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## IGEP (ECE) Program Samples (archived)

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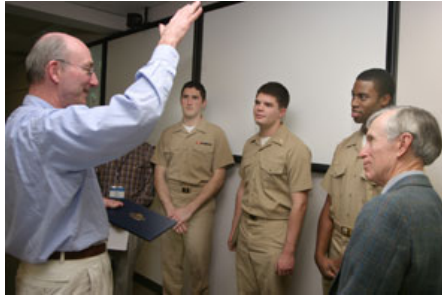
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## IGEP (ECE) Program Samples

### Immediate Graduate Education Program (IGEP) Program of Study in Electrical Engineering

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**Naval Postgraduate School alumnus Vice Adm. Stanley Szemborski '72**, chats with fellow electrical engineering (EE) students and his thesis advisor after he was presented the Distinguished Alumni Award. The distinction recognizes his significant accomplishments and impact on the education programs of NPS. Ensigns' Chris Schuster, Jonathan Gilliom, Dane Brown and Prof. Jeff Knorr, Former Chairman for the Electrical and Computer Engineering Department were included in the informal ceremony. **Szemborski, like the ensigns, was selected to attend NPS's EE curriculum through the Immediate Graduation Education Program immediately following his graduation from the Naval Academy in 1971.**  
U.S. Navy photo by Javier Chagoya

### Graduate Program General Information

NPS has an in-residence, one-year Immediate Graduate Education Program (IGEP). Each year's program typically begins in July and ends the following June. Bowman scholars sent to NPS for a 4-quarter program fall under the IGEP Program. Bowman scholars enrolled in the Electrical/Electronic systems Curriculum may earn a

- [Master of Science degree in Electrical Engineering \(MSEE\)](#) or
- a [Master of Sciences in Engineering Sciences \(focus in Electrical Engineering\) \(MSES-EE\)](#)

depending on their undergraduate background.

Bowman scholars with a BSEE degree will earn a MSEE Degree by completing requirements for the MSEE Degree (a set of 9 to 10 graduate level courses which include the selection of a focus area and one to two elective courses). BSSE, or BSCE degree holders may need on average an additional two undergraduate courses to satisfy the undergraduate equivalence requirements depending on their specific undergraduate backgrounds.

Bowman scholars with an undergraduate degree in engineering fields other than EE, SE, or CE may earn a Master of Science in Engineering Sciences (focus in Electrical Engineering) by completing requirements for the MSES(EE) Degree and taking any required undergraduate level courses needed to meet minimum prerequisite to enroll in their selected graduate level courses.

### Graduate Program Focus Areas

The ECE Department offers graduate programs of study covering the following focus areas:

- Communication & Information Engineering
- Cyber Engineering
- Nano-electronics & Energy Engineering
- Sensor & Control Engineering

Each focus area consists of two sets of four courses each in specific specializations to be selected among

- Communications
- Computers
- Cyber
- Electronics
- Guidance & Control
- Networks
- Power
- Sensors
- Signal Processing

Note that not all specialization options may be open to Bowman scholars due to the short duration of their NPS program of study and their undergraduate backgrounds. Several examples are provided below. Please contact the ECE Department Academic Associate, [Prof. Monique P. Fargues](#) to discuss specific details.

In addition, students must successfully complete the thesis requirement. Each student performs the underlying research and then writes an independent

master's thesis on a topic of direct scientific and technological interest to the Navy's technical programs, DoD, and the scientific community. Students are directly involved in cutting-edge research with world-class faculty and support staff, tackling many of the most important scientific problems facing the Navy today and preparing for future assignments as key military decision makers. A sample of recent theses undertaken by students is shown [here](#).

**Background requirements**

Students interested in applying to the one-year IGEP Graduate Program should have a solid undergraduate engineering background. Students without a BSEE will need to complement their graduate level program of study to satisfy a BSEE Equivalence in order to be eligible for a MSEE degree. Others will be eligible for an MSES(EE) degree. That program will be set-up by the Academic Associate upon arrival. Satisfying the undergraduate equivalence will result in a program of study with specific undergraduate courses needed to satisfy the equivalence taken in place of some of the graduate electives. Interested IGEP students with a BS in Computer or Systems Engineering should be able to get the MSEE Degree during their 4-quarter in-residence program. Non BSEE holders interested in pursuing the MSEE Degree Program may get additional details by contacting the ECE Department Academic Associate, [Prof. Monique P. Fargues](#). Students who do not have a BSEE Degree, or do not meet requirements for a BSEE equivalence by the end of their one-year graduate program at NPS, will be eligible for a Master of Science in Engineering Science with major in Electrical Engineering (MSES(EE)). Specific MSES(EE) program details are available [here](#).

**Option to receive a 53XX series subspecialty code for NAVY IGEP students**

Officers have the option to complete the Navy educational skill requirements (ESRs) offered by the Electronics Systems Curriculum. Please contact the [Program Officer](#) for specific details.

**Programs of study**

A few possible programs of study leading to the MSEE Degree are shown below. These specific programs require a BSEE degree for background. Students without a BSEE Degree need to satisfy a BSEE Equivalence, which may be set-up with the Academic Associate upon arrival. Satisfying a BSEE Equivalence will result in a program of study with specific undergraduate courses needed to satisfy the BSEE equivalence taken in place of some of the graduate electives. Interested IGEP students with a BS in Computer or Systems Engineering should be able to get the MSEE Degree during the 4-quarter in-residence program. Non BSEE holders interested in pursuing the MSEE Degree Program may get additional details by contacting the ECE Department Academic Associate, [Prof. Monique P. Fargues](#). Numerous variations of these programs are possible, and programs of study finalized at the beginning of the program. Individuals assigned to the Electrical/Electronic systems Curriculum are encouraged to contact the Academic Associate to discuss specific choices of specialties by June 15th to allow for maximum flexibility in the design of their final NPS programs of study. Specific details regarding MSEE minimum requirements are available in the MSEE Degree webpage [here](#). Requirements for each focus area are satisfied by selecting two allowed specialties within a specific focus area (shown with √ in the table below).

Focus Areas <input type="checkbox"/>	Cyber Engineering (For USN students selecting this focus area: "Cyber" is required as one of the two specialties)		Nanoelectronics & Energy Engineering	Sensor & Control Engineering
Specialties ↓	Communications & Information Engineering			
Communications	√	√		
Computers	√	√	√	
Cyber		√		√
Electronics	√		√	
Guidance & Control			√	√
Networks	√	√		
Power			√	√
Sensors	√			√
Signal Processing	√	√		√

**Examples of Programs of Study**

Numerous variations of these programs are possible, and programs of study finalized at the beginning of the program. Individuals assigned to the Electrical/Electronic systems Curriculum are encouraged to contact the Academic Associate to discuss specific choices of specialties by June 15th to allow for maximum flexibility in the design of their final NPS programs of study. Specific course information is available [here](#).

- [Communications & Information Engineering \(Networks & Signal Processing\)](#)
- [Sensor & Control Engineering \(Sensor & Cyber Specialties\)](#)
- [Cyber Engineering \(Computer & Cyber specialties\)](#)
- [Sensor & Control Engineering \(Power & Control specialties\)](#)
- [Sensor & Control Engineering \(Power & Signal Processing specialties\)](#)
- [Nano-electronics & Energy Engineering \(Power & Electronic specialties\)](#)

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[Communications & Information Engineering \(Networks & Signal Processing\)](#)

Summer quarter	EC3410 Discrete time random signals	<a href="#">EC3150</a> Solid state power conversion	EC3600 Antennas & Propagation	<a href="#">EC3820</a> Computer systems
Fall quarter	<a href="#">EC4440</a> Statistical signal processing	<a href="#">EC4430</a> Multimedia information & communications	<a href="#">EC3710</a> Computer communications methods	<a href="#">EC3400</a> Digital signal processing
Winter quarter	Thesis	Thesis	<a href="#">EC4785</a> Internet engineering	<a href="#">EC4480</a> Image processing & recognition
Spring quarter	<a href="#">EC4010</a> Introduction to systems engineering	<a href="#">EC4745</a> Mobile ad-hoc wireless networking	Thesis	Thesis

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**Sensor & Control Engineering ( Sensor & Cyber Specialties)**

Summer quarter	EC3600 Antennas & propagation	EC3150 Solid state power conversion	EC3410 Discrete time random signals	<a href="#">ECE3820</a> Computer systems
Fall quarter	EC3700 Electronic warfare I	EC3730 Cyber networks & physical infrastructure	EC3750 SIGINT Systems	Thesis
Winter quarter	EC3740 Reverse engineering	EC3760 Information Operation Systems	Thesis	Thesis
Spring quarter	EC4680 Electronic warfare II	EC4765 Cyber warfare	EC3610 Microwave engineering	Thesis

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**Cyber Engineering (Computer & Cyber Specialties)**

Summer quarter	<a href="#">EC3410</a> Discrete time random signals	<a href="#">EC3820</a> Computer systems	EC3600 Antennas & propagation	EC3150 Solid state power conversion
Fall quarter	<a href="#">EC3800</a> Microprocessor based system design	<a href="#">EC4820</a> Advanced computer architecture	EC3730 Cyber networks & physical infrastructure	Thesis
Winter quarter	EC3830 Digital computer design methodology	<a href="#">EC4870</a> VLSI systems design	EC3740 Reverse engineering	EC3760 Information operation systems
Spring quarter	EC4765 Cyber warfare	Thesis	Thesis	Thesis

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**Sensor & Control Engineering (Power & Signal Processing Specialties)**

Summerquarter	<a href="#">EC3150</a> Solid state power conversion	EC3410 Discrete time random signals	<a href="#">EC3820</a> Computer systems	EC3600 Antennas & propagation
Fall quarter	EC4150 Advanced solid state power conversion	<a href="#">EC4440</a> Statistical signal processing	<a href="#">EC3400</a> Digital signal processing	Thesis
Winter quarter	<a href="#">EC3130</a> Electrical machine theory	<a href="#">EC4480</a> Image processing & recognition	Thesis	Thesis
Spring quarter	<a href="#">EC4130</a> Advanced electrical machine theory	EC4010 Introduction to Systems Engineering	Thesis	Thesis

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**Sensor & Control Engineering (Power & Control specialties)**

Summer quarter	<a href="#">EC3150</a> Solid state power conversion	EC3410 Discrete time random signals	<a href="#">EC3820</a> Computer systems	EC3600 Antennas & propagation
Fall quarter	EC4150 Advanced solid state power conversion	EC4310 Fundamentals of Robotics	EC3320 Optimal Control Systems	Thesis
Winter quarter	<a href="#">EC3130</a> Electrical machine theory	EC3310 Optimal Estimation: Sensor & Data Association	Thesis	Thesis
Spring quarter	<a href="#">EC4130</a> Advanced electrical machine theory	EC4330 Navigation, Missile & Avionics	Thesis	Thesis

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**Nanoelectronics & Energy Engineering (Power & Electronic specialties)**

Summer quarter	<a href="#">EC3150</a> Solid state	<a href="#">EC4220</a>	<a href="#">EC4950</a> Emerging	EC3820
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	power conversion <a href="#">EC3220</a>	Introduction to Analog VLSI	nanotechnology <a href="#">EC4150</a>	Computer systems
Fall quarter	Semiconductor device technology <a href="#">ECE3130</a>	<a href="#">EC4010</a> Introduction to systems engineering	Advanced solid state power conversion	PH3655 Semiconductor device physics
Winter quarter	Electrical machine theory <a href="#">EC4130</a>	<a href="#">EC4230</a> Reliability issues for military electronics	Thesis	Thesis
Spring quarter	Advanced electrical machine theory <a href="#">EC3200</a>	<a href="#">EC3200</a> Advanced Electronics	Thesis	Thesis

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