The Capstone Initiative
“Discovering Your Capabilities”

Overview and Instructions for the School of Medicine Class of 2015
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*Capstone Project Handbook - Version 1: Class of 2015*
Capstone Project – Statement of Purpose

“A cohort of students in the Class of 2015 will be selected to perform a longitudinal project of advanced scientific inquiry. These projects will include basic (bench) research, clinical projects, performance improvement projects, operational studies or other public health projects.”

The Capstone is designed to promote a period of self-directed discovery and advanced scientific inquiry as students progress through their MD program. The Capstone program provides dedicated time during the Post-Clerkship phase allocated specifically for participation in a Capstone experience. Planning for participation in the Capstone program should begin prior to the Post-Clerkship period (selection of an area of interest, identification of potential mentors and projects, discussions about study design, opportunities to complete on-line training and obtain necessary approvals). Students will be allowed to spend two to three months in the Post-clerkship period to complete their projects.

The Capstone project is student-selected and implemented. The project will be formally assessed and faculty-mentored. Interested students will be selected and paired with a faculty mentor in one of the main areas described (basic science, clinical science, global and public health, education, or self-initiated independent projects) based on student interest. With guidance from the Office of Student Affairs, students and faculty will work together to ensure adequate progression on capstone objectives as participating students progress through medical school. The faculty mentor for the specific capstone activity is the primary point of contact for assisting students with Capstone application, preparation, execution, and completion. Students are encouraged to meet with potential mentors early in the process to identify topical areas for study. Each individual track (area of interest) also has an advisory group of mentors who can provide additional general advice to students, as well as the Capstone Director. The Capstone faculty member will mentor the student through the duration of the project, provide informal and formal assessments, and ensure satisfactory completion of specific tasks. The Capstone project will include a final public presentation (poster, podium presentation, or academic paper) that details the experiment or process conducted and the results obtained.

Capstone Project – Eligibility and Timing of Activities

While it is the long-term intent to eventually allow support for every USUHS student to participate in a Capstone project, this capability will be launched with the intention of including 15 to 20% of the class of 2015, with gradual expansion in subsequent years. During the first few years, Capstone projects will focus on optimizing the use of mentors with strong ties to the Uniformed Services University and will frequently enhance academic activities under currently supported and successful senior electives.
Capstone applicants must be in good academic standing within the University, without any outstanding remediation requirements, and must not be in an academic probationary status. Students must demonstrate successful passing of Step 1 of the NBME, and all pre-clerkship, clerkship, and “Bench to Bedside and Beyond” requirements. Students must first schedule all the mandatory aspects of advanced electives and selectives, and should follow the advice of the Office of Student Affairs regarding strategic planning for their early rotations and interviews for postgraduate medical education. As noted in the “timeline” of important dates, all students must be available for their military field exercise during October of 2014 and should plan to fill their last elective month (April, 2015) with a clinical rotation. Any rare exceptions to these requirements would need to be negotiated with the OSA.

Capstone Project – Requirements

The Capstone Project will be a student-initiated inquiry involving testing a hypothesis, studying a problem, performing a quality-improvement process, asking a new question of an established cohort or dataset, acquiring advanced skills and their application, etc. It will be expected that this will include dedicated planning on the student’s part, which may likely involve writing research proposals, taking preparatory courses, obtaining regulatory approvals, participating in planning workshops, performing background research, etc. as required by their mentor(s).

On selection for a specific Capstone activity, students will be required to develop a written plan prior to actually beginning the elective capstone period. This will serve as an early progress report which must be approved by the track committee and capstone director prior to initiation of work. In most cases this requirement will be accomplished by filling out the relevant sections of the University’s standard 3201 research application form, primarily the contact information and “Research Plan” section. This should be a short summary of anticipated activities. For certain experiences there may be equivalent alternate planning forms. This will be specified for each experience. This will be kept brief.

Upon successful completion, there will be an expected “product” synthesized by the student with the guidance of their mentor. These may include a mix of the following: writing a thesis paper or report, preparation and delivery of an oral presentation, development of a new tool for subsequent students, and construction of a poster for USU Research Day. The final option will be strongly encouraged, as this will allow the maximum number of students to share their accomplishments with the university community. Students will also be required to write a final reflection upon completion of their experience, to summarize how the experience influences their plans for future career development.
Capstone Project – Application and Progress Reports, Reflective Analysis

The initial application for the Capstone Project is the first chance for students to define the purpose of their desired projects and to reflect on how these experiences will impact on their professional development and create opportunities for the future. Upon acceptance to the Capstone program, the Track Committees and director will offer feedback and guidance to the student on preparing a more detailed plan prior to actually beginning the elective capstone period. This plan will serve as an early progress report, which must be approved by the track committee and capstone director prior to initiation of work. In most cases this will be accomplished by filling out the relevant sections of the University’s standard 3201 research application form, as described in the Requirements section. For certain experiences there may be equivalent alternate planning forms. This will be specified for each experience.

At the end of the protected block of time, the student and mentor will prepare a progress report to summarize the experience and the progress made toward the stated objectives. Any continuing data analysis, writing, pending poster or abstract, report or manuscript preparation should be reported with anticipated dates of completion.

Upon completion of this work, the mentor will submit a final report and proposed grade, and there will be an opportunity for the mentor to offer feedback to the student at this time. Feedback from the student on the capstone project process will also be encouraged, in order to help improve future capstone projects. A final mandatory student requirement will be the completion of a 200 to 400 word reflection paper on the impact of the capstone project on the student’s personal development. Students should use the “REAP” format with which they are well-acquainted from their pre-clerkship and post-clerkship reflective writing assignments. They will be asked to consider and expand on their reactions during and at the completion of their experience, analyze their own response to the experience, and most importantly relate how the experience impacts their plans for future career choices and development. The capstone project will not be considered complete until this reflective feedback is submitted.

Capstone Project – Assessment and Grading Policy

The Capstone Project will be graded on a “Pass vs. Fail” basis as decided by the School of Medicine academic community. As stated above, each capstone mentor and Track Committee will clarify the expectations for individual projects prior to the initiation of work. The mentor will inform the Track Committee of any delays or problems with completion of the proposed work as soon as possible, and seek help/approval for alternate requirements where applicable. The mentor will inform the Track Committee upon successful completion of the capstone project in the final progress report as stated above, and notify the Track/Director when the student has fulfilled the requirements to receive a final grade.
# Capstone Project – Critical Dates: Timeline and Calendar

## Class of 2015

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
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<tbody>
<tr>
<td>September - December 2013</td>
<td>Capstone Website Open – review program descriptions, contact potential mentors, consider options; Review post-BBB schedule options with OSA Advisors</td>
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<tr>
<td>January 2014</td>
<td>Attend Capstone Open House and briefings; contact and meet with mentors, Capstone Director, OSA</td>
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<tr>
<td>Late January 2014</td>
<td>Step 1 – NBME Exam</td>
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<tr>
<td>January - February 2014</td>
<td>Submit Capstone applications; selection process through Capstone Track Committees/mentors</td>
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<tr>
<td>February-March 2014</td>
<td>Students notified of selection for Capstone Activities. Preparation and submission of plans to Track Committees</td>
</tr>
<tr>
<td>March - April 2014</td>
<td>Finalize Post-Clerkship Schedule: Advanced Electives and timing of Capstone Activities, regulatory and continued planning approvals</td>
</tr>
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</table>
| April 2014 – March 2015   | Perform Capstone work (This may be 3 straight months or may involve one month, then a later 2-month period for certain projects)  
  *Note – the final rotation (April, 2015) should be filled with a clinical activity unless a “rare” exception is approved by OSA |
| October 2014              | MS IV Military Field Exercise – (29 Sept to 24 Oct 2014) All MS IV Students (No Capstone activities scheduled this month) |
| April 2015                | Finalize any remaining Capstone theses, reports, poster, presentations; prepare for USUHS Research Day  
  *Note - All final work will be due by 30 April 2015 at the latest unless otherwise specified by Capstone Director/OSA |

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*Note - All final work will be due by 30 April 2015 at the latest unless otherwise specified by Capstone Director/OSA*
## CAPSTONE TIMELINE for STUDENTS

### September '13
- Capstone website open: Review program descriptions, contact potential mentors, consider options

### October '13
- Capstone Open House
- Capstone briefings
- Step 1 NBME exam

### November '13
- Capstone Selection Notifications and Plans
- Perform Capstone work

### December '13
- Submit Capstone applications
- Finalize electives and timing of Capstone activities

### January '14
- Perform Capstone work

### February '14
- Submit Capstone applications

### March '14
- Capstone Selection Notifications and Plans

### April '14
- Perform Capstone work

### May '14
- FTX 401: Sep 29 through Oct 24

### June '14
- Perform Capstone Work

### July '14

### August '14

### September '14

### October '14

### November '14

### December '14

### January '15

### February '15

### March '15

### April '15
- Capstone Completion Final Report due
- Prepare Poster/presentation for USU Research Day*

### May '15
- Research Week Presentations May 12 & 13

*Note - Final rotation (April 2015) should be filled with a clinical activity unless an exception is approved by OSA
# Track: Laboratory Research

<table>
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<tr>
<th>Description</th>
<th>Requirements</th>
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<tbody>
<tr>
<td><strong>Objectives:</strong></td>
<td>Candidates for a Capstone project in this track may need to take certain trainings such as CITI, Animal Usage, Radiation Safety, Lab Safety or any other training specifically required for the chosen project and laboratory. <em>Where possible, students are encouraged to apply for available funds to contribute to the laboratory’s resources – students will be made aware of opportunities by the Capstone Program.</em></td>
</tr>
</tbody>
</table>
| Capstone projects in this track will provide students with the following skills:  
- Experience in the review and evaluation of the literature relevant to a chosen topic  
- Formulation of an advanced scientific question, development of specific aims, and planning for a research project  
- Familiarization with laboratory methodologies and technical approaches; and the design and execution of experimentation to answer the formulated question  
- Appreciation of the synergy and teamwork required among the many different team members contributing to the success of complex research  
- Experience with research highly relevant to the Military/Public Health/Global Health communities supported by the USUHS | Pre-requisites: |
| **Committee:** TBD | **Additional requisites:** In most circumstances students will complete the appropriate paperwork to be added to an existing approved USUHS protocol. In certain situations students may apply to establish a new protocol under the guidance of their mentors. |
| **Venues and Affiliations:** Capstone projects in this track should be executed in cooperation with a DoD activity at USU or an approved offsite organization. Completion in non-DoD agencies in which suitable approved mentors are available will be considered on a case-by-case basis. See the catalog listing for potential pre-approved experiences. | **Time requirements:** 3 months of continual direct laboratory experience is expected. |
| **Example Projects:** - Identify genes important for infection by the gastric pathogen Helicobacter pylori  
- Investigate the role of a host cell signaling pathway in cancer development  
- Define biochemical pathways associated with essential biological processes | **Formative Peer Review:** Students may present their data in laboratory/departmental venues to obtain broader scientific input. |
functions in eukaryotic cells
-Type clinical isolates of *Staphylococcus aureus* and investigate new virulence factors associated with invasive disease

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<th><strong>Expectations of the rotation:</strong></th>
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<td>- These rotations will encompass continuous full-time responsibilities; students must be free from concurrent obligations during the time committed to the actual laboratory experience (some preparatory writing/on-line training may need to be completed during prior electives)</td>
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<td>- A student will function as a self-sufficient laboratory researcher and be held responsible for maintaining his/her own media, animal care duties, etc.; as expected of any senior student</td>
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<td>- The student will follow approved laboratory practices, including maintaining a lab notebook and producing scientific writing of a quality to meet the rigor of consideration by key peer-reviewed journals.</td>
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<tr>
<th><strong>Outcomes of the rotation:</strong></th>
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<tr>
<td>Students will likely achieve varying degrees of progress and success toward the goals of their research; this is expected with scientific inquiry. Students will at the minimum write a summary report following the standards of scientific writing, with intent for contribution to the academic productivity of the faculty mentor(s) and laboratory team. Further requirements may be established by the mentor(s).</td>
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<td>Posters and presentations at local or regional meetings are encouraged; in particular preparation of a poster for presentation at the USUHS Research Days is expected.</td>
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<thead>
<tr>
<th><strong>When formulating Capstone projects students must:</strong></th>
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<tr>
<td>- Clearly define a scientific objective and associated specific aims</td>
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<tr>
<td>- Perform an in-depth review of the literature relevant to the area of interest (this may begin prior to and continue through the specific capstone experience)</td>
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<tr>
<td>- Work with their faculty mentor to secure appropriate scientific reviews and approvals before collecting any data</td>
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<tr>
<td>- Work with Capstone director and faculty mentor to ensure adequate progress on the project as they continue through the medical school curriculum</td>
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<tr>
<td>- Work with the Capstone director and faculty mentor to agree on an appropriate forum for presentation of findings (paper, poster, podium presentation)</td>
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<tr>
<td>- Work with the Capstone director and faculty mentor to ensure that regular feedback is provided and that final summative project evaluations are completed. It is anticipated that students will complete these requirements by the end of the dedicated Capstone period, though certain scientific writing projects such as abstracts, posters, and manuscripts may be concluded at a later date.</td>
</tr>
<tr>
<td>Track: Global, Public Health, and Military Experiences</td>
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<tr>
<td><strong>Objectives:</strong></td>
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<tr>
<td>Capstone projects in this track will provide students with exposure and experience with the following:</td>
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<tr>
<td>- Issues regarding access to the level of sophistication, and quality of care in the developing world</td>
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<tr>
<td>- Exposure to the unique health care problems and diseases seen in low resource or exotic environments (USA or International)</td>
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<td>- Causes and remedies of shortages in public health support in the developing world; and rights and responsibilities of those giving and receiving care</td>
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<tr>
<td>- Military medical sustainable interventions (including mil-mil and mil-civ partnership in research and training) in the developing world which meet national strategy objectives</td>
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<td>- Planning/Training for military and humanitarian contingencies</td>
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<tr>
<td><strong>Pre-requisites:</strong></td>
</tr>
<tr>
<td>Candidates for a Capstone project in this track may need to undertake training such as CITI, AT1 Force Protection, Sere 100B, Trafficking in Human Persons, and submission of Pro-FILE personnel recovery (Pre-international travel and research requirements)</td>
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<tr>
<td>Any Capstone projects requiring travel planning and additional resources may be impacted by travel and budget complexities; advance planning is recommended.</td>
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<tr>
<td><strong>Committee:</strong> TBD</td>
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<tr>
<td><strong>Additional requisites:</strong></td>
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<td>Though it is anticipated that the majority of the work in this track will be exempt from IRB oversight, standard regulatory practices involving research review will apply. Mentors will provide guidance regarding any requirements.</td>
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<tr>
<td><strong>Venues and Affiliations:</strong></td>
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<tr>
<td>Capstone projects in this track must be executed in cooperation with a DoD/US Government activity. These may include USU, NMRC, WRAIR, USAMRU, NAMRU, COCOM, CHPPM, AFHSC-GEIS, NHRC-DHAP, FDA, and CDC, to name some major sites.</td>
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<tr>
<td><strong>Time requirements:</strong></td>
</tr>
<tr>
<td>Total time will be 3 months; some rotations may request that students attend a &quot;common month&quot; of preparation well in advance of the travel; to fulfill the above training as well as participate in several workshops and introductions to global and international health.</td>
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<tr>
<td><strong>Example Projects:</strong></td>
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<tr>
<td>- Epidemiologic studies at the major Navy and USA overseas labs. Example: In the context of an active USAMRU-K (Kenya) disease surveillance study of visceral leishmaniasis, how does school participation relate to disease incidence in an endemic area?</td>
</tr>
<tr>
<td>- Evaluate global health care disparities by comparing and contrasting surgical post-operative care between WRNMMC and the Georgetown Public Hospital, Guyana (Or other similar lower resource locales).</td>
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<tr>
<td><strong>Formative Peer Review:</strong></td>
</tr>
<tr>
<td>Each experience will have its own review and advisory group.</td>
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- Under the supervision of NAMRU Lima Peru, qualitatively assess patient-centered needs mismatch of U.S. military medical missions (MEDCAP, MEDRETE) through post-encounter interviews of Peruvians leaving the U.S. clinic.
- Through CDHAM work with a strategic planning group to develop contingency plans for future response to a major natural disaster.

**Expectations of the rotation:**
- Mentors will specify the prerequisite planning and background research required for each Capstone experience in this track.
- It is expected that each student will develop a plan identifying a hypothesis/aim/goal for the rotation, and prepare a plan for their experience using the same format as a research project.

**Outcomes of the rotation:**
Students will at the minimum write a summary report following the format of scientific writing, with intent for contribution to the academic productivity of the faculty mentor(s) and laboratory team. Mentors may require an academic presentation at the close of the experience. Posters and presentations at local or regional meetings are encouraged; in particular preparation of a poster for presentation at the USUHS Research Days is expected.

**When formulating Capstone projects students must:**
- Clearly define a scientific objective and associated specific aims, even for “practical” experiences
- Perform an in-depth review of the literature relevant to the area of interest (this may begin prior to and continue through the specific capstone experience)
- Work with their faculty mentor to secure appropriate scientific reviews and approvals before collecting any data
- Work with Capstone director and faculty mentor to ensure adequate progress on the project as they continue through the medical school curriculum
- Work with the Capstone director and faculty mentor to agree on an appropriate forum for presentation of Capstone findings (paper, poster, podium presentation)
- Work with the Capstone director and faculty mentor to ensure that regular feedback is provided and that final summative project evaluations are completed
# Track: Clinical Research

<table>
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<tr>
<th>Description</th>
<th>Requirements</th>
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<tr>
<td><strong>Objectives:</strong></td>
<td><strong>Pre-requisites:</strong></td>
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<tr>
<td>Capstone projects in this track will provide students with exposure and experience with the following:</td>
<td>Students will need to take CITI and HIPPA training</td>
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<tr>
<td>- Familiarization with relevant literature surrounding the chosen topic</td>
<td>Clinical experiences may be preceded by a &quot;common month&quot; of training and workshops in the acquisition of exposure and familiarization with the basic components of clinical research.</td>
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<tr>
<td>- Formulation of an advanced scientific question and clear and obtainable specific aims</td>
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<td>- Design and execution of experimentation to answer the formulated question</td>
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<td>- Familiarization with data management tools including data collection instruments and techniques, use of databases, and statistical analysis, under the guidance of experienced mentors</td>
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<td>- Gaining an understanding of the multiple stages involved in the planning, conduct, analysis, and presentation of results in clinical research activities</td>
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<tr>
<td>- Military and Public Health relevancy</td>
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<tr>
<th>Committee:</th>
<th>Additional requisites:</th>
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<td>TBD</td>
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<tr>
<th>Venues and Affiliations:</th>
<th>Time requirements:</th>
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<tbody>
<tr>
<td>Capstone projects in this track must be executed in cooperation with a DoD activity at USU or an approved offsite organization (Primarily military medical treatment facilities).</td>
<td>3 months, which may be either continuous or may involve a common initial month, followed by a 2-month clinical research experience at a later point</td>
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<tr>
<th>Example Projects:</th>
<th>Formative Peer Review:</th>
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<tbody>
<tr>
<td>- Join an ongoing major clinical research program. Example: the prospective evaluation of prevailing <em>Staphylococcus aureus</em> isolates and the host immunologic response to skin and soft tissue infections at Ft. Benning, GA (Current USUHS/IDCRP Protocol)</td>
<td>- The clinical research track review committee will look at the feasibility and appropriateness of each proposed project.</td>
</tr>
<tr>
<td>- Perform a Chart Review to analyze outcomes data or identify risk factors for undesirable complications (or other QA/QI projects)</td>
<td>- Additionally, specific experiences may undergo their own mentor review. Some projects will require institutional review by the USUHS or site Offices of Research.</td>
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<td>- Further query and analysis of a robust database to uncover new associations, or patterns which may lead to new hypotheses</td>
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<tr>
<th>Expectations of the rotation:</th>
<th>Outcomes of the rotation:</th>
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<tr>
<td>- These will be full-time responsibilities; students must be free from</td>
<td>Students will likely vary as to the degree of progress and success</td>
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</table>
concurrent obligations during the time committed to the actual experiences (some preparatory writing/on-line training may need to be completed during prior electives)
- The students will work closely under the mentor's direction.
- The student will produce scientific writing of a quality to meet the rigor of consideration by key peer-reviewed journals

| towards the goals of their clinically associated research - this is expected with scientific inquiry. Some students may spend more time on acquiring core skills and pre-operational design experiences, while others will be involved with data collection and analysis. Students will at the minimum write a summary report following the format of scientific writing, with intent for contribution to the academic productivity of the faculty mentor(s) and laboratory team. Posters and presentations at local or regional meetings are encouraged. In particular, preparation of a poster for presentation at the USUHS Research Days is expected. |
| When formulating Capstone projects students must: |
| - Clearly define a scientific objective and associated specific aims |
| - Perform an in-depth review of the literature relevant to the area of interest (this may begin prior to and continue through the specific capstone experience) |
| - Work with their faculty mentor to secure appropriate scientific reviews and approvals before collecting any data |
| - Work with Capstone director and faculty mentor to ensure adequate progress on the project as they continue through the medical school curriculum |
| - Work with the Capstone director and faculty mentor to agree on an appropriate forum for presentation of Capstone findings (paper, poster, podium presentation) |
| - Work with the Capstone director and faculty mentor to ensure that regular feedback is provided and that final summative project evaluations are completed |
### Track: Education and Simulation

**Objectives:**
Capstone projects in this track will provide students with the following skills and experiences:
- Familiarization with adult learning theory, and modern education methods
- Exploration of cutting-edge technologies in educational applications
- Refinement of core knowledge and skills in vital areas such as anatomy, imaging, tropical medicine, etc.
- Military/Public Health relevancy

**Pre-requisites:**
Due to the complexity and particular calendar restrictions of many of these activities, students are encouraged to contact potential mentors early.

*Where possible, students may be encouraged to apply for available funds to support their activities - students will be made aware of any such opportunities by their mentor or the Capstone director.*

**Committee:** TBD

**Venues and Affiliations:**
Capstone projects in this track must be executed in cooperation with a DoD activity at USU or an approved offsite organization.

**Time requirements:**
Total time will be 3 months; some rotations may request that students attend a "common month" well in advance of the specific education activity; to participate in several workshops and introductions to education theory and skills.

**Example Projects:**
- Develop a new simulation, teach, and/or analyze data in the USUHS Simulation Center
- Become an anatomic educator; refresh general, head/neck, or orthopedic anatomy while developing teaching skills
- Develop new medical education tools such as podcasts (MilMed), packaged "Ted Talks" (Radiology)

**Expectations of the rotation:**
Mentors will specify the prerequisite planning and background research required for each Capstone experience in this track. It is expected that each student will develop a plan identifying a hypothesis/aim/goal for his/her rotation, and prepare a plan for their experience using the same format as a research project.

**Outcomes of the rotation:**
Students will acquire educational skills and refinement of core knowledge for the future. Many projects will involve the development of a specific tool/resource which can be shared with other USUHS students. Mentors may require additional efforts within the experience, such as participating in literature reviews, scientific writing projects, etc.

**Formative Peer Review:**
The education track review committee will look at the feasibility and appropriateness of each proposed project.

- Additionally, specific experiences may undergo their own mentor review. Rare projects may require institutional review by the USUHS or site Offices of Research.

**Outcomes of the rotation:**
Students will acquire educational skills and refinement of core knowledge for the future. Many projects will involve the development of a specific tool/resource which can be shared with other USUHS students. Mentors may require additional efforts within the experience, such as participating in literature reviews, scientific writing projects, etc.

Posters and presentations at local or regional meetings are...
Proposed Capstone Tracks (D-R-A-F-T)  09-04-13

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>- Clearly define a specific education objective and associated specific aims</td>
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<tr>
<td>- Perform an in-depth review of the literature relevant to the area of interest (this may begin prior to and continue through the specific capstone experience)</td>
</tr>
<tr>
<td>- Work with their faculty mentor to secure appropriate scientific reviews and approvals before collecting any data</td>
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<td>- Work with Capstone director and faculty mentor to ensure adequate progress on the project as they continue through the medical school curriculum</td>
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<td>- Work with the Capstone director and faculty mentor to agree on an appropriate forum for presentation of Capstone findings (paper, poster, podium presentation)</td>
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<td>- Work with the Capstone director and faculty mentor to ensure that regular feedback is provided and that final summative project evaluations are completed</td>
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encouraged; in particular preparation of a poster for presentation at the USUHS Research Days is expected.
<table>
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<tr>
<th><strong>Track: Self-Initiated Projects</strong></th>
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<tr>
<td><strong>Description</strong></td>
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| **Objectives:** Capstone projects in this track allow for the following opportunities:  
- Continuation of excellent work begun by a student prior to the post-clerkship period  
- Participation in a unique opportunity not encompassed by the other capstone tracks (in a well-supervised environment)  
- Military and/or Public Health relevancy | **Pre-requisites:** These will be determined by the unique situations considered. All standard training, such as CITI, HIPPA, any safety/travel/security training will apply as required per USUHS and DoD standards. |
| **Committee:** TBD | **Additional requisites:** As determined by the unique experience. Students will be expected to submit a detailed plan including well-defined goals/outcomes and timeline for any unique experiences. Early contact with the Capstone director, and communication with any associated reviewers is strongly suggested. |
| **Venues and Affiliations:** Capstone projects in this track must be executed in cooperation with a DoD activity at USU or an approved offsite organization. | **Time requirements:** Up to 3 months will be allocated |
| **Example Projects:** The majority of these experiences will be the continuation of a successful prior academic activity. This category will also consider well-designed and well-supported activities led by outstanding experienced mentors associated with the USUHS which do not currently fit into one of the already approved categories. | **Formative Peer Review:** The self-initiated track review committee will look at the feasibility and appropriateness of each proposed project. A high level of scrutiny will be applied to any offsite/distant activities. Some projects will require institutional review by the USUHS or site Offices of Research. |
| **Expectations of the rotation:** Mentors will specify the prerequisite planning and background research required for each Capstone experience in this track. It is expected that each student would develop a plan identifying a hypothesis/aim/goal for the rotation, and prepare a plan for their experience using the same format as a research project. | **Outcomes of the rotation:** These will be determined and approved by the track oversight committee. Mentors may require additional academic productivity within the experience. Posters and presentations at local or regional meetings are encouraged; in particular preparation of a poster for presentation at the USUHS Research Days is expected. |

**When formulating Capstone projects students must:**  
- Clearly define a scientific or other objective and associated specific aims  
- Perform an in-depth review of the literature relevant to the area of interest (this may begin prior to and continue through the specific
- Work with their faculty mentor to secure appropriate scientific reviews and approvals before collecting any data
- Work with Capstone director and faculty mentor to ensure adequate progress on the project as they progress through the medical school curriculum
- Work with the Capstone director and faculty mentor to agree on an appropriate forum for presentation of Capstone findings (paper, poster, podium presentation)
- Work with the Capstone director and faculty mentor to ensure that regular feedback is provided and that final summative project evaluations are completed
Application Process:

Student’s Areas of Interest, Future Career Plans

Review Website, Attend Briefings, Open House, Discuss with OSA Advisors, Contact Potential Mentors

Laboratory Research
Clinical Research
Global, Public Health, Military
Education, Simulation
Self-Initiated / Other Projects

Submit Application to Capstone Program

Review by Track Advisory Committees

Selection - Communication with Students, Mentors

Finalize Plans with Mentors and Track Committees

Finalize Post-BBB Schedule with OSA
STUDENT CAPSTONE APPLICATION – CLASS OF 2015 – Simple Instructions:

1. Capstone activities are optional for the Class of 2015, not mandatory. These are exciting activities to enhance your long term skill set and expose you to interesting career options. There also may be some research and other special electives which are not initially under the Capstone Program at this time. Contact the Capstone Director (Dr. Ottolini), the specific activity mentor(s), or OSA, with any questions or concerns.

   Capstone Director: Martin G. Ottolini, Col (ret) USAF, MC, Ph: 301-295-3665; MOTTOLINI@USUHS.EDU

2. Review the content of the five individual areas of interest, or “tracks.” Each track will be advised and supervised by a review committee, which will look at all the applications submitted for that track.

3. The Sakai website with the Capstone handbook and activity descriptions will open in the fall of 2013. More descriptions will be posted through the fall as arrangements are finalized. A class-wide briefing will be held in the January, 2014 Step 1 study period.

4. Look carefully at individual Capstone Activity Descriptions. They are expanded descriptions of the laboratories, facilities, and locations; the scope of work currently being done; and the contribution these activities may make to your future careers.

5. Applications can be submitted to the Capstone course website after 1 January 2014. For all Capstone activities, the Track Advisory Committees will work with mentors/sponsors to select prospective students. Students will be informed late February through March of Capstone selection. Committees will continue to place students in alternate choices whenever possible.*

6. Any proposed “self-initiated” projects will be highly scrutinized by a senior team of researchers and educators. This track will be limited during the initial launch of the Capstone Program, and should only be considered for work currently done or proposed under experienced USUHS-affiliated faculty.

7. Feel free to contact the listed mentors. For some experiences, this will be encouraged earlier in the process, as complicated scheduling requirements may be built into certain experiences. You may also always contact the Capstone Director (Dr. Ottolini) with any questions.

*Note – Due to the initial launch of the Capstone Program, and finite resources, not all students will be selected. The Class of 2015 will also be kept informed of any Federal Budget/Travel/Other resource issues which may impact certain options.
1. **Contact Information**
   a. Name: [Click here to enter text.]
   b. Best E-mail address/Alternate E-mails: [Click here to enter text.]
   c. Best phone number: [Click here to enter text.]

2. I would like to apply for a capstone activity in the following areas:
   (Rank up to 3 choices in order of preference using 1, 2, and 3)
   
   - [ ] Laboratory Research
   - [ ] Clinical Research
   - [ ] Global/Public Health/Military Experience
   - [ ] Education and Simulation
   - [ ] Self-Initiated Projects
     - Please specify any additional projects you are suggesting: [Click here to enter text.]

3. Each Capstone category encompasses a number of individual activities. List the specific Capstone activity for which you are applying, using the same description posted by the mentors/sponsors:  
   First choice [Click here to enter text.]
   Second choice [Click here to enter text.]
   Third choice [Click here to enter text.]

4. If you are proposing an activity outside the scope of the group of pre-approved projects, please summarize that activity in concise detail: [Click here to enter text.]

5. In 100 words or fewer, tell us why you are particularly interested in your first Capstone choice. You can also write short statements for choices 2 and 3, though this is not required. Please attach your statement to this form when submitting.

6. Do you have a particular mentor with whom you’d like to work? Have you had any contact/activities or advanced planning with this individual? What is their relationship to the USUHS? (Reminder – Capstone Mentors must be affiliated with the USUHS): [Click here to enter text.]

7. The GME specialty in which you plan to apply for training is: [Click here to enter text.]

8. In which of the following time periods of the post-clerkship would you prefer to do this activity? (Remember all MS-IV students will participate in the military medical practice field exercise in October of 2014) Choose from one of these three time periods:
9. Briefly mention any other important rotations or special scheduling considerations (family considerations, etc.) that may impact the timing of the Capstone activity during your post-BB time period: ______

10. Have you discussed this project/preference with any USUHS advisors (list whom)? ______

11. Have you reviewed your year plan with anyone from OSA at this time? ______

12. Do you have any outstanding incomplete grades or required remediation activities at this time? ______
“The Capstone Initiative – Discovering Your Capabilities”

Martin G. Ottolini, Col (Ret) USAF, MC
Director, Capstone Program
Assoc. Professor of PMB, Pediatrics, Microbiology and Immunology, and EID
Current Medical School Experience:

- “Common” (near identical) pre-clerkship; clerkship; and early post-experience
- Core military value – “it’s not about me”
- Team >>> Individual
- Dual Oaths:
  - Service to country
  - Service to patients
- Reluctance to focus on self-oriented/self-promoting activities
Who do We Become …?

The Old “Triple Threat”:
- Clinical Expert
- Teacher
- Researcher

Has evolved to ....
Many More Potential Roles …

- Clinical Providers
- Educators / Training Program Directors
- Bench/Basic Researchers
- Clinical Researchers
- Operational Military Physicians and Leaders
- Global Medicine Experts – Tropical, Humanitarian, EID
- CBRNE/Disaster planning
- Managers/Planners
What is a Capstone Experience?

• “A cohort of students in the Class of 2015 will be selected to perform a longitudinal project of advanced scientific inquiry. These projects will include basic (bench) research, clinical projects, performance improvement projects, operational studies and other public health projects.”

• Military physicians have a lot of influence over their career choices

• Initially, about 15% of the Class of 2015 will be encouraged to do a Capstone Activity
As per the Post-Clerkship Committee...
The Capstone Experience Will Entail:

- **Active Inquiry** – curiosity
- **Enthusiasm** – An Opportunity, not a Requirement
- **Mentor and activity** - the most important requirement – must be experienced / successful
  - Initially **USUHS-linked activities** = guaranteed regulatory awareness and proven track records
- 3 months of dedicated time
- Application to one of 5 areas – the full proposal
- Specific Product/Deliverable – thesis, poster, manuscript, reflective writing, etc.

*Appropriate level for a medical student to do within 3 months*
Follow the Scientific Research Model – Even if it is a Practical Experience:

• Develop a "Hypothesis" or Purpose – Inquiry/Discovery
  Identify a question/Study a problem/Answer a need
• Research the background and significance
• Develop a Plan: Methods, timeline, resources, regulatory (3201, with section #13 fleshed out – research plan)
• Do the work - obtain data, information
• Analyze the results, reflect on findings
• Present a summary and conclusions – at the site or for that group; plus USUHS Research Week
  – Poster, Thesis, Presentation, Reflection, Feedback
Initial 5 Tracks for Capstone: (Advisory and Review Panel for Each)

1. **Laboratory Research** – USUHS or DoD-based
   - In vitro, model systems, animal models, etc.
   - **USUHS-based labs; WRAIR, NMRIC, Surgery**
   - Small number of USUHS sponsored projects

2. **Clinical Research** - databases, review, prospective
   - Chart review
   - Further query and analysis of a robust database
   - **MAJORITY** - Join an ongoing long term project
   - Clinical Experiences (may be regulatory-exempt)
   - QI/PI activities

**Specialty interest groups; IDCRP; large cohort studies; data analysis groups**
Initial 5 Tracks for Capstone:
(Advisory and Review Panel for Each)

3. Global/Public Health/Military: global, tropical, humanitarian, operational medicine, etc.

- Overseas Tropical Medicine rotations (GEIS)
- Surgery trips to the Philippines, Mexico – Long-term surgical relationships
- CDHAM planning
- Participate in USPHS activities – CDC, planning agencies
- Work with military medical divisions
Initial 5 Tracks for Capstone:
(Advisory and Review Panel for Each)

4. Educational, Simulation, Systems: (QA, PI), Information Technologies, Ethics
   - Develop a new simulation experience
   - Look at utilization data
   - Become an educator (anatomy) but also learn more education skills
   - Anatomic Teaching in General and Neuroanatomy
   - Simulation center “teaching rotations”
   - Development of Simulation CTR teaching tools
   - Analysis of performance data from Sim CTRs
Initial 5 Tracks for Capstone: (Advisory and Review Panel for Each)

5. Self Initiated – with cautions

- Set up a special experience/rotation with a mentor/office/division
  Mentor’s experience
  Simple approvals
  Practical and not excessively ambitious

- Continuation of a pre-existing experience into the Capstone time frame (summer student, work begun on a rotation)

- These will require careful review by experienced research faculty
Common Training = Similar Background:

• Example – everyone going overseas may be required to:
  – Similar CITI, HIPPA, International safety training
  – All attend a month of classes and planning:
    • Focus on “international” disease, global health – special talks, library training, self-study
    • Work to identify rotation’s purpose – workshops to structure their plans

• This will give a common experience and background useful for the future, allows the mentor to focus on “your” specific proposal; guarantees similar quality of academic structure
Anticipated Timelines:

- Website descriptions will be updated and open for review for the class of 2015 in the fall of 2013
- Students apply for options from early January until end of February 2014 by a pre-proposal to the track groups and capstone mentors. **Final Approval of all student schedules is performed by OSA advisors**
- May be required to work on a full application afterwards; or perform regulatory/training prep work (CITI, HIPPA, lab safety, international travel clearance) during other electives
- Some capstone activities may involve a “Common Month” of training and preparation with similar students
- 2-3 month block in April 2014-March 2015 timeframe
- April 2015 – must be a clinical month
- March/April: finish all remaining work; prepare posters for USUHS research day; etc.
You May Still Pursue Traditional Elective Activities Outside of the Capstone Program ...

• Many outstanding options already exist, Capstone is not initially going to compete with or absorb everything; but will “test pilot” several experiences...
Advice and Request for Students:

- Be open minded to possibilities!
- Look for areas of interest on clerkships, in BBB
- Remember, mentors must be strongly linked to USUHS
- Be prepared for paperwork in late 2014, early 2015
- Do not be OVERAMBITIOUS/UNREALISTIC – “brand new clinical research” is unlikely ...
- Anticipate preparation of a final presentation, manuscript, report, poster, reflective writing, feedback
- We (CD, Post-Clerkship Committee) would appreciate student advice regarding suggestions for selecting the first Capstone students
- Await news of future DoD travel and other budgets
- Contact me:
  
  mottolini@usuhs.edu
  
  301-295-3665