SUBMARINE COMBAT SYSTEMS  
July 8 – July 12, 2019

LECTURER-IN-CHARGE: Mr. Martin Moebus, Chief Strategic Analyst, Naval Undersea Warfare Center (NUWC)

TUITION: $2140

DAILY CLASS ROUTINE:

Monday: Classroom facility opens at 0730 and will be secured at 1700. Class begins at 0800 and ends at 1700. Optional ice breaker at Muddy Charles after class.

Tuesday: Classroom facility opens at 0730 and will be secured at 1700. Class begins at 0800 and ends at 1700.

Wednesday: Classroom facility opens at 0730 and will be secured at 1700. Class begins at 0800 and ends at 1700.

Thursday: Field trip to Naval Undersea Warfare Center, Newport RI. Bus departs from front of Draper Laboratory (555 Technology Square) at 0700 and returns around 1800. Lunch will be provided during the tour.

Friday: Classroom facility opens at 0730 and will be secured at 1600. Class begins at 0800 and ends at 1600.

COURSE DESCRIPTION AND OBJECTIVE: The objective of this course is to provide the student with an overall knowledge of submarine combat systems and the factors that drive their design. This course will also examine the impact of submarine missions and operating environment from the point of view of platform design impacts. The course covers current and future trends in submarine combat systems. Maintaining undersea superiority and sustaining the undersea advantage are the themes for this course. The performance and design of individual combat subsystems (sonar, combat control, communications imaging, electronic warfare, weapons, payloads and launcher systems) will be addressed.

Characteristics and capabilities of the SSN-688 and 688I Los Angeles class, SSN-21 Seawolf class, Virginia class, SSBN class, ORP class and potential future SSN class combat systems will be discussed. The Submarine Force’s increased emphasis on Power Projection, Special Warfare, ISR/I&W, and Mine Countermeasures, as well as traditional missions, including ASW and ASUW, will be discussed in detail. Advanced SSN/SSGN payloads and Navy experimentation of future concepts are presented. Surface ship undersea warfare systems are included for comparison. The following topics will be covered:

- Introduction and Overview of Submarine Missions and Roles
- Submarines 2050 – sustaining the advantage
- Submarine Combat System Architecture Implications for Submarine Design
- Communications/Electro-Magnetic/Electro-Optical Systems
- Sonar Arrays (Hull/Towed Arrays) and In-Board Processing and ARCI philosophy and program
- Combat Control Systems
• USW Weapon and Off-Board Vehicle Systems
• Undersea Strike – A Current Perspective
• Advanced Payloads for Future USW and Littoral Operations
• Payload Storage and Launcher Systems
• Submarine-Based Special Warfare
• Perspectives on Strategic Systems, Future Systems and Current Submarine Operations
• Off board Vehicles

LECTURERS (Subject to Availability):

Mr. Martin Moebus  Chief Strategic Analyst, Naval Undersea Warfare Center, NUWC
Mr. David Grande  Department Head, Undersea Warfare and Analysis, NUWC
Mr. Martin Steele  Virginia Class UWDC, NUWC
Mr. Jeff Merritt  Analysis Lead for Acoustic Rapid Cots Insertion program, NUWC.
Mr. Michael Kalisz  System Validation and Acceptance Branch Head, NUWC
Mr. Tom O’Malley  Combat System Analysis Team, NUWC
Mr. Steve Devin  Common Submarine Radio Room Technical Program Manager, NUWC
Mr. Bill Jankowski  Principle Investigator Science for Technology for Communications, Imaging, and Electronic Warfare, NUWC
Dr. Thomas Kenny  Chief Engineer for Advanced Development, NUWC
Ms. Julie White  Engineering Director Sensors and Sonar, NUWC
Dr. Tom Stottlemyer  Program Manager, Surface Ship USW Systems, NUWC
Mr. James Gutkowski  Director of Payload Integration, NUWC
Mr. David Gimple  Chief Engineer Undersea Strike Warfare, NUWC
Mr. Ed Rishmany  USW Strike Mission Capability Manager, Combat Systems, NUWC
Mr. Mark Campbell  Lead Engineer, Torpedo Development, NUWC
Mr. Jeffrey Cadman  Special Warfare Mission Capability Manager, NUWC
Dr. Joshua Liberty  Unmanned Systems Engineer, NUWC
Mr. John Babb  Director Concepts Formulation Office, NUWC

GUEST LECTURERS  Senior Officer(s)/Civilian(s) from the Operational & Acquisition Community

SPECIAL NOTE: This course contains material governed by Distribution Statement D. Distribution authorized to the Department of Defense and U.S. DoD contractors only. Other requests shall be referred to Naval Undersea Warfare Center, 1176 Howell St., Newport, RI 02841-1708 via the Lecturer-in-Charge, Mr. Martin Moebus.

LOCATION: Classes will be held in the Hill Building, Building NE-80, Room 1409 at One Hampshire, Cambridge, MA. The classroom is adjacent to MIT’s main campus at The Charles Stark Draper Laboratory. An interactive MIT campus map is available on-line at http://whereis.mit.edu/.

COURSE ELIGIBILITY AND CLASSIFICATION: Applicants are expected to have mature technical backgrounds which, either through experience or education is at least equivalent to graduate education. This course is classified SECRET/NORFORN. It is open to active-duty U.S. military, U.S. government employees, and U.S. civilian contractor personnel with U.S. government sponsorship. It is NOT open to foreign nationals. A SECRET security clearance is required. A current U.S. Government ID or current Passport will be required each day to obtain a badge for classroom access. The course is limited to 36
students. Students with appropriate clearances that are outside of DoD must apply by 30 April 2019 to allow time for “need to know” to be established and approval received through appropriate channels.

**APPLICATION AND TUITION PAYMENT:** Course enrollment is limited. Seats are reserved in order of receipt of complete applications with “confirmation of enrollment” upon receipt of payment or obligation of funding through your training coordinator (SF-182).

Note: If course demand is high, we reserve the right to release any unconfirmed enrollments in order to provide a wait-listed student an opportunity to attend. Nominally will do so three weeks before course start date. However, we will make every effort to notify you beforehand and request your intentions.

Flexible payment options, including:
1) Wire transfer
2) Credit card (VISA, MasterCard, Discover Card, American Express)
3) Check

Please see detailed directions on our website for application and payment. Link on upper right of the 2N course webpage [http://web.mit.edu/2n/](http://web.mit.edu/2n/) or direct to link of [http://naval-pro-summer.mit.edu/](http://naval-pro-summer.mit.edu/)

**It is critical that you provide the name of your training coordinator and/or the person who will be making the tuition payment on your application as we must receive payment in order to hold your place in the course – without payment (or obligated funds via approved SF-182) we may need to release your seat to someone else on the wait list.**

In advance of payment, a training officer approval (block 3b of SF182) obligating funds is accepted to confirm enrollment. Full payment is due MIT at least one week before course.

**CANCELLATION:** Cancellations within **ONE (1) week of the first day of the course** will be subject to a $100.00 charge. Substitution by another applicant will be allowed provided an application is received and their security clearance is processed by Draper Laboratory.

**ACCOMMODATIONS:** Course tuition DOES NOT include accommodations. Each student must arrange his or her own transportation and hotel accommodations. Hotel space in Cambridge is very limited during the summer, so early advance reservations are strongly recommended. We have reserved a small block of rooms at the government rate at a local hotel which is located a short walking distance from the classroom and provides convenient access to the MBTA Red Line at the Kendall/MIT station. We will send you information about our hotel block when we confirm enrollment in the course. The hotel will release the hold on any unclaimed rooms **FOUR (4) weeks prior to the first day of the course.** Car rental is neither necessary nor recommended.

**STUDENT ATTIRE:** Business casual. Students are advised to bring a sweatshirt, sweater or jacket in the event that the classroom is cold.

**REFRESHMENTS:** Continental breakfast will be provided in the morning and a light snack each afternoon. Lunch will be provided on those days when working lunches/guest speakers are scheduled.
**POINT OF CONTACT:** If you have any questions, please contact the Naval Professional Summer Coordinator at 617-324-2237 or by e-mail to profsum@mit.edu.

**EMERGENCY CONTACT INFORMATION:** During class, students may be contacted by leaving a message at 617-258-3431 or by e-mail at mmorgenstern@draper.com.

**PORTABLE ELECTRONIC DEVICES:** This course is CLASSIFIED. The classroom will be managed as a CLOSED AREA at all times during the period of instruction. Among other restrictions, this means that no recording devices or other electronic devices will be allowed into the room unless prior arrangements have been made. Such arrangements must be made at least three weeks prior to the first day of class. Personal electronic equipment must be left outside the classroom. The area will be guarded, but will NOT be locked. Please keep this in mind when deciding what to bring with you and what to leave in your hotel room. Examples of personal electronic equipment that are NOT allowed in the classroom: laptops, PDAs, iPods, calculators, wireless fitness trackers (such as Fitbit, Basis Peak or Jawbone Up), cell phones, cameras and flash drive memory sticks. NOTE that this is not an all-inclusive list. If you have a Portable Electronic Device not listed here, do not hesitate to ask Draper Security prior to bringing the device inside the classroom.

If you require a medical assist electronic device, arrangements can be made to allow these in the classroom. Please contact Draper at 617-258-3431 or mmorgenstern@draper.com at least three weeks prior to the first day of class.

**VISIT REQUESTS:** JPAS is the preferred method for passing visit requests. The JPAS SMO is 519934. **Important information to include to prevent visit request being rejected:** The (Reason for Visit) “Pro-Summer Course,” (POC) “Mark Morgenstern,” (POC Phone) “617-258-3431,” (visit access) “secret,” along with the dates of your course (NOT for a year), will be needed to process your JPAS visit. Visits should be processed at least **five (5) working days** prior to the start of your course to ensure adequate processing time.

If your clearance cannot be sent via JPAS, a Visit Authorization Letter (VAL) will need to be faxed to The Charles Stark Draper Laboratory, Inc.

**NOTE:** The VAL should be sent on your letterhead to include name, address and telephone number of the commercial or government entity (CAGE Code), certification of the level of the facility clearance, full name of course attendee, SSN, citizenship, date and place of birth, dates of visit for your course (NOT for a year), the purpose of the meeting (Pro-Summer Course), your Draper point of contact (Mark Morgenstern, 617-258-3431) and your clearance information. Please specify if you are a student or an instructor.

The Charles Stark Draper Laboratory, Inc.
555 Technology Square
Cambridge, MA 02139-3563
Attn: Rachel Malcolm, Room 1004
JPAS SMO: 519934
rmalcolm@draper.com
Tel: 617-258-1859
Fax: 617-258-2000
If you need to check on status of your visit request contact Draper’s Personal Security office at persec@draper.com 617-258-1844.

In addition, this course includes a day trip to Naval Undersea Warfare Center located in Newport RI.

NUWC VISIT REQUESTS:

A visit request is mandatory also needed to NUWC Division Newport, government and civilian. Access to NUWC Division Newport will not be granted under any circumstances without a valid visit authorization request on file along with two forms of official government pictured ID upon arrival.

− Joint Personnel Adjudication System (JPAS) is the preferred method for submitting visit requests
− The Security Management Office (SMO) for visits is 666045
− Technical POC: Martin Moebus
− Include “Submarine Combat Systems Course” in POC Phone Number
− Date of visit (only list single date): 11 July 2019
− Questions may be addressed to NUWCDIVNPT Security Division at 401-832-2551. Additional POCs Robin Spradling at 401-832-7786 and Deanna Monell at 401-832-7408.

For those that are unable to use JPAS, a visit request must be FAXED to the NUWC Division Newport Security Division at 401-832-4396 on company letterhead containing the following information:

− Visitor’s full name (Last, First, Middle Initial)
− Company or Organization Name – complete address, phone number, fax number & CAGE code
− Visitor’s Social Security Number – This information is protected by the Privacy Act of 1974
− Visitor’s Date of Birth and Place of Birth (city/state)
− Citizenship
− Individual’s Level of Clearance Access – This information is verified using JPAS
− Specific Date(s) of Visit (include the year): 11 July 2019
− Technical Point of Contact (POC) at NUWC Division Newport (include name & phone number)
− Specific Purpose of Visit (include classification of visit): Submarine Combat Systems Course
− Name, Title and Signature of authorizing company official (may NOT be one of the listed visitors)

Note: In addition, a CAC, DBIDS, or Military ID will be required to gain entrance into the NUWC Facility.