Our Mission

Developing the Next Generation of Civilian Engineers for the Navy through project-based education, collaboration, and curriculum development.
Who We Are

Participating Universities

– Florida Atlantic University
– Florida State University/Florida Agricultural and Mechanical University
– Georgia Institute of Technology
– Massachusetts Institute of Technology
– Old Dominion University
– Pennsylvania State University
– Stevens Institute of Technology
– Tennessee State University
– University of Iowa
– University of Michigan
– University of New Orleans
– University of Texas-San Antonio
– University of Washington
– Virginia Polytechnic Institute
– Webb Institute

Professional Societies

– The American Society of Naval Engineers (ASNE)
– The Society of Naval Architects & Marine Engineers (SNAME)
Why Does NEEC Exist?

Approximately 30% of the Navy’s engineering workforce will be eligible to retire by 2014.

Major Accomplishments

Developed and initiated 23 NEEC project teams

- 215 Undergraduate and Graduate students directly engaged in projects
- Projects engaging cross-section of NSWC
- SMART (11) & NREIP (9) students engaged
- Projects cover a wide-range of important Navy topics
- *Base funding – 133 targeted students*
- 166 engaged after PoE1
- 215 engaged during current PoE2
The Pillars of NEEC

Engaged, Educated, U.S. citizen naval engineers

Curriculum

Collaboration

Center Activity & Communications

Project-Based Education
NEEC Project-based education

• Engage students in multi-disciplinary research.
• Investigate real Navy problems.
• Generate interest in Navy-related career opportunities.
• Focused on undergraduate students.
• Projects coordinated NAVSEA and Naval Surface Warfare Centers across the country.
# Project-based Education

## Projects – PoE1 (15)

<table>
<thead>
<tr>
<th>Project</th>
<th>Member</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acoustic Diagnostics for Sound Sources in a Noisy Environment</td>
<td>University of Michigan</td>
</tr>
<tr>
<td>Air Layer Drag Reduction for Energy Conservation</td>
<td>University of Michigan</td>
</tr>
<tr>
<td>Assessing the Relative Capabilities of Large-Scale System Architectures Using Network Science</td>
<td>Georgia Tech</td>
</tr>
<tr>
<td>Battery Systems Engineering</td>
<td>Penn State</td>
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<tr>
<td>Design and Construction of Reduced-Sale Railgun</td>
<td>Virginia Tech</td>
</tr>
<tr>
<td>Life Cycle Performance Prediction Informed by Wireless Hull Monitoring</td>
<td>University of Michigan</td>
</tr>
<tr>
<td>Nanosensors for Explosive Detection</td>
<td>Tennessee State University</td>
</tr>
<tr>
<td>Noise Source Detection and Localization in Reverberant Chambers</td>
<td>Penn State</td>
</tr>
<tr>
<td>Robotic Inspection of Tanks and Voids</td>
<td>Virginia Tech</td>
</tr>
<tr>
<td>Ship Design Initiation Through Comparative Naval Architecture and Its Influence on the Programmatic Process of Ship Design</td>
<td>Massachusetts Institute of Technology</td>
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<tr>
<td>Synthetic Aperture Imaging of Turbulent Sheet Breakup and Ship Spray</td>
<td>Massachusetts Institute of Technology</td>
</tr>
<tr>
<td>Total Ship Powering Systems Architecture to Support High Energy Weapons</td>
<td>Webb Institute</td>
</tr>
<tr>
<td>Unmanned Autonomous Vehicle Testbed-A Multi-Agent Testbed for Teaching, Training and Learning</td>
<td>University of Michigan</td>
</tr>
<tr>
<td>Control of Single and Duel Shaft SOFC/GT Hybrid Power Systems for All Electric Ships</td>
<td>University of Michigan</td>
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</tbody>
</table>
## Project-based Education

### Additional Projects – PoE2

<table>
<thead>
<tr>
<th>Project</th>
<th>Member</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptive Control, Communication and Navigation for Navy-Relevant Autonomous Vehicles</td>
<td>University of Texas, San Antonio</td>
</tr>
<tr>
<td>Noise and Thermal Management of Naval Systems</td>
<td>Florida State University</td>
</tr>
<tr>
<td>Part 1 - Aircraft Carrier Noise Measurement and Mitigation</td>
<td></td>
</tr>
<tr>
<td>Part 2 - Thermal Management</td>
<td></td>
</tr>
<tr>
<td>Design Integration of Ship and Combat Systems</td>
<td>Old Dominion University</td>
</tr>
<tr>
<td>Development of a 2nd Law Analysis for the Evaluation and Design of Network-Centric Systems-of-Systems</td>
<td>Georgia Tech</td>
</tr>
<tr>
<td>Evaluation of Marine Corps' Future Amphibious Vehicles and Systems</td>
<td>Stevens Institute of Technology</td>
</tr>
<tr>
<td>Flow control on marine vehicles for high maneuverability and station keeping in shallow waters</td>
<td>Florida Atlantic University</td>
</tr>
<tr>
<td>Robust, Property Driven, Automated Hull Shape Generation and Optimization</td>
<td>University of New Orleans</td>
</tr>
<tr>
<td>Schedule/Budget Implications of Shipyard Production Manning Options</td>
<td>University of Washington</td>
</tr>
</tbody>
</table>
NEEC Featured Projects

Design and Construction of a Reduced Scale Railgun

Institution: Virginia Tech

Principal Investigator: Prof. Hardus Odendaal

Navy POCs: Mr. Jack Bernardes, Dahlgren and Mr. Charles Garnett, Dahlgren
NEEC Featured Projects

Unmanned Autonomous Vehicle Testbed – A Multi-Agent Testbed for Teaching, Training and Learning

Institution: University of Michigan

Principal Investigator: Prof. Ryan Eustice

Navy POCs: Mr. Frank Ferrese, Carderock-Philly; Mr. Roger Anderson, Panama City; Mr. Nelson Mills, Dahlgren
The Pillars of NEEC - Curriculum

Engaged, Educated, U.S. Citizen Naval Engineers

Curriculum
Collaboration
Center Activity & Communications

Project-Based Education

Naval Engineering Education Center • www.GoNEEC.org
NEEC Curriculum Goals

- Faculty expertise and diversity at NEEC schools is very rich.
- Would like to have a variety of long and short courses for **credit, enrichment and professional development**.
- Would like NEEC schools to offer NE minor and certificate programs.
- Would like to capture and share knowledge from NEEC projects with all NEEC students and beyond.
- Collaborate with NEEC universities to join “Team-Taught” courses.
- Work with other universities to set up NE minor and certificate programs.
- Develop short and clip courses (asynchronous) and post on NEEC website.
The Pillars of NEEC – Center Activity & Communications

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NEEC Communications

• **Communication Strategy**
  – Understanding messages and markets
  – Creating value

• **Communication Tools**
  – Website
  – Social media
  – E-strategies and E-news
  – Print material
  – Press and PR

• *Overall, how does our communication generate value and extend our reach?*
The Value of NEEC

Engaged, Educated, U.S. citizen naval engineers

Curriculum
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Naval Engineering Education Center • www.GoNEEC.org
The Value to NEEC: Students

- Career Development
- Peer Exposure
- Facilitate Connections (Faculty, Mentors, Navy Personnel)
- Insight to Navy Experience (How the Navy Works, Navy Problems, Navy Culture)
- Enrichment (Activities, Meetings and Conferences)

**Exposure**

Overall, Students who engage NEEC are better connected, have a more experience, will be in a better position to compete for jobs and fellowships, and are better prepared to contribute to the naval enterprise.
The Value of NEEC: Navy

- Providing engineers that understand multidisciplinary engineering in a time of need.
- Contributes to Navy STEM initiative.
- Strengthen Naval Engineering faculty cohort.
- Provide a centralized focus for Naval Engineering Education at an Undergraduate level.
- Connect the Navy with capable students who understand what naval engineering is all about!
- Engage students in important Navy problems through project-based education.
Conclusion

• Contact us with any questions
• Potential partnerships?
• Website: www.GoNEEC.org
• Contact: Steve Ceccio
• Find our social media networks:
  - Facebook: www.facebook.com/GoNEEC
  - Twitter - @GoNEEC
  - LinkedIn – NEEC