

M.S. ELECTRICAL ENGINEERING

UNIVERSITY OF THE
DISTRICT OF COLUMBIA
SCHOOL OF ENGINEERING AND APPLIED SCIENCES



MASTER OF SCIENCE IN ELECTRICAL ENGINEERING

Looking for professional advancement in Electrical Engineering? Interested in staying abreast of fast-moving development? Would you like to stay competitive in today's job market?

Join our Master of Science in Electrical Engineering (MS) program at UDC! Our faculty members are enthusiastic researchers as well as passionate teachers. You will not only learn state-of-the-art technology, but also conduct research in diverse areas solving real-world problems. You will be encouraged and guided to reach your highest potential. We teach, we mentor, and we care! You succeed!

About the Program

UDC's Master of Science degree program in Electrical Engineering (MS) is tailored to meet the needs of working professionals. The MS in EE program has strong foundations to: a) equip students with the in-depth and interdisciplinary skills required to grasp and develop new technologies and trends in electrical engineering; and b) prepare electrical engineers with the knowledge and tools needed to advance into professional leadership roles and to shape the future of this dynamic field.

Curriculum

The program focuses on two important areas of emphasis in the context of urban issues and homeland security: 1) Communications and Signal Processing, and 2) Systems Engineering. These two niche areas have numerous applications in national security, defense, and high-tech consumer products. There is a great demand for highly qualified engineers in these areas nationally and in the Greater Washington Metro area.

Your total 30-credit-hour curriculum consists of:

Core courses...24

Electives...6

Students who do not have an undergraduate BS in Electrical Engineering or a degree in a related discipline, will be required to take additional background coursework in electrical engineering. For details about these background courses, students need to consult with graduate program director.

Active Grants

Title: "NSF Targeted Infusion Project: Course Development for a 21st Century Smart Grid Workforce," Award Amount: \$398,345, PI: Sasan Haghani, Co PI: Pawan Tyagi and Wagdy Mahmoud.

Title: "NSF Targeted Infusion Project: Integration, Cultivation, and Exposure to Biomedical Engineering at the University of the District of Columbia," Award Amount: \$399,991, PI: Lara Thompson, Co PI: Sasan Haghani and Nian Zhang

Title: "NSF An Intelligent Optimization, Clustering and Classification Framework for High Dimensional, Overlapped Classes, and Imbalanced Data," Award Amount: \$200K, PI: Nian Zhang

Title: "Performance Data-Driven Methods and Tools for Computer Network Defense through Network Science," Award Amount: \$594,755 Army Research Office (ARO) Department of Defense Research and Educational Program, PI: Paul Cotae



What makes UDC's Electrical Engineering master's program different?

The Electrical Engineering program at UDC is designed with the success of the individual student in mind. With smaller class sizes, students benefit from a personal teaching environment and individual attention.

How will my credits transfer?

Once you are enrolled, you need to contact the graduate program director in the department for possible course transfer. UDC accepts academic coursework (up to nine credit hours) from regionally accredited colleges and universities.

May I speak to a current UDC student?

Contact the graduate program director to be connected with a continuing or recently graduated student who will share their experience with you.

"My goal was to excel academically. It is one of the reasons why every time I was told that a specific field was geared towards men, I would do my best to join that field, and do extremely well in it. It is also the reason why I chose the University of the District of Columbia, an excellent institution, with accredited engineering programs that could give me a top education at an affordable price."

~ FATOU MBENGUE | Class of 2009

For more information about an MS in Electrical Engineering, visit www.udc.edu/seas or contact:

*Department Chair, Dr. Paul Cotae
202-274-6290, pcotae@udc.edu*

*Program Director, Dr. Wagdy Mahmoud
202-274-5239, wmahmoud@udc.edu*

*Department Office, Ms. Clara Cooper
202-274-5740, cvcooper@udc.edu*

Curriculum of the MS in EE program

Core courses

ELEC 571 Linear systems
ELEC 507 Probability and Random Processes

Areas of Emphasis

Communications and Signal Processing area

- ELEC 558 Digital Signal Processing I
- ELEC 569 Digital Communications I
- Groups A (Suggested Electives) and Group C (Free Electives)

Digital Systems Engineering area

- ELEC-559 Computer Architecture
- ELEC-584 Digital System-level Design
- Groups B (Suggested Electives) and Group C (Free Electives)

Group A list of Suggested Elective Courses

ELEC 510 Communications and Security for Smart Grid
ELEC 520 Power Electronics
ELEC 555 Adaptive Filters
ELEC 559 Computer Architecture
ELEC 560 Digital Image Processing
ELEC 568 Wireless Communications
ELEC 569 Digital Communications I
ELEC 574 Digital Information Theory
ELEC 575 Wireless Networks
ELEC 578 Digital Integrated Circuit Design
ELEC 579 Digital Integrated Circuit Design Laboratory
ELEC 580 Digital System Design and Synthesis
ELEC 584 Digital System-level Design
ELEC 585 Design of a System on a Chip (SoC)
ELEC 586 Advanced Embedded System Design
ELEC 658 Digital Signal Processing II
ELEC 659 Advanced Computer Architecture
ELEC 665 Multimedia Communications
ELEC 669 Digital Communications II
ELEC 673 Coding Theory and Applications
ELEC 678 Advanced Digital Integrated Circuit Design
ELEC 692 Advanced Topics in Signal and Image Processing
ELEC 693 Advanced Topics in Digital Communications
ELEC 599 Master's Project (3 credit hours)
ELEC 699 Master's Thesis (6 credit hours)

Group B list of Suggested Elective Courses

ELEC 510 Communications and Security for Smart Grid
ELEC 520 Power electronics

Thesis or Project (Non-Thesis) option

Project option

Students must take ELEC 599 Master's Project (3 credits)

Thesis option

Students must take ELEC 699 Master's Thesis (6 credits, two semesters)



ELEC 555 Adaptive Filters
ELEC 558 Digital Signal Processing I
ELEC 564 Digital Image Processing
ELEC 568 Wireless Communications
ELEC 569 Digital Communications
ELEC 574 Digital Information Theory
ELEC 575 Wireless Networks
ELEC 578 Digital Integrated Circuit Design
ELEC 579 Digital Integrated Circuit Design Laboratory
ELEC 580 Digital System Design and Synthesis
ELEC 583 Introduction to Computer Aided Digital Design Lab
ELEC 585 Design of a System on a Chip (SoC)
ELEC 586 Advanced Embedded System Design
ELEC 592 Advanced Topics in Signal and Image Processing
ELEC 658 Digital Signal Processing II
ELEC 659 Advanced Computer Architecture
ELEC 665 Multimedia Communications
ELEC 669 Digital Communications
ELEC 673 Coding Theory and Applications
ELEC 678 Advanced Digital Integrated Circuit Design
ELEC 693 Advanced Topics in Digital Communications
ELEC 599 Master's Project (3 credit hours)
ELEC 699 Master's Thesis (6 credit hours)

Group C (Free Electives)

Courses in computer science, mathematics, or any other related courses that the student's advisory committee approves. Selected courses must logically fit within the student's plan of study.

Faculty Expertise

Department of Electrical and Computer Engineering

The outstanding qualifications of the faculty coupled with their professional expertise, the quality of their teaching and research, and access to state-of-the-art laboratories provide our students with a highly competitive education, close mentoring with attention to student needs and academic progress.

Paul Cotae, Ph.D.

Digital Communication, Cyber Security, Machine Learning, Anomaly Detection, Intrusion Visualization.

Hongmei Dang, Ph.D.

Nanoscale Device Fabrication & Modelling, Defect Analysis, Nanoscale Electronic & Solar Cells, 2D Materials.

Sasan Haghani, Ph.D.

Smart Grid and Renewable Energy, Wireless Sensor Networks, Broadband Communications.

Wagdy Mahmoud, Ph.D., P.E.

System-level Hardware/Software Co-design, Digital Signal Processing, Embedded & Cyber-Physical Systems.

Esther Ososanya, Ph.D. (Department Chair)

Microcomputer Architecture, VLSI & ASIC Designs, Embedded Systems, Nanotechnology, Renewable Energy.

Amir Shahirinia, Ph.D.

Power Systems Optimal Planning and Control, Power Electronics and Motor Drives, Renewable Energy; Smart Grids; V2G and G2V; Plug-in Electric Vehicle, Artificial Intelligence, Bayesian Statistics, Data Analysis, Algorithm Development.

Nian Zhang, Ph.D.

Computational Intelligence, Machine Learning and Data Mining, Big data, Time Series Prediction.