MS in Computer Engineering
&
MS in Electrical Engineering

UPM – Fall 2023
Speaker: Kris Gaj
Associate Chair for Graduate Programs

Research and teaching interests:

• applied cryptography
• FPGA design
• software/hardware codesign
• cryptographic engineering
• hardware security

Contact:
e-mail: kgaj@gmu.edu
Academic Programs Run by the ECE Department

• Undergraduate Degrees
  • BS in Computer Engineering
  • BS in Electrical Engineering

• Master’s Degrees
  • MS in Computer Engineering (MS CpE)
  • MS in Electrical Engineering (MS EE)
  • MS in Digital Forensics
  • MS in Telecommunications

• Ph.D. Degree
  • PhD in Electrical and Computer Engineering
College of Engineering and Computing

Volgenau School of Engineering

- ECE – Electrical and Computer Engineering
- CYSE – Cybersecurity Engineering
- BENG – Bioengineering
- ME – Mechanical Engineering
- SEOR – Systems Engineering and Operations Research
- CEIE – Civil, Environmental and Infrastructure Engineering

School of Computing

- CS – Computer Science
- IST – Information Sciences and Technology
- STAT – Statistics

Most related to Computer Engineering
Most related to Electrical Engineering
Networking in Your Classes

International Full-Time

Domestic Part-Time

Domestic Full-Time
Concentrations of MS CpE

RECENTLY CREATED

MACHINE LEARNING & INTELLIGENT COMPUTING ARCHITECTURES
HARDWARE SECURITY & CRYPTOGRAPHIC ENGINEERING
INTERNET OF THINGS & NETWORK SECURITY
SPACE-BASED SYSTEMS

MORE TRADITIONAL BUT VERY POPULAR

COMPUTER ARCHITECTURE & EMBEDDED SYSTEMS
COMPUTER NETWORKS
DIGITAL SYSTEMS DESIGN
DIGITAL SIGNAL PROCESSING
Concentrations of MS EE

RECENTLY CREATED

- MACHINE LEARNING IN ELECTRICAL ENGINEERING
- POWER SYSTEMS & SMART GRID
- SPACE-BASED SYSTEMS

TRADITIONAL & VERY POPULAR

- COMMUNICATIONS & NETWORKING
- CONTROL & ROBOTICS
- SIGNAL PROCESSING
- ELECTRONICS
- BIOENGINEERING
CONCENTRATIONS

• You have to choose only ONE
• You can change your concentration any time during your studies at GMU!
• The concentration determines your 2 required courses and a list of electives
• It is best to select in the first semester at GMU
• Choose based on what you enjoy doing and what you are good at
• Talk to your advisor about it!
Examples of Recently Developed Courses

ECE 554: Machine Learning for Embedded Systems

ECE 556: Neuromorphic Computing

ECE 555: GPU Architecture and Programming

ECE 655: Advanced GPU Programming and Deep Learning

ECE 657: Probabilistic Machine Learning

ECE 532: Secure Wireless Communications and Networks

ECE 699: Post-Quantum Cryptography
Our Courses

• The same courses for full-time and part-time students

• Most graduate courses meet once per week
  4:30-7:10 PM or 7:20-10:00 PM

• The same course can be taken by students from multiple programs
  • MS CpE
  • MS EE
  • PhD ECE
  • BS CpE
  • BS EE
  • etc.
OUR COURSES (A.K.A. CLASSES)

• 500-level: Introductory
  Taken by MS and senior undergraduate students

• 600-level and 700-level: Upper-Level/Advanced
  Taken by MS and PhD students
DEGREE REQUIREMENTS

30 credit hours = 10 courses
Up to 12 credit hours may be transferred from UPM

1. Concentration Requirement
   • 1 concentration =
     2 required courses + 3 concentration electives (min. 2 upper-level)

2. Upper-Level Course Requirement
   • 3 upper-level (600 and above; may overlap with concentration electives)

3. ECE Course Requirement
   • MSEE: max. 2 non-ECE courses
   • MSCpE: max. 2 non-ECE + 2 DFOR, CS, ISA, or SWE courses
CHOOSING A GRADUATION OPTION

1. MS Thesis Option
   - 8 courses
   - ECE 799 MS Thesis (6 cr. hrs)

2. Research Project Option
   - 9 courses
   - Scholarly paper + ECE 798 Research Project

3. Scholarly Paper Option
   - 10 courses
   - Scholarly paper
Funding Your Education

- Graduate Research Assistantships (GRA)
- Graduate Teaching Assistantships (GTA)
- Wage jobs on Campus
  - department offices
  - GMU library
  - post-office
  - computer labs
  - bookstore
  - cafeteria, etc.
- Search and apply using https://gmu.joinhandshake.com\login
RESEARCH ASSISTANTSHIPS

20 or 10 hours per week, salary + in-state tuition

Research in the area of interest of a given ECE faculty member

Work on a research grant of a given professor

Candidates selected individually by each professor

Preference given to students with good GPA, with no C’s or F’s, with excellent grades in courses taught by the given faculty member

Documented practical skills and experience in the area of research of the given faculty member very welcome

MS Thesis option, earlier publications, and Ph.D. plans a plus
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<th>Full Name</th>
<th>Directors</th>
<th>Since</th>
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<td>Kris Gaj &amp; Jens-Peter Kaps</td>
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<td>Dr. Jiang’s Quantum-Classical Computer-Aided Design Lab</td>
<td>Weiwen Jiang</td>
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TEACHING ASSISTANTSHIPS

• 20 or 10 hours per week

• Salary + out-of-state to in-state tuition release

• Grading, recitations, and labs for selected ECE undergraduate and a few ECE graduate courses

• About 25 20-hr-per-week positions available each semester.

• Applications need to be submitted to the ECE main office in the middle of the preceding semester

• Deadlines and detailed procedures announced on the ECE website

• Preference given to students maintaining good GPA, with no C’s or F’s
SKILLS ARE IMPORTANT (RA & TA):

- Practical skills, such as documented knowledge of:
  - Matlab,
  - PSpice,
  - VHDL or Verilog,
  - C/C++,
  - Python,
  - Assembly languages,
  - Xilinx Vivado,
  - ModelSim,
  - FPGA boards,
  - Microcontroller boards,
  - measurement equipment,
  - telecommunication equipment,
  - etc.

are very welcome
Benefits of Your Degree

• Most full-time students get a job either while finishing their degree or maximum 2-3 months after graduation

• Many part-time students get a promotion or raise after completing their degree

• Average annual salary in the U.S. companies for employees with MS in Computer Engineering & MS in Electrical Engineering: ~$130k

• Some students decide to pursue Ph.D. studies at Mason or at another university
Placement of Our Recent Graduates

Atharv Dixit
Fall 2020
General Electric Digital

Lineeesh Kizhakkeveetil
Fall 2020
Micron Technology

Srivatsa Niranjan Raju
Spring 2020
Cisco Meraki

Jun Wang
Spring 2020
A10 Networks
Placement of Our Recent Ph.D. Students

Farnoud Farahmand  
2020  
Apple

Viet Ba Dang  
2022  
Qualcomm

Panasayya Yala  
2017  
Riscure
Companies in the Vicinity of GMU

- Accenture
- Amazon
- AWS
- ARL
- BAE Systems
- Booz Allen
- CACI
- Cadence
- Collins Aerospace
- Raytheon
- TwoSix Labs
- Wireless Ventures
Useful Resources and Information

• GMU Catalog
  https://catalog.gmu.edu
  Find a Program: Computer Engineering  
  Electrical Engineering  
  Find a Course: ECE ....

• ECE Website
  https://ece.gmu.edu  
  ACADEMICS => Master’s  
  ACADEMICS => Courses  
    including Featured Courses  
    Fall 2023 Syllabi, Spring 2023 Syllabi  
  PEOPLE => ECE Faculty
Useful Resources and Information

- **OIPS: Office of International Programs and Services**
  
  [https://oips.gmu.edu](https://oips.gmu.edu)
  [https://oips.gmu.edu/new-students](https://oips.gmu.edu/new-students)

- Visa-related issues, Practical advice
Welcome to ECE @ GMU!

We are looking forward to meeting you in person!
Students Currently in the 1+1 Program

“Mavi”
Maria Victoria Clerico Da Costa

Miguel Medina Anton
Thank you!

Questions?

Concerns?

How can we help you?