

United States Naval Academy STEM Center for Education and Outreach

Spring 2016

USNA STEM Center

Rickover Hall, Room 303
590 Holloway Road
Annapolis, MD 21402
usnastem@usna.edu
410.293.6534

Follow us:

www.usna.edu/STEM
www.facebook.com/usnastem
www.twitter.com/USNASTEMCenter



UNITED STATES NAVAL ACADEMY



Inside this Issue:

- Midshipmen & Faculty Impact
- STEM Outreach in the Community
- STEM Outreach Around the Nation
- Supporting DoD STEM Outreach
- STEM Educator Training
- Upcoming Events

www.usna.edu/stem

MIDSHIPMEN & FACULTY IMPACT: STEM OUTREACH IN THE COMMUNITY

The USNA STEM Center for Education and Outreach is focused on addressing an urgent national need for more young people to pursue careers in science, technology, engineering and math. USNA faculty and midshipmen provide STEM outreach to local and national communities to engage and positively influence students and educators.

Faculty serve as subject matter experts, developing hands-on STEM activities, while STEM outreach is a leadership opportunity for midshipmen. Midshipmen strengthen skills in communicating complex ideas to diverse audiences, gain experience in event planning and logistics, and serve as role models for youth.

STEM Center Impact (annual)

60 Faculty & Staff
300 Midshipmen
70 Events
1300 Hours
17,000 Students
900 Teachers
150 Informal Educators



FIRST Robotics Events USNA, Jan 9-10, 2016

Five-hundred elementary, middle and high schools students competed in the FIRST Tech Challenge and FIRST LEGO League robotics events at USNA's Dahlgren Hall. Thirty midshipmen volunteered at the event as judges and facilitators.



STEM Merit Badge Jamboree USNA, Jan 16, 2016

USNA National Eagle Scouts Association hosted a STEM Merit Badge Jamboree for 600 Boy Scouts. Sessions were led by 30 midshipmen in topics such as Nuclear Sciences, Electronics, Space Exploration, and Oceanography. Ten faculty & staff facilitated preparation for merit badge activities.



Girls Only STEM Day USNA, Mar 5, 2016

Two-hundred and forty middle school girls participated in hands-on activities in a wide range of STEM fields. Led by 58 midshipmen & 17 faculty, students rotated through STEM modules, learning the engineering design process and real-world applications of science and math.



SeaPerch Showcase USNA, May 6, 2016

After spending months building SeaPerch underwater remotely operated vehicles, 450 5th graders from Anne Arundel County and Talbot County Public Schools launched their SeaPerch in the Hydro lab tow tanks. Other activities included straw rockets and buoyancy experiments.

MIDSHIPMEN & FACULTY IMPACT: STEM OUTREACH AROUND THE NATION

Midshipmen volunteers share their passion for STEM with youth in our community and around the nation. Mids can participate in MSTEM, an extracurricular activity which includes STEM outreach as well as 17 additional STEM-related clubs. Mids can also enroll in a STEM Education and Outreach course which provides academic credit for serving 15 leadership hours/semester dedicated to developing and implementing academic year STEM activities.

TOP STEM MIDSHIPMEN BY HOURS (AcYear 2016)			
Rachel Busiek *	75	Jose Medina	54
David Dedios	74	Peter Guo	53
Rachel Bailey	72	Jacob Teepen	52
Courtney Mason	71	Naomi Ngalle	51
Megan Hough	57	Gabriella Lucchese	51
Montana Geimer	55	Mark Hackworth	50
Aldrin Racelis	54	Jocelyn Rodriguez	50

* MIDN 1/C Busiek will receive the first annual Service and Leadership Award in STEM Education and Outreach as well as the MOVSM Military Outstanding Volunteer Service Medal for over 500 hours of community service in STEM outreach.



STEM Day Flint, MI, Feb 29, 2016

Five STEM midshipmen presented a STEM Day in Flint, MI for 200 students at Brownell-Holmes STEM Academy. Midshipmen led hands-on activities in cyber technologies, fluids and polymers, and the engineering design process.



Akron Inspiration Day Akron, OH, Mar 19, 2016

MIDN 2/C Amy Krick and MIDN 4/C Jocelyn Rodriguez led activities in electrochemistry and corrosion at the University of Akron Inspiration Day for middle school girls. The event was sponsored by DoD STEM.



Maryland Regional SeaPerch Challenge USNA, Apr 9, 2016

Over 400 middle & high school students competed in teams with SeaPerch underwater robots that they built and tested in a series of trials. Judging and support was provided by 35 mids and 30 faculty & staff. Eight teams qualified to compete in the National Challenge to be held at Louisiana State University.



USA Science & Engineering Festival Washington, D.C., Apr 15-17, 2016

USNA hosted a booth at the USA Science & Engineering Festival. During the 3-day biennial event, 41 midshipmen & 8 faculty interacted with over 3000 festival-goers, with hands-on activities such as robotics, engineering design and more.

STEM EDUCATOR TRAINING

The USNA STEM Center is dedicated to promoting quality STEM education for all youth. To achieve and sustain this aim, the STEM Center is committed to training teachers in methods for implementing quality STEM education.

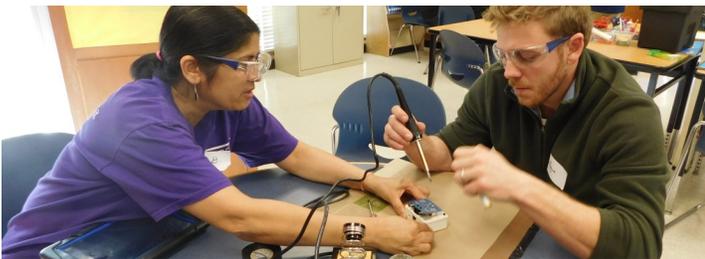
Teacher training is focused on project based learning methodology, with an emphasis on a hands-on approach, connections to real world applications, and techniques for student engagement.

Programs are offered year-round to meet the needs of educators, ranging from several hours to week-long sessions. Educators include K-16 teachers from public, private, and DoDEA schools around the nation and abroad,

as well as informal educators from museums, after-school programs and more. Workshops are held both on-site at the U.S. Naval Academy in Annapolis, MD, and at remote locations.

STEM trainings are enhanced by partnerships with school districts, community organizations, institutions, and local and federal agencies.

Program evaluation and assessment data show that teachers who attend the USNA STEM trainings are empowered to promote active, effective, hands-on learning in the classroom.



SeaPerch/NOAA Educator Workshop Baltimore, MD, Feb 4 & 6, 2016

USNA, in collaboration with NOAA, presented a workshop for 16 Baltimore County Public School teachers, held at Southwest Academy. Teachers built SeaPerch underwater robots and gained resources for teaching about underwater exploration.



SET Sail Workshop USNA, Feb 20, 2016

Each Fall and Spring, USNA hosts a one-day workshop for STEM educators. 130 teachers explored methods and activities for student engagement in topics including engineering design, bioengineering, sounds & waves, Arduino, and cyber.



SeaPerch/NOAA Educator Workshop Washington, D.C., Mar 2-3, 2016

In partnership with NOAA, USNA held a workshop for D.C. Public School teachers at Friendship Tech Prep Academy. Teachers trained on building a SeaPerch robot and using NOAA's resources for underwater exploration.



STEM Workshops Atlanta, GA, Mar 16-18, 2016

USNA presented a SeaPerch/NOAA workshop for 28 teachers from DeKalb County Public Schools. A separate professional development was held for 36 Atlanta Public School teachers in hands-on methodology for teaching STEM. Topics included electricity, hydraulics and engineering design.

SUPPORTING DoD STEM OUTREACH

Promoting science and engineering is part of the mission for the Department of Defense (DoD), which plays an important role in engaging and inspiring youth and educators around the nation. The USNA STEM Center supports STEM outreach efforts in the Naval STEM and broader DoD STEM community, through trainings and partnerships.

With support from the Office of Naval Research (ONR), USNA presents an ongoing series of workshops on Best Practices in STEM Outreach. Workshops provide training for participants involved in STEM outreach at Naval commands around the nation, including research labs, warfare centers, recruit commands, medical commands and more. Attendees learn

methods and techniques for student engagement using hands-on activities in a range of DoD relevant topic areas. A chance to put training into action is included at the workshop, with a STEM fair for local youth, and a module development session. Workshops have been extended to other DoD STEM partner agencies.

Training in STEM education has also been extended to Navy Museum educators, through a collaboration supported by ONR. Trainings have been offered to teachers and museum educators in DoD relevant topic areas to enhance STEM education and build community STEM awareness.



DoD STEM Workshop Ft. Belvoir, Jan 20, 2016

USNA conducted a STEM outreach training at Ft. Belvoir for 21 participants from Missile Defense Agency, Defense Acquisition University, and partner agencies. The focus was on methods for student engagement with hands-on activities.



STEM Onboard USS Hornet, Alameda, CA, Mar 12, 2016 USS Midway, San Diego, CA, Apr 27, 2016

In partnership with the USS Hornet Museum, USNA faculty and midshipmen presented STEM educator workshops onboard two museum ships. USNA also participated in the Live Aboard overnight for 400 youth on the USS Hornet.



Best Practices in Naval STEM Workshop USNA, Apr 18-19, 2016

USNA hosted a workshop for 24 participants from Naval commands around the nation supporting STEM outreach. Learning activities and methodology, attendees also held a Youth Center STEM event and developed new modules.



Science Fair Judging JSHS, Dayton, OH, Apr 27-30, 2016 ISEF, Phoenix, AZ, May 8-13, 2016

USNA faculty participated as judges at the National Junior Science & Humanities Symposium, sponsored by U.S. Army, Navy and Air Force. Faculty also served as judges at the Intel International Science & Engineering Fair.

UPCOMING EVENTS

Summer 2016

Thank You to our
Sponsors & Partners



Ralph E. Odgers Chair in STEM



NORTHROP GRUMMAN



May

- **Cyber Security Teacher Training, i2Learning:**

Newark, NJ, May 14

Training for middle & high school teachers who will implement USNA-developed curriculum for week-long student summer camps in cyber security to be held at schools around the country.

- **Navy League Naval STEM Expo:**

National Harbor, MD, May 15

USNA faculty will host a booth with hands-on activities for students at this Expo sponsored by Navy League STEM Institute & Office of Naval Research.

June

- **Summer STEM Program:**

USNA, June 6-24

In collaboration with the Office of Admissions, the USNA STEM Center hosts “Land, Air, Sea: Annapolis”, a week-long residential camp for a total of 650 high school students over 3 weeks in June. Students participate in hands-on modules led by midshipmen and faculty in a range of STEM topic areas.

- **Summer Heroes Youth Program:**

USNA, June 13-24

Fifty youth from Baltimore City will participate in this 2-week pilot program held at USNA, in collaboration with the Office of Diversity. Midshipmen will lead middle school students in a sports-themed day camp, engaging in STEM topics, literature & arts, health & fitness, leadership and life skills.

- **Girls Tech Camp:**

USNA, June 27-July 1

Fifty middle school girls will attend a week-long day camp held at USNA, supported by Naval Academy Foundation. Girls will explore STEM topics with mentorship from faculty & staff, under this year’s theme: “Color Me STEM”.

July

- **SET Sail STEM Educator Training:**

USNA, July 11-21

Two residential week-long sessions of STEM professional development are offered to a total of 100 teachers from around the nation and DoDEA schools here & abroad. The focus is on project based learning to promote hands-on student engagement.