

BME 499.102:

CLINICAL OBSERVATION AND NEEDS FINDING

Lecture: Fridays 2:00 – 4:00pm in 1121 LBME

Lab: Fridays 9am – 1pm

Course Syllabus and Outline

Instructor:

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Course Description:

In this two credit course, students will observe nurses, technicians, surgeons, and physicians at the UM or VA Hospital, observing clinical practices in various medical specialties and settings. From these observations, students will identify important clinical problems and generate need statements based on their understanding. By the end of the term, students will assess the impact, marketability, and feasibility of solving these needs, with the possible intent to pursue one need as part of their senior design project (e.g. in BME 450 or 451/452) during the upcoming academic year.

Learning Objectives:

- 1.) Acquire a basic understanding of the critical aspects and limitations of the clinical environment – room layout, medical equipment present, use of space, and work flow.
- 2.) Learn how to conduct observations of clinicians using diagnostic and therapeutic technologies, including how the technologies are used and the associated challenges.
- 3.) Learn to identify problems associated with the clinical environment and technology, to formulate the problems into needs statements, and screen these needs for impact, marketability, and feasibility.

Course Policies:

All students are expected to attend every lecture and scheduled clinical shadowing session during the term. Furthermore, everyone is expected to show respect to everyone associated with the course at all times. Other conduct to keep in mind:

1. To gain access to the UM Hospital and clinics within the health system, students must provide proper documentation that the following requirements have been completed:
 - o Hepatitis B vaccinations (3 shot series), flu shot (current season) and TB test (within the past year). Info can be found at the following link:
<http://hr.umich.edu/mhealthy/programs/occupational/ohs/services/neha.html>.
 - o HIPAA module, "*Module 1: Basics*". The HIPAA module can be found at the link:
<http://www.med.umich.edu/hipaa/ppt/>. The link only works if you are connected through UM. If you are off-campus, see module posted on CTools.

- PEERRS module on "*Human Subjects - Biomedical & Health Sciences*" and submit a completed certificate. Link is at <http://my.research.umich.edu/peerrs/>.
 - "*UMHS Policies and PHI.pdf*" document has been read and the accompanying document, "*UMHS Code of Conduct & Medication Compliance*" has been signed.
 - Safety training link has been read and understood:
http://www.med.umich.edu/sms/SafetyStudentOrientation_files/frame.htm
 - Attendance at a clinical training session offered through the Nathan Kirkpatrick of the Anesthesiology Department (nkirkpat@med.umich.edu). The date of the session will be posted on CTools.
2. Absences may be excused under limited circumstances such as illness, family emergency, etc. Contact Dr. Schmedlen at least 24 hours prior to the session to make appropriate accommodations. You may be asked to provide verification.
 3. Students are expected to ethically and professionally respect each other, the course instructor, guest speakers, and the health care professionals you encounter in the hospital. Hence:
 - Late entries and early departures from class are a sign of disrespect to your fellow classmates and more importantly, the guest speakers that have taken time out of their valuable schedules to come and speak.
 - Laptops, cell phones, and other electronic devices are typically not needed during class and must be turned off and put away throughout the class unless otherwise indicated.
 - Show respect to all the healthcare professionals you encounter at all times throughout the observation process. As representatives of the BME Department, your actions in the clinic reflect how BME students are perceived by UM clinicians. See "Guidelines for Clinical Interactions" below for expectations.
 4. You are expected to come prepared to lectures by completing any assigned readings for that day. The readings are provided to help you become fully engaged in class discussions and provide guidance on the observation and needs finding process.

Logistics:

Students will meet together weekly as a class for:

- Lectures – see schedule below
- Presentation, discussion and analysis of the clinical problems they observed during the week

Students will engage in 3-4 hours per week of clinical observations in a clinical department shadowing various clinicians or under the sole direction of a single clinician. These observations will generally take place during the scheduled "lab" time; however observations can be arranged at another time during the week that is mutually agreed upon by the clinical department/clinician and student. Students will be assigned to a clinical department based on their interests and qualifications provided in a survey.

In addition, students are expected to participate in at least one observation at either the UM Medical School Clinical Simulation Center (G2400 Towsley Center) or the School of Nursing Clinical Learning

Center (426 North Ingalls) AND a Medical Device Sandbox session (3500 suite Taubman Health Sciences Library).

Homework/Deliverables

- 1.) Submit documentation of the requirements listed in above “Course Policies”
- 2.) Research medical procedures prior to observations
- 3.) Maintain a weekly journal on the clinical procedures and problems observed
- 4.) Annotate assigned reading materials in preparation for lecture
- 5.) Prepare short (5-7 minute), informal presentation(s) on clinical needs identified
- 6.) Submit a progress report on the needs defined thus far and a preliminary assessment
- 7.) Submit a report that assesses the impact, marketability, and feasibility of clinical needs

Performance:

Each individual will be graded on their participation in class and clinical rotations. Punctuality and professionalism is expected at all times when interacting with the clinicians. Students will be evaluated on the completeness and thoughtfulness of weekly journals and final report. Essentially, the grade will be broken down as follows:

Participation	20%
Lecture & clinical attendance	
Professionalism	
In class discussions/presentations	
Attendance at 1 Sim Center and	
1 Medical Device Sandbox session	5%
Reading annotations (5)	5%
Weekly Journals (8)	16%
Need Progress Report	4%
Needs Assessment Report	50%

The course is graded on a straight scale (i.e. A = 100-90%, B = 89-80%, C = 79-70%, etc.); however, the instructor reserves the right to increase or decrease the average grade for this course in accordance with student performance.

Annotation of Reading Materials:

Students will be required to read assigned readings posted at nb.engin.umich.edu and provide annotations, i.e. questions, comments and/or reactions to questions or comments posted by others. Students will be graded based on the quantity, quality, and timeliness of their annotations. The purpose of these assignments is threefold: 1.) to learn from technical texts and notes, a critical skill for lifelong learning, 2.) to take ownership of learning by reading with inquiry, 2.) to identify areas of confusion and gain a deeper understanding of the material. The grading rubric for annotations can be found on the CTools site.

Late Assignment Submissions:

All assignments in this course are to be submitted both electronically on Ctools and in hard copy. Failure to turn in both a hard copy and electronic copy on time, will result in a 10% penalty per day (any portion of a 24 hr. period after the due date issued on Ctools).

Regrade Requests:

If a student believes that portions of an assignment are incorrectly graded or has received an incorrect course grade, a memo requesting a regrade may be submitted, along with the assignment (if applicable), to Dr. Schmedlen within one week of receiving the grade. The memo must include a description of the

grading error and explanation of why the grade is believed to be incorrect. Students understand that the entire assignment will be regraded and reviewed, not just the portion of the assignment in question.

Student Mental Health and Wellbeing:

University of Michigan is committed to advancing the mental health and wellbeing of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, contact **Counseling and Psychological Services (CAPS)** at (734) 764-8312 and <https://caps.umich.edu/> during and after hours, on weekends and holidays, or through its counselors physically located in schools on both North and Central Campus. You may also consult **University Health Service (UHS)** at (734) 764-8320 and <https://www.uhs.umich.edu/mentalhealthsvcs>, or for alcohol or drug concerns, see www.uhs.umich.edu/aodresources.

For a listing of other mental health resources available on and off campus, visit:

<http://umich.edu/~mhealth/>.

Guidelines for Clinician Interactions

1. Clinical Observations
 - Be punctual
 - DO NOT come into the hospital if you are sick
 - Dress appropriately, which generally means business casual (polos & khakis, NO skirts)
 - *Exception:* Ophthalmology requires dress shirts and ties
 - NO shorts, jeans, T-shirts, open-toed shoes, sneakers
 - NO cologne or perfume
 - Introduce yourself when enter clinical area, that you are part of the BME 499 class and indicate your purpose for the observation. Here is an example of what to say:
 - *“Hello, my name is _____. I’m a student enrolled in the BME 499 Clinical Observation and Needs Finding course. I’m here to shadow a nurse/physician in your department and identify current clinical problems that could be solved by the development of novel diagnostic and therapeutic medical devices.”*
 - Wash hands before entering patient areas
 - Blend in with background, be discreet and quiet
 - Respect the patient’s privacy
 - Protect any patient information you encounter
 - Do not talk to the patient
 - DO NOT publicize your experience on social media (e.g. Twitter, Facebook)
 - DO NOT touch anything in the clinical area
 - DO NOT use personal electronic devices of any kind (e.g. cell phones, iPods)
2. Conversation with Health Care Professionals
 - Always address the clinician as Dr. or Mr./Ms. [Last name] unless otherwise instructed
 - Ask questions only when appropriate - DO NOT distract any clinician while they are in the middle of something
 - Be respectful of their time, act professionally, and thank them for their time
3. Email
 - Always address the clinician as Dr. or Mr./Ms. [Last name] unless otherwise instructed
 - Try to maximize the quality vs. quantity ratio – in other words, please make sure that your emails are substantive and less frequent. Basically, do not spam.
 - Thank them for their time

Winter Term Detailed Schedule (tentative):			
Date	Lecture Topic	Observation "Lab" Time	Action Items
Week 1			
8-Jan	F Course Overview - Dr. Schmedlen	-none-	
Week 2			
15-Jan	F Introduction to Observations - Dr. Schmedlen	Tours of Med School and Nursing Sim Centers	Perusall annotation #1 due by 9am on 1/15 Meet at Towsley Center - 10:45am, Nursing Sim Center noon
Week 3			
22-Jan	F Needs Finding - Saja Al-Dujaili	Clinical training - Nathan Kirkpatrick	HIPAA, PEERRS, flu, hepatitis immunizations, TB test, Code of Conduct due; read Safety Training; Student survey due
Week 4			
29-Jan	F Introduction to Clinical Departments - UM Clinicians	-none-	
Week 5			
5-Feb	F Disease State - Dr. Schmedlen	Clinical observations begin	Perusall annotation #2 due by 9am
Week 6			
12-Feb	F Treatment Options - Dr. Schmedlen	Clinical observations	Perusall annotation #3 due by 9am; Journal 1 due
Week 7			
19-Feb	F Stakeholder Analysis, Cycle of Care, Flow of Money -Dr. Schmedlen	Clinical observations	Perusall annotation #4 due by 9am; Journal #2 due
Week 8			
26-Feb	F Reflection on clinical problems	Clinical observations	Need progress report; Journal #3 due
Week 9			
4-Mar	F <i>Spring Break (no class)</i>		
Week 10			
11-Mar	F Market Analysis - Max Shtein, Center for Entrepreneurship	Clinical observations	Perusall annotation #5 due by 9am; Journal #4 due
Week 11			
18-Mar	F Needs Filtering - Dr. Schmedlen (should-could analysis)	Clinical observations	Journal #5 due
Week 12			
25-Mar	F Regulatory issues - speaker TBA	Clinical observations	Journal #6 due
Week 13			
1-Apr	F Entrepreneurship - Doug Rimatzki, EntreMentor LLC	Clinical observations end	Journal #7 due
Week 15			
8-Apr	F IP and Patentability - Tara Hartman, UM General Counsel	-none-	Journal #8, Clinical Evaluation due
Week 16			
15-Apr	F Wrap up	-none-	Need Assessment Report due