School of Science and Engineering
Department of Electrical and Computer Engineering
Faculty

Listed below are the names of the engineering faculty – their specialty, room number, telephone number and e-mail address. Please feel free to contact them with any questions you might have.

Ghader Eftekhari Professor **eftekhar@engr.newpaltz.edu**	Electronic Circuits & Devices REH 103	257·3720
Julio Gonzalez Associate Professor **gonzalj@engr.newpaltz.edu**	Control Systems REH 213	257·3724
Baback Izadi Associate Professor **bai@engr.newpaltz.edu**	Computer Systems REH 203	257·3823
Hassan Kalhor Professor **kalhorh@engr.newpaltz.edu**	Microwave & Power Systems REH 216	257·3721
Yaser Khalifa Assistant Professor **yaserma@engr.newpaltz.edu**	Computer Systems REH 202	257·3764
Michael Otis Lecturer **otism@engr.newpaltz.edu**	Computer Systems REH 201	257·3827
Damu Radhakrishnan Associate Professor **damu@engr.newpaltz.edu**	Computer Systems REH 204	257·3772
Faramarz Vaziri Associate Professor **vazirif@engr.newpaltz.edu**	Communication & Computer Systems REH 215	257·3811
Mohammad Zunoubi Associate Professor **zunoubm@engr.newpaltz.edu**	Microwave Systems REH 205	257·3932

School of Science and Engineering

Department of Electrical and Computer Engineering

Resnick Engineering Hall

John Harrington, Dean
845-257-3728
harringj@newpaltz.edu

Ghader Eftekhari, Chair
845-257-3720
eftekhar@engr.newpaltz.edu

Listed below are the names of the engineering staff, their room numbers, phone numbers and e-mail addresses. Please feel free to contact them if you need help or have questions.

Judy DePuy Department Secretary **depuyj@engr.newpaltz.edu**	REH 103	257·3720
Thomas LaBarr Instructional Support Technician **labarrt@engr.newpaltz.edu** (Supervises maintenance of electronics laboratories)	REH 008	257·3733
Robert Trahan Computer Systems Administrator **trahanr@engr.newpaltz.edu** (Manages student computer laboratories)	REH 007	257·3735

Office Hours

Monday – Friday8:30 to 5:00
Closed for lunch
12:00 to 1:00

Engineering Administration

Department of Electrical and Computer Engineering
(845) 257-3720

Professors
Ghader Eftekhari, (Chair), Ph.D., PE
University of Nottingham, England

Hassan Kalhor, Ph.D., PE
University of California, Berkeley

Associate Professors
Julio Gonzalez, Ph.D., Colorado State University
Baback Izadi, Ph.D., Ohio State University
Damu Radhakrishnan, Ph.D., University of Idaho
Faramarz Vaziri, Ph.D., University of Houston

Assistant Professor
Yaser Khalifa, Ph.D., University of Wales, England
Mohammad Zunoubi, Ph.D., Mississippi State University

Lecturer
Michael Otis, MS, State University of New York, Binghamton

Master of Science in Electrical Engineering

The Master of Science in Electrical Engineering program offers courses in electromagnetic fields and waves, communications, electronics, computer and control systems. The program has two options: with thesis and with non-thesis. The program with thesis emphasizes research and requires submission of a thesis. This option requires completion of 30 credits, 24 course credits and 6 thesis credits. The non-thesis option requires completion of 30 course credits and successful passing of a comprehensive examination. Students can elect courses from an approved list of electrical engineering courses, according to his/her interest. Students can take up to 6 credits of relevant graduate courses from other departments, subject to department approval.

The program, which can be pursued either full or part-time, is designed to serve recent graduates and practicing engineers who need in-depth knowledge in the rapidly changing and expanding areas of electrical engineering beyond what can be included in the traditional bachelor's program.

Admission Requirements

- A bachelor's degree in Electrical Engineering or a closely related field from an ABET accredited program. A minimum undergraduate grade point average of 3.00.

- Three letters of recommendation attesting to the applicant's aptitude and promise for graduate study.
- Acceptable scores on the Graduate Record Examination (GRE), general portion.
- English competency according to College procedures and standards. These include a TOFEL score of 550 and satisfactory performance on the campus-designed and administered English proficiency examination.
- On a case-by-case basis, applicants who do not meet all of the conditions for admission may be granted conditional admission status. These students may register as non-matriculated students for courses of a preparatory nature following the guidance of the Department. They can be considered by the Graduate School for matriculation after this prescribed preparatory work is completed.

Program Requirements

- File a "plan of study" during the **first** semester after matriculation. The advisor of the student, the department chair and the chairman of the graduate faculty must approve the plan of study.
- Completion of prescribed course work and other requirements within seven years after matriculation.
- Maintain a cumulative average of 3.00 or better, with no more than two grades below B-.
- For completion of the program and graduation, students must meet the following requirements:

1. **Thesis option**:
   Completion of 24 credits (all electives) of graduate courses.
   Completion of research and presentation of thesis counting as 6 credits.

2. **Non-Thesis option**:
   Completion of 30 credits (all electives) of graduate courses.
   Successful passing of comprehensive examination.

Electrical Engineering Electives

Eight (8) (thesis option) and ten (10) (non-thesis option) courses are elected by the students from a list of the department graduate courses in electromagnetic fields and waves, communications, electronics, computer, and control systems depending on the students' needs and interest.

The program does not require specialization in a concentration and the student under guidance of a graduate advisor may select courses of interest that will prepare him/her to pursue thesis or future work. Appropriate courses (maximum two) offered by cognate departments may be used to meet this requirement.

MS Thesis in Electrical Engineering (6)

Research, writing and defense of a thesis under the guidance of a faculty member. Prerequisite: MS in Electrical Engineering candidate and PI

Comprehensive Examination

Students with non-thesis option must pass a written comprehensive examination after completing their course works. This examination covers four (4) subject matters based on the plan of study.

Graduation

Students must complete an "Application for Master Degree or Certificate of Advanced Study" and send it to Records & Registration. Late November is the deadline to file for May graduation; April is the deadline to file for August graduation; and July is the deadline to file for December graduation. (Please check the Records & Registration website for actual dates.)

COURSES

40505 Analytical Techniques I (3)
Theory of complex variables, analytics, singularities and complex integration. Cauchy's and residue theorems. Series expansions. Taylor and Laurent series. Conformal mapping. Laplace, Fourier and Z transforms.

40506 Analytical Techniques II (3)
Linear algebra. State variables applied to continuous and discrete systems. Linear vector spaces. Matrices and matrix transformation. Cayley-Hamilton theorem. Solution to state equations.

40512 Advanced Communications (3)
Probability theory and random processes. Behavior of communications systems in presence of noise. Optimum signal detection. Information theory. Error connecting codes.

40513 Digital Signal Processing (3)
Continuous-time signals and systems. Discrete-time linear systems. State-space representation. Discrete Fourier transform. Fast Fourier transform. Digital filter design. Finite wavelength and quantization effects.

40522 Advanced Analog Circuits (3)
Review of bipolar and MOS transistors. GaAs transistors and circuits. CMOS and BiCMOS amplifiers. Cascade amplifier and its frequency response. Common collector-common emitter cascade and its frequency response. Frequency response of differential amplifiers. Differential amplifier as a wide band amplifier. CMOS and cascade CMOS operational amplifiers. Power MOSFET and class AB power amplifier. Non-linear waveform shaping circuits. Filters, including switched capacitor filters.

40523 Wireless Communications (3)

Overview of wireless systems, propagation characteristics of wireless channels, modems for wireless communications, cells and cellular traffic, fading and multiple access techniques.

40525 Microelectronic Fabrication (3)
The physics and technology of various steps required to fabricate complicated integrated circuits are explained. The Si and GaAs materials will be covered. The course will cover micro-electromechanical systems (MEMS) fabrication as well.

40532 Computer Arithmetic (3)
This course deals with algorithms and architectures used for computer arithmetic. Issues that will be addressed include: number systems and representation, redundant and residue systems. Addition/subtraction circuits. Multiplication, division, square root algorithms, cordic arithmetic system. Floating-point arithmetic systems. Implementation issues – pipelining, low-power, fault-tolerant designs.

40533 Introduction to Parallel Computing (3)
Paradigms of parallel computer systems. Memory system implementation. Cache memory design of multiprocessors. Pipelining, superscalar, and vector processing. Instruction level concurrency. Parallel algorithms. Survey of commercial parallel machines.

40534 Fault-Tolerant Design of Digital Systems (3)
Faults and their manifestations. Reliability, availability and maintainability analysis. System evaluation and performance reliability tradeoffs. Hardware, software, code and time redundancy techniques. Fault-tolerant communication in distributed systems. Real-time fault tolerance. Case study of fault-tolerant systems.

40535 Low Power VLSI Design (3)
This course deals with the design of digital systems for low power dissipation. Issues that will be addressed include CMOS power dissipation, analysis and design tools used for low power digital circuits, design methodologies for low power CMOS circuits, low power memory system designs and a discussion on future challenges in low power digital design.

40542 Numerical Methods in Engineering (3)
Review of electromagnetic theory and analytical methods. Time and frequency domain finite difference methods. Variational methods. Moment methods. Applications to radiation and scattering problems.

40543 Antennas and Wave Propagation (3)
Wire antennas and arrays. Aperture antennas and arrays. Solution of antennas by the moment method. Antenna synthesis and optimization.

40544 Microwave Circuits (3)
Review of transmission lines, waveguides, impedance matching and scattering parameters. Microwave resonators, power dividers, directional couplers, and hybrids, microwave litters, microwave defectors, mixers, amplifiers, and oscillators.

40545 Satellite Communication (3)

Satellite orbits and their effect on communication systems. Design of communication satellites and their sub systems. Communication link analysis. Modulation. Multiplexing. Multiple access. Encoding and error correction. Atmospheric propagation effects.

40551 Logic Synthesis Optimization (3)
The aim of this course is to present automatic logic synthesis techniques for computer-aided design (CAD) of very large-scale integrated (VLSI) circuits and systems. This course will broadly survey the state-of-the-art, and give a detailed study of various problems, pertaining to the logic-level synthesis of VLSI circuits and systems, including: two-level Boolean network optimization, multi-level Boolean network optimization, technology mapping for library-based designs and field-programmable gate-array (FPGA) designs, and state-assignment and re-timing for sequential circuits. The course will also cover various representations of Boolean functions, such as binary decision diagrams (BDDs), and discuss their applications in logic synthesis.

40561 Adaptive Control (3)
Basic concept of adaptive control. Real time parameter estimation. Model reference adaptive systems. Self-tuning regulators stability. Auto tuning. Gain scheduling. Perspectives on neural networks.

40562 Optimal Control (3)
Review of matrix algebra, gradients and series. Introduction to optimization problems. Static optimization. Dynamic optimization. Maximum principle-Hamiltonian. Linear regulator and associated topics. Output feedback problems.

40564 Non-linear Control (3)
Phase plane analysis. Lyapunov analysis. Advanced stability theory. Describing function analysis. Feedback linearization design. Sliding control design.

40570 Fiber Optic Technology: Fundamentals and Applications (3)
This course will provide an introduction to optical fiber communication systems. Topics to be covered include lasers and other optical transmitters, optical receivers, fiber optic cable design, link budgets and noise sources, and the design of practical fiber networks. Data encoding and standard protocols including SONET, Ethernet, Fibre Channel, and others will be covered, as well as time and wavelength multiplexing, optical amplifiers, and advanced research topics such as optical MEMs, nanofibers and parallel optical links.

40575 Hectrostructure Devices (3)
Heterostructure materials, quantum theory of heterostructures, quantum heterostructure devices (quantum wells, resonant tunneling and superlattice), heterojunction diode, heterojunction bipolar transistor, HBT (operation and properties), modulation doped field effect transistor, MODFET (operation and properties).

40580 Power Electronics (3)
The course will enable the students to analyze converter circuits, choose an appropriate converter topology for an application, understand power semiconductor switching devices, design magnetic elements and feedback loops including compensators for the duty-ratio controlled PWM converters.

40590 MS Thesis in Electrical Engineering (6)
Research, writing and defense of a thesis under the guidance of a faculty member.

40593 Electronic Properties of Materials
This course will review basic properties of materials. Topics include fundamentals of quantum mechanics and its applications, electrical, thermal, optical and magnetic properties and a brief review of semiconductors and devices.

40593 Internship (3)
Students will work for one semester (at least half time – 300 hours) on a scientific project under the supervision of a scientist in industry. After conclusion of the internship, the company supervisor will evaluate student work and send a copy of the evaluation to the Engineering Department. Student will give a PowerPoint presentation outlining experiences, results gained and subjects learned. Student will submit a full written report. After studying the evaluation and the quality of the student work, presentation and report, an appropriate grade is determined.