Naval Science Curriculum

Program Academic Requirements

Students must complete academic requirements consisting of three parts:

- Baccalaureate degree program with a selected academic major,
- NROTC-specified courses (offered by the institution),
- Naval Science courses

Normal loading for NROTC students shall be between 15 and 18 semester hours per term, including all NROTC required course work. Normal length of degree programs is four years for midshipmen and MECEP officer candidates, and no more than 36 months for STA-21 officer candidates.

Naval Science Courses Overview

Naval Science Laboratory (Presented throughout all years)

Topics cover general Navy/Marine Corps mission and policies, force protection, operational security, watch standing, physical fitness, nutrition, stress management, and other professional development subjects.

Introduction to Naval Science (Freshman year)

A general introduction to the USN and USMC that emphasizesorganizational structure, warfare components and assigned roles/missions of USN/USMC; covers all aspects of Naval Service from its relative position within DoD to the specific warfare communities/career paths; and includes basic elements of leadership and Navy Core Values. The course will provide students with initial exposure to many elements of Naval culture and provides conceptual framework/working vocabulary for student to use on summer cruise.

Sea Power and Maritime Affairs (Freshman year)

A study of the U.S. Navy and the influence of sea power upon history that incorporates both a historical and political science process to explore the major events, attitudes, personalities, and circumstances that have imbued the U.S. Navy with its proud history and rich tradition; deals with issues of national imperatives in peacetime, as well as war, varying maritime philosophies that were interpreted into Naval strategies/ doctrines, budgetary concerns which shaped force realities, and the pursuit of American diplomatic objectives; and concludes with a discussion of the Navy's strategic and structural changes at the end of the Cold War and its new focus, mission and strategy in the post September 11, 2001 world.

Navigation (Sophomore year)

In-depth study of the theory, principles, procedures, and application of plotting, piloting, and electronic navigation, as well as an introduction to maneuvering boards. Students learn piloting techniques, the use of charts, the use of visual and electronic aids, and the theory of operation of both magnetic and gyrocompasses. Students develop practical skills in plotting and electronic navigation. Other topics

include tides, currents, effects of wind/weather, voyage planning, and an application and introduction to the international/inland rules of navigation. The course is supplemented with a review/analysis of case studies involving moral/ethical/leadership issues pertaining to the concepts listed above.

Not required for Marine Corps Options.

Leadership and Management (Sophomore year)

The course introduces the student to many of the fundamental concepts of leading Sailors and Marines, which shall be expanded upon during the continuum of leadership development throughout NROTC; develops the elements of leadership vital to the effectiveness of Navy/Marine Corps officers by reviewing the theories and parameters of leadership and management within and outside of the Naval Service and progressing through values development, interpersonal skills, management skills, and application theory. Practical applications are explored through the use of experiential exercises, readings, case studies, and laboratory discussions.

Naval Ships Systems I (Engineering) (Junior year)

Students learn detailed ship design, hydrodynamic forces, stability, propulsion, electrical theory and distribution, hydraulic theory and ship control, and damage control. The course includes basic concepts of theory/design of steam, gas turbine, diesel, and nuclear propulsion. Case studies on leadership/ethical issues in the engineering arena are also covered.

Not required for Marine Corps Options.

Naval Ships Systems II (Weapons) (Junior year)

The course outlines the theory and employment of weapons systems. Students explore the processes of detection, evaluation, threat analysis, weapon selection, delivery, guidance, and explosives. Fire control systems and major weapons types are discussed, including capabilities and limitations. The physical aspects of radar and underwater sound are described. Facets of command, control, communications, computers, and intelligence are explored as a means of weapons system integration. The tactical and strategic significance of command and control warfare and information warfare is discussed. This course is supplemented with review/analysis of case studies involving the moral and ethical responsibilities of leaders in the employment of weapons.

Not required for Marine Corps Options.

Evolution of Warfare (Sophomore/Junior year)

Students trace the development of warfare to the present day. This course is designed to cover the causes of continuity and change in the means and methods of warfare. It addresses the influence of political, economic, and societal factors on the conduct of war, with significant attention focused on the role of technological innovation in changing the battlefield. Students will explore the contribution of preeminent military theorists and battlefield commanders to our modern understanding of the art and science of war.

Required for Marine Option and MECEP students; optional for Navy students.

Amphibious Warfare (Junior/Senior year)

Students learn the fundamental terms, concepts, and theories of general warfare and amphibious warfare. These terms, concepts, and theories shall be applied through a historical analysis of amphibious operations, identifying the evolution of amphibious doctrine, tactics, and technology. Focuses on the evolution of the U.S. Marine Corps into a specialized amphibious force, with particular attention devoted

to the structure and capabilities of the present day U.S. Marine Corps as a forward deployed and rapid deployment force and the development of Expeditionary Maneuver Warfare concepts.

Required for Marine Option and MECEP students; optional for Navy students.

Naval Operations and Seamanship (Senior year)

A continued study of relative motion, formation tactics, and ship employment. Introductions to Naval operations and operations analysis, ship behavior and characteristics in maneuvering, applied aspects of ship handling, afloat communications, Naval command and control, Naval warfare areas, and joint warfare are also included. The course is supplemented with a review/analysis of case studies involving moral/ethical/leadership issues pertaining to the concepts listed above.

Not required for Marine Corps Options.

Leadership and Ethics (Senior year)

The course completes the final preparations of Ensigns and 2nd Lieutenants for service in the Fleet and Marine Corps. The course integrates an intellectual exploration of Western moral traditions and ethical philosophy with a variety of topics, such as military leadership, core values, and professional ethics; the UCMJ and Navy regulations; and discussions relating to the roles of enlisted members, junior and senior officers, command relationships, and the conduct of warfare. The course provides midshipmen with a foundation of moral traditions, combined with a discussion of actual current and historical events in the United States Navy and Marine Corps, to prepare them for the role and responsibilities of leadership in the Naval Service of the 21st century.

Faculty & Staff

LT Colin D. Bredl

LT Colin Bredl is from New Castle, PA. A graduate of the University of Pittsburgh, he earned a Bachelor of Science degree in Economics and commissioned through Carnegie Mellon University's NROTC in May 2015. LT Bredl is also a graduate of the Navy War College's Joint Professional Military Education Phase I and is a graduate student at Old Dominion University's Strome College of Business.

LT Bredl's first Division Officer tour was onboard USS KIDD out of Everett, WA. Operational experience included a deployment to the Middle East and Western Pacific areas of responsibility.

LT Bredl's second Division Officer tour was onboard USS MAHAN out of Norfolk, VA where he served as the Training Officer and ultimately the Plans and Tactics Officer. Operational experience included National Tasking, Fleet Tasking, and underway training certifications.

He has been serving as the Officer-in-Charge and a Naval Science instructor at Hampton University's NROTC since June 2020.

Academy Building Room 117
757-728-6938
Colin.bredl@hamptonu.edu