

NAVAL SHIP DESIGN GRADUATE CERTIFICATE

Banner Code: EC-CERG-NSDN

Academic Advising

3300 Nguyen Engineering Building
Fairfax Campus

Phone: 703-993-5383
Email: mechengr@gmu.edu
Website: mechanical.gmu.edu

The graduate certificate in naval ship design provides students with the fundamentals and hands-on experience to be effective ship designers and design managers. Through coursework and experiential learning, students will develop specific knowledge in the art of naval ship design and acquire the skills to support the management of new and in-service design programs.

Upon completion of the certificate program, graduates will be able to:

- Design a vessel to execute a specified mission profile.
- Critically assess the impact of vessel design decisions on the concept of operations.
- Support programmatic needs by translating fleet requirements to design specifications while managing cost.

Admissions & Policies

Admissions

In addition to general admission requirements of the university (<https://www.gmu.edu/admissions-aid/apply-now/how-apply/graduate/>), applicants must have earned a GPA of 3.00 or better on a 4.0 scale in the last 60 credits of their baccalaureate degree. Other application requirements are as follows:

- A one-page statement of educational and career goals
- Current resume
- Internationally-educated students must submit their English Proficiency scores

Requirements

Certificate Requirements

Total credits: 15

This certificate may be pursued on a full-or part-time basis.

Core Courses

Code	Title	Credits
ME 551	Naval Engineering	3
ME 552	Fundamentals of Naval Architecture	3
ME 553	Ship Design Process and Tools	3

ME 554	Naval Project Management	3
Total Credits		12

Elective

Students must take one elective course (3 credits) selected from the following options:

Code	Title	Credits
ME 521	Energy Transfer	3
ME 531	Energy Transmission	3
ME 541	Power Generation	3
ME 542	Energy Utilization	3
ME 575	AI Design and Deployment Risks	3
ME 576	AI: Ethics, Policy, and Society	3
ME 620	Mechanical Engineering Decision Making	3
ME 621	Foundations of Fluid Mechanics	3
ME 631	Advanced Dynamics of Mechanical Systems	3
ME 714	Fracture Mechanics	3
ME 715	Impact Dynamics	3
ME 721	Advanced Fluid Mechanics	3
ME 722	Introduction to Turbulence	3
ME 723	Compressible Flow	3
ME 724	Viscoelastic Flow	3
ME 725	Introduction to Computational Fluid Dynamics for Engineers	3
ME 728	Foundations of Heat Transfer	3
ME 732	Advanced Thermodynamics	3
ME 740	Introduction to Continuum Mechanics	3
ME 741	Theory of Elasticity	3
ME 742	Finite Element Analysis for Solids	3
ME 745	Mechanics and Properties of Materials	3
ME 750	Nanomaterials Enabled Renewable Energy	3
ME 751	Advanced Materials for Water Treatment	3
ME 753	Tribology and Surface Engineering	3
ME 754	Introduction to Nano-Materials	3
ME 755	Optofluidics	3
ME 762	Nano Bio Sensors	3
PHYS 510	Computational Physics I	3
GBUS 653	Organizational Behavior	3
Other course at the 5XX level or above by permission of program director. ¹		3

¹ Elective courses may be from any academic department, but must be pre-approved, in writing, by the program director.