Tuskegee University
College of Engineering
M.S. in Electrical Engineering

Name of Degrees Offered		College	Department
Master of Science in Electrical Engineering		Engineering	Electrical Engineering
Regular Thesis Program X☐	Non-Thesis ☐	Non-Degree☐ Certificate☐ Other☐	
Dr. Gregory Murphy, Head Mrs. Cheryl Jackson, Coordinator	334-727-8995/8298 334-727-8298	gvmurphy@mytu.tuskegee.edu cjackson@mytu.tuskegee.edu	

The Department of Electrical Engineering offers programs of study leading to the B.S. and M.S. degrees in Electrical Engineering. The Department of Electrical Engineering is the largest of six departments in the College of Engineering, Architecture, and Physical Sciences with approximately 200 students in our undergraduate program and approximately 20 students in our graduate programs. Our students also participate in the Ph. D. program in Material Science and Engineering. The programs in the department are lead by 10 faculty members, and we attract outstanding students from the US and abroad. Many of our students are supported through scholarships, fellowships, research assistantships, and teaching assistantships. The Accreditation Board for Engineering and Technology accredits the undergraduate program, and the graduate program is accredited through the Southern Association of Colleges and Schools. The program is accredited by EAC/ABET (Engineering Accreditation Commission/Accreditation Board of Engineering and Technology), 111 Market Place, Suite 1050, Baltimore, MD 21202.

Admission Requirements:

Based on SAT/ACT results, a student may be required to take Reading 101 and/or Reading 102. Each Reading course yields one-hour credit and must be taken during the first year of enrollment. Additionally, a student may be required to take English 100, a 3 credit hour course. A minimum grade of "C' is required in English 100 and each Reading course. Note: If required; credit does not count towards graduation.

Core Courses (12 credits): Required for All Students in the Master's program
EENG 0538: Communication Theory – 3 credits
EENG 0540: Power System Analysis – 3 credits
EENG 0560: Electrical Properties of Materials – 3 credits
EENG 0586: CMOS Integrated Circuits – 3 credits

Elective Courses (12 credits): Determined by Student's Major Professor
Elective courses may be any graduate. level courses offered at Tuskegee University or elsewhere. Approval of the Major Professor is necessary for a student to sign up for electives.

Transfer Credits
The student's Advisory Committee may recommend transfer credits for up to 9 hours for graduate courses taken by the student at Tuskegee University as part of another graduate program or at any other institution. Transfer credits may be recommended under both core and elective categories.

Advisory Committee
During the first semester of his/her study in the Master of Science program, the student and his/her Major Professor must recommend to the Head of the Department for approval, the student's Advisory Committee consisting of a minimum of four members including the Major Professor and the Head of the Department. The Advisory Committee shall also serve as the Examination Committee.

Admission to Candidacy
Immediately after completing 9 credits of course work at Tuskegee University, the student must submit, to the Dean of Graduate Studies, a completed application for the Candidacy for the degree.

Seminars

A student pursuing the Master of Science degree in Materials Science and Engineering must present at least two seminars. The first seminar shall be the presentation of the student's research proposal of the Master's thesis. The second or the final seminar shall be his/her Final Oral Examination for the degree. The student is also required to participate in all seminars arranged by the department.

Research assistantships and fellowships are available for students admitted to the program. Continuation of the financial support depends on student's performance in course work and research and availability of funds.

List Core Courses with University Catalog number and brief Description

EENG 0522	SYSTEMS ANALYSIS. 2nd Semester. Lect. 3, Lab 0, 3 credits. The linear graph and matrix approach to general linear systems having two-terminal and multiterminal components. State variable formulations. Prerequisite: EENG 0431 or Permission of Instructor.
EENG 0537	RANDOM VARIABLES AND STOCHASTIC PROCESSES. 1st Semester. Lect. 3,3 credits. Events, probability and random variables; Distribution functions; Density functions; Correlation functions; Spectral density; Linear system analysis; Markov chains; Gaussian and Poisson processes; Stochastic processes; applications. Prerequisite: EENG 0323 or Permission of Instructor.
EENG 0538	COMMUNICATION THEORY. 1st Semester. Lect. 3, Lab 0, 3 credits. Signal analysis, Random signals, Matched receivers; Analog communication; AM, FM; Digital communication; Multiplexing; Information theory, applications; Diversity techniques. Prerequisite: EENG 0323 or Permission of Instructor.
EENG 5381	COMMUNICATION LAB. 1st Semester. Lect. 3, Lab 0, 3 credits. This laboratory provides experiments involving communication circuits and systems that are covered in EENG 0538 Communication Theory. Corequisite: EENG 0538.
EENG 0539	WIRELESS COMMUNICATION. 2nd Semester. Lect. 3, Lab 0, 3 credits. This course covers fundamental; theory and design of high capacity wireless communication systems. Topics include trunking, propagation, frequency reuse, modulation, coding, and equalization. Emerging cellular and PCN systems are analyzed. Prerequisites: EENG 0537, EENG 0538.
EENG 0540	POWER SYSTEM ANALYSIS. 1st Semester. Lect. 3, Lab 0, 3 credits. Balanced Power Systems at Steady state conditions. Transmission line calculations; Systems analysis using bus admittance and impedance matrices. Power-flow analysis, Economic operation. Prerequisite: EENG 0423 or Permission of Instructor.
EENG 0541	POWER SYSTEMS PROTECTION AND STABILITY. 2nd Semester. Lect 3, Lab 0, 3 credits. Unbalanced power systems at steady state conditions. Fault analysis, power transfer and system stability, Insulations. Protective systems; Relay coordination. Prerequisite: EENG 0423 or Permission of Instructor
EENG 0546	POWER SYSTEM PLANNING. 2nd Semester. Lect. 3, Lab 0, 3 credits. Design and layout of generation stations, switch yards and transmission lines. Detailed course description available from depart, mental offices. Prerequisite: Permission of Instructor.
EENG 0558	RE TRANSMITTER & RECEIVER DESIGN. 2nd Semester. Lect. 3, Lab 0, 3 credits. RF electronic circuits, analysis and design; Oscillators; Amplifiers; Coupling circuits; Binary systems; Mixers; IF Amplifiers; Demodulators; Microwave Systems, and multiplexing. Prerequisites: EENG 0330 and EENG 0334 or Permission of Instructor.
EENG 0560	ELECTRICAL PROPERTIES OF MATERIALS. 1st Semester. Lect. 3, Lab 0, 3 credits. Crystal structure; Bravais lattices, energy bands; Metals, Nonmetals, conduction processes, effective mass, scattering mechanisms, continuity equation and junction theory; Field-material interaction, dielectric losses, magnetic

	permeability; Energy converting properties of solids. Prerequisites: EENG 0413, PHYS 0402 or Permission of Instructor.
EENG 0568	MICROWAVE MEASUREMENTS. 1st Semester. Lect. 3, Lab 0, 3 credits. Prerequisite: EENG 0334 or Permission of Instructor.
EENG 0570	ELECTROMAGNETIC THEORY 1st Semester. Lect. 3, Lab 0, 3 credits. Static electric fields, Static magnetic fields, Boundary conditions; Boundary value problems, Laplace equation; Maxwell's equations; Plane waves; wave guides; Cavities; special topics; Cavities, plasmas. Prerequisite: EENG 0334 or Permission of Instructor.
EENG 0572	ANTENNAS AND PROPAGATION. 1st Semester. Lect. 3, Lab 0, 3 credits. Introduction; Typical Antenna concepts, gain, directivity, radiation pattern; Wave polarization, Pointing vector; Sources, point source, dipoles, loops, isotropic source and radiated fields; Antenna array, loop and helical antennas; Parabolic reflector antennas. Prerequisite: EENG 0334 or Permission of Instructor.
EENG 0574	ADVANCED ELECTRONICS. Summer. Lect. 3, Lab 0, 3 credits. Nonlinear electronic systems, advanced analysis and design techniques, applications, wave shaping; switching comparators, bistable systems; oscillators; modulation processes, Signal processing; noise reduction and communication systems. Prerequisite: EENG 0330 or Permission of Instructor.
EENG 0578	ELECTRONIC DEVICE DESIGN AND FABRICATION. Ist Semester. Lect. 3, Lab 0, 3 credits. Monolithic IC technology; Bipolar and MOSFET processes and structures; Layout design, fabrication, applications. prerequisite: EENG 0413 or Permission of Instructor.
EENG 0580.	ADVANCED CONTROL THEORY. 2nd Semester. Lect. 3, Lab 0, 3 credits. Classical techniques; State variables; Optimization; Deterministic and Stochastic systems; Noise measurement and filtering; Simulation; Introduction to game theory. Prerequisite: EENG 0431 or Permission of instructor.
EENG 0584	ADVANCED DIGITAL DESIGN. 2nd Semester. Lect. 3, Lab 0, 3 credits. Advanced design of digital logic circuits. Topics include: gate and flip-flop level design using standard integrated circuit chips, i programmable logic array design, system level design using a hardware description language (VHDL), computer aided design tools used to create and verify designs, fault diagnosis and testing. Prerequisite: EENG 040, or Permission of instructor.
EENG 0585	VLSI DESIGN. 1st Semester. 3 credits. Introduction to VLSI layout. The switch and the inverter. Logic design. Stick diagrams. Design-fabrication interface. Delay and power calculations. Memory system. Static RAM, Dynamic RAM, ROMs. Structured design and Test. Prerequisite: EENG 0413.
EENG 0586	CMOS INTEGRATED CIRCUITS. 2nd Semester. Lect. 3, Lab 0, 3 credit. MOS Transistor Models. Feedback and sensitivity in Analog Integrated Circuits. Operational Amplifier Design. Continuous Time and Sampled-Data Active Filters. D/A and A/D converters. Low-power, low-voltage analog integrated circuits. Prerequisites: EENG 0413, EENG 413L or Permission of instructor.
EENG 0587	POWER ELECTRONICS. 2nd Semester. Lect. 3, Lab 0, 3 credits. Polyphase power rectifiers and inverters. Solid-state drivers for rotating machines. Characteristics of high-power solid-state components. Design of switching power supplies. Prerequisites: EENG 0423, EENG 0423L, EENG 0330. EENG 0330L.
EENG 0590	SPECIAL TOPICS. 1st and 2nd Semester. 1-4 credits. Topics of special interest of the faculty and the students. Offered by specific Course Reference Numbers and title. Prerequisite: Permission of Instructor.
EENG 590J	ADVANCED SOLID STATE DEVICES. 1st Semester. Lect. 3, Lab 0, 3 credits. Review of Si and GaAs devices, fabrication processes, analysis of P-n junctions, heterojunctions and metal-semiconductor contacts, bipolar transistors, field effect transistors, power device structures and microwave diodes. Prerequisite: EENG 0413 or Permission of Instructor
EENG 590L	SEMICONDUCTOR MEASUREMENTS. 2nd Semester. Lect. 3, Lab 0, 3 credits. Introduction, chemical, physical characterization techniques; electrical measurement techniques; measurement of resistivity, carrier

	concentration, lifetimes, junction and contact parameters, MOS characteristics, deep-level states. Prerequisite: EENG 0413 or Permission of Instructor.
EENG 590P	ADVANCED VLSI DESIGN. 2nd Semester. 3 credits. State of the art of CMOS technology. Arithmetic building blocks including adders, multipliers, and shifters. Designing memory and array structures, logic and system optimization. Timing issues, interconnect, signal integrity, power distribution and consumption. Prerequisite: EENG 0585.
EENG 0624	NETWORK SYNTHESIS I. Lect. 3; Lab. 0, 3 credits. Properties of network functions. Physical realizability. Synthesis techniwurd Foster, Cauer, Brune, Darlington, Gullemin and others. Prerequisite: Graduate Standing.
EENG 0625	NETWORK SYNTHESIS II. Lect. 3 Lab. 0, 3 credits. A continuation Network Synthesis I Two-port LC network transmission characteristics; filter design techniques based on image parameters; Cauer filters, Butterworth, Chebsyshev and elliptic filters, phase equalizers. Prerequisites: Graduate Standing.
EENG 0642	TRANSIENT PHENOMENA IN POWER SYSTEMS. Lect. 3; Lab. 0, 3 credits. Offered on demand. Prerequisite: EE 540 or equivalent. Study and analysis of transients in power systems caused by various types of faults and switching processes. Prerequisite: Graduate Standing.
EENG 0644	DIRECT. ENERGY CONVERSION II. Lect. 3; Lab 0, 3 credits. Offered on demand. Prerequisite: EE 424 or equivalent. Electrogasdynamic, Magnetohydrodynamic, thermoelectric, thermoelectronic and thermionic converts; furl and solar cells; utilization of solar proton influx, or ground level and terrestrial energies; global power transmission. Prerequisite: Graduate Standing.
EENG 0690	PROJECTS. 3 credits. Individual design project of an experimental study under the minimum supervision of the major professor resulting in a formal typewritten report, and presentation. Prerequisite Graduate Standing.
EENG 0700	THESIS. Supervised research culmination a written dissertation in conformity with requirements of the Graduate Handbook. Typically, two or more registrations for three hours each are required. Total of six (6) hours required for credit.
EENG 0752	ONTINUOUS REGISTRATION. See Graduate Handbook.
EENG 0754	CANDIDATE FOR DEGREE. See Graduate Handbook.

List key Graduate Faculty* supporting the degree in the College

Murphy, Gregory V., Dr.	334-727-8995/8298	gvmurphy@mytu.tuskegee.edu
Aganah, Kennedy	334-724-4470	kaganah@mytu.tuskegee.edu
Bhuiyan, Sharif	334-724-4855	bhuiyans@mytu.tuskegee.edu
Ebrahim, Arbin	334-724-4907	aeabrhim@mytu.tuskegee.edu
Karam, Marc	334-727-8991	karam@mytu.tuskegee.edu
Khan, Jesmin	334-727-8987	khanj@mytu.tuskegee.edu
Kirovi, Naga	334-727-8992	nkorivi@mytu.tuskegee.edu
Li, Jiang	334-727-8048	ljiang@mytu.tuskegee.edu
Lu, Zhao	334-724-4864	zl0628087@mytu.tuskegee.edu
Ndoye, Mandoye	334-727-8623	mndoye@mytu.tuskegee.edu
Oni, Ben	334-727-8990	oni@mytu.tuskegee.edu
Thapa, Arun	334-724-4908	athapa@mytu.tuskegee.edu

Please go to http://www.tuskegee.edu/academics/colleges/ceps/electrical_engineering.aspx for further details