Capstone Scholarship and Discovery Course Manual

TABLE OF CONTENTS

Table of Contents....1
Course Overview....3
Guidance....3
UMMS Competencies....4
Capstone Scholarship & Discovery Course Goals....6
Capstone Scholarship & Discovery Course Objectives....6
Capstone Scholarship & Discovery (CSD) Course Leadership and Professionals....7
CSD LEADERSHIP....7
CSD PROFESSIONALS....7
Capstone Scholarship and Discovery Course Governance....9
Capstone reports timeline at a Glance....10
Capstone activities by curriculum year....11
Grade Assignment....12
Capstone Completion Policy....13
Assignment Policy....13
Course Materials Sites....13
Blackboard Learn (BBL) Classroom....13
Office of Undergraduate Medical Education (OUME) Website....13
Capstone Scholarly Project Processes....14
Group Projects....14
Inter-professional (IP) and Legacy Projects....14
Identifying and Developing your Capstone Topic....14
School of Medicine Courses....14
Generating Ideas with Your Learning Communities Mentor....15
The LC Mentor…....16
Examples: Capstone Scholarly Project (CSP) Ideas....16
Advanced Studies Capstone Month....18
Finding a Capstone Faculty Advisor....19
Capstone Advisor Criteria and Considerations....20
Capstone Reports and Descriptions....21

FOM1 Spring Semester Progress Report 21
FOM2 Fall Semester Progress Report 21
FOM2 Advisor Selection Form 22
FOM2 Capstone Scholarly Project Proposal 22
CCE Fall & Spring Semester and AS Fall Semester Progress Reports 22
Group Project – Report Writing 23
Change of Project/Change of Design or Methods/Advisor Change Request 23
AS Written Capstone Scholarly Project Report 24
Individual Project Reports must include 24
Group Project Reports must include 24
AS Capstone Deliverables 25
AS Capstone Reflection 25
AS Capstone Project Presentation 25
Institutional Review Board (IRB) and Institutional Animal Care and Use Committee (IACUC) 26
Capstone IRB Screener information and questions 26
Capstone, MD/PhD, Clinical Translational Research Pathway (CTRP) and Senior Scholars* Programs 27
Major differences between components of Capstone within each program 27
Capstone Course Resources 29
Writing, Presentation, and Public Speaking Resources 29
Scientific Paper Writing 29
Poster Construction 29
PowerPoint 29
Public Speaking 29
The Academic Medicine Handbook 30
UMMS Academic Computing training sessions 30
Capstone Course Hints for Success 31
Hints for a Successful Capstone Experience and Project 31
Documentation In Process 32

Manual updated July 2015

COURSE OVERVIEW

The Capstone Scholarship and Discovery (CSD) course represents the key principles of the University of Massachusetts Medical School (UMMS) Learner-centered Integrated Curriculum (LInC). It is a four year longitudinal curricular experience that is a graduation requirement for all classes beginning with students entering in 2012. Through this course, each student will complete an individualized scholarly project that puts into practice one or more of the UMMS core competencies (Physician as Professional, Scientist, Communicator, Clinical Problem Solver, Advocate, and Person), allowing students to build on a personal passion as it relates to medicine. A student's topic of interest might be one that existed prior to entering medical school, or one that she/he identifies and develops after having matriculated. Students earn four credits upon completion of the CSD course. The CSD course is required for graduation; "credit" or "no credit" is assigned for the course. Students must remediate any non-credit grade prior to graduation.

A primary goal of the CSD course is to give students the opportunity to define and complete a mentored scholarly project about which *the student* is passionate, while completing other required courses. Students participate in the course during their four years of medical education, with proscribed steps in place to ensure successful completion.

The initial step is for the first-year student to discover interests that may be developed into a longitudinal project. While some students will arrive at UMMS with interests already identified in college or through post-college experiences, many will prefer to wait to choose a topic after having engaged in the new experiences inherent to medical education. In fact, it is anticipated that students will participate in such a variety of activities in the first year (FOM1), that new passions *will* arise, informing new topic choices. Examples of activities that may develop into project topics include volunteering at a free clinic, participating in an out-of-country healthcare experience, developing a quality improvement project, "TA-ing" a course, participating in an optional enrichment elective or FOM1 summer program, or conducting basic or clinical research. Students may also reacquaint themselves with an artistic talent, activity or other area of interest and explore how this passion relates to their new profession.

During the second year (FOM2), students develop a formal project proposal after selecting an advisor who either has expertise in or shares a passion for a student's chosen topic. In year three (CCE), while students are occupied in clinical learning, the project focus is on reviewing professional literature, obtaining or refining data, completing related Flexible Clinical Experiences (FCEs) and engaging in any other activities that further develop the project. The fourth year (AS) allows 4 weeks of credit-bearing time to finalize specific project activities, including its formal write-up and presentation.

The focus of the Capstone Scholarly Project is on students learning and sharing of that learning, not publication or other external metrics. There is no expectation for a major written 'thesis', although students are expected to complete a scholarly report of their work that includes a guided reflection on the process and learning, as well as a presentation of their work at the annual exhibit of Capstone Projects. While some students may work toward presenting at a regional or national meeting, or have their work accepted for publication, that is not an expectation of the CSD course.

GUIDANCE

Throughout the process of participating in the CSD course, across all four years, the course framework guarantees that students have continued support from CSD course leadership and Project Advisors, Capstone Faculty Committee (CFC) members, Learning Community (LC) mentors, Lamar Soutter "House Librarians", and other members of the UMMS community who are committed to supporting students' CSD projects.

UMMS COMPETENCIES[1]

Physician as Advocate

Our graduates understand the importance of educating the entire community about health-related issues and recognize the physician's responsibility to contribute to the larger community.

Capstone projects that meet the requirements of the *physician as advocate* competency must be endeavors that utilize the concept of service as the core element for the project. Service to community and patients may include development or collaboration with community organizations, educational or media campaigns, or political advocacy on behalf of and in partnership with community and patient populations.

Physician as Person

Our graduates understand their motivations, limitations, and values; recognize their own reactions to difficult situations; and understand how these personal responses may affect their lives and work.

Capstone projects that meet the requirements of the *physician as person* can include studies of self-care, self-awareness, and integrative practices (e.g. meditation, mindfulness based skills), including those based in integration of humanities and medicine or work-life balance oriented projects.

Physician as Clinical Problem-Solver

Our graduates use critical thinking skills to deliver care that is customized and responsive to individual patients. They appreciate the importance of coordination among health care professionals to enhance continuity of care, safety and reliability.

Capstone projects that meet the competency of the *physician as clinical problem-solver* focus exclusively on problems or processes based in the clinical realm. These projects may range from a clinical research project, to a case report, quality or process improvement project, or a public health initiative.

Physician as Communicator

Our graduates build productive relationships with patients and their families, responding appropriately to their needs and preferences based on their cultures, backgrounds and social systems.

Capstone projects that meet the requirements of the *physician as communicator* will focus on the skills necessary to be an effective caregiver and develop strong relationships with patients utilizing patient-centered, sensitive and culturally-competent communication. Projects may also be related to collaboration with team members and inter-professional groups to provide the highest quality of patient care and education.

Physician as Professional

Our graduates define and describe the importance of professional values and ethical principles, explain appropriate standards of care and participate as effective members of a health care team.

[1] Additional information related to competencies can be found on the OUME website- *http://umassmed.edu/oume/oume/umms-competencies-for-medical-education1/*

Capstone projects that meet the requirements of the *physician as professional* will focus on the principles of life-long learning and the highest ethical and inter-professional standards which include compassionate care focused on the patient's best interest.

Physician as Scientist

Our graduates acquire core clinical and scientific knowledge and the ability to understand and apply the scientific method to both patient care and career-long learning.

Capstone projects that meet the requirements of the *physician as scientist* competency must be scholarly investigations that apply the scientific process – gathering data, generating and/or testing hypotheses, and analyzing and interpreting outcomes – to solving problems for which answers are not yet known. Project content and setting can range from basic science in the laboratory to clinical and translational science at the bedside or in the community. Scholarly work may expand to non-traditional areas if the scientific process is employed as the approach.

CAPSTONE SCHOLARSHIP & DISCOVERY COURSE GOALS

- Create a uniform opportunity for all students to follow an individual passion consistent with at least one of the six UMMS medical education competencies
- Foster analytical thinking skills and the development of tools for rational decision making for UMMS students
- Provide role models, mentorship, and guidance for students regarding careers that integrate research, service, teaching, clinical service
- Present scholarly pursuits to students as endeavors that involve collegial interaction
- Enhance the medical school culture of self-directed and peer-fostered feedback and learning
- Develop oral and written communication skills of graduating medical students that are important to the profession of medicine
- Demonstrate effective dissemination and public presentation of scholarly work
- Cultivate a spirit of lifelong scholarly inquiry among UMMS students

CAPSTONE SCHOLARSHIP & DISCOVERY COURSE OBJECTIVES

Completion of a longitudinal student project which…

- Is related to a clinical, basic science, public health, professional, or social problem or question
- Develops a student's understanding of an area of his/her own interest related to medicine. (Addresses competencies: Physician as Professional, Scientist, Communicator, Advocate, Person, Clinical Problem Solver)
- Maps to at least one of the School of Medicine (SOM) medical education competencies. (Addresses competencies: Physician as Professional, Scientist, Communicator, Advocate, Person or Clinical Problem Solver)
- Demonstrates a student's organizational, analytical, and reflective reasoning. (Addresses competencies: Physician as Scientist, Clinical Problem Solver)
- Demonstrates a student's ability to communicate effectively about the work. (Addresses competencies: Physician as Professional, Communicator)
- Meets relevant criteria with regard to goal clarity, adequate student preparation, appropriate methodology, collection of findings or creation of a product, effective presentation (e.g. written, oral, performance), and self-reflective critique. (Addresses competencies: Physician as Professional, Scientist, Communicator, Clinical Problem Solver)
- Adheres to required CSD course and project longitudinal timelines. Encourages student's ability to work collegially. (Addresses competency: Physician as Professional)

CAPSTONE SCHOLARSHIP & DISCOVERY (CSD) COURSE LEADERSHIP AND PROFESSIONALS

Capstone course leadership is comprised of leaders and an oversight committee, all of whom contribute to the design, structure and administration of the course. Professionals assist students by providing direct guidance to them for their capstone project work.

CSD LEADERSHIP

CSD Course Co-Leader(s)

> Oversee all aspects of the Capstone program. They are involved in the development of the BBL classroom, make content decisions, respond to student questions and concerns, evaluate submitted reports, guide program managers and the CFC members, and supervise remediation. Course co-leaders communicate with the CFC members, LC mentors, and advisors as to the goals of the Capstone program, directing course governance and addressing issues as they arise. Course co-leaders also serve as ambassadors of the program, helping to recruit Capstone advisors and educate the UMMS community about the CSD course. They are available to meet with students for additional support.

CSD Program Manager(s)

> These team members help organize the BBL course room and web components of the program, assisting with course content development and student progress review. CSD program managers communicate with students and Capstone team members, and are available to meet with students for additional support.

Capstone Faculty Committee (CFC) Chair

> This individual leads the CFC and communicates with CFC members on aspects of the CSD program. The CFC chair participates in decisions related to course content and student evaluations, recruits advisors and CFC members and introduces others to the Capstone requirements at the university. The CFC chair evaluates student report submissions and is involved in remediation efforts, along with the CFC.

CFC Members

> These professionals provide input related to program structure, management, materials and expectations and are involved with project evaluation and remediation plan design. They encourage others to serve as advisors and interact with students to encourage success. This committee includes one student representative from each class year.

CSD PROFESSIONALS

LC Mentors

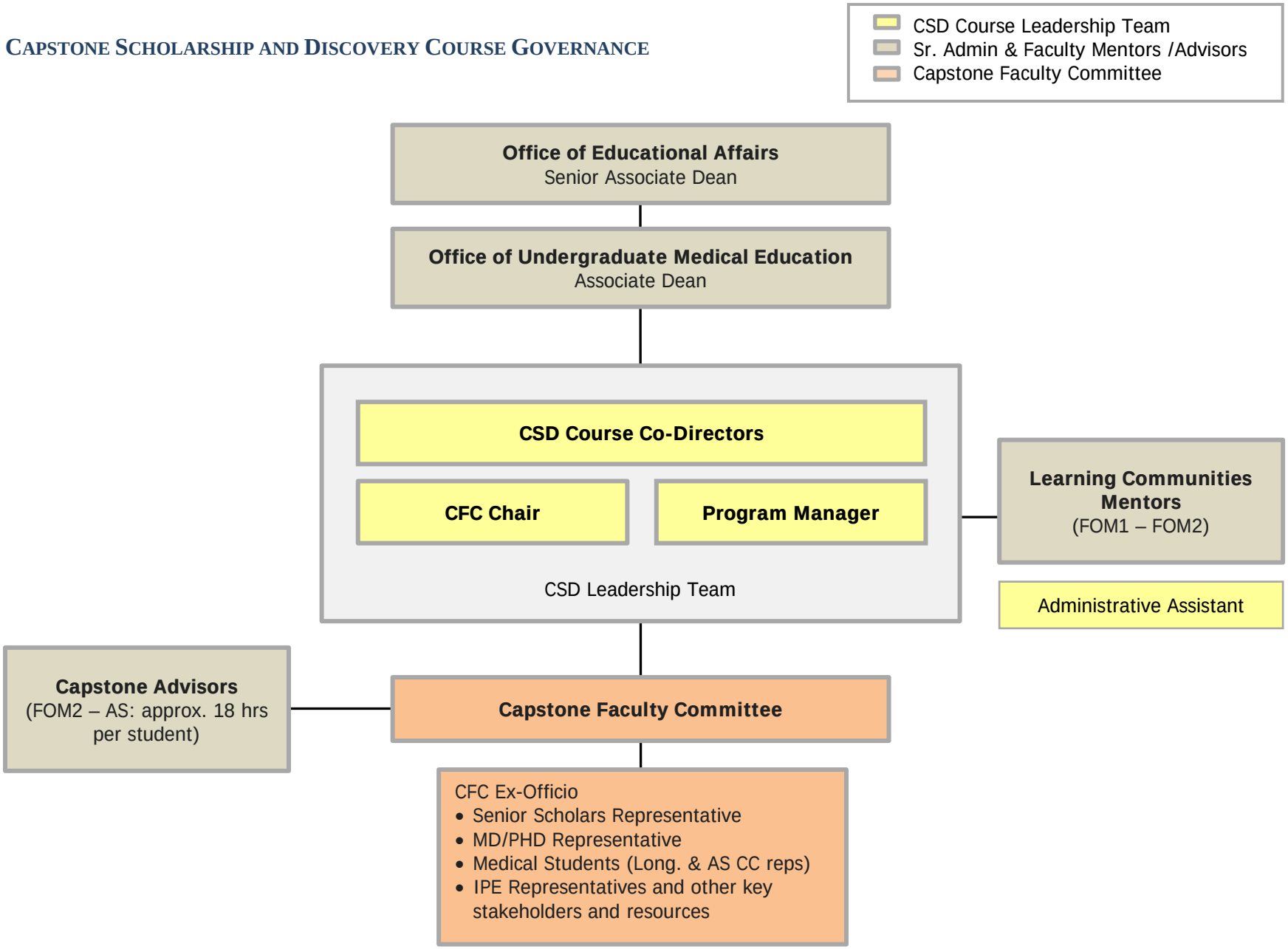
> These physicians work closely with students throughout their UMMS years. Through fall FOM2, mentors assist students with developing CSD project ideas and identifying advisors. Mentors review submitted progress reports through the fall Semester of FOM2, and hold Capstone-related meetings with students individually throughout their FOM1 and FOM2 years. They may continue to act as a resource for Capstone projects through the third and fourth years.

CSD Advisors

These professionals work closely with students before or during the FOM2 Spring Semester. Each advisor potentially works with one student or one group (maximum of 3) of students from each medical school curriculum year (four CSD projects), and is dedicated to assisting his/her students to successfully meet individual project goals. Advisors provide guidance to students throughout the project, beginning with the development of the Proposal, through the final Project Report write-up, presentation and feedback. Advisors facilitate Institutional Review Board (IRB) and Institutional Animal Care and Use Committee (IACUC) submission and approval when necessary. They assist students in identifying resources, right-sizing their projects and time management, and participate in any required remediation efforts.

For a listing of the current Capstone leadership and CFC Committee members, please go to the OUME Capstone Website

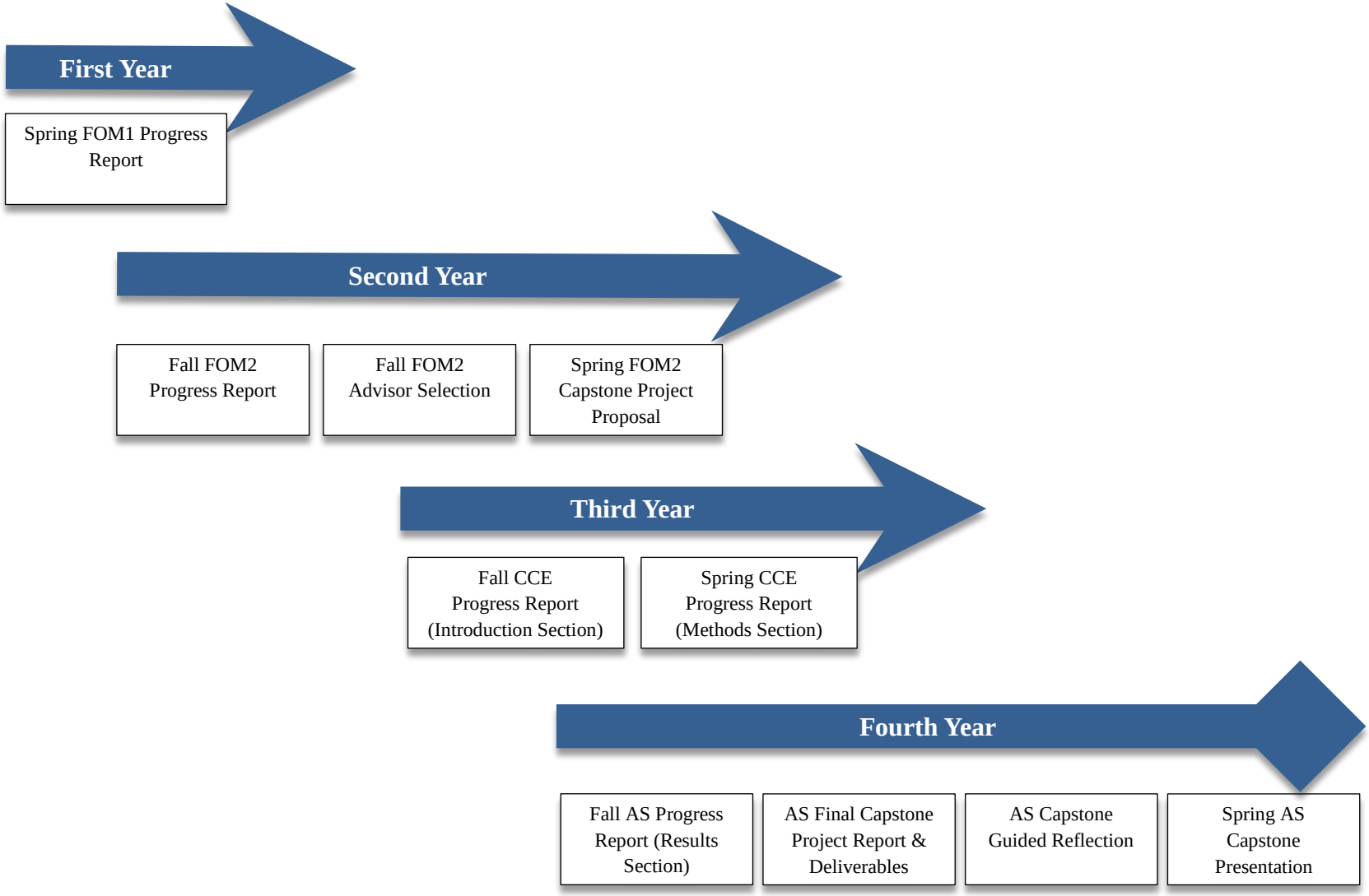
CAPSTONE SCHOLARSHIP AND DISCOVERY COURSE GOVERNANCE



CAPSTONE REPORTS TIMELINE AT A GLANCE

This table highlights the primary activities of the CSD course.

Current actual due dates vary from year-to-year and are listed in the CSD BBL classroom via *https://umassmed.umassonline.net/*



CAPSTONE ACTIVITIES BY CURRICULUM YEAR

UMMS Curriculum Year	Goal	CSD Activity
FOM 1	Explore your interests, consult with LC mentors, senior students and house librarians, meet potential advisors, and cultivate scholarship skills.	• Transition to Medical School: Capstone Scholarship & Discovery Course Orientation with Associate Dean of Undergraduate Medical Education • Discussions with Learning Community Mentors at regular mentoring meetings • Attendance at Capstone Informational Forums *(optional) (Fall and Spring)* • Summer Opportunities Orientation *(summer work is optional)* • IRB training in Principles of Pharmacology course (CITI online course) • Develop skills though Determinants of Health (DoH)1: Epidemiology and Biostatistics • Formulate Project Idea(s) • Submit FOM1 Spring Semester Topic Selection progress report
FOM 2	Conduct focused work on scholarly project (review background information- medical or other literature, patient history, case review, skills-development, legacy project history) leading to selection of advisor and submission of Project Proposal	• Discussions with Learning Community Mentors at regular meetings • Attendance at Capstone Informational Forums (*optional)* (*Fall*) • Submit FOM2 Fall Semester Progress report. • Consider project ideas (i.e., DoH: Population Health Clerkships) • Build scholarship skills through DoH: Epidemiology and Biostatistics (poster preparation) • Select Capstone project and advisor and submit FOM2 Advisor Selection Form (any time after FOM2 Fall Semester Progress Report submission but prior to Proposal submission) • Submit FOM2 Capstone Project Proposal Form
CCE[2]	Develop clinical medicine competencies, consider relationship between clinical medicine and Capstone Scholarly Project (CSP)	• Plan Flexible Clinical Experience(s) that supports Capstone project work • Conduct effective literature searches and critical appraisal of medical literature to practice skills and develop background knowledge for CSP • Ongoing discussions with CSP Advisors • Submit CCE Fall Semester Progress report, including draft of Introduction and CCE Spring Semester Progress report, including draft of Methods • Students may change their project until January 31st of CCE year
AS	Complete scholarly project, obtain advanced skills, disseminate work	• AS Capstone month may be taken May-January • Submit AS Fall Semester Progress report, including draft of Results (only needed if AS month taken October-January) • Submit Capstone Written Report and deliverables at the end of Capstone month • Develop Presentation materials (during AS Capstone month) • Present Capstone Project (poster, ppt, etc.) at Forum • Submit Reflection paper at time of Project Presentation • Consider other dissemination opportunities (*optional*)

MD/PhD students should check with MD/PhD Program Directors and Capstone Leadership Team for specifics.
+ Senior Scholar students follow all Capstone deadlines until they are formally accepted into the Senior Scholars program.

[2] Scholarship & Discovery Year 3 (CCE) - *During year 3, students will predominantly focus on their clinical clerkships and refine their scholarly skills to support clinical medicine (e.g., critically appraise the medical literature, conduct effective literature searches to answer clinical questions). While they may choose to work on their project through a Flexible Clinical Experience or on an ad hoc basis, there is no requirement to do so. Semester check-ins with Capstone Advisors are required.*

GRADE ASSIGNMENT

Because the CSD course is a longitudinal four year course, credit is not submitted until the completion of the final project and its presentation. However, interim grades are submitted to document progress through the course. The CSD grading structure is as follows.

Foundations of Medicine 1 (FOM1)

Fall Semester grades will be recorded as *In Progress* (IP); Spring Semester will be recorded as *Satisfactory* (S) or *Not Satisfactory* (NS). A grade of S will be submitted upon successful completion of the Spring Progress Report.

Foundations of Medicine 2 (FOM2)

Fall Semester grades will be recorded as *In Progress* (IP); Spring Semester will be recorded as *Satisfactory* (S) or *Not Satisfactory* (NS). A grade of S will be submitted upon successful completion of the Spring Progress Report.

Core Clinical Experiences (CCE)

Fall Semester grades will be recorded as *In Progress* (IP); Spring Semester will be recorded as *Satisfactory* (S) or *Not Satisfactory* (NS). A grade of S will be submitted upon successful completion of the third year CSD assignments.

Advanced Studies (AS)

Fall Semester grades will be recorded as *In Progress* (IP); Spring Semester will be recorded as *Credit* (CR) or *No Credit* (NCR). A grade of CR will be submitted upon successful completion of the fourth year CSD assignments (including presentation of CSP). Students successfully completing all CSD course assignments over all curricular years will receive four credits, which are required for graduation.

Any grade of NS or NCR must be remediated as defined by the CFC.

Extending

Students who extend will need to develop a timeline for CSD submissions as part of their extension planning with the Office of Student Affairs and submit that Proposal to CSD. Generally, students should follow Capstone requirements and due dates as they align with the student's designation of Class Year (FOM1, FOM2, CCE, AS)

Students who extend will submit an Extension Timeline Plan to CSD and provide the following information:

Original graduation year
New graduation year
Capstone course work completed to date
New start and end dates for fall and spring semesters for: FOM1, FOM2, CCE, AS

You will receive an email confirming a timeline for completing your Capstone work following your submission of this information to the CSD leadership team.

Remediation

Students who have not successfully completed the course requirements will have until April 30th of the AS year to remediate.

Capstone Completion Policy

Assignment Policy

It is the expectation that all Capstone work will be submitted on time. If a student is concerned that a submission may be late, it must be addressed by emailing the CSD leadership *prior* to the due date. Consideration will be given to extenuating circumstances. Students with late submissions may be required to meet with CSD leadership with the goal of supporting student success. A pattern of missed deadlines will be addressed according to the UMMS student honor code.

Course Materials Sites

Blackboard Learn (BBL) Classroom

All students, CFC members, LC mentors, and CSD advisors are enrolled in the CSD BBL classroom, which can be accessed via https://umassmed.umassonline.net/

Office of Undergraduate Medical Education (OUME) Website

General course information and forms for CSD faculty and professionals can be found on the OUME website via http://www.umassmed.edu/oume/Capstone-Course/

CAPSTONE SCHOLARLY PROJECT PROCESSES

The following outlines processes by which students develop and complete the Capstone Scholarly Project (CSP). It is our goal to make the CSP an enjoyable and rewarding experience for all of our medical students and the faculty with whom they work. We believe this outcome is best achieved by ensuring that students stay on track with goals, and effectively communicate with LC mentors, CSP Advisors and the CSD course leadership team. The processes included in this document permit the student to know requirements necessary for satisfactory progress toward and successful completion of the CSP.

Videos and other resource materials which are highly useful for each step of this process are available in BBL.

GROUP PROJECTS

Students may elect to work in a group, with a maximum of 3 students. All students in the group will have a shared Project, but each student will need to complete a distinct part of the Project to demonstrate their own learning. Each student in the group will submit individual reports throughout the course, although report content will typically be written collaboratively. In addition, students should be careful to plan group projects so that delay in one individual's effort does not impact another's substantially.

Students may have one Advisor for the Project, or each student may have their own Advisors. Multiple Advisors must coordinate with one another.

INTER-PROFESSIONAL (IP) AND LEGACY PROJECTS

Students are also able to work with other students to build an inter-professional CSP, including those involved in the nursing and graduate programs at the university. The student may work with a member of his/her curriculum year or in years above or below. While 2-3 students may work together on a group project with one advisor, it is important to note that the responsibilities and tasks for each student must be clearly stated such that each member of the group is working to complete a distinct piece of the larger CSP. Medical students participating in an inter-professional project are required to submit all CSD reports and present the CSP on behalf of the IP team.

Legacy projects are those projects which can be carried on by subsequent matriculating students after the initial work. Legacy projects must *build on and may not duplicate* previously completed projects, extending and supporting growth in the original project.

IDENTIFYING AND DEVELOPING YOUR CAPSTONE TOPIC

Throughout your time in medical school, you will be exposed to numerous topics of interest. As you engage in the field of medicine, try to identify areas in which you would like to develop more knowledge. Exposure in any course or activity may pique your interest in a topic for Capstone. Remember that you are in charge of selecting your area of interest, so it does not have to be connected to course content; you may choose a topic based on prior work, volunteer activities, interest groups, etc. The following are examples of experiences that can help you identify and/or develop your Capstone work.

SCHOOL OF MEDICINE COURSES

FOM1

- Transition to Medical School
- Doctoring and Clinical Skills (DCS) including LPP and PD

- Determinants of Health (DoH)
- Integrated Case Exercises (ICE)
- Development, Structure and Function (DSF)
- Specific basic and clinical science coursework during the FOM1 year

FOM2

- Doctoring and Clinical Skills (DCS) including LPP and hospital sessions
- Determinants of Health (DoH) including Population Health Clerkship
- Integrated Case Exercises (ICE)
- Introduction to Core Clinical Experiences (CCE)
- Specific basic and clinical science coursework during the FOM2 year

CCE

Students have the option to change their Capstone topic as late as mid-CCE year in order to allow maximum flexibility; should you decide to change, these experiences may help you to select and can certainly help you to develop your project

- Transition to Core Clinical Experiences (CCE)
- Flexible Clinical Experiences (FCE)
- Specific clerkship experience

Optional and Elective experiences

- UMMS Longitudinal Pathway Programs (Clinical & Translational Research, Rural Health, Global Health)
- UMMS Optional Enrichment Electives participation in FOM1 and FOM2 years
- UMMS Summer Research Fellowship Program between FOM1 and FOM2
- UMMS Summer Community Assistantship Program between FOM1 and FOM2
- UMMS Summer Curriculum Development Program between FOM1 and FOM2
- UMMS International Medical Education Program participation
- International Service Trip to Dominican Republic (Spring)
- UMMS Student Interest Group participation/Volunteer Work
- Collaboration with other student groups (e.g., Nursing Capstone)
- Previous scholarly projects conducted during college or graduate school
- Previous volunteer work experiences; international health experiences, shadowing health care providers
- Exposure to specific illnesses or medical conditions through family members or friends

Students may choose to use research, volunteer, humanities, advocacy or other work that they were engaged in prior to attending UMMS.

GENERATING IDEAS WITH YOUR LEARNING COMMUNITIES MENTOR

The LC mentor role is to provide guidance to students as they begin the development of the CSD project - until fall of the FOM2 year when a Capstone advisor is identified. The mentor role is to assist in identifying general area(s) the student would like to explore, general timeline planning and to help guide the student in the identification of an advisor.

THE LC MENTOR…

- Helps the student begin to identify an area of interest
- Incorporates discussions related to student interests prior to entering medical school, coursework, and extracurricular activities to inspire students to consider building on those interests
- May also identify specific knowledge or skills gaps that the student may want to explore and address as a Capstone project
- Helps the student outline a longitudinal timeline plan
- Helps the student identify potential advisors
- May assist with advisor search through outreach to house specialty advisors, colleagues, and others mentors
- Ensures the student meets deadlines up to advisor selection
- Reviews and provides comments as needed on Semester Progress Reports during FOM1 and the Fall Semester of FOM2, sharing concerns with CSD leadership in order to assist the student in meeting course requirements.

The following types of questions will encourage the student to explore and discuss realistic possible Capstone project topics, timelines, and an advisor.

- Have you thought about a topic that interests you enough to pursue in more depth for a Capstone Project?
    - In considering this question you might reflect on coursework to date at UMMS, interests you had prior to starting medical school, etc.
- What area of medicine is starting to pique your interest?
- Does the topic idea relate to what you think you might be interested in for your career focus?
    - If there is no clear relationship, how do you think completing the project might influence your career?
- Does the topic relate in any way to what you are going to do this summer? (for FOM1 students)
- What electives have your participated in?
- Have you become involved in any volunteer programs?
- Do you participate in extra-curricular activities that are important to you? (e.g., music, art, yoga, volunteering)
- Would you like to further explore any of your undergraduate activities?
- What undergraduate or post graduate experiences have you had that you would like to continue into your professional career?
- Are there specific skill areas or gaps you think it would be important to address through a Capstone project?
- Have you met or worked with any faculty with whom you would like to spend more time professionally?

EXAMPLES: CAPSTONE SCHOLARLY PROJECT (CSP) IDEAS

The ideas shared below provide brief descriptions of a variety of ways one can develop a CSP. When developing your project, be creative as you decide what area to explore, how to learn about it, and the most effective way to share the information with the UMMS community.

Student A: (clinical focus)

- Worked in a community health clinic between college and medical school
- Identifies a patient to follow longitudinally (COPD, diabetic pregnant mother who delivers…) during the two years with Longitudinal Preceptor Program (LPP) at a community health center
- Completes an FCE in a related clinical field as part of the CCE year
- Writes a detailed **case report**, including **literature search** related to this patient and **presents** it as the CSP.

Student B: (research, patient education focus)

- Enters medical school directly from college

- Works in genetics lab summer between FOM1 and FOM2 as part of summer research program developing genetic test X
- Completes FCE working with genetic counselors as part of the CCE year
- Writes **informational flier** about genetic test X, receives feedback as the result of a **pilot** with pediatric patients/families, **edits** and **writes up** process and findings as CSP

Student C: (community service focus)

- Joins the Community Assistantship program in the summer between FOM1 and FOM2 working with a group that focuses on refugee help
- Continues this effort with the 'refugee health' group for the Population Health Clerkship in the FOM2 year
- Develops mentoring program for immigrant children implemented during occasional volunteer days in CCE year
- Researches background data on this population and **writes about mentoring program** as CSP; engages junior students to adopt elements as a future Capstone legacy project

Student D: (humanities focus)

- Flutist in college, plays in Seven Hills Symphony
- Completes FCE in the CCE year with palliative care team; **surveys** patients on hospital environment and well-being
- Plays flute on hem-onc floor and **surveys** new set of patients on effects of the music on their sense of well-being
- Completes **poster** on music in medicine and presents **data** collected as CSP
- Shares idea with another Seven Hills member who decides to pick this up for their Capstone as a legacy project

Student E: (bench research focus)

- Interested in basic science research but has no experience from college
- Completes summer research project in UMMS laboratory
- Discusses with lab mentor and is connected with a PhD student in the lab to help identify focused lab project, including background reading
- Completes identified lab work during research-focused FCE in CCE year; or completes clinical FCE related to summer research
- **Writes up** background, **analyzes data** and creates scientific **poster** as CSP

ADVANCED STUDIES CAPSTONE MONTH

The AS Capstone month is required for graduation* and designed for students to complete their final Capstone Scholarly Project Report (CSPR), begin work on presentation materials and, if needed, finalize any minor details of their project work. Students may complete this month anytime from May-January aligned with the AS electives schedule, and will submit their choice to the CSD course via http://umassmed.edu/oume/capstone-course/csd-forms-and--reports/as-csd-month-selection/ .

The CSPR and Deliverables will be reviewed first by the Advisor and then submitted to CSD by the last day of the AS Capstone month. Students who complete the month from October – January will be required to submit an AS Fall Progress Report with Results Section, due by August 31st. Capstone Presentation materials should be finalized once the student has received an email from CSD acknowledging acceptance of the Capstone Scholarly Project Report.

(*see comparison table on page 28 for further info)

FINDING A CAPSTONE FACULTY ADVISOR

Finding the right advisor is crucial to the success of the Capstone project! The role of the advisor is to guide the student through Capstone work, providing support and assistance in focusing on particular key tasks. The advisor may provide scholarly resources; assist with obtaining necessary approvals by regulatory bodies, and support additional dissemination planning such as publication or conference presentation. The advisor who is a "good fit" may also provide valuable career guidance.

Tips for Identifying the Right Capstone Project Advisor

Visit the BBL CSD course classroom

- The classroom has a link to a datasheet that includes a list of professionals who have volunteered to be Capstone advisors that can be searched by topic interest, department, and other keywords
- The classroom contains links to legacy and group projects – should you choose one of these projects, the PI for the project would likely be your Advisor

Search for faculty members through other UMMS resources to generate a list of faculty members with whom you would like to work with based on their past or current research projects and overall interests.

The most common strategies for finding advisors include:

- Involvement in UMMS Programs such as Summer Research Fellowship, Summer Community Assistantship, International experiences, Student Interest groups, and Optional Enrichment Electives
- FOM 2 Population Health Clerkship immersion experience
- Interacting with Course and Interest Group Faculty
- *Asking around* -- Former advisors, Learning Community Mentors, students, Capstone leadership, the CFC committee and course directors sometimes also provide referrals
- Reviewing UMMS department websites, faculty profiles, UMMS faculty web profiles. Don't forget to search interesting faculty via PubMed to read their publications and identify their colleagues

Electronic Resources

- CSD Website *Advisor database* ~ includes professionals who have volunteered to be Capstone advisors
- The BBL classroom Project Ideas & Resources
- UMMS website *search UMMS* ~ Review UMMS department websites, faculty profiles, UMMS faculty web profiles. Don't forget to *search interesting faculty via PubMed* to read their publications and identify their colleagues
- Google the topic area or www.scholar.google.com
- Office of Faculty Affairs website (http://www.umassmed.edu/ofa/Mentoring/FindMentor)
- UMMS Faculty Affairs UMass Profiles website (http://profiles.umassmed.edu/Profiles/search/) - search in *Research Topics* field.

CAPSTONE ADVISOR CRITERIA AND CONSIDERATIONS

CAPSTONE PROJECT ADVISORS…

- Should have expertise and interest in the student's proposed Capstone project area
- Should be available to participate as an advisor for the student over the course of two years (approximately 20 hours)
- Do not need a UMMS faculty appointment (CSD course leadership will work with Advisors to obtain a Faculty Appointment if so desired, or facilitate collaboration with advisors who otherwise fulfill CSD advisor requirements)
- Cannot be CSD course leadership; on a select basis may be CFC members, or LC mentors

Each advisor may serve only one student, or one group of two to three students, from each medical school curriculum year. If a faculty member is already serving as an advisor for a student or student group in a given class cohort, that faculty member may provide guidance to additional cohort students, but we recommend that they not be the primary Advisor; they may also provide assistance with the identification of other potential advisors. The Capstone Project belongs to the student; the Advisor acts as a resource to the student, not as a primary driver. Students are responsible for meeting deadlines, project development, resource identification, etc. While the Advisor role will vary depending on particular project types, the effective Advisor offers insight and guidance toward student success. Group Projects may have a single Advisor for all students, or each student may have their own Advisor. If the latter, Advisors will need to coordinate with one another.

It is the student's responsibility to formally ask the potential Advisor for assistance. While initial contact will most certainly be via email or phone, the student and potential Advisor should try to meet face-to-face to discuss the project plan and Advisor responsibilities. The goal of the meeting is to determine if the potential Advisor is a "good fit", as well as if they can be an effective guide for successful completion of the Capstone project. Students should keep the "CAPE" matrix in mind while talking with a potential Advisor: **C**apable – **A**vailable – **P**roject is interesting to you both – **E**asy to interact with.

What to tell a potential Advisor about their role in Capstone

The Advisor's primary responsibilities include assisting students with: finding resources, right-sizing Projects, time management and feedback on written work. It is estimated that Advisors will spend 18-20 hours working with a student advisee over 2.5 years.

The student must

1. confirm with the selected Advisor that he/she agrees to be an Advisor
2. submit the Student Advisor Selection Form
3. ask the Advisor to submit the Advisor Interest Form (if they have not done so previously)
4. notify any other "interviewed" faculty members that they are free to offer assistance to other students

(Forms are available in BBL and Capstone website)

CAPSTONE REPORTS AND DESCRIPTIONS

The following section contains a description of each Report and the process of review. In general, there is some type of report due in each semester. The practice of regularly checking in and reporting is designed to ensure that students are making satisfactory progress, and so that students, LC Mentors and Advisors have the support necessary for a successful longitudinal experience. Students should feel comfortable and are strongly encouraged to seek clarification or assistance at any time, which should be done prior to deadlines rather than submitting a report late. Course Leadership will review all reports to provide additional oversight and recommendations. In addition, CFC members will review Proposals and final Project Reports and, if needed, will help students develop an action or remediation plan toward successful completion of the project.

The **Capstone Scholarly Project Report** is the final report on the Project work, will be written in the format used in the medical and scientific literature, and will include the following sections: Introduction, Methods, Results, and Discussion. The scholarly format will be used for all project types, including projects that are not empirically based.

Students will access all report forms and submit work via links in BBL. Reports have a WORKSHEET version for the students to use as a draft, and for review by the LC Mentor or Advisor. The WORKSHEET versions may have additional background information and links to resources. Final SUBMISSION versions contain only the required information for the particular report.

FOM1 SPRING SEMESTER PROGRESS REPORT

This first report is developed to cue early thinking about a potential Capstone project. It is an opportunity for the student to share ideas about topics of interest and to outline next steps. This first progress report is not meant to be a *detailed* explanation of an *exact* project.

Throughout the FOM1 year, the student and her/his LC mentor will discuss topic ideas during scheduled meetings. The progress report, which is reviewed by the LC mentor, will assist the student to clarify where she/he is in the process of developing an achievable Capstone project. The report is first reviewed by the LC mentor who may have additional questions for the student or wish to arrange for a meeting to discuss the outlined progress.

After the mentor has approved the progress report, it is submitted to the CSD leadership team for additional review. In the event the CSD review reveals questions or concerns, the student will be contacted directly by the reviewer.

FOM2 FALL SEMESTER PROGRESS REPORT

This report is for students to declare their anticipated Capstone Project and share the progress made on the initial stages of that project. If a student remains uncertain, they may describe the steps they are taking to make that determination.

It is anticipated that before this report is due, students will have engaged in some activities related to their potential CSP (e.g., literature review, summer program, volunteer activities, travel, etc.). During the FOM2 fall semester, the student continues to discuss project ideas and narrow their focus with his/her LC mentor.

As with the previous progress report, the report is reviewed by the LC mentor, who may have additional questions for the student or wish to arrange for a meeting to discuss the outlined progress. When the mentor is satisfied that the student has articulated a clear topic with associated goals, and has completed several project-related steps, the student will submit the progress report to the CSD leadership team for additional review.

CSD leadership reviews the report to confirm the student is heading in the right direction for submitting a quality Project Proposal early in the spring semester. If the CSD leadership believes any student needs support or the review reveals additional concerns, the student will be contacted directly by the reviewer.

FOM2 Advisor Selection Form

The Advisor Selection Form is the formal notification to CSD of an identified advisor. The form is submitted only *after* having received confirmation from the Advisor that he/she is willing to work with the student. Confirmation is obtained by the student contacting the potential Advisor by email, phone, or meeting face-to-face to discuss the project and the Advisor's responsibilities. The selection form may be submitted any time after confirming your Advisor, and before the due date.

The selection form is submitted online, and is reviewed ad hoc by the CSD Program Manager and CSD leadership. In the event the review reveals any concerns, the student will be contacted directly with specific questions or a request to meet to discuss alternative selections.

Students will ask Advisors to complete the Advisor Interest Form. This form will be completed *only once* by an Advisor, regardless of how many students they are advising.

FOM2 Capstone Scholarly Project Proposal

The Capstone Scholarly Project Proposal is a detailed description of the Capstone Scholarly Project. It will include a clear project topic, its scope, and specific steps for successful completion. More specifically, Proposals will include detailed information on Goals/Objectives, Resources, Methods, Deliverables and Format for Final Presentation.

From this report forward, students will submit each report draft to their Advisor for review prior to submission of the approved report to the CSD. Students must share draft reports with Advisors in time for feedback and revision prior to submission deadlines. It is recommended that students check with Advisors on their availability around the time that any submissions are due and develop a timeline for their work together.

Advisors will evaluate Proposals according to the expected benchmarks described in the CSD Project Proposal Rubric which has been developed to provide consistent feedback toward successful completion of the final projects. After reviewing the Project Proposal, the Advisor may have additional questions for the student or wish to arrange for a meeting to discuss questions. The Advisor will approve the proposal when all recommended revisions have been completed by the student. Students then submit the Project Proposal via BlackBoard Learn (BBL). The Advisor will contact the CSD course leadership if there are any concerns regarding the Project.

A member of the CFC will conduct a final review of the proposed project after the Advisor has approved the Proposal. CSD will also review the Proposal. In the event the CFC or CSD review determines additional recommendations, the student and or Advisor will be contacted directly with specific questions or a request to meet for discussion. Students may resume work on the Capstone project when final approval has been communicated by CSD.

From this point on, students interact primarily with their Advisor with regard to project completion. If a student has concerns or questions about the level of support provided by his/her Advisor, it is recommended that they contact the CSD Program Manager to discuss.

CCE Fall & Spring Semester and AS Fall Semester Progress Reports

The student continues to submit progress reports to CSD, after Advisor review, across the CCE and AS years. While it is expected that student-advisor meetings will occur at least monthly, the submission of each progress report provides the opportunity to summarize current status, outline future project goals, and to articulate a general update on project development.

As with the previous Proposal submission, the Advisor will provide feedback on written work and address any concerns he/she has with regard to actual progress. In the event the Advisor determines remediation is necessary, he/she will work with the student to develop a strategy for successful advancement through the project.

From this point, each report is an opportunity for the student to write one of the sections to be included in the final Project Report, helping students to make gradual progress toward final completion.

- CCE Fall Progress Report will include a draft of the Introduction section
- CCE Spring Progress Report will include a draft of the Methods section
- AS Fall Progress Report will include a draft of the Results section
    - Required for students who do not complete the AS Capstone month and submit the final Project Report by end September (this will apply to most students)

GROUP PROJECT – REPORT WRITING

As noted, students will begin writing sections of the final Project Report with each semester progress report beginning in the CCE year.

Students working on Capstone *Group Projects* should write collaboratively, beginning with the CCE Fall Semester Report and Introduction. One of the intentions of group work is collaboration; as such, collaborative writing meets this goal, and models best scholarly practice. Each student will submit an individual report and each report will include the same collaboratively written section(s) (eg, the same Introduction is submitted with each individual group member's report).

It is expected that all group members will contribute in the writing of each section. As is standard in the professional literature, contributions should be detailed in the Methods and Results sections, as is demonstrated in this example: http://www.nature.com/ncomms/2015/150212/ncomms7113/full/ncomms7113.html#author-information.

The collaboratively written group project report is a total of 10-12 pages, not including the reference section, figures, or appendices.

CHANGE OF PROJECT/CHANGE OF DESIGN OR METHODS/ADVISOR CHANGE REQUEST

Requests to change proposed project topic, significantly alter project design or methods, and/or change advisors may be made by submitting the respective form via the link in BBL. While a student may lose interest in a proposed project or have difficulty working with an approved advisor, it is important to remember that part of professional development is meeting and seeing through on commitments.

Mentors, Advisors, CSD course leaders, and CFC members are available to discuss with the student the value of completing initially proposed work, including developing strategies for working with one's advisor. The student who is considering a Project change or significant project modification will be asked to reflect on what has caused them to want to change the project, as well as any "lessons learned" that will help to inform future work or collaboration.

The change form is required after the Capstone Project Proposal has been submitted, through January of the CCE year, which is the deadline for any changes. If a student changes their project any time *before* the Capstone Project Proposal is submitted, this form is not required.

A meeting with CSD Leadership, and/or a new or updated Project Proposal or CCE Fall Progress Report may be required after a change request has been submitted, along with a new advisor selection form if applicable. The CSD course leadership will review change requests; no work on the new Project or change of Project design should begin until CSD leadership has confirmed that the change may go forward.

AS WRITTEN CAPSTONE SCHOLARLY PROJECT REPORT

The written final Capstone Scholarly Project Report (CSPR) provides the opportunity for students to complete a scholarly report which describes the work in which she/he has been engaged, and provides the Advisor and others involved with the Capstone course with a detailed summary of that work.

Capstone Project Reports will be 5-7 pages (plus figures and appendices) in length and written in the same format as articles in the medical and scientific literature. Reports will include the following sections: Introduction, Methods, Results, and Discussion.

Examples of scholarly articles can easily be found in any major online or print professional medical or scientific journal such as the *New England Journal of Medicine, Nature, Academic Medicine* or *Health Affairs*.

The scholarly format will be used for all project types, including projects that are not empirically based.

The Project Report and relevant project materials are submitted to the Advisor for feedback during the AS month and evaluated based on the CSD Written Report Rubric; the complete report is due to CSD leadership on the last day of AS Capstone month. After the report has been approved by the Advisor, a member of the CFC will conduct an evaluation of the final Project Report to determine that it has met all CSD course requirements. Once the student is notified by CSD that the Project Report has been successfully completed, the student may proceed in completing the Project Presentation and presentation materials.

In the event that the CFC evaluation reveals concerns, questions, or the need for remediation, the student and/or Advisor will be contacted directly with specific questions or a request to meet and further plans will be delineated.

INDIVIDUAL PROJECT REPORTS MUST INCLUDE

- **Total 5-7 pages** (not including References Section, figures, or appendices), font size 12, single-spaced, 1-inch margins
- Title
- Introduction
- Method Section
- Results Section
- Discussion (including possible further study)
- Reference Section
    - Endnote style (Chicago or MLA Style: numerical footnotes with corresponding reference list at the end of the report) OR
    - Parenthetical in-text style (APA or AMA Style: with an alphabetical reference section at the end of the report)
- APPENDICES (if applicable)

GROUP PROJECT REPORTS MUST INCLUDE

- **Total 10-12 pages** (not including References Section, figures, or appendices), font size 12, single-spaced, 1-inch margins
- Title
- Introduction
- Method Section
- Results Section
- Discussion (including possible further study)
- Reference Section
    - Endnote style (Chicago or MLA Style: numerical footnotes with corresponding reference list at the end of the report) OR

    - Parenthetical in-text style (APA or AMA Style: with an alphabetical reference section at the end of the report)
- APPENDICES (if applicable)

AS CAPSTONE DELIVERABLES

Deliverables are defined as any components that are integral to your Project work but do not necessarily fit into the required sections of the CSD Project Report, Reflection or Project Presentation.

Examples of deliverables include, but are not limited to: research protocols, educational pamphlets, surveys or any type of presentation materials used outside of presentation at the Capstone Presentation Day. Deliverables should be included as appendices in the Project Report that is due on the last day of the AS Capstone month.

AS CAPSTONE REFLECTION

Reflective write-ups are used throughout the UMMS curriculum to provide the student with the opportunity to determine the personal impact of various experiences. Capstone is a major endeavor and, therefore, requires a Reflection paper using guided questions. The Reflection paper will be due on the same day that the student presents the CSP.

AS CAPSTONE PROJECT PRESENTATION

Presentation of Capstone Projects to the UMass Community will take place in March. Available dates and times for presentations will be emailed to the students in January of their AS year. Specific student presentation dates will be determined based on project topic and presentation format. Students may finalize materials for their presentation upon CSD approval of their Project Report. Those who are not on campus for any of the offered dates, or for those who have projects particularly suited for virtual presentation, may do so after consultation with CSD. Public presentation is a key component of the Capstone course; as such, all presentations must incorporate a process or opportunity for audience feedback, regardless of the project venue.

INSTITUTIONAL REVIEW BOARD (IRB) AND INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE (IACUC)

Any Projects that involve human subjects or animals with the intent of collecting data that will contribute to generalizable knowledge may require IRB review.

Information regarding Projects that may require IRB review is available here. Information is also available in BBL under Capstone Manual, FAQs & Resources. In addition, the staff at IRB is available for pre-screening discussions via phone or email. *Please note*, if you meet the criteria for IRB review, but you believe IRB review will lead to exempt status, you must still submit to IRB so that they may make the final determination.

You may also use the following information to help determine whether your Project requires IRB review. When in doubt, please discuss with IRB.

CAPSTONE IRB SCREENER INFORMATION AND QUESTIONS

Some scholarly projects include research involving human subjects.

1. If you will gather or previously gathered data about living individuals through intervention or interaction with them, your activity includes human subjects.
2. If you will gather or previously gathered private identifiable information about living individuals, your activity includes human subjects.
3. If your activity is in whole or in part a systematic investigation designed to develop or contribute to generalizable knowledge, your activity involves research.

If your project is research and does include human subjects, obtain Institutional Review Board (IRB) approval before the research starts. Again, please contact IRB by phone or email if uncertain.

Some scholarly projects include the use of invertebrate and vertebrate animals in research, teaching, or testing. If your project does use animals, obtain Institutional Animal Care and Use Committee (IACUC) approval before activities start. If you are uncertain if you need IACUC review, please contact that office to discuss.

CAPSTONE, MD/PHD, CLINICAL TRANSLATIONAL RESEARCH PATHWAY (CTRP) AND SENIOR SCHOLARS* PROGRAMS

UMMS offers a variety of ways in which students can engage in research and develop scholarly project skills. The table below compares key ways in which these programs interact. If you are participating in any of these programs, please review their websites and speak with faculty leaders with specific questions. In general, CSD requirements must be met until time is dedicated to these other programs.

MAJOR DIFFERENCES BETWEEN COMPONENTS OF CAPSTONE WITHIN EACH PROGRAM (noted in bold – updated 3.5.15)

Timing	MD	Senior Scholars* (CTRP)	MD PhD
Involvement in CSD program per curriculum year	Longitudinal program occurring over four years of medical school. During AS the student dedicates 1 month (between May and February) to finalizing Capstone write-up and deliverables.	Occurs during 2-3 months of AS year. Must be completed by March.	PhD research component occurs after one CCE thematic section. Students are enrolled in the GSBS while obtaining the PhD. Students complete Capstone requirements through spring FOM2 and start with fall CCE on return to SOM. Capstone must be completed following MD/PhD specifications.
Spring FOM1 progress report	Begin to think about topics and areas of interest, Describe next steps **Work with LC mentor**	Begin to think about topics of interest, Describe next steps **Work with LC mentor and CTRP advisor**	Begin to think about topics of interest, Describe next steps **Work with LC mentor and MD PhD advisor**
Fall FOM2 progress report	Ongoing topic formulation; define potential goals and 3 steps accomplished to date. Describe next steps **Work with LC mentor**	Ongoing topic formulation; define potential goals and 3 steps accomplished to date. Describe next steps **Work with LC mentor and CTRP advisor**	Ongoing topic formulation; define potential goals and 3 steps accomplished to date. Describe next steps **Work with LC mentor and MD PhD advisor**
Advisor selection (winter FOM2)	**Select new project-specific advisor (work with that person moving forward in lieu of LC mentor)**	**Continue to work with CTRP advisor or specific advisor for Senior Scholars project if known**	**Continue to work with MD PhD advisor or specific advisor for PhD research if lab is known**
Project Proposal (Spring FOM2)	Project proposal including basic information on goals, proposed methods, anticipated challenges, IRB needs , etc.	Project proposal including basic information on goals, proposed methods, anticipated challenges, IRB needs , etc.	**Uses same proposal form to help advance lab/research area selection (no requirement to define specific project)** *** MD PhD students can choose to do a separate Capstone unrelated to their PhD work if desired (follows MD timeline on return to SOM)**
CCE fall progress report	Outline any major changes, revisit IRB, describe next steps, draft Introduction Section of final report	Outline any major changes, revisit IRB, describe next steps, draft Introduction Section of final report	Same - completed on return from PhD work.
Change of Advisor or Project (winter CCE)	Last date to change either (unless advisor leaves institution)	**N/A – based on program timing**	N/A – works with MD PhD advisor until lab selection made

CCE spring progress report	Draft Methods Section of final report, outline accomplishments, revisit IRB, describe next steps.	Draft Methods Section of final report, outline accomplishments, revisit IRB, describe next steps.	Draft Methods Section of final report, outline accomplishments, revisit IRB, describe next steps.
AS fall progress report *	Draft Results Section of final report, update accomplishments, plan next steps. Only done if AS Capstone month NOT completed by September 30	**N/A – students complete Senior Scholars work**	Draft Results Section of final report, update accomplishments, plan next steps. Only done if AS Capstone month NOT completed by September 30.
AS Capstone month *	Finalize and submit report and deliverables	**N/A – submit reflection when Senior Scholars completed**	Finalize and submit report and deliverables
AS spring	Present at Capstone Presentation Forum and submit reflection	**Present at Senior Scholars poster session, and submit reflection**	Presentation (depending on project) and submit reflection
Remediation	April as necessary	**N/A**	April as necessary
Additional information	See BBL course room	Senior Scholars Program website	UMass Graduate School of Biomedical Sciences MD PhD website

* Students apply to the Senior Scholars program when planning their Advanced Studies year. Thus, all activities up to the point at which they are accepted into this program are THE SAME as for all MD students. Major differences begin with the AS fall progress report as noted.

CAPSTONE COURSE RESOURCES

WRITING, PRESENTATION, AND PUBLIC SPEAKING RESOURCES

SCIENTIFIC PAPER WRITING

UMMS Library – Parts of a Scientific Paper (as of 3/2015 under revision)

George Mason University, Department of Biology. (ND). *The Scientific Paper*. Retrieved September 2013, from A Guide to Writing in the Biological Sciences: http://classweb.gmu.edu/biologyresources/writingguide/ScientificPaper.htm

Hengle, T., & Gould, M. (2002). *Rules of thumb for writing research articles.* Retrieved September 2013, from Catholic University of Louvain: http://www.uclouvain.be/cps/ucl/doc/acfa/documents/hengl_rules.pdf

Schwanz, K., Mehta, S., Dickins, K., & Arora, V. (2013). *Writing an Abstract*. Retrieved September 2013, from Pritzker Scholarship & Discovery: https://sites.google.com/site/scholarshipdiscovery/scholarly-resources/writing-an-abstract

POSTER CONSTRUCTION

Schwanz, K., Mehta, S., Dickins, K., & Arora, V. (2013, February). *Poster Resources*. Retrieved September 2013, from Pritzker Scholarship & Discovery: https://sites.google.com/site/scholarshipdiscovery/scholarly-resources/poster-resources

POWERPOINT

Theriault M (1999-2015). 9 tips for more powerful business presentations. AllBusiness Networks. Retrieved March 23, 2015 from http://www.forbes.com/sites/allbusiness/2013/11/25/7-principles-for-making-powerpoint-slides-with-impact/.

Dartmouth Biomedical Libraries (2015). PowerPoint: Guides, tips and help. Retrieved March 23, 2015 from http://www.dartmouth.edu/~library/biomed/guides/powerpoint.html?mswitch-redir=classic.

University of Michigan Health System (2015). Department of Internal Medicine: Powerpoint tips. Retrieved March 23, 2015 from http://www.med.umich.edu/intmed/resident/info/powerpoint_tips.html.

Indiana University School of Medicine (2014). Tips for success – Division of Internal Medicine. Retrieved March 23, 2015 from http://cme.medicine.iu.edu/presenters/tips/.

PUBLIC SPEAKING

Edward PN (2014). How to give an academic talk v.5.2. School of Information, University of Michigan. Retrieved April 14, 2015 from http://pne.people.si.umich.edu/PDF/howtotalk.pdf

Ni PC (2013). 5 tips for public speaking. Online excerpt from "Confident Communication Skills at the Workplace". Retrieved April 14, 2015 from https://www.psychologytoday.com/blog/communication-success/201305/5-tips-reducing-public-speaking-nervousness.

Smith J (2014) Business Insider: 11 tips for calming your nerves before a big presentation. Retrieved April 14, 2015 from http://www.businessinsider.com/tips-for-calming-nerves-before-a-speech-2014-6.

Boyd S (2003-2015). Public Speaking Tips. BleedingEdge.net. Retrieved April 14, 2015 from http://www.speaking-tips.com/.

MIT UROP (nd). Find Projects and Apply - Public Speaking Tips. Retrieved April 14, 2015 from http://web.mit.edu/urop/resources/speaking.html.

THE ACADEMIC MEDICINE HANDBOOK

Laura Weiss Roberts (ed.), *The Academic Medicine Handbook*, 2013, A Guide to Achievement and Fulfillment for Academic Faculty, DOI:10.1007/978-1-4614-5693-3, Spring Science+Business Media New York 2013.

UMMS ACADEMIC COMPUTING TRAINING SESSIONS

UMMS training sessions are open to everyone, including students.

Adobe Systems Incorporated. (2013). *Adobe Captivate*. Retrieved September 2013, from ADOBE TV: http://tv.adobe.com/product/captivate/

Adobe Systems Incorporated. (2013). *ADOBE TV Sign In*. Retrieved September 2013, from ADOBE TV: http://tv.adobe.com/

Microsoft. (2012). *E-Learning*. Retrieved September 2013, from Microsoft Learning: http://business.microsoftelearning.com/

Microsoft Corporation. (2013). *Training courses for Excel 2010*. Retrieved September 2013, from Office.com: http://office.microsoft.com/en-us/excel-help/training-courses-for-excel-2010-HA104039038.aspx

CAPSTONE COURSE HINTS FOR SUCCESS

HINTS FOR A SUCCESSFUL CAPSTONE EXPERIENCE AND PROJECT

The project is of interest to you

- Interest in the Project will be a fundamental part of success. Should you develop an alternative interest and wish to change your Project Topic, speak with your advisor, the CSD course leaders, CFC members or your LC mentor about an alternate project. Carefully consider whether it is feasible to change based on how much time you have left to complete the Project; carefully consider whether adjusting your existing Project might be more feasible. Schedule the meeting as soon as possible. If you still wish to make the change, submit the proposal/advisor change request form described within this document

The project has been carefully vetted by your CSP Advisor

- Discuss the project in detail with your CSP Advisor and make sure he/she agrees with all aspects of it

The project is not overly ambitious

- Discuss with your Advisor whether/how you need to focus the scope of the work so that you have a reasonable expectation of accomplishing your goals

The project is focused, has a measurable objective or testable hypothesis and/or has an obvious question

- Work with your advisor to refine the project to be sure these are clearly defined

The advisor and student have an effective working relationship

- Should there be any difficulties in working together, this may reflect issues with the project itself or with the individuals. Plan a meeting with the CSP Course Director as well as your Capstone Project Advisor to resolve any problems that arise

The project requires resources that are readily available to the student

- Consider your Project design carefully in the context of what resources are available to you. You can seek out funding or modify your project so that you can accomplish it with the resources available. Funding for Capstone projects is not provided through the CSD course

The project does not require the study of a rare disease or other process for which patients or other subjects are infrequently encountered

- If it does require work that may be difficult to obtain, consider refining the question or the project

The project is connected to the field of medicine

- Work with your advisor to review the competencies, clarify links and define the medical relevance

The project requires IRB review (or other required institutional approvals)

- Submit for IRB review/approval early or pick a project for which an existing IRB approval is present, or modify your work so it does not require IRB approval

The student meets required due dates

- Review the Capstone manual and online course materials so that timelines are understood and due dates met

DOCUMENTATION IN PROCESS[3]

- Guided Questions for Capstone Reflection
- Capstone Project Presentation Feedback Form

[3] For more information, please contact CSD@umassmed.edu