**ENGINEERING PROGRAMS**

**Phone:** (845) 257-3720  
**Location:** Resnick Engineering Hall Room 103

The Division of Engineering Programs offers high-quality undergraduate programs in Computer Engineering, Electrical Engineering, and - as of Fall 2015 - Mechanical Engineering, as well as five-year programs through which students may earn their bachelor's degree in Electrical or Computer Engineering and master's degree in Electrical Engineering. Our Computer and Electrical Engineering programs are accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET); the Mechanical Engineering program also aligns with ABET's stringent standards and will be reviewed for accreditation as soon as ABET's timeline for new programs permits.

SUNY New Paltz's engineering programs are designed to meet the needs of a rapidly changing technological society. Each program includes a broad General Education experience, foundation coursework to ensure fundamental knowledge of mathematics and natural science, a core curriculum through which students develop and refine discipline-specific knowledge and skills, and elective courses that provide opportunities for applying knowledge and using the tools and techniques of modern engineering practice. Our students benefit from quality facilities, small classes and labs, close interaction with faculty with real-world experience, and opportunities for research and internships with industry partners. Students acquire the cultural, social, and communication skills that only a liberal arts college can provide and graduate fully prepared for the engineering profession of today and tomorrow.

**Departmental Academic Policies**

Non-engineering students may not enroll in engineering or engineering-related courses other than Introduction to EGG101 and EGG321. Exceptions are frequently granted for EGE200, EGE201, EGC220, and EGC221. Permission to register in any of these courses must be obtained from the Division of Engineering Programs prior to registration.

Permission is not required for Computer Science students to register for EGC220 Digital Logic Fundamentals and EGC221 Digital Logic Laboratory.

Admission of transfer students will be based on transcript review, detailed comparison with SUNY New Paltz foundation requirements, and consultation with an adviser from the Division of Engineering Programs. Transfer students from other SUNY campuses will find information about Seamless Transfer here (http://www.suny.edu/attend/get-started/transfer-students) and about designated transfer path courses here (http://www.suny.edu/attend/get-started/transfer-students/suny-transfer-paths/suny-transfer-paths-all-2015).

Students may not enroll in any engineering course unless all prerequisites have been met with a grade of C- or better.

Students are required to receive grades of C- or better in any course that is used to satisfy engineering major requirements. Except for Fieldwork (EGC494/EGE494/EGM494), courses taken on a Satisfactory/Unsatisfactory basis cannot be applied toward engineering major requirements.

**Please note:** Our program is designed to be completed in four (4) years if students begin the math sequence with Calculus I.

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**Computer Engineering Major**

Computer Engineering continues to be a growth area in the field of engineering due to rapidly changing technologies and expanding industrial needs. SUNY New Paltz's program is designed to meet these needs, both generally and within the Mid-Hudson Valley, specifically. Our goal is to provide students with a solid knowledge of math, science and engineering concepts and the ability to apply them to engineering problems. The flexibility of the engineering curriculum serves full- and part-time students, traditional and non-traditional students, and students new to engineering as well as those who have some experience in technical areas.

The Computer Engineering curriculum consists of a modified General Education requirement, foundation coursework in math and science, required core courses, and technical electives. Design is emphasized throughout the curriculum. The General Education component complements students' engineering education and encourages them to understand engineering roles in a broader context.

**Electrical Engineering Major**

Electrical Engineering continues to be a growth area in the field of engineering due to rapidly changing technologies and expanding industrial needs. New Paltz's program is designed to meet these needs, both generally and within the Mid-Hudson Valley, specifically. Our goal is to provide students with a solid knowledge of math, science and engineering concepts and the ability to apply them to engineering problems. The flexibility of the engineering curriculum serves full- and part-time students, traditional and non-traditional students, and students new to engineering as well as those who have some experience in technical areas.

The Electrical Engineering curriculum consists of a modified General Education requirement, foundation coursework in math and science, required core courses, and technical electives. Design is emphasized throughout the curriculum. The General Education component complements students' engineering education and encourages them to understand engineering roles in a broader context.

**Mechanical Engineering Major**

Mechanical engineering continues to be a growing program in the field of engineering due to rapidly changing technologies and expanding industrial needs. SUNY New Paltz's program is designed to meet these needs, both generally and within the Mid-Hudson Valley, specifically. Our goal is to provide students with a solid knowledge of math, science and engineering concepts and the ability to apply them to engineering problems. The flexibility of the engineering curriculum serves full- and part-time students, traditional and non-traditional students, and students new to engineering as well as those who have some experience in technical areas.

The Mechanical Engineering curriculum consists of a modified General Education requirement, foundation coursework in math and science, required core courses, and professional electives. Design is emphasized throughout the curriculum. The General Education component complements students' engineering education and encourages them to understand engineering roles in a broader context.

**Minor in Electrical/Computer Engineering**

The minor in Electrical/Computer Engineering is intended for students majoring in the following programs:
Engineering Programs

- Astronomy
- Biology
- Chemistry
- Computer Science
- Environmental Geochemical Science
- Geology
- Mathematics
- Physics

The Electrical/Computer Engineering minor will provide these science majors with fundamental knowledge of electronic instrumentation and/or computer hardware and related software that they may encounter during their careers. Through lectures and hands-on labs, science students will gain experience working in an environment that resembles what they will face in the work force.

Majors


Minor


Undergraduate

EGC220. Digital Logic Fundamentals. 3 Credits.
An introduction to digital logic analysis and design. Topics include: number representations used in today's digital systems and their arithmetic properties and conversion techniques; combinational switching theory of digital element networks where no feedback is present; analysis and design of clocked sequential circuits where feedback is present; and an introduction to modern programmable logic devices and their programming and synthesis techniques.
Prerequisites:
- MAT 251 with a minimum grade of C- and EGC 221 (may be taken concurrently) with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Mechanical Engineering (521)
  - Computer Engineering (518)
  - Computer Science (513)
  - Electrical Engineering (517)

EGC221. Digital Logic Lab. 1 Credit.
Experiments in both combinational and sequential logic design. Breadboarding, schematic capture, and Verilog implementation of digital circuits of varying complexity. Use of software tools to design FPGA based circuits.
Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Mechanical Engineering (521)
  - Computer Engineering (518)
  - Computer Science (513)
  - Electrical Engineering (517)

EGC251. C/C++ Programming. 3 Credits.
A course in computer programming using high level programming languages (C/C++) as a tool to solve engineering problems. Topics include programming structure, decisions, repetition, arrays, functions, data files, addresses and pointers and object oriented design.
Prerequisites:
- (EGG 101 with a minimum grade of C-)

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Electrical Engineering (517)

EGC293. Engr Selected Topics. 1-12 Credits.
Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.

EGC193. Engineering Selected Topic. 1-12 Credits.
Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.
EGC295. Indep Study Comptr Engin. 1-12 Credits.

EGC320. Digital Systems Design. 3 Credits.
State minimization, assignment, and design of synchronous sequential circuits. Verilog coding. Analysis and design of asynchronous sequential circuits. PLDS. Digital system design examples. Additional topics such as design of CMOS circuits, power reduction, testing etc.

Prerequisites:
- EGC 220 with a minimum grade of C- and EGC 221 with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGC331. Microcontroller System Design. 3 Credits.
An introduction to Microcontroller Hardware and Software Design. Topics include organization and architecture; memory and I/O interfacing; and Assembly and C language programming. Interfacing and programming techniques with microcontroller peripherals that include: UART (Serial Communications), Counters and Timers, Interrupts, and Analog and Digital Interfacing.

Prerequisites:
- EGC 220 with a minimum grade of C- and EGC 221 with a minimum grade of C- and EGC 251 with a minimum grade of C- and EGE 200 with a minimum grade of C- and EGE 201 with a minimum grade of C-

Restrictions:
- Must have the following field(s) of study (major, minor or concentration):
  - Mechanical Engineering (521)
  - Computer Engineering (518)
  - Engineering (EGG)
  - Electrical Engineering (517)

EGC332. Microcontroller Laboratory. 1 Credit.
Self-paced laboratory to provide hands-on experience encompassing Assembly and C programming languages and interfacing peripheral devices as applied to microcontroller systems.

Prerequisites:
- EGC 220 with a minimum grade of C- and EGC 221 with a minimum grade of C- and EGC 251 with a minimum grade of C- and EGE 200 with a minimum grade of C- and EGE 201 with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Mechanical Engineering (521)
  - Computer Engineering (518)
  - Engineering (EGG)
  - Electrical Engineering (517)

EGC412. Data Communications . 3 Credits.
A first course in Data Communications, which introduces the problems, solutions, and limitations associated with interconnecting computers by communication networks (LAN or WAN). The seven layer ISO Open Systems Interconnect (OSI) reference model serves as framework for the course with major emphasis on layers one through four (physical, data link, network, and transportation.

Prerequisites:
- EGC 331 with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGC433. Embedded Systems. 3 Credits.
Analysis and design processes required for utilizing advanced functionality, real-time (interrupt) interfacing, and bare-metal and RTOS programming techniques (using C) as applied to an industry standard microcontroller-based embedded system. Topics include: analog interfacing and data acquisition, sensors, actuators, signal conditioning, timers and PWM, parallel and serial interfacing, communication and networking and control concepts.

Prerequisites:
- EGC 331 with a minimum grade of C- and EGC 332 with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Mechanical Engineering (521)
  - Computer Engineering (518)
  - Engineering (EGG)
  - Electrical Engineering (517)

EGC442. Introduction to Computer Architecture. 3 Credits.
Computer architecture and hardware system organization are examined. Topics include performance issues, CPU organization and instruction set implementation, performance enhancement through pipelining, memory organizations, input/output structure, and an introduction to parallel architectures.

Prerequisites:
- EGC 331 with a minimum grade of C- and EGC 332 with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Mechanical Engineering (521)
  - Computer Engineering (518)
  - Engineering (EGG)
  - Electrical Engineering (517)
EGC445. VLSI Design. 3 Credits.

**Prerequisites:**
- (EGC 220 with a minimum grade of C- and EGC 221 with a minimum grade of C-) and (EGE 320 with a minimum grade of C- and EGE 322 with a minimum grade of C-)

**Restrictions:**
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGC446. VLSI Design Lab. 1 Credit.
Static and dynamic characteristics of CMOS logic gates. Design of CMOS circuits using transistor schematics, and verification through simulation. Layout of CMOS circuits using state-of-the-art VLSI tools, design rule check, and verification through simulation.

**Restrictions:**
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGC447. Functional Verification of Hardware Systems. 3 Credits.
An introduction to the hardware verification practices used in industry. Students will learn how to create architecture for test benches, object-oriented approach, stimulus generation techniques, results checking, and how to analyze coverage using SystemVerilog.

**Prerequisites:**
- EGC 450 with a minimum grade of C- and EGC 455 with a minimum grade of C-

**Restrictions:**
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGC448. Software Defined Networks. 3 Credits.
Broadband and Carrier Ethernet Networks and technologies. Role of SDN in defining architecture of the next generation of networks. Determination of conformance criteria for network standards and protocols to support industry solutions and applications.

**Prerequisites:**
- CPS 210 with a minimum grade of C- or EGE 331 with a minimum grade of C-

**Restrictions:**
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGC451. Real-Time Systems. 3 Credits.
Practical experience of real-time operating systems (RTOS) and real-time debugging as applied to real-time embedded systems. Design and implementation of real-time embedded systems: controllers, data storage, data acquisition, and communication using a commercially available RTOS.

**Prerequisites:**
- (EGC 433 with a minimum grade of C- or EGC 416 with a minimum grade of C-)

**Restrictions:**
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGC455. System-on-Chip (SoC). 3 Credits.
System-on-chip (SoC) design methodology and IP (intellectual property) reuse, system modeling and analysis, hardware/software co-design, behavioral synthesis, embedded software, reconfigurable computing, design verification and test, and design space exploration.

**Prerequisites:**
- EGC 320 with a minimum grade of C- and EGC 442 with a minimum grade of C- and EGC 445 with a minimum grade of C- and EGC 446 with a minimum grade of C-

**Restrictions:**
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)
EGC493. Comp Eng Select Topics. 3-12 Credits.
Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.
Prerequisites:
• EGE 230 with a minimum grade of C- or EGE 220 with a minimum grade of C-

EGC494. Fieldwork Computer Engin. 0 Credits.

EGC495. Indep Study Comptr Engin. 1-12 Credits.

EGE193. Engineering Selected Topic. 3-12 Credits.
Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.
Prerequisites:
• PHY 202 with a minimum grade of C-

Restrictions:
• Must have the following level: Undergraduate

EGE200. Circuit Analysis. 3 Credits.
Electrical circuit parameters; Kirchhoff’s laws; circuit theorems; transient analysis of first and second-order circuits; sinusoidal excitation: phasor analysis, complex power; frequency response; resonance and filters; magnetically-coupled circuits and transformers; three-phase circuits.
Prerequisites:
• (PHY 202 with a minimum grade of C- and MAT 359 with a minimum grade of C-)
• EGE 201 (may be taken concurrently) with a minimum grade of C-

Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration):
  • Mechanical Engineering (521)
  • Computer Engineering (518)
  • Undeclared: Pre-Engineering (00EN)
  • Electrical Engineering (517)

EGE201. Circuits Laboratory. 1 Credit.
Computer simulation and hardware experimentation on equivalent resistance, nodal and mesh approaches. Thevenin theorem, maximum power transfer; step response of first and second order circuits, power factor correction, and resonant circuits.
Prerequisites:
• (PHY 202 with a minimum grade of C- and MAT 359 with a minimum grade of C-)

Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration):
  • Mechanical Engineering (521)
  • Computer Engineering (518)
  • Undeclared: Pre-Engineering (00EN)
  • Electrical Engineering (517)

EGE293. Engineering Selected Topic. 1-12 Credits.
Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.
Prerequisites:
• PHY 202 with a minimum grade of C-

Restrictions:
• Must have the following level: Undergraduate

EGE295. Indep Study Elec Engineering. 1-12 Credits.
Selected research areas specific to faculty.
Restrictions:
• Must have the following level: Undergraduate

EGE302. Antenna Laboratory. 1 Credit.
Measurement of the far field pattern and characteristics of wire antennas and arrays for VHF. Measurement of the field pattern and characteristics of reflector type antennas in the X-band, and of aperture type antennas and arrays in the X-band.
Prerequisites:
• EGE 445 (may be taken concurrently) with a minimum grade of C-

Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration):
  • Computer Engineering (518)
  • Mechanical Engineering (521)
  • Electrical Engineering (517)

EGE303. Microwave Fundamentals Laboratory. 1 Credit.
Measurement of VSWR and wavelength in waveguides, stub tuners and matching, calibration of attenuators, time domain reflectometry and frequency domain network analyzer measurement. Prerequisite/Corequisite: EGE342.
Prerequisites:
• EGE 342 with a minimum grade of C-

Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration):
  • Computer Engineering (518)
  • Mechanical Engineering (521)
  • Electrical Engineering (517)

EGE306. Microwaves Circuits Laboratory. 1 Credit.
Design, build and test planar microwave devices such as power divider, coupler, filter, mixer, amplifier, and oscillator.
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration):
  • Computer Engineering (518)
  • Mechanical Engineering (521)
  • Electrical Engineering (517)
EGE311. Signals and Systems . 3 Credits.
Continuous and discrete-time signals, systems, and their properties; linear time-invariant systems: convolution; system descriptions using differential and difference equations; Fourier series, Fourier Transform and their properties. Laplace transform and Z-transform.
Prerequisites:
- (EGE 200 with a minimum grade of C- or EGE 250 with a minimum grade of C-)

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Mechanical Engineering (521)
  - Computer Engineering (518)
  - Engineering (EGG)
  - Electrical Engineering (517)

EGE320. Electronics I . 3 Credits.
Prerequisites:
- (EGE 200 with a minimum grade of C- or EGE 250 with a minimum grade of C-) and EGE 322 (may be taken concurrently) with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Mechanical Engineering (521)
  - Computer Engineering (518)
  - Engineering (EGG)
  - Electrical Engineering (517)

EGE321. Electronics II . 3 Credits.
Prerequisites:
- EGE 320 (may be taken concurrently) with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Mechanical Engineering (521)
  - Computer Engineering (518)
  - Engineering (EGG)
  - Electrical Engineering (517)

EGE322. Electronics I Laboratory . 1 Credit.
Laboratory exercises covering op-amps, characterization of diodes, BJT, and MOSFET, diode circuits, biasing and amplification of BJT and MOSFET, including simple current source.
Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Mechanical Engineering (521)
  - Computer Engineering (518)
  - Engineering (EGG)
  - Electrical Engineering (517)

EGE323. Electronics II Laboratory . 1 Credit.
Laboratory exercises covering the multistage amplifier, direct coupled amplifier, difference amplifier, op-amp applications, frequency response, oscillator, waveform generator, power amplifier, and frequency response.
Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Mechanical Engineering (521)
  - Computer Engineering (518)
  - Engineering (EGG)
  - Electrical Engineering (517)

EGE331. Computer Simulation. 3 Credits.
Prerequisites:
- (EGE 200 (may be taken concurrently) with a minimum grade of C- or EGE 250 (may be taken concurrently) with a minimum grade of C-)

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)
EGE340. Applied Electromagnetics. 3 Credits.
Transmission line theory. Graphical solutions using Smith Chart. Impedance matching. Transients on lossless lines. Electrostatics, capacitance and electric energy. Magnetostatic, Inductance and magnetic energy. Maxwell’s equations, the wave equation, and uniform plane waves.
Prerequisites:
• (EGE 200 with a minimum grade of C- or EGE 250 with a minimum grade of C-) and MAT 353 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration):
  • Mechanical Engineering (521)
  • Computer Engineering (518)
  • Engineering (EGG)
  • Electrical Engineering (517)

EGE342. Microwave Fundamentals . 3 Credits.
Review of Maxwell’s equations, propagation of plane waves, reflection and transmission of plane waves, transmission line analysis, strip lines and microstrip lines, waveguide analysis, microwave networks.
Prerequisites:
• EGE 340 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration):
  • Mechanical Engineering (521)
  • Computer Engineering (518)
  • Engineering (EGG)
  • Electrical Engineering (517)

EGE350. Electric Energy Systems. 3 Credits.
Electric energy generation by using resources such as fossil fuels, nuclear, wind, water, and waves. Power plant equipment, such as boilers, reactors, turbines, generators, transformers and switchgear. Electric power transmission, distribution, utilization and conversion to other energy forms.
Prerequisites:
• EGE 340 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration):
  • Computer Engineering (518)
  • Mechanical Engineering (521)
  • Electrical Engineering (517)

EGE351. Electric Energy Systems Laboratory. 1 Credit.
Experimental verification of material studied in EGE350 such as single phase and three phase circuit, two watt meter method for measurement of three phase power, in balanced and unbalanced circuits, characteristics of single phase and three phase transformers, synchronous generators, electric power transmission, and distribution, three phase and single phase induction motors.
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration):
  • Computer Engineering (518)
  • Mechanical Engineering (521)
  • Electrical Engineering (517)

EGE393. Engineering Selected Topics. 3-12 Credits.
Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.
Restrictions:
• Must have the following level: Undergraduate

EGE399. Modular Course. 0 Credits.
Restrictions:
• Must have the following level: Undergraduate

EGE412. Communication Systems. 3 Credits.
Signal analysis, signal transmission. Digital communication systems. Amplitude modulation; angle modulation.
Prerequisites:
• EGE 311 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration):
  • Computer Engineering (518)
  • Mechanical Engineering (521)
  • Electrical Engineering (517)

EGE413. Communication Systems Laboratory. 1 Credit.
AM communication circuits. FM communication. SSB communication circuits. RF power transmitting. Phase-locked loop circuits, frequency synthesis, time division multiplexing (sampling, PCM, DM), frequency division multiplexing, amplitude shift keying, phase shift keying, frequency shift keying.
Prerequisites:
• (EGE 412 with a minimum grade of C- or EGE 312 with a minimum grade of C-)
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration):
  • Computer Engineering (518)
  • Mechanical Engineering (521)
  • Electrical Engineering (517)
EGE416. Control Systems. 3 Credits.
Feedback and robustness; transfer function, block diagram and signal-flow graph: Mason's gain formula; stability. Routh-Hurwitz array; steady-state error; state-space: relation to transfer function, state-diagram; design of PID controllers; design of state-feedback controllers.
Prerequisites:
- EGE 311 with a minimum grade of C- or EGM 312 with a minimum grade of C-
_restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGE417. Digital Control Systems. 3 Credits.
Analysis and design of control systems that use digital controllers. Representation of digital systems with difference equations and the Z-transform; Representation of Hybrid control systems (digital controller-analog plant); Stability analysis; Design of digital controller algorithms; Verification of digital controller design via MATLAB simulation.
Prerequisites:
- EGE 416 with a minimum grade of C-
_restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGE418. Control Systems Laboratory. 1 Credit.
Simulation and hardware experiments on the following topics: plant parameter identification, robustness, steady-state error, transient duration, absolute and relative stability. Verification via simulation of controller design in the same time domain and in the frequency domain.
Prerequisites:
- EGE 416 (may be taken concurrently) with a minimum grade of C-
_restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGE421. Microelectronic Technology. 3 Credits.
Miller indices, Crystal growth, Major steps in the fabrication of microelectronic devices (diffusion ion implantation, thermal oxidation, film deposition (physical and chemical), etching, lithography, contacts and interconnections and yield.
Prerequisites:
- EGE 320 with a minimum grade of C-
_restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGE422. Electronic Design Automation Lab. 1 Credit.
Principles of electronic design, schematic design, electronic packaging technologies, PCB materials, PCB Layout, PCB Assembly, PCB manufacturing processes, principles of 3D modeling, 3D modeling of electronic components and enclosures.
Prerequisites:
- EGC 331 (may be taken concurrently) with a minimum grade of C-
_restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGE423. Solid State Devices. 3 Credits.
This course introduces the basics of semiconductor physics and modeling and devices such as pn junction diode, bipolar transistor, metal-semiconductor contacts, field effect translator (MESFET and MOSFET), optical (solar cell LED, laser diode), power and microwave devices.
Prerequisites:
- EGE 320 with a minimum grade of C-
_restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)
EGE424. Microelectronic Technology Lab. 1 Credit.
This course introduces students to various processing involved in fabrication of integrated circuits such as thermal oxidation, film deposition, lithography, cleaning and etching, rapid thermal processing and characterization.
Prerequisites:
• EGE 320 with a minimum grade of C- and EGE 436 (may be taken concurrently) with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate

EGE435. VLSI Design . 3 Credits.
Introduction to MOS devices and circuits (N-MOS, CMOS), MOS transistor theory. Integrated system processing technology and design rules (N-MOS and CMOS), circuit characterization and performance estimation, N-MOS and CMOS circuits and logic design. Interfacing. Introduction to VLSI design tools. Testability analysis. Microarchitecture of VLSI systems. Chip design projects.
Prerequisites:
• (EGC 230 with a minimum grade of C- or EGC 220 with a minimum grade of C-) and EGE 320 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate

EGE441. Transmission Line Theory. 3 Credits.
Analysis and design of short, medium, and long transmission lines. Bundled conductors, skin effect, proximity effect, and geometric mean distance. Ferranti effect. Standing waves and traveling waves.
Prerequisites:
• EGE 340 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate

EGE445. Antenna Systems . 3 Credits.
Antenna parameters, wire antennas, arrays of wire antennas, aperture and printed circuit type antennas, reflectors and feeds.
Prerequisites:
• EGE 340 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate

EGE446. Antenna Systems Laboratory. 1 Credit.
Measurement of the far field pattern and characteristics of wire antennas and arrays for VHF. Measurement of the field pattern and characteristics of reflector type antennas in the X-band, and of aperture and printed circuit type antennas and arrays in the X-band.
Prerequisites:
• EGE 445 (may be taken concurrently) with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate

EGE451. Electromechanical Energy Conversion . 3 Credits.
Advanced topics in electromechanical energy conversion and drives. Transformers. Induction machines, three phase and single phase, Synchronous machines, Electric drives, Induction generators.
Prerequisites:
• EGE 350 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate
EGE452. Electric Power Systems. 3 Credits.
Energy courses, transmission line parameters, transmission line modeling, power flow analysis, voltage frequency control, power system protection.
Prerequisites:
• EGE 350 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate

EGE455. Electromechanical Energy Conversion Laboratory. 1 Credit.
Prerequisites:
• EGE 451 (may be taken concurrently) with a minimum grade of C-
Restrictions:
• Must have the following field(s) of study (major, minor or concentration):
  • Mechanical Engineering (521)
  • Computer Engineering (518)
  • Engineering (EGG)
  • Electrical Engineering (517)

EGE493. Engineering Selected Topics. 12 Credits.
Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.
Restrictions:
• Must have the following level: Undergraduate

EGE494. Fieldwork Engineering. 1-12 Credits.
Complete a prearranged and supervised industry-based project and submit a final technical report.
Restrictions:
• Must have the following level: Undergraduate

EGE495. Indep Study Elec Engineering. 1-12 Credits.
Selected research areas specific to faculty.
Restrictions:
• Must have the following level: Undergraduate

EGG101. Introduction to Engineering Science. 3 Credits.
This entry-level course provides students with an overview of the engineering sciences. Equal emphasis is placed on the three fields of engineering in which SUNY New Paltz offers degree programs; Electrical Engineering, Computer Engineering, and Mechanical Engineering. Each module offers hands-on learning experiences through projects.
Prerequisites:
• Math Placement Level with a score of 5 or MAT 181 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate

EGG193. Engineering Selected Topic. 1-12 Credits.
Prerequisites:
• EGG 101 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate

EGG199. Modular Course. 1-12 Credits.

EGG250. Energy and the Environment. 3 Credits.
Energy fundamentals, fossil based (coal, oil and gas), nuclear and renewable energy sources (such as solar, wind, hydro, geothermal, biomass, tidal and ocean thermal). Heat engines, use of energy in transportation, energy conservation and effect of energy consumption in the environment (locally and globally) are studied.
Prerequisites:
• Math Placement Level with a score of 3

EGG293. Engineering Selected Topic. 1-12 Credits.
Restrictions:
• Must have the following level: Undergraduate

EGG295. Indep Study General Engi. 1-12 Credits.
Restrictions:
• Must have the following level: Undergraduate

EGG311. Engineering Statistics. 3 Credits.
This course will provide students with an understanding of the principles of engineering data analysis using basic probability theorems and statistical methods with emphasis on their application to real-world data processing problems.
Prerequisites:
• MAT 252 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate

• Must have the following field(s) of study (major, minor or concentration):
  • Computer Engineering (518)
  • Mechanical Engineering (521)
  • Electrical Engineering (517)
EGG321. Technical Communication. 3 Credits.
Prepare proposal for Senior Design Project. Build high level statement, audience definition, product definition statement, product plan, risk assessment, and product verification and wrap-up plan. Also covers business memos, abstracts and summaries mechanical descriptions, poster sessions, business ethics, and business-oriented oral presentation. Two oral presentations are required.
Prerequisites:
- ENG 180 with a minimum grade of C- or ENG 170 with a minimum grade of C- or ENG 206 with a minimum grade of C- or ENG 207 with a minimum grade of C-
Restrictions:
- Must have the following level: Undergraduate

EGG393. Engineering Selected Topic. 3-12 Credits.
Restrictions:
- Must have the following level: Undergraduate

EGG399. Modular Course. 0 Credits.
Restrictions:
- Must have the following level: Undergraduate

EGG408. Senior Design Project I. 3 Credits.
First of the two-semester design project. Students choose a project and an advisor and learn about the design process. A written progress report is required as the end of the semester.
Restrictions:
- Must have the following level: Undergraduate

EGG409. Sr Design Project 2. 3 Credits.
Second part of a two-semester design project. A formal report and an oral presentation are required at the end of the semester.
Prerequisites:
- EGG 408 with a minimum grade of C-
Restrictions:
- Must have the following level: Undergraduate

EGG472. Engineering Management. 3 Credits.
Prepares engineering students for a career in management. Through class discussions, group projects, various videos, and guest speakers, students find out what a management's role will entail, including ethical issues. Students learn how to go from being a practicing engineer to being and engineering manager.
Prerequisites:
- EGE 200 with a minimum grade of C- and EGE 201 with a minimum grade of C-
Restrictions:
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGG493. Engineering Selected Topic. 3-12 Credits.
Restrictions:
- Must have the following level: Undergraduate

EGG495. Indep Study Generl Engin. 1-12 Credits.
Restrictions:
- Must have the following level: Undergraduate

EGM101. Design With Additive Manufacturing. 1 Credit.
This course will present students with practical experience in the design of products. Students will learn the principals of design including the design, build, analyze paradigm. Students will leverage the power of 3D printing to take a novel product from concept to manufacture.
Prerequisites:
- EGG 101 (may be taken concurrently) with a minimum grade of C- and PHY 201 with a minimum grade of C- and PHY 211 with a minimum grade of C-
Restrictions:
- Must have the following level: Undergraduate

EGM193. Engineering - Mechanical Selected Topics. 1-12 Credits.
Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.
Restrictions:
- Must have the following level: Undergraduate
EGM201. Design Using Reverse Engineering. 1 Credit.
Building upon the practical experiences in Design with Additive Manufacturing (EGM101), students will use the principals of design by reverse engineering an existing product. Emphasis will be placed on improved design and functionality by reverse engineering as existing product from initial inspection to manufacture during this laboratory.

Prerequisites:
- EGM 101 with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration): Mechanical Engineering (521)

EGM211. Statics. 3 Credits.
Statics is the branch of engineering mechanics that is concerned with the analysis of forces on physical systems in static equilibrium. This class will help you interpret the forces supporting objects we encounter in our daily lives. Topics include: force systems, equilibrium, structural analysis, distributed forces, internal forces, friction, and virtual work. Finally, an introduction to mechanics of materials will be covered.

Prerequisites:
- PHY 201 with a minimum grade of C- and PHY 211 with a minimum grade of C- and MAT 252 with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGM212. Dynamics. 3 Credits.
Analysis of motions of particles and rigid bodies encountered in engineering. Topics include: velocity, acceleration, relative motion, work, energy, impulse, and momentum. Further development of mathematical modeling and problem solving. Vector mathematics where appropriate.

Prerequisites:
- EGM 211 with a minimum grade of C- and MAT 359 (may be taken concurrently) with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGM221. Engineering Materials. 3 Credits.
The relationship between the structure of materials and the resulting mechanical, thermal, electrical, and optical properties. Topics include: Atomic structure, bonding, atomic arrangement; crystal symmetry, crystal structure, habit, lattices, defects and the use of X-ray diffraction, phase equilibria, and micro-structural development. Applications to design.

Prerequisites:
- CHE 201 with a minimum grade of C- and CHE 211 with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration): Mechanical Engineering (521)

EGM293. Engineer-Mechanical Sel Topics. 1-12 Credits.
Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.

Restrictions:
- Must have the following level: Undergraduate

EGM295. Indep Study Mechanical Engineering. 1-12 Credits.

Restrictions:
- Must have the following level: Undergraduate

EGM301. Design of Measurement Instrumentation. 1 Credit.
Building upon the practical experiences in EGM 101 & EGM 201, students will use the principles of design, to design an experiment to measure a physical quantity. In addition to designing the experiment, students will be required to design and manufacture the instrumentation for the experiment. Students will be expected to plan the design process of both the experiment and the instrumentation, as well as, prepare a proposal detailing the design including time and cost schedules.

Prerequisites:
- EGM 101 with a minimum grade of C- and EGE 201 with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGM302. Finite Element Analysis. 3 Credits.
An introduction to the theory and practice of the finite element methods. One and two dimensional elements are studied, including structural elements. Primary fields of applications are strength of materials (deformation and stress analysis), dynamics, and heat transfer. Extensive use of commercial finite element software packages, through in-class (hands-on) experiences, and a course project.

Prerequisites:
- EGM 322 with a minimum grade of C- and EGM 332 with a minimum grade of C- and EGM 334 (may be taken concurrently) with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)
EGM311. Kinematics of Machines. 3 Credits.
This course will focus on the application of kinematics to the analysis, synthesis, and design of mechanisms. Specific topics covered will include linkage synthesis (graphically and analytically), position analysis, velocity analysis, acceleration analysis, cam design, and gear trains.

Prerequisites:
- EGM 212 with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGM312. System Dynamics. 3 Credits.
This course will focus on the modeling of dynamic systems in the mechanical, Electrical, thermal, and fluid domains. Steady-state and transient response will be addressed within the time domain and frequency domain techniques.

Prerequisites:
- EGM 311 with a minimum grade of C- and (EGE 200 with a minimum grade of C- or EGE 250 with a minimum grade of C-) and (EGE 201 with a minimum grade of C- or EGE 209 with a minimum grade of C-)

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGM322. Mechanics of Materials. 3 Credits.
Integrated approach to mechanics of materials. Topics include: stress and strain in structural elements; mechanical properties of materials; extension; torsion and bending of members; thermal stress; pressure vessels; static indeterminacy, stress transformation, Mohr’s circle, strain energy, failure criteria, and buckling.

Prerequisites:
- EGM 221 with a minimum grade of C- and EGM 323 (may be taken concurrently) with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGM323. Materials Lab. 1 Credit.
Study of the properties, behavior, and performance of engineering materials including: stress-strain relations, strength, deformation, fracture, creep, and cyclic fatigue. Introduction to experimental techniques common to mechanical engineering: interpretation of experimental data, comparison of measurements to numerical/analytical predictions, and formal engineering report writing.

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGM331. Thermodynamics. 3 Credits.
Properties of working fluids and fundamental relations for processes involving the transfer of energy. Topics include: First and second laws of thermodynamics, entropy, reversible and irreversible processes, properties of pure substance. Application to engineering problems.

Prerequisites:
- CHE 201 with a minimum grade of C- and CHE 211 with a minimum grade of C- and PHY 202 with a minimum grade of C- and PHY 212 with a minimum grade of C- and MAT 252 with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)

EGM332. Fluid Mechanics. 3 Credits.
Analysis of steady ideal and viscous fluid flow systems using the continuity, Bernoulli and momentum equations. Boundary layer theory is treated in terms of viscous and pressure drag, lift, and its importance in heat and mass transfer. Dimensional analysis and dynamic similitude are studied to provide an understanding of flow systems analysis and modeling. Introduction to pipe flow and open channel flow.

Prerequisites:
- EGM 212 with a minimum grade of C- and EGM 331 (may be taken concurrently) with a minimum grade of C- and MAT 359 with a minimum grade of C-

Restrictions:
- Must have the following level: Undergraduate
- Must have the following field(s) of study (major, minor or concentration):
  - Computer Engineering (518)
  - Mechanical Engineering (521)
  - Electrical Engineering (517)
EGM333. Thermo-Fluids Lab. 1 Credit.
An introduction to experimental methods in Mechanical Engineering: review and use of pressure, temperature, and flow measuring devices. Experimentation, data acquisition and analysis selected from within the thermo-fluids area.
Prerequisites:
• EGM 331 with a minimum grade of C- and EGM 332 (may be taken concurrently) with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration):
  • Computer Engineering (518)
  • Mechanical Engineering (521)
  • Electrical Engineering (517)

EGM334. Heat Transfer. 3 Credits.
The course discusses quantitatively the three main modes of heat transfer, which are conduction, convection, and radiation. A combined approach will be followed that will stress both the fundamentals of the rigorous differential description of the involved phenomena and the empirical correlations used for engineering design.
Prerequisites:
• EGM 331 with a minimum grade of C- and EGM 332 with a minimum grade of C- and (EGE 200 with a minimum grade of C- or EGE 250 with a minimum grade of C-) and (EGE 201 with a minimum grade of C- or EGE 209 with a minimum grade of C-)
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration):
  • Computer Engineering (518)
  • Mechanical Engineering (521)
  • Electrical Engineering (517)

EGM335. Thermo System Design. 3 Credits.
Thermodynamics of power cycles, refrigeration, air conditioning, and combustion processes; analysis, design, and testing of systems involving both conventional and renewable energy sources for power generation, heating, and cooling applications.
Prerequisites:
• EGM 331 with a minimum grade of C- and EGM 332 (may be taken concurrently) with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration):
  • Computer Engineering (518)
  • Mechanical Engineering (521)
  • Electrical Engineering (517)

EGM393. Engineer-Mechanical Sel Topics. 1-12 Credits.
Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.
Restrictions:
• Must have the following level: Undergraduate

EGM441. Mechanical Vibrations. 3 Credits.
The objective of this course is for students to learn analytical, experimental, and numerical treatment of vibration phenomena. Topics include linear oscillator analysis (Laplace transforms, complex harmonic balance, Fourier transforms, eigenvalue problems, modal analysis, and simulation), experimental methods, and an introduction to nonlinear dynamic systems. Free and forced vibrations of mechanical systems with lumped inertia, springs, and dampers are the primary emphasis.
Prerequisites:
• EGM 212 with a minimum grade of C- and MAT 362 with a minimum grade of C-
Restrictions:
• Must have the following level: Undergraduate
• Must have the following field(s) of study (major, minor or concentration):
  • Computer Engineering (518)
  • Mechanical Engineering (521)
  • Electrical Engineering (517)

EGM493. Engineer-Mechanical Sel Topics. 1-12 Credits.
Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.
Restrictions:
• Must have the following level: Undergraduate

EGM494. Fieldwork Mechanical Engineering. 1-12 Credits.
Restrictions:
• Must have the following level: Undergraduate

EGM495. Indep Study Mech Engineering. 1-12 Credits.
Restrictions:
• Must have the following level: Undergraduate