

FREQUENTLY ASKED QUESTIONS

HOW DOES THIS CERTIFICATE PROGRAM HELP ME?

Completion of the ESPS Certificate Program provides you with the skills needed to develop and apply knowledge and principles in the area of electrical power conversion and electro-mechanical power conversion.

WHAT ARE THE PREREQUISITES?

- Acceptance by the ECE Department. Process requires a sufficient background in mathematics and technical undergraduate studies. Applicants with a BSEE degree will usually satisfy the requirements.
- Command/Company Endorsement.

IS THERE A SERVICE COMMITMENT?

Per OPNAVINST 1520.23C, a Naval officer will incur a 1 year service obligation upon completion or withdrawal from the Certificate Program, which is served concurrently with any other service obligation. All students must submit a signed Participation Agreement prior to enrolling in the program.

WHO IS ELIGIBLE?

Applicants with a US government affiliation, government laboratory engineers, active or reserve military personnel, Navy civilians, current NPS resident students, and a limited number of contractors sponsored by Department of Defense (DOD) organizations.

NPS student studying in Iraq



CONTACT INFORMATION

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**For more information on the
ECE department, go to:**

www.nps.edu/ece

**For more information on other
NPS DL programs, go to:**

www.nps.edu/dl

Produced by

Naval Postgraduate School



Graduate Education
Advancement Center

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DEPARTMENT OF
ELECTRICAL and COMPUTER ENGINEERING

GRADUATE CERTIFICATE PROGRAM IN **ELECTRIC SHIPS POWER SYSTEMS**

A DISTRIBUTED LEARNING PROGRAM



NAVAL POSTGRADUATE SCHOOL

ELECTRIC SHIPS POWER SYSTEMS GRADUATE CERTIFICATE

THE PROGRAM

The Naval Postgraduate School (NPS) offers a 4-graduate-course certificate program in Electric Ships Power Systems.

THE ESPS CERTIFICATE PROGRAM:

- Provides a solid engineering foundation in electrical power and electromechanical power conversion at the advanced level.
- Exposes students to a mixture of instruction and computer-based laboratories, while studying the behavior and performance of power systems in a virtual environment.

Credits from courses completed through the ESPS Certificate Program can be applied towards a Masters Degree in the ECE Department at NPS.

DDG1000: Artist rendition



THE CURRICULUM

EC3130 Electrical Machine Theory (4-2)

Introduction to the analysis of magnetically-coupled circuits, dc machines, induction machines, and synchronous machines. Includes basics of machine simulation as required in shipboard electric drive analysis.

EC4130 Advanced Electrical Machinery Systems (4-2)

Analysis of detailed and reduced-order representations of shipboard electric machinery and power electronic drives. Extensions to 3-phase machine & network connections, constant flux & current source control, investigation of linearized and reduced-order machine and drive representations.

EC3150 Solid State Power Conversion (3-2)

Analysis of the operation, performance, and control of solid state power converters found in naval shipboard power systems. Analysis of high power converters: phase controlled rectifiers, line commutated inverters, self-commutated inverters, transistor converters, & switching regulators.

EC4150 Advanced Solid State Power Conversion (4-1)

Design and analysis of modern power electronic drives with emphasis on electric drives for present and future ship propulsion systems and variable frequency/variable speed power converters for advanced shipboard electric power distribution.

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THE OUTCOMES

Upon completion of the Electric Ship Power Systems Certificate Program, students will understand the characteristics of power semiconductor switching devices and their application in high power converters as well as have the cognitive skills and abilities required to:

- Analyze and design solid state power converters.
- Design and analyze electric drive systems for ship propulsion.
- Analyze compatibility and interface issues between electrical and mechanical systems.
- Analyze magnetically coupled circuits, dc machines, induction machines and synchronous machines and the ability to simulate shipboard electric drive systems.
- Analyze reduced order representations of shipboard electric machinery and power electronic drives.
- Analyze 3-phase machines and network connections, constant flux and current source control systems.

Railgun

