



STEVENS
INSTITUTE *of* TECHNOLOGY
THE INNOVATION UNIVERSITY



Handbook for ECE Master's Programs

Department of Electrical and Computer Engineering

Fall 2021

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I. Programs

A. General Guidelines – Study Plan

- Build a Study Plan in Workday in your first semester of study.
 - Contact academic advisor, Ms. Nina Cheung at ncheung@stevens.edu with questions.
 - Each student is assigned a faculty advisor, who provides guidance on in-depth and long-term planning, including topics such as selecting a concentration or electives. You can find out who is your faculty advisor in Workday.
- Submit the Study Plan to Workday early to clear your registration hold for upcoming semesters.
- Keep a copy of your approved Study Plan and refer to the approved Study Plan when registering for courses. Do not take courses that are not listed on the approved Study Plan.

B. Degree Programs and Curriculum

- Master of Engineering (ME) in Electrical Engineering (EE)
- Master of Science (MS) in EE
- Master of Engineering in Computer Engineering (CPE)
- Master of Science in CPE
- Master of Engineering in Applied Artificial Intelligence (AAI)
- Master of Science in AAI

B.1 Program Timeline

- Minimum 30 credits (10 courses) to graduate
 - Typically, it takes one and a half years to complete the ME degree, two years to complete the MS degree.
 - Full-time study: flat-rate tuition charge for 3 or 4 courses per semester.
 - Final semester: per-credit tuition charge for 1 or 2 courses.

B.2 Program Structure

- 500, 600, 800, 900 level courses are for graduate students.
- 100 to 400 level courses are for undergraduate students; Do not take any course under 500 level.

B.3 Study Plan for ME (Master of Engineering) Degrees

Students are required to complete:

- 1 mathematical foundation course
- 4 core courses in a chosen program
- 3 concentration courses in a chosen concentration
- 2 elective courses

Important notice:

- Complete the mathematical course and core courses during the first two semesters of study.
- The elective courses could be any ECE graduate courses at the 500 or 600 levels.
 - If you need to take a non-ECE graduate course as elective, your faculty advisor must approve it before including it on your Study Plan.
 - The AAI/CPE/EE 800 project course cannot be used as elective.

B.4 Study Plan for MS (Master of Science) Degrees

Project Track. Students are required to complete:

- 1 mathematical foundation course
- 4 core courses in a chosen program
- 3 concentration courses in a chosen concentration
- 1 elective course
- one 3-credit project course and EE 820 (0-credit research seminar)

or

Thesis Track. Students are required to complete:

- 1 mathematical foundation course
- 4 core courses in a chosen program
- 3 concentration courses in a chosen concentration
- one 6-credit master thesis

Important notice:

- Complete the mathematical course and core courses during the first two semesters of study.
- MS students in the **Project Track**
 - Must have a project advisor first.
 - Take the 3-credit project course (EE/CPE/AAI 800) in the third semester.
 - EE 820 and EE/CPE/AAI 800 are co-requisites.
- MS students in the **Thesis Track**
 - Must have a thesis advisor first.
 - Take the first 3-credit thesis course (EE/CPE/AAI 900) in the third semester and the second 3-credit thesis course in the fourth semester.

B.5 Course Schedule

- The majority of ECE courses are offered on campus. Online courses are primarily designed for part-time students. Full-time students need to take the on-campus courses.
- If a course is offered both on campus and online, it is denoted as (A/WS).
 - Courses offered only on campus are denoted as (A)
 - Courses offered only online are denoted as (WS)
- Courses offered in Fall, Spring, Summer are denoted as [F], [S], [M], respectively. [FS] means a course is offered in both Fall and Spring semesters.
- Course schedule is subject to change depending on enrollments and the availability of resources.

B.6 Program Requirements

B.6.1 Mathematical Foundation Courses (select 1 for each program)

- EE
 - EE 602 Analytical Methods in Electrical Engineering (A/WS) [FS], or
 - EE 605 Probability and Stochastic Processes I (A/WS) [FS]
- CPE
 - CPE 602 Applied Discrete Mathematics (A) [FS], or
 - EE 605 Probability and Stochastic Processes I (A/WS) [FS]

- AAI
 - EE 602 Analytical Methods in Electrical Engineering (A/WS) [FS], or
 - EE 605 Probability and Stochastic Processes I (A/WS) [FS]

B.6.2 Core Courses (select 4 for each program)

- EE
 - EE 548 Digital Signal Processing (A) [F]; (WS) [SM]
 - EE 575 Introduction to Control Theory (A) [FS]; (WS) [S]
 - EE 603 Linear Systems Theory (A/WS) [FS]; (WS) [M]
 - EE 609 Communication Theory (A) [FS]
 - EE 608 Applied Modeling and Optimization (A/WS) [FS]
- CPE
 - CPE 517 Digital and Computer Systems Architecture (A/WS) [FS]
 - CPE 555 Real-Time and Embedded Systems (A) [FS]; (WS) [M]
 - CPE 593 Applied Data Structures & Algorithms (A) [FS]
 - CPE 690 Introduction to VLSI Design (WS) [F]; (A) [S]
 - EE 608 Applied Modeling and Optimization (A/WS) [FS]
- AAI
 - AAI 646 Pattern Recognition and Classification (A) [FS]; (WS) [M]
 - AAI 695 Applied Machine Learning (A/WS) [FS]
 - AAI 627 Data Acquisition, Modeling and Analysis: Big Data Analytics (A/WS) [FS]
 - AAI 628 Introduction to Deep Learning for Engineering (WS) [F]; (A) [S]
 - AAI 672 Applied Game Theory and Evolutionary Algorithms (A) [F]
 - EE 608 Applied Modeling and Optimization (A/WS) [FS]

B.6.3 Concentration Courses for EE and CPE

- **EE and CPE Concentrations**
 1. Communications (EE)
 2. Power Engineering (EE)
 3. Robotics and Automation Systems (EE)
 4. Microelectronics and Photonics (EE)
 5. Artificial Intelligence (EE and CPE)
 6. Embedded Systems (CPE)
 7. Software and Data Engineering (CPE)
 8. Networks and Security (CPE)
- **Courses for EE and CPE Concentrations**
 - Concentration 1: Communications (select 3)**
 - EE 510 Introduction to Radar Systems (WS) [S]
 - EE 583 Wireless Communications (A) [F]; (WS) [S]
 - EE 585 Physical Design of Wireless Systems (WS) [FS]
 - EE 582 Wireless Networking: Architecture, Protocols and Standards (A) [S]; (WS) [F]
 - EE 568 Software-Defined Radio (WS) [M]
 - Concentration 2: Power Engineering (select 3)**
 - EE 575 Introduction to Control Theory (A) [FS]; (WS) [S]

- EE 589 Introduction to Power Engineering (A)[F]; (WS)[S]
- EE 590 Smart Grid (A) [S]
- EE 629 Internet of Things (A) [FS]
- CPE 679 Computer and Information Networks (WS) [FS]
- CPE 691 Information Systems Security (A) [S]; (WS) [F]

Concentration 3: Robotics and Automation Systems (select 3)

- EE 575 Introduction to Control Theory (A) [FS]; (WS) [S]
- EE 621 Nonlinear Control (A) [S]
- EE/CPE 631 Cooperating Autonomous Mobile Robots (A) [S]
- CPE 521 Introduction to Autonomous Mobile Robots (A/WS) [F]
- CPE 645 Image Processing and Computer Vision (WS) [M]
- EE 553 Engineering Programming: C++ (A) [FS]

Concentration 4: Microelectronics and Photonics (select 3)

- CPE 690 Introduction to VLSI Design (WS) [F]; (A) [S]
- EE/PEP 503 Introduction to Solid State Physics (A) [S]
- EE/PEP 509 Intermediate Waves and Optics (A) [S]
- PEP 515 Photonics I (A) [F]
- PEP 516 Photonics II (A) [S]

Concentration 5: Artificial Intelligence (select 3)

- AAI 551 Engineering Programming: Python (A/WS) [FS]
- AAI 672 Applied Game Theory and Evolutionary Algorithms (A) [F]
- AAI 627 Data Acquisition, Modeling and Analysis: Big Data Analytics (A/WS) [FS]
- AAI 628 Introduction to Deep Learning for Engineering (WS) [F]; (A) [S]
- AAI 646 Pattern Recognition and Classification (A) [FS]; (WS) [M]
- AAI 695 Applied Machine Learning (A/WS) [FS]

Concentration 6: Embedded Systems (select 3)

- CPE 517 Digital and Computer Systems Architecture (A/WS) [FS]
- CPE 555 Real-Time and Embedded Systems (A/WS) [FS]; (WS) [M]
- CPE 556 Computing Principles for Embedded Systems (A) [F]
- CPE 690 Introduction to VLSI Design (WS) [F]; (A) [S]
- EE 629 Internet of Things (A) [FS]

Concentration 7: Software and Data Engineering (select 3)

- CPE 593 Applied Data Structures & Algorithms (A) [FS]
- EE 551 Engineering Programming: Python (A/WS) [FS]
- EE 552 Engineering Programming: Java (A/WS) [F]; (WS) [S]
- EE 553 Engineering Programming: C++ (A) [FS]
- EE 627 Data Acquisition, Modeling and Analysis: Big Data Analytics (A/WS) [FS]
- EE 628 Introduction to Deep Learning for Engineering (WS) [F]; (A) [S]
- EE 629 Internet of Things (A) [FS]
- CPE 810A Special Topics in Computer Engineering: GPU & Multicore Programming (A) [FS]

Concentration 8: Networks and Security (select 3)

- CPE/CS 579 Foundations of Cryptography (A) [S]

- EE 584 Wireless Systems Security (WS) [FS]
- CPE 654 Design and Analysis of Network Systems (WS) [FS]
- CPE 679 Computer and Information Networks (WS) [FS]
- CPE 691 Information Systems Security (A) [S]; (WS) [F]

B.6.4 Concentration Courses for AAI

- **AAI Concentrations**

1. Electrical Engineering
2. Computer Engineering
3. Data Engineering
4. Software Engineering
5. Biomedical Engineering
6. Systems Biology
7. Mechanical Engineering
8. Artificial Intelligence in Design and Construction

- **Courses for AAI Concentrations**

Concentration 1: Electrical Engineering (select 3)

- EE 548 Digital Signal Processing (A) [F]; (WS) [SM]
- EE 575 Introduction to Control Theory (A) [FS]; (WS) [S]
- EE 582 Wireless Networking: Architecture, Protocols and Standards (A) [S]; (WS) [F]
- EE 603 Linear Systems Theory (A/WS) [FS]; (WS) [M]
- EE 609 Communication Theory (A) [FS]
- EE 608 Applied Modeling & Optimization (A/WS) [FS]

Concentration 2: Computer Engineering (select 3)

- CPE 517 Digital and Computer Systems Architecture (A/WS) [FS]
- CPE 555 Real-Time and Embedded Systems (A/WS) [FS]; (WS) [M]
- CPE 593 Applied Data Structures & Algorithms (A) [FS]
- CPE 679 Computer and Information Networks (WS) [FS]
- CPE 690 Introduction to VLSI Design (WS) [F]; (A) [S]
- EE 608 Applied Modeling & Optimization (A/WS) [FS]

Concentration 3: Data Engineering (select 3)

- CPE 593 Applied Data Structures & Algorithms (A) [FS]
- AAI 627 Data Acquisition, Modeling and Analysis: Big Data Analytics (A/WS) [FS]
- AAI 628 Introduction to Deep Learning for Engineering (WS) [F]; (A) [S]
- AAI 551 Engineering Programming: Python (A/WS) [FS]

Concentration 4: Software Engineering (select 3)

- CPE 593 Applied Data Structures & Algorithms (A) [FS]
- AAI 627 Data Acquisition, Modeling and Analysis: Big Data Analytics (A/WS) [FS]
- EE 553 Engineering Programming: C++ (A) [FS]
- EE 552 Engineering Programming: Java (A/WS) [F]; (WS) [S]
- AAI 551 Engineering Programming: Python (A/WS) [FS]
- CPE 810A Special Topics in Computer Engineering: GPU & Multicore Programming (A) [FS]

Concentration 5: Biomedical Engineering

- BME 810: Biomedical Digital Signal Processing
- BME 558: Introduction to Brain Computer Interface
- BME 504/CPE 585: Medical Instrumentation and Imaging

Concentration 6: Systems Biology

- BIO 687: Molecular Genetics
- CH 580 Biochemistry I
- BIO 668 Computational Biology

Concentration 7: Mechanical Engineering

- ME 598 Introduction to Robotics
- ME 621: Introduction to Modern Control
- ME 644: Computer-Integrated Design and Manufacturing

Concentration 8: Artificial Intelligence in Design and Construction

- OE 511 Urban Oceanography
- CM 530 Strategic Responses to Cyclical Environments
- CM 560 Sustainable Design

B.6.5 Electives

- You may choose any ECE graduate courses at the 500 or 600 levels as electives.
 - If you need to take a non-ECE graduate course as elective, your faculty advisor must approve it before including it on your Study Plan.
 - The AAI/CPE/EE 800 project course cannot be used as elective.

B.6.6 Project Courses and Thesis Courses for MS Students

- List of Project Courses (3 credits in one semester)
 - EE/CPE/AAI 800 Special Problems in EE/CPE/AAI
 - Take it in the third semester; Could be individual project or team-based project
 - You must also enroll in the 0 credit Research Seminar Course EE 820 as a co-requisite for EE/CPE/AAI 800
- List of Thesis Courses (6 credits in two semesters)
 - EE/CPE/AAI 900 Thesis Course in EE/CPE/AAI
 - Take the first 3-credit thesis course in the third semester, and take the second 3-credit thesis course in the fourth semester

Important notice: Students need to enroll in the 800 and 900 courses before the semester starts.

B.7 Online Courses Offered in the Summer (denoted as [M])

- CPE 555WS Real-Time and Embedded Systems (WS) [M]
- CPE 645WS Image Processing & Computer Vision (WS) [M]
- AAI/CPE 646WS Pattern Recognition & Classification (WS) [M]
- EE 548WS Digital Signal Processing (WS) [M]
- EE 568WS Software-Defined Radio (WS) [M]
- EE 603WS Linear System Theory (WS) [M]
- CPE 679 Computer and Information Networks (WS) [M]

C. ECE Graduate Certificates (Optional)

1. Artificial Intelligence for Engineering
2. Autonomous Robotics
3. Microelectronics and Photonics
4. Real-Time & Embedded Systems
5. Secure Network Systems Design
6. Software Design for Embedded and Information Systems
7. Wireless Communications

• Courses for Graduate Certificates

Certificate 1: Artificial Intelligence (select 4)

- AAI 646 Pattern Recognition and Classification
- AAI 695 Applied Machine Learning
- AAI 551 Engineering Programming: Python
- AAI 627 Data Acquisition, Modeling and Analysis: Big Data Analytics
- AAI 628 Introduction to Deep Learning for Engineering
- AAI 672 Applied Game Theory and Evolutionary Algorithms

Certificate 2: Autonomous Robotics (select 4)

- CPE 521 Introduction to Autonomous Mobile Robots
- CPE 555 Real-Time and Embedded Systems
- EE 575 Introduction to Control Theory
- EE 621 Nonlinear Control
- EE/CPE 631 Cooperating Autonomous Mobile Robots

Certificate 3: Microelectronics and Photonics (select 4)

- CPE 690 Introduction to VLSI Design
- EE/PEP 503 Introduction to Solid State Physics
- EE/PEP 509 Intermediate Waves and Optics
- EE/PEP 507 Introduction to Microelectronics and Photonics
- EE/PEP 561 Solid State Electronics for Engineering I
- EE/PEP 562 Solid State Electronics for Engineering II

Certificate 4: Real-Time & Embedded Systems

- CPE 517 Digital and Computer Systems Architecture
- CPE 555 Real-Time and Embedded Systems
- CPE 556 Computing Principles for Embedded Systems
- CPE 690 Introduction to VLSI Design

Certificate 5: Secure Network Systems Design

- CPE 592 Computer and Multimedia Network Security
- CPE 654 Design and Analysis of Network Systems
- CPE 691 Information Systems Security
- EE 584 Wireless Systems Security

Certificate 6: Software Design for Embedded and Information Systems (select 4)

- CPE 555 Real-Time and Embedded Systems

- CPE 556 Computing Principles for Embedded Systems
- CPE 593 Applied Data Structures & Algorithms
- EE 553 Engineering Programming: C++
- EE 552 Engineering Programming: Java
- EE 551 Engineering Programming: Python

Certificate 7: Wireless Communications

- EE 583 Wireless Communications
- EE 584 Wireless Systems Security
- EE 585 Physical Design of Wireless Systems
- EE 586 Wireless Networking: Architecture, Protocols and Standards

Notice: not all certificate courses are offered every year.

D. Program Change Policy

- Students need a minimum 3.85 GPA to request ME to MS degree change.
- ME to MS degree change requests will not be granted to first semester students until all your first semester grades are submitted to reflect the minimum 3.85 GPA.
- There is no minimum GPA requirement to request MS to ME degree change.

II. Advising

1. Advising and Student-Faculty Interaction

- Academic advisor (Ms. Nina Cheung): Advises on Study Plan and Application for Candidacy
 - The Application for Candidacy must match your most recently approved Study Plan and Stevens transcript.
 - Nina’s email: ncheung@stevens.edu
- Each student is assigned a faculty advisor, who provides guidance on in-depth and long-term planning, including topics such as selecting a concentration or technical electives. You can meet your faculty advisor during his/her office hours for technical questions or by appointment.
- ECE Open Advising
 - Every Wednesday 4:00 PM - 5:00 PM
 - Burchard 212 conference room or Zoom link: <https://stevens.zoom.us/j/8284137706>
- ECE Student-Faculty Social Hour
 - One Wednesday in the 2nd month of each semester. Check your Stevens email for details.
- ECE Student Advisement Canvas page for announcements, events, and forms.

2. Planning for a Successful Stevens’ Experience

- Cultural and extracurricular experience
- Mental health and wellness
<https://www.stevens.edu/directory/counseling-and-psychological-services>
- Design project and research experience
 - Visit the department website to learn ECE’s 4 research clusters and faculty’s research.
 - ECE Honors Summer Research Program. Details will be announced in late spring.

- ECE seminar talks: EE 820, 0-credit, Wednesday, 2:00 - 3:00 PM. Check Canvas announcements.
 - MS students in the Project Track must register EE 820 and attend all talks. MS students in the Thesis Track are strongly recommended to register EE 820 and attend all talks.
- Seminars organized by the School and Institute. Check your Stevens email.
- Activities organized by the Graduate Student Affairs. Check your Stevens email.
- Internship and work experience
 - Internship (CPT) – 1-3 credit CPT course with maximum of 3 credits total for all semesters.
 - Work experience (OPT): Inquire at International Student and Scholar Services (ISSS). <https://www.stevens.edu/directory/international-student-and-scholar-services>
 - On-campus jobs: <https://www.stevens.edu/directory/stevens-career-center>
- IEEE and ASEE societies: www.ieee.org; www.asee.org
- Graduate Student Code of Conduct: https://www.stevens.edu/sites/stevens_edu/files/Graduate-Student-Code-Academic-Integrity.pdf
- Safety and drug-free environment
- Study for a Ph.D. degree in EE and CPE

3. English Language Experience

- English Language Communication courses:
 - ELC 071: 4-credits, ELC 081: 2-credits, ELC 091: 2-credits
 - <https://web.stevens.edu/catalog/archive/2014-2015/special.html>

Appendix. The AAI/CPE/EE 800 project course enroll process

If you are a Master of Science (MS) student in the Project Track, you need to take one 3-credit project course (EE/CPE/AAI 800) in the third semester. Below is the process to enroll in the course. Please contact Nina (ncheung@stevens.edu) for questions.

1. Go through the [AAI/CPE/EE 800 Projects](#) and contact the professor who will advise your 800 project.
2. Fill in the [AAI/CPE/EE 800 Project Enrollment form](#). This form confirms that you are eligible for 800 Project and that you have secured an ECE professor to advise you on a project topic.
3. Submit the **Workday** 800 Project request by following these steps: Request "Course Section Pre-requisite Override". You can find this request by searching in the global search bar for "Course Section Pre-requisite Override" (it should populate the item based on part of the name), fill out the form with the course information and course section you want to enroll in, and then fill out the questionnaire on the following page. Once you submit the questionnaire, the request will route through Workday. If it is approved, you will receive a notification in Workday, which you can view by clicking on the bell icon. Once the request is approved you should be able to enroll in the 800 project course. Link for Workday Student Processes: <https://sit.instructure.com/courses/35399/modules>.
4. You must also enroll in EE 820 - Research Seminar when enrolling in the AAI/CPE/EE 800 project course. EE 820 is a zero-credit, Pass/Fail seminar course. Students need to attend the seminars to hear distinguished lectures on field-related topics.

Electrical Engineering (M.E. and M.S.) 10 courses/30 credits						
Y E A R 1	Choose ONE math course (3 credits)	<input type="checkbox"/> EE 602 Analytical Methods in Electrical Engineering		<input type="checkbox"/> EE 605 Probability and Stochastic Processes I		
	Choose FOUR core courses (12 credits)	<input type="checkbox"/> EE 548 Digital Signal Processing	<input type="checkbox"/> EE 575 Introduction to Control Theory	<input type="checkbox"/> EE 603 Linear Systems Theory	<input type="checkbox"/> EE 608 Applied Modeling and Optimization	<input type="checkbox"/> EE 609 Communication Theory
Y E A R S 1 & 2	Concentrations	Communications	Power Engineering	Robotics and Automation Systems	Microelectronics and Photonics	Artificial Intelligence
	Choose THREE concentration courses from one topic (9 credits)	<input type="checkbox"/> EE 510 Introduction to Radar Systems <input type="checkbox"/> EE 568 Software-Defined Radio <input type="checkbox"/> EE 582 Wireless Networking: Architecture, Protocols and Standards <input type="checkbox"/> EE 583 Wireless Communications <input type="checkbox"/> EE 585 Physical Design of Wireless Systems	<input type="checkbox"/> EE 575 Introduction to Control Theory <input type="checkbox"/> EE 589 Introduction to Power Engineering <input type="checkbox"/> EE 590 Smart Grid <input type="checkbox"/> EE 629 Internet of Things <input type="checkbox"/> CPE 679 Computer and Information Networks <input type="checkbox"/> CPE 691 Information Systems Security	<input type="checkbox"/> EE 553 Engineering Programming: C++ <input type="checkbox"/> EE 575 Introduction to Control Theory <input type="checkbox"/> EE 621 Nonlinear Control <input type="checkbox"/> EE/CPE 631 Cooperating Autonomous Mobile Robots <input type="checkbox"/> CPE 521 Introduction to Autonomous Mobile Robots <input type="checkbox"/> CPE 645 Image Processing and Computer Vision	<input type="checkbox"/> EE/PEP 503 Introduction to Solid State Physics <input type="checkbox"/> EE/PEP 509 Intermediate Waves and Optics <input type="checkbox"/> PEP 515 Photonics I <input type="checkbox"/> PEP 516 Photonics II <input type="checkbox"/> CPE 690 Introduction to VLSI Design	<input type="checkbox"/> AAI 551 Engineering Programming: Python <input type="checkbox"/> AAI 627 Data Acquisition, Modeling and Analysis: Big Data Analytics <input type="checkbox"/> AAI 628 Introduction to Deep Learning for Engineering <input type="checkbox"/> AAI 646 Pattern Recognition and Classification <input type="checkbox"/> AAI 672 Applied Game Theory and Evolutionary Algorithms <input type="checkbox"/> AAI 695 Applied Machine Learning
	Degrees	Master of Engineering			Master of Science	
	M.E. or M.S. degree specific courses (6 credits)	Any TWO approved EE/CPE courses or up to TWO approved relevant courses outside the ECE department.			<input type="checkbox"/> Project: ONE 3-credit EE 800 Special Problems and ONE 3-credit elective <input type="checkbox"/> Thesis: EE 900 Thesis in EE (TWO 3-credit theses in the last two terms)	

Computer Engineering (M.E. and M.S.) 10 courses/30 credits						
Y E A R 1	Choose ONE math course (3 credits)	<input type="checkbox"/> CPE 602 Applied Discrete Mathematics		<input type="checkbox"/> EE 605 Probability and Stochastic Processes I		
	Choose FOUR core courses (12 credits)	<input type="checkbox"/> CPE 517 Digital and Computer Systems Architecture	<input type="checkbox"/> CPE 555 Real-Time and Embedded Systems	<input type="checkbox"/> CPE 593 Applied Data Structures and Algorithms	<input type="checkbox"/> CPE 690 Introduction to VLSI Design	<input type="checkbox"/> EE 608 Applied Modeling and Optimization
Y E A R S 1 & 2	Concentrations	Artificial Intelligence		Embedded Systems	Software & Data Engineering	Networks and Security
	Choose THREE concentration courses from one topic (9 credits)	<input type="checkbox"/> AAI 551 Engineering Programming: Python <input type="checkbox"/> AAI 627 Data Acquisition, Modeling and Analysis: Big Data Analytics <input type="checkbox"/> AAI 628 Introduction to Deep Learning for Engineering <input type="checkbox"/> AAI 646 Pattern Recognition and Classification <input type="checkbox"/> AAI 672 Applied Game Theory and Evolutionary Algorithms <input type="checkbox"/> AAI 695 Applied Machine Learning		<input type="checkbox"/> CPE 517 Digital and Computer Systems Architecture <input type="checkbox"/> CPE 555 Real-Time and Embedded Systems <input type="checkbox"/> CPE 556 Computing Principles for Embedded Systems <input type="checkbox"/> CPE 690 Introduction to VLSI Design <input type="checkbox"/> EE 629 Internet of Things	<input type="checkbox"/> CPE 593 Applied Data Structures & Algorithms <input type="checkbox"/> CPE 810 Special Topics in CPE: GPU and Multicore Programming <input type="checkbox"/> EE 551 Engineering Programming: Python <input type="checkbox"/> EE 552 Engineering Programming: Java <input type="checkbox"/> EE 553 Engineering Programming: C++ <input type="checkbox"/> EE 627 Data Acquisition, Modeling and Analysis: Big Data Analytics <input type="checkbox"/> EE 628 Introduction to Deep Learning for Engineering <input type="checkbox"/> EE 629 Internet of Things	<input type="checkbox"/> CPE/CS 579 Foundations of Cryptography <input type="checkbox"/> CPE 654 Design and Analysis of Network Systems <input type="checkbox"/> CPE 679 Computer and Information Networks <input type="checkbox"/> CPE 691 Information Systems Security <input type="checkbox"/> EE 584 Wireless Systems Security
	Degrees	Master of Engineering			Master of Science	
	M.E. or M.S. degree specific courses (6 credits)	Any TWO approved EE/CPE courses or up to TWO approved relevant courses outside the ECE department.			<input type="checkbox"/> Project: ONE 3-credit CPE 800 Special Problems and ONE 3-credit elective <input type="checkbox"/> Thesis: CPE 900 Thesis in CPE (TWO 3-credit theses in the last two terms)	

Applied Artificial Intelligence (M.E. and M.S.) 10 courses/30 credits										
Y E A R 1	Choose ONE math course (3 credits)	<input type="checkbox"/> EE 602 Analytical Methods in Electrical Engineering				<input type="checkbox"/> EE 605 Probability and Stochastic Processes I				
	Choose FOUR core courses (12 credits)	<input type="checkbox"/> AAI 646 Pattern Recognition and Classification	<input type="checkbox"/> AAI 695 Applied Machine Learning	<input type="checkbox"/> EE 608 Applied Modeling and Optimization	<input type="checkbox"/> AAI 627 Data Acquisition, Modeling and Analysis: Big Data Analytics	<input type="checkbox"/> AAI 628 Introduction to Deep Learning for Engineering	<input type="checkbox"/> AAI 672 Applied Game Theory and Evolutionary Algorithms			
Y E A R S 1 & 2	Concentrations	Electrical Engineering	Computer Engineering	Data Engineering	Software Engineering	Biomedical Engineering	Systems Biology	Mechanical Engineering	AI in Design & Construction	
	Choose THREE concentration courses from one topic (9 credits)	<input type="checkbox"/> EE 548 Digital Signal Processing <input type="checkbox"/> EE 575 Introduction to Control Theory <input type="checkbox"/> EE 582 Wireless Networking: Architecture, Protocols and Standards <input type="checkbox"/> EE 603 Linear Systems Theory <input type="checkbox"/> EE 608 Applied Modeling & Optimization <input type="checkbox"/> EE 609 Communication Theory	<input type="checkbox"/> CPE 517 Digital and Computer Systems Architecture <input type="checkbox"/> CPE 555 Real-Time and Embedded Systems <input type="checkbox"/> CPE 593 Applied Data Structures & Algorithms <input type="checkbox"/> CPE 679 Computer and Information Networks <input type="checkbox"/> CPE 690 Introduction to VLSI Design <input type="checkbox"/> EE 608 Applied Modeling & Optimization	<input type="checkbox"/> CPE 593 Applied Data Structures & Algorithms <input type="checkbox"/> AAI 551 Engineering Programming: Python <input type="checkbox"/> AAI 627 Data Acquisition, Modeling and Analysis: Big Data Analytics <input type="checkbox"/> AAI 628 Introduction to Deep Learning for Engineering	<input type="checkbox"/> CPE 593 Applied Data Structures & Algorithms <input type="checkbox"/> CPE 810 Special Topics in CPE: GPU and Multicore Programming <input type="checkbox"/> AAI 551 Engineering Programming: Python <input type="checkbox"/> EE 552 Engineering Programming: Java <input type="checkbox"/> EE 553 Engineering Programming: C++ <input type="checkbox"/> AAI 627 Data Acquisition, Modeling and Analysis: Big Data Analytics	<input type="checkbox"/> BME 504/CPE 585 Medical Instrumentation and Imaging <input type="checkbox"/> BME 558 Introduction to Brain Computer Interface <input type="checkbox"/> BME 810 Biomedical Digital Signal Processing	<input type="checkbox"/> BIO 668 Computational Biology <input type="checkbox"/> BIO 687 Molecular Genetics <input type="checkbox"/> CH 580 Biochemistry I	<input type="checkbox"/> ME 598 Introduction to Robotics <input type="checkbox"/> ME 621 Introduction to Modern Control <input type="checkbox"/> ME 644 Computer Integrated Design & Manufacturing	<input type="checkbox"/> CM 530 Strategic Responses to Cyclical Environments <input type="checkbox"/> CM 560 Sustainable Design <input type="checkbox"/> OE 511 Urban Oceanography	
	Degrees	Master of Engineering				Master of Science				
	M.E. or M.S. degree specific courses (6 credits)	Any TWO approved EE/CPE courses or up to TWO approved relevant courses outside the ECE department.				<input type="checkbox"/> Project: ONE 3- credit AAI 800 Special Problems and ONE 3-credit elective <input type="checkbox"/> Thesis: AAI 900 Thesis in AAI (TWO 3-credit theses in the last two terms)				

Electrical and Computer Engineering Graduate Certificates (Optional)

Certificate	1. Artificial Intelligence	2. Autonomous Robotics	3. Microelectronics and Photonics	4. Real-Time and Embedded Systems
Choose FOUR courses	<input type="checkbox"/> AAI 551 Engineering Programming: Python <input type="checkbox"/> AAI 627 Data Acquisition, Modeling and Analysis: Big Data Analytics <input type="checkbox"/> AAI 628 Introduction to Deep Learning for Engineering <input type="checkbox"/> AAI 646 Pattern Recognition and Classification <input type="checkbox"/> AAI 672 Applied Game Theory and Evolutionary Algorithms <input type="checkbox"/> AAI 695 Applied Machine Learning	<input type="checkbox"/> CPE 521 Introduction to Autonomous Mobile Robots <input type="checkbox"/> CPE 555 Real-Time and Embedded Systems <input type="checkbox"/> EE 575 Introduction to Control Theory <input type="checkbox"/> EE 621 Nonlinear Control <input type="checkbox"/> EE/CPE 631 Cooperating Autonomous Mobile Robots	<input type="checkbox"/> EE/PEP 503 Introduction to Solid State Physics <input type="checkbox"/> EE/PEP 507 Introduction to Microelectronics and Photonics <input type="checkbox"/> EE/PEP 509 Intermediate Waves and Optics <input type="checkbox"/> EE/CPE 561 Solid State Electronics for Engineering I <input type="checkbox"/> EE/PEP 562 Solid state Electronics for Engineering II <input type="checkbox"/> CPE 690 Introduction to VLSI Design	<input type="checkbox"/> CPE 517 Digital and Computer Systems Architecture <input type="checkbox"/> CPE 555 Real-Time and Embedded Systems <input type="checkbox"/> CPE 556 Computing Principles for Embedded Systems <input type="checkbox"/> CPE 690 Introduction to VLSI Design
Certificate	5. Secure Network Systems Design	6. Software Design for Embedded and Information Systems	7. Wireless Communications	
Choose FOUR courses	<input type="checkbox"/> CPE 592 Computer and Multimedia Network Security <input type="checkbox"/> CPE 654 Design and Analysis of Network Systems <input type="checkbox"/> CPE 691 Information Systems Security <input type="checkbox"/> EE 584 Wireless Systems Security	<input type="checkbox"/> CPE 555 Real-Time and Embedded Systems <input type="checkbox"/> CPE 556 Computing Principles for Embedded Systems <input type="checkbox"/> CPE 593 Applied Data Structures and Algorithms <input type="checkbox"/> EE 551 Engineering Programming: Python <input type="checkbox"/> EE 552 Engineering Programming: Java <input type="checkbox"/> EE 553 Engineering Programming: C++	<input type="checkbox"/> EE 583 Wireless Communications <input type="checkbox"/> EE 584 Wireless Systems Security <input type="checkbox"/> EE 585 Physical Design of Wireless Systems <input type="checkbox"/> EE 586 Wireless Networking: Architecture, Protocols and Standards	Not all certificate courses are offered every year.