

Graduate Courses in Different Concentration Areas for Ph.D. and MS in Electrical Engineering

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The research activities and graduate course offerings in the Department can be broadly divided into five major areas. Within each major area, there may be several sub-areas. Students in the Ph.D. and MS programs are recommended to choose their courses to focus on one or two concentration areas, to gain sufficient depth in the selected areas. This document provides a list of courses related to each area. **Under each area, the fundamental courses in that area are highlighted in bold and students are recommended to take those courses first, unless they have had equivalent courses in their prior education.**

To see the catalog description and prerequisites of all ECE graduate courses, in the following link, select "EL-GY" as prefix, and click on "filter":

<http://bulletin.engineering.nyu.edu/content.php?catoid=9&navoid=864>

Typical semesters that a course is offered (Fall or Spring or both semesters) are listed in the ECE graduate student manual. Tentative course scheduling for the coming semesters are posted at <http://engineering.nyu.edu/academics/departments/electrical/graduate-resources>

- ***Communication, Networking, and Signal Processing***

Communications

EL-GY 6303 Probability and Stochastic Processes

EL-GY 6013 Digital Communications

EL-GY 6023 Wireless Communications

EL-GY 6063 Information Theory

EL-GY 6333 Detection and Estimation

EL-GY 90x3 Selected topics in Communications

Networking

EL-GY 5373 Internet Architecture and Protocols

EL-GY 6303 Probability and Stochastic Processes

EL-GY 6383 High-Speed Networks

EL-GY 7353 Network Modeling and Analysis

EL-GY 7363 Network Design and Algorithms

EL-GY 7373 High Performance Switches and Routers

EL-GY 6233 System Optimization Methods

EL-GY 9333 Selected Topics: Data Center and Cloud Computing

EL-GY 93x3 Selected topics in networking

Signal Processing

EL-GY 6113 Digital Signal Processing I

EL-GY 6303 Probability and Stochastic Processes

EL-GY 6123 Image and Video Processing

EL-GY 6183 Digital signal processing laboratory

EL-GY 5253 Applied Matrix Theory

EL-GY 6233 System Optimization Methods

EL-GY 6333 Detection and Estimation

EL-GY 7133 Digital Signal Processing II

EL-GY 6813 Medical Imaging

EL-GY 5813 Biomedical instrumentation
EL-GY 9173 Selected topics in signal processing: audio content analysis
EL-GY 91x3 Selected topics in signal processing
EL-GY 9xx3 Selected topics in Machine Learning

- **Computer Engineering and Microelectronics**

Computer Architecture and Digital Circuits Design

EL-GY 6463 Advanced Hardware Design

EL-GY 6473 Introduction to VLSI System Design

EL-GY 6483 Realtime embedded system design

CS-GY 6133 Computer architecture 1

EL-GY 6443 VLSI System and Architecture Design

EL-GY 6453 Advances in Reconfigurable Systems

EL-GY 6493 Design and Test of Digital Systems

EL-GY 9423 Selected topics: Design of trust worthy hardware

EL-GY 94x3 Selected topics in computer engineering

EL-GY 6813 Biomedical instrumentation

CS-GY 6143 Computer architecture 2

(Note that course numbering with prefix EL-GY 64x3 does not indicate the suggested sequencing of courses.)

Microelectronic Devices & Circuits Design

EL-GY 6513 Solid State Electronic Devices

EL-GY 6523 Nanoelectronic devices

EL-GY 6403 Analog integrated circuit design

- **Electromagnetics and Analog/RF Circuits**

Electromagnetics

EL-GY 6713 Electromagnetic Theory and Applications

EL-GY 6723 Electromagnetic Radiation and Antennas

EL-GY 5753 Introduction to Plasma Engineering

EL-GY 6583 Fiber communication systems

EL-GY 97x3 Selected topics in Electrophysics

Analog/RF Circuits

EL-GY 6403 Analog integrated circuit design

EL-GY 5463 Introduction to RF/Microwave Integrated Circuits

EL-GY 5733 RF and Microwave Systems Engineering

- **Energy Systems and Power Electronics**

EL-GY 5613 Introduction to Electric Power Systems

EL-GY 6603 Power Electronics

EL-GY 5623 Finite Elements for Electrical Engineering

EL-GY 5663 Physics of Alternative Energy (colisted PH-GY 5663)

EL-GY 5673 Electronic Power Supplies

EL-GY 6613 Electrical Transmission & Distribution Systems

EL-GY 6623 Power Systems Economics and Planning
EL-GY 6633 Transients, Surges and Faults in Power Systems
EL-GY 6653 Power System Stability
EL-GY 6663 Distributed Generation Systems
EL-GY 6673 Resonant Power Converters
EL-GY 6683 Electric Drives
EL-GY 96x3 Selected topics in power engineering

- ***Systems, Controls, and Robotics***

Controls and Robotics

EL-GY 6243 System Theory and Feedback Control

EL-GY 6253 Linear Systems

EL-GY 5223 Sensor Based Robotics

EL-GY 5253 Applied Matrix Theory

EL-GY 6233 System Optimization Methods

EL-GY 7253 State Space Design for Linear Control Systems

EL-GY 8223 Applied Nonlinear Control

EL-GY 8233 Optimal Control Theory

EL-GY 8253 Large-Scale Systems and Decentralized Control

EL-GY 9213 Selected Topics: Game Theory for Multi-Agent Systems

EL-GY 9223 Selected Topics: Reinforcement Learning for Complex Systems

EL-GY 92x3 Selected Topics in Control Systems

System Engineering:

EL-GY 5213 Introduction to Systems Engineering

EL-GY 6213 System Modeling, Analysis and Design