signal processing, and solid state materials and devices. The degree requires a minimum of 121 credit hours which include at least 27 credit hours from UNLV's General Education Core. Graduates of the program will receive a Bachelor of Science in Engineering with Major in Electrical Engineering.

The Department also offers a major in Computer Engineering. For further information about that major, a separate handbook is available on the Electrical and Computer Engineering Department website.



3. ELECTRICAL ENGINEERING MAJOR ENTRANCE REQUIREMENTS

To enter the Electrical Engineering (EE) Major, a student must be admitted to the College of Engineering. Students who have been admitted to the College of Engineering and are interested in being admitted to the EE Major will be placed in the Electrical Engineering Pre-major (EEPRE). A student in the EEPRE is eligible to submit an application to the Engineering Advising Center for advanced standing in the EE Major after completing 8 credits of the 46-credit EEPRE curriculum

ELECTRICAL ENGINEERING CURRICULUM

The undergraduate Electrical Engineering major requires the completion of courses in the following areas, which are described in the remainder of the section.

Χ	General Education Core:	27-30	credits
Χ	Math, Computer Science, and Natural Science:	29	credits
Χ	Fundamental Courses:	33	credits
Χ	Core Courses:	15	credits
Χ	Labs:	4	credits
Χ	Professional Electives:	9	credits
Χ	Math/Science Elective:	4	credits
	TOTAL:	121-124	credits

4.1 REQUIRED UNLV GENERAL EDUCATOOONRE COURSEST (30 CREDITS)

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English Cighisinhin1 -2c Ehhins

Mathematics - Credits: (Fulfilled by Major Requirements)

f MATH 181 - Calculus I

Multicultural and International Requirements (overlap) f Multicultural requirement (3 credits) f International requirement (3 credits)

The multicultural and international requirements can simultaneously fulfill[/Bota1.993 (1Tth15 (II[/Bota1ng(ent)4

4.6 REQUIRED ELECTRICAL ENGINEERING PROFESSIONAL ELECTIVE COURSES (9 CREDITS)

Each student must complete 9 credits of approved professional electives that are listed in Table 1. Of the 9 credits, six of the credits must be EE or CpE courses. Students are encouraged to select sequences within a particular core field. The other three credits must be mathematics or science courses (BIOL, CHEM, MATH, PHYS, STAT). Students who want to apply a professional elective that is not listed in Table 1 towards their EE degree• — • – ' " – f (• – Š ‡ † ' f " – • ‡ • – Š f (" \ddot{i} • f Undergraduate Curriculum Committee Š f (" \ddot{i} • f " " \ddot{i} • f "

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Table 1: Professional Electives for Electrical Engineering

Unless also listed below, the prerequisites for these courses do not qualify as professional electives.

CpE400 CpE403 CpE404 CpE405 CpE 407 CpE 408 CpE 409 CpE 476 CpE 477	Computer Communications Network Advanced Embedded Systems Modern Processor Architecture Information Coding Systems Biometrics and Machine Learning VLSI Physical Design and Testing Embedded DSP Mobile Robotics Embedded Security and Machine Learning
EE 310	Principles of Solid State and Optoelectronic Systems
EE 330	Engineering Electromagnetics
EE 340	Power System Engineering
EE 370	Control System
EE 420	Electronics II
EE 421	Digital Integrated Circuit Design
EE 430	Transmission Lines
EE 431	Engineering Optics
EE 432	Antenna Engineering
EE 436	Active and Passive Microwave Eng.
EE 442	Power Electronics
EE 446	Photovoltaic Devices and Systems
EE 450	Solid State Devices
EE 451	Electroinc & Mag. Materials & Devic.
EE 452	Intro to Optical Electronics

4.9 MISCELLANEOUS REQUIREMENTS

Each student must also meet all College of Engineering requirements including those relating to college suspension and readmission. The Department can refuse to accept any course taken more than eight years prior to graduation.

5. COURSE PLANS AND GRADUATION APPLICATIONS

Every student must consult an advisor in the Engineering Advising Center every semester before registering and make or update a Degree Worksheet. One year before graduation the student should submit a Graduation application. The example schedules and degree worksheet located at the end of this handbook are provided to help guide students while planning their class schedules.

Electrical engineering students should expect to study about 2 to 3 hours per week outside class for each credit. For example, a student taking 16 credit hours should expect to spend 32 to 48 hours each week studying outside of class. Combined with time in class, this works out to a total of 48 to 64 hours spent on academic work. Students who are working while attending school should adjust their academic load accordingly. The following serves as an overall guideline.

Academic Load		Expected Study Time	Maximum Non-Academic Workload
Fall or Spring	Summer		
16 credits	6 credits	32 to 48 hours / week	0 to 8 hours / week
12 credits	3 credits	24 to 32 hours / week	8 to 16 hours / week
8 credits		16 to 24 hours / week	16 to 22 hours / week
3 credits		6 to 9 hours / week	32 to 40 hours / week

6. FACULTY

The faculty of the Department of Electrical and Computer Engineering are:

Emma Regentova
Ebrahim Saberinia
Robert Schill, Jr.
Henry Selvaraj
Sahjendra Singh
Peter Stubberud
Ke-Xun (Kevin) Sun

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Brendan Morris

7. COURSE DESCRIPTIONS IN ELECTRICAL ENGINEERING

ELECTRICAL ENGINEERING

All prerequisites must be completed with a grade of C or higher.

EGG 101 - Introduction to Engineering Experience

Prerequisites: For undergraduate degree-seeking students only.

Notes: Combination of EGG 101 and EGG 202 satisfies First Year Seminar requirement.

EGG 202 - Second Year Hands-on Design Experiences in Engineering and Computer Science

A holistic experience for second-year engineering and computer science students. Lab work, improve study skills, strengthen/solidify their sense of community, career paths exploration, update of their academic plan1 Credits.

Prerequisites: Sophomore standing and EGG 101.

Notes: Combination of EGG 101 and EGG 202 satisfies First Year Seminar requirement.

EE 220 Circuits I

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Corequisite: EE 220D:Prerequisite: MATH 182

EE 220D Circuits I Discussion

Introduction to PSpice simulation tool for electrical circuits, problem solving using SPICD.credits Corequisite: EE 220

EE 221 Circuits II

Sinusoidal steady state analysis using phasors, sinusoidal steady state power, three-phase circuits, the Laplace transform and its application to circuit analysis, transfer functions, frequency response, magnetically coupled circuits and transformers, two-port networks 3 credits

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Prerequisites: EE 220 and (CS 117 or CS 135)

EE 221L Circuits II Laboratory

EE 320 Engineering Electronics I	

EE 361 Signals and Systems II

Stochastic and deterministic signals and linear systems. Analog and discrete Fourier series, analog and discrete Fourier transforms, basic probability theory, stochastic processes, stochastic signals, and linear systems.3 credits

Prerequisites: EE 360 and (MATH 432 or MATH 459)

EE 370 Classical Feedback and Control Systems

Introduction to control systems. Feedback control characteristics, performance, stability. Analysis,

EE 430 Transmission Lines

Telegraphist $\ddot{\cdot} \cdot \ddot{\cdot} = f - \ddot{\cdot} \cdot \hat{a} - \ddot{f} \cdot \ddot{\cdot} \cdot \ddot{s}$ teady \$\frac{1}{2}\text{teady} \text{\$\text{teady}} \text{\$\text{teady}} \text{\$\text{teate} \text{\$\text{response}}; reflection diagrams; Smith chart; matching techniques and designs; narrow and broadband impedance; scattering matrix; introduction to stripline and microstrip devices. 3 credits

Prerequisite: EE 330

EE 431 Engineering Optics

Engineering applications of optics. Includes aperture and grating antennas, holography, optical EE 3378 05 /TT3 11.049.783f 33.2496d 02 2 an(i)nn

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EE 480 Digital Signal Processing

Review of discrete linear system theory including the transform, the Fourier transform, discrete and fast Fourier transform. Sampling, reconstruction and multirate systems, IIR and FIR digital filter design including digital filter structures and finite word length effects. 3 credits Prerequisite: EE 361

EE 480L g3li5p (li5p (li-22.(8)-16.005 95 (m)-s)-4.004 (t[73.995 To3)-2.e)1157J /TT2 11.04 Tf 41(n)15 (g)-5-16

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CpE 200D Digital Logic Design II Discussion

HDL tools and assembly language.

Corequisite: CpE 200

CpE 200L Digital Logic Design II Laboratory

Sequential circuits, finite state machines (FSMs), and integer arithmetic circuits. Timing analysis. Programmable logic devices (PLDs). Hardware Description Language (HDL). Assembly language. Modeling, verification, simulation and testing of design solutions using programmable logic devices and hardware description language (HDL).credit

Corequisite: CpE 200;Prerequisite: CpE 100

CpE 260 Theory of Systems

Real and complex signals and linear time invariant (LTI) systems. Signal analysis using linear Cetetetear tCt t-4.004 (-26.993 (f)tc).993 (s)2(ear)(c()-25 (e)-26.993 (f)

CPE 476 Mobile Robotics

CS 465 Computer Networks

Data communication fundamentals. The hardware components, topology, interconnections, software, protocols and uses of computer networks. The OSI protocol. The physical datalink, network, transport, session, presentation and application layers credits

Prerequisite: CS 370

CS 472 Software Product Design and Development I

A formal approach to current techniques in software design and development. Students work in teams in the organization, management, and development of a large software projectredits Prerequisites: CS 326 and CS 370

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CS 445 - Internet Security

8. EXAMPLE COURSE SCHEDULES AND DEGREE WORKSHEET

ELECTRICAL ENGINEERING FOUR-YEAR PROGRAM

EE	FALL	SPRING	Credits
YEAR I	ENG 101 (3)	ENG 102 (3)	
	Constitutional Requirement (4)	MATH 182 (4)	
	MATH 181 (4)	PHY 180 +L (4)	32
	EGG 101/101L (21)	CS 135 (3)	32
	CPE 100 (3)	Social Science (3)	
	15 Credits	17 Credits	
	PHY 181 + L (4)		

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YEAR II