SHIP AND SUBMARINE SIGNATURES
JUNE 17 – 21, 2019

LECTURER-IN-CHARGE: Dr. Brian A. Glover, Physicist, Underwater Electromagnetic Signatures and Technology Division, NSWCCD

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 with a 1 hour break for lunch. 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 with a 1 hour break for lunch.

**Wednesday:** Classroom facility opens at 0730 and will be secured at 1700. 
Class begins at 0800 and ends at 1700 with a 1 hour break for lunch.

**Thursday:** Classroom facility opens at 0730 and will be secured at 1700. 
Class begins at 0800 and ends at 1700 with a 1 hour break for lunch.

**Friday:** Classroom facility opens at 0730 and will be secured at 1200. 
Class begins at 0800 and ends at 1200.

COURSE DESCRIPTION AND OBJECTIVE: The objective of this course is to provide the student with a fundamental understanding of ship and submarine signatures and their impacts on naval design. Signatures are the energy emitting and reflecting characteristics that are used for detection, classification and targeting. Basic theory, threats, signature examples, modeling and reduction techniques will be presented. Radar, infrared, magnetic and acoustic signatures will be covered. Principles and techniques will be brought together with illustrative problems. The following topics will be covered:

- Underwater Electromagnetic Signatures
- Acoustic Radiation
- Electro-Optic Signatures
- Infrared Signatures
- Topside Signature Technology Overview
- Radar Signatures
- Structural Acoustics
- Hydroacoustics
- Propulsor Acoustics
- Non-Acoustic Signatures
- Acoustic Target Strength
LECTURERS

Dr. Jason Anderson Senior Scientist, Propulsor Acoustics, NSWCCD
Dr. Matthew A. Craun Senior Scientist, Structural Acoustics, NSWCCD
Dr. Brian A. Glover Physicist, Underwater Electromagnetic Signatures and Technology Division, NSWCCD
Dr. Natasha Chang Mechanical Engineer, Hydroacoustics, NSWCCD
Dr. Dane M. Hendrix Technical Project Manager for Submarine Security, NSWCCD
Mr. Robert Kollars Acoustic Superiority Senior Scientific Technical Manager, NSWCCD
Mr. Dennis Lueken Deputy Technical Warrant Holder for Topside Signatures, Ship Survivability Division, NAVSEA
Dr. Saliou Telly Research Engineer, Acoustic Target Strength Control Technology, NSWCCD
Mr. William T. Stephens Division Head, Electromagnetic Signatures and Technology, NSWCCD
Mr. Suk Yi Technical Warrant Holder for Topside Signatures, Ship Survivability Division, NAVSEA

SPECIAL NOTE: This course contains material governed by Distribution Statement D. Distribution is authorized to the Department of Defense and U.S. DoD contractors only. Other requests shall be referred to NAVSEA 05P1 via the Lecturer-in-Charge, Dr. Brian A. Glover.

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/ or direct to link of 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.