

Naval Science and Technology, Certificate

Requirements

The undergraduate Certificate in Naval Science and Technology requires 18 s.h. of credit. Students must maintain a grade-point average of at least 2.00 in work for the certificate. The certificate may be earned by any student admitted to the University of Iowa who is not concurrently enrolled in a UI graduate or professional degree program.

All of the certificate courses have prerequisites; students must complete all of a course's prerequisites before they may register for the course. Prerequisites do not count toward the 18 s.h. required for the certificate.

Mechanical engineering students may use the certificate as a tailored engineering focus area by adding an eligible course. In addition, mechanical engineering students may earn the Certificate in Naval Science and Technology while they complete either the design or the robotics and autonomous systems focus area for their major. For examples of combined plans of study, visit Naval Science and Technology Certificate on the Department of Mechanical Engineering website. College of Engineering students earning the certificate are advised by the Department of Mechanical Engineering.

The Certificate in Naval Science and Technology requires the following coursework.

Naval Hydrodynamics Courses

In certain circumstances, if it is not possible for students to complete two of these courses, they may request permission to take ME:5143 Computational Fluid and Thermal Engineering instead of ME:4175 Computational Naval Hydrodynamics.

Course #	Title	Hours
At least two of these:		
ME:4125	Biomimetic Fluid Dynamics	3
ME:4175	Computational Naval Hydrodynamics	3
ME:4176	Experimental Naval Hydrodynamics	3

Autonomous Systems and Machine Learning Courses

Course #	Title	Hours
At least two of these:		
ME:4111/CEE:4511	Scientific Computing and Machine Learning	3
ME:5114	Nonlinear Control in Robotic Systems	3
ME:6115	Cooperative Autonomous Systems	3

Capstone Course

Students must complete either a capstone design project on an approved naval science and technology topic or an

independent investigation involving research or testing of a system related to naval hydrodynamics. If a student chooses, both courses may be completed for credit toward the certificate.

Course #	Title	Hours
One or both of these:		
ME:4098	Individual Investigations: Mechanical Engineering (students must register for at least 3 s.h.)	arr.
ME:4186	Enhanced Design Experience (subject to approval of application for capstone design path; ME:4086 is a prerequisite course)	3

Electives

Students select the remainder of the 18 s.h. required for the certificate from the following.

Course #	Title	Hours
ME:4116/ISE:4116	Manufacturing Processes Simulations and Automation	3
ME:4120	Advanced Linear Control Systems	3
ME:4140	Modern Robotics and Automation	3
ME:4150	Artificial Intelligence in Engineering	3
ME:4200	Modern Engineering Materials for Mechanical Design	3
ME:5143	Computational Fluid and Thermal Engineering	3
ME:5160/CEE:5369	Intermediate Mechanics of Fluids	3