

RAD 609
Radiology Specialty

CLERKSHIP ELECTIVE ROTATION SYLLABUS

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At Michigan State University College of Osteopathic Medicine (MSUCOM), we are constantly working to improve our curriculum and to meet accreditation guidelines. We need to meet the challenges of modern medicine that force us to innovate. While changes will generally be instituted at the beginning of the school year, changes may also be implemented semester to semester.

Please be mindful of the need to read your syllabi before beginning your rotation.

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INTRODUCTION AND OVERVIEW

This syllabus provides an overview of rotation goals and objectives designed to help you gain an understanding of the breadth and scope of this subject. As you progress through the rotation, you will perform certain activities intended to help you meet the identified goals and objectives. Please make sure to review this syllabus in its entirety to ensure understanding of the rotation format, syllabus content, and Michigan State University College of Osteopathic Medicine (MSUCOM) expectations.

ELECTIVE COURSE SCHEDULING

Preapproval

- This course does not require preapproval from the IOR. The student should follow the below directions for elective course confirmation and enrollment.

Required Prerequisites

- This course does not require any prerequisite courses.

Course Confirmation and Enrollment

- The student must be an active student at MSUCOM.
- Student must complete five core rotations prior to any elective rotation.
- It is the student's responsibility to provide the elective site/rotation acceptance material to the COM.Clerkship@msu.edu for MSU confirmation and scheduling.
 - MSUCOM clerkship confirmation is complete when the rotation is visible on the students Medtrics schedule.
- It is the student's responsibility to ensure enrollment prior to beginning any course/rotation.
 - Enrollment will be processed by the MSUCOM Registrar's Office upon clerkship confirmation.
 - Enrollment can be verified by the student by reviewing the Student Information System
- MSUCOM confirmation must occur at least 30 days in advance of the rotation.
- Once confirmed, the rotation may only be cancelled 30 days or more in advance of the start date.

ROTATION FORMAT

This course is designed to provide the student with an opportunity to actively engage in patient-based, learning experiences under the guidance of a faculty member (preceptor) in collaboration, as appropriate, with residents and/or fellows. Rotations are typically two weeks, 3 credit hours or four weeks, 6 credit hours in duration. Timeframes for each rotation are decided at least 30 days prior to the beginning of the rotation. The overall performance of course participants will be evaluated through customary assessment instruments normally employed by the department for core rotations, at the discretion of the instructor of record.

GOALS AND OBJECTIVES

Students must have the opportunity to improve their understanding of the radiological aspect of medicine. The purpose of this rotation is to familiarize the student with common radiological investigational modalities, their indications and basic interpretation. They are expected to gain an understanding of the most appropriate use of radiological examinations in patient

management including sequence of examinations, monetary costs, patient inconvenience, and discomfort. Additionally, the student will develop an understanding of the impact of diagnostic imaging on the patient and society.

Principal Teaching Methods

1. Students will rotate in the designated radiology department for the designated time of the rotation.
2. Daily assignments involve observing clinical work in the department, review of the components of a cross campus 17-unit on-line course, utilization of; departmental library, MSU library, book, periodical, and digital resources.
3. Weekly Seminars and Lectures – Attend appropriate conferences within the institution where radiology content may be presented or discussed. (i.e., Grand Rounds, Tumor Board, CPC, M&M Conferences, Radiology Conference, etc.).
4. Students may participate in the Tuesday Didactic session in East Lansing if approved by the supervising radiologist.
5. Students will observe plain film Conventional Radiology (CR) images, Ultra sonograms, Computed Tomography (CT) scans, Magnetic Resonance Imaging (MRI) images and Nuclear Medicine (NM) and Positron Emission Tomography (PET) scans where available. Additionally, the students may observe the performance of the actual scans and procedures that may take place in the department. The student will observe interpretations as performed by attending radiologists, fellows, and resident's dependent on resources in the designated radiology department.

Educational Content

1. Mix of diseases: The disease mix includes all patients, inpatient and outpatient, who are undergoing radiological testing.
2. Patient characteristics: Radiology cases include both outpatient and inpatient cases as determined by the patient mix at the host department. Demographic and ethnic mix approximates that of the local community. The extensive socioeconomic diversity of the various participating institutions and patient populations support a stimulating training experience with broad diagnostic challenges.
3. Learning venues: Each of the participating radiology departments provides a stimulating and balanced exposure to the patients in that community.
4. Procedures: The types of radiological examinations and procedures available for observation are listed below:
 - Chest X-Rays
 - Computed Tomography
 - Magnetic Resonance Imaging
 - Ultrasonography
 - Nuclear Imaging
 - Positron Emission Tomography (not available at all sites)
 - Fluoroscopy
 - Mammography
5. Ancillary individuals interacted with may include residents, fellows, technologists, and staff.
6. Duration: The rotation is intended for a 2- 4-week block.

7. Structure: Typically, 8 AM to 5 PM daily. The assignment may vary according to the individual departments' clinical schedule. A schedule of daily assignments will include at minimum:
 - Clinical time 5 days a week.
 - Reading educational materials with daily assignments.
 - Viewing of the MSU Radiology on-line module series and other on-line resources such as the Harvard University Radiology on-line teaching series and the RSNA resources for medical students.
 - Attend hospital and department conference including interdisciplinary and radiology specific conferences.
 - Students are expected to continue to attend any mandatory conferences and didactic sessions of their college during the rotation.

Principal Ancillary Educational Materials

1. Textbooks from which selected reading are assigned:
 - Felson's Principles of Chest Roentgenology, A Programmed Text, Third Ed. by Lawrence R. Goodman
 - Essential Radiology, Second Edition by Richard B. Gunderman
 - Clinical Radiology, The Essentials, Third Edition by Richard H. Daffner
 - Chest, Abdomen, Bone and Clinical Skills, A Problem-Based Text, Third Edition by Amorosa, Novelline, and Squire.
 - Fundamentals of Radiology, Squires
2. Textbooks, current radiology periodicals, and digital teaching series will be available in the onsite Radiology library and may vary by site.
3. Full service, extended hour, libraries are present at Michigan State University with onsite medical librarians, web-based searchable medical databases, and standard medical journals in both print and electronic formats. In addition, all MSU students have 24-hour access to the extensive online Michigan State University electronic library, including databases and electronic journals.

Rotation Specific Competency Objectives

1. To increase the student's knowledge of the various diagnostic imaging modalities offered by a modern radiology department and achieve a better understanding of how to select and sequence the appropriate imaging examinations for specific clinical presentations.
2. To gain additional insight into how diagnostic imaging fits into the multidisciplinary approach to patient care and understand the importance of communication, professionalism, and teamwork between clinicians and radiologists relating to patient management.
3. To offer the student the opportunity to observe diagnostic imaging exams, instill sensitivity towards the patient's needs and apprehension about particular procedures and discuss the results and interpretation with the radiologist.
4. To encourage correlation of diagnostic images with previously learned normal and pathologic anatomy and pathophysiology.
5. Increase the student's understanding and recognition of common processes and pathology available from diagnostic images.
6. Introduce students to the indications, contra-indications, patient preparation, post-

procedure care, and relative radiation exposure for various diagnostic imaging exams.

7. Know the relative costs of different diagnostic imaging exams and be able to plan and sequence patient exams that optimizes outcome and cost-effective patient care.
8. Increase the students understanding of image digitization, how variables in digitization influence resolution and the computer's impact on diagnostic imaging (PACS).

COLLEGE PROGRAM OBJECTIVES

In addition to the above course-specific goals and learning objectives, this clerkship rotation also facilitates student progress in attaining the College Program Objectives. Please refer to the complete list provided on the MSUCOM website (<https://com.msu.edu/>) and in the Student Handbook.

REFERENCES

REQUIRED STUDY RESOURCES

Desire 2 Learn (D2L): Please find online content for this course in D2L (<https://d2l.msu.edu/>). Once logged in with your MSU Net ID, your course will appear on the D2L landing page. If you do not see your course on the landing page, search for the course with the following criteria, and pin it to your homepage: **RAD609**.

If you encounter any issues accessing this D2L course, please email the CA (on the title page of this syllabus). It is your responsibility to make sure you have access to the course D2L page on the first day of the course.

SUGGESTED STUDY RESOURCES

Selected texts can be of value during the clerkship and to assist in the understanding of the materials included in the on-line learning modules. Suggested readings will be provided via D2L but are not essential for the successful completion of the clerkship.

1. [Felson's Principles of Chest Roentgenology, A Programmed Text](#), 5th Edition
2. [Basic Radiology](#), 2nd Edition
3. [Brant and Helms' Fundamentals of Diagnostic Radiology](#), 5th Edition
4. [Learning, Radiology](#), 5^h Edition
5. [Weir & Abrahams' Imaging Atlas of Human Anatomy](#), 6th Edition

Textbooks, current radiology periodicals, and digital teaching series may be available in the onsite Radiology library and may vary by site.

Full service, extended hour, libraries are present at Michigan State University with onsite medical librarians, web-based searchable medical databases, and standard medical journals in both print and electronic formats. In addition, all MSU students have 24-hour access to the extensive online Michigan State University electronic library, including databases and electronic journals.

ROTATION REQUIREMENTS

REQUIREMENT	SUBMISSION METHOD	DUE DATE Please refer to D2L for actual (month/day) due dates
Attending Evaluation of Clerkship Student	Students must select their attending physician as directed within the rotation description in Medtrics. At the start of the last week of the rotation, students will need to request an evaluation in Medtrics. By requesting an attending evaluation from their assigned attending physician, the attending physician will receive an automated email link connecting them to their assigned Attending Evaluation within Medtrics. Attendings will be able to electronically access and submit the forms on behalf of their students.	Last Day of Rotation
Student Evaluation of Clerkship Rotation	Students will submit their rotation evaluations electronically at the conclusion of every rotation by accessing the Medtrics system: https://msucom.medtricslab.com/users/login/ . By the last week of each rotation, students will receive an automated email link connecting them to their assigned evaluation. Students can also access pending evaluations on the 'Home' or 'Evaluations' tabs within their Medtrics accounts.	Last Day of Rotation

ROTATION EVALUATIONS

Attending Evaluation of Student

Attending Evaluation of the Student is completed electronically via Medtrics by the supervisor designated within the Medtrics rotation description. To initiate this evaluation, each student must select their attending physician as directed within the rotation description in Medtrics. Students will receive an email from Medtrics to select the attending 7 days prior to the end of the rotation. Should your rotation lack a rotation description or if you have any questions, please contact COM.Clerkship@msu.edu Upon selecting the attending physician directed within the Medtrics rotation description, the attending physician will receive an automated email link connecting them to their assigned Attending Evaluation within Medtrics.

Attendings will be able to electronically access and submit the Attending Evaluation of the Student. Attendings will access the electronic form within Medtrics by selecting the email link on a smart device. No login (username/password) will be required for attendings to access their pending evaluation(s) assigned to them. After the electronic form has been submitted by their attending, students can review the Attending Evaluation of the Student that were completed by visiting the 'Evaluations' module (in the 'About Me' tab) of their Medtrics profiles.

Students are encouraged to seek formative/verbal feedback on their performance at least weekly. Students are also encouraged to discuss the Attending Evaluation of the Student with the supervisor completing the evaluation.

Any evidence of tampering or modification while in the possession of the student will be considered “unprofessional behavior” and will be referred to the Committee on Student Evaluation (COSE).

Grades are held until all rotation requirements are received. Students are required to ensure their rotation requirements are completed correctly.

Student Evaluation of Clerkship Rotation

Students will submit their rotation evaluations electronically at the conclusion of every rotation by accessing the Medtrics system: <https://msucom.medtricslab.com/users/login/>. By the last week of each rotation, students will receive an automated email link connecting them to their assigned evaluation for the respective rotation. Students can also access their pending evaluations on the ‘Home’ or ‘Evaluations’ tabs within their Medtrics accounts.

Unsatisfactory Clinical Performance

The Instructor of Record will review/investigate a student’s performance on a rotation when a concern is raised by the supervisor(s), and/or when the Attending Evaluation of Clerkship Student contains any below expectation marks within the professionalism area, any unsatisfactory written comments, or a total of two or more below average marks on the evaluation. After investigations, the Instructor of Record will determine a final grade for the student.

Professionalism concerns, as well as accolades, will also be referred to the MSUCOM Spartan Committee Clearinghouse for resolution, per MSUCOM’s Common Ground Framework for Professional Conduct.

CORRECTIVE ACTION

There is no corrective action available for this course.

As determined by the IOR, the student will receive an N grade for the course if all assignments are **not completed** successfully within 14 days after the last day of rotation at 11:59pm (except for the Attending Evaluation). Additionally, a letter of unprofessional behavior for late submission of assignments will be sent to the MSUCOM Spartan Community Clearinghouse.

BASE HOSPITAL REQUIREMENTS

Students are responsible for completing all additional requirements set by the hospital/clinical site at which they are completing a rotation. Students are not responsible for reporting to MSUCOM the results of any requirements that exist outside of those listed above.

STUDENT RESPONSIBILITIES AND EXPECTATIONS

Course participants will meet the preceptor on the first day of the rotation at a predetermined location to be oriented to rotation hours, location(s), and expected duties and responsibilities while on-service.

- *The student **will** meet the following **clinical responsibilities** during this rotation:*
 - Students are expected to function collaboratively on health care teams that include health professionals from other disciplines in the provision of quality,

patient- centered care.

- *The student **will** meet the following **academic responsibilities** during this rotation:*
 - Students are expected to identify, access, interpret and apply medical evidence contained in the scientific literature related to patients' health problems.
 - Students are expected to: assess their personal learning needs specific to this clinical rotation, engage in deliberate, independent learning activities to address their gaps in knowledge, skills, or attitudes; and solicit feedback and use it daily to continuously improve their clinical practice.

MSU COLLEGE OF OSTEOPATHIC MEDICINE STANDARD POLICIES

The following are standard MSUCOM policies across all Clerkship rotations.

CLERKSHIP ATTENDANCE POLICY

MSUCOM requires student participation in clerkship rotations and clinical activities with consistent attendance to acquire the skills and knowledge necessary for successful program completion. This policy will define the policy and procedures regarding absences for clerkship activities. [Clerkship-Absence-Policy.pdf \(msu.edu\)](#)

POLICY FOR MEDICAL STUDENT SUPERVISION

The MSUCOM curriculum includes required clinical experiences in a variety of clinical learning environments. The Medical Student Supervision Policy outlines all supervision agreements and expectations. [Clerkship Medical Student Supervision Policy.pdf](#)

MSUCOM STUDENT HANDBOOK

The Student Handbook is published electronically by MSUCOM for students in the Doctor of Osteopathic Medicine program. This handbook does not supersede other Michigan State University or College of Osteopathic Medicine policies, regulations, agreements, or guidelines. <https://osteopathicmedicine.msu.edu/current-students/student-handbook>.

COMMON GROUND FRAMEWORK FOR PROFESSIONAL CONDUCT

The Common Ground Framework provides the MSUCOM community with a reminder of the unity of mind, body, and spirit that underlines the field of osteopathic medicine. The framework is a set of guiding, foundational principles that underpin professional conduct and integrity and applies to all professionals at work within the shared college community, independent of their specific roles or responsibilities. <https://osteopathicmedicine.msu.edu/about-us/common-ground-professionalism-initiative>

MEDICAL STUDENT RIGHTS AND RESPONSIBILITIES

The rights and responsibilities of students enrolled in MSUCOM are defined by the medical colleges of Michigan State University, including the College of Osteopathic Medicine, the College of Human Medicine, and the College of Veterinary Medicine. Students enrolled in the professional curricula of these colleges are identified as "medical students." These colleges collectively define "Medical Student Rights and Responsibilities" (MSRR). This document addresses academic rights and responsibilities, governance,

procedures for complaints, due process, and other topics. The current version is available on the MSU Spartan Life website at the address below: <http://splife.studentlife.msu.edu/medical-student-rights-and-responsibilities-mssr>

MSU EMAIL

MSU email is the official communication from faculty and staff to students and students are responsible for checking it daily and maintaining their MSU email accounts so that messages can be received.

Forwarding MSU email to another email account or failure to check email are not valid excuses for missing a deadline or other requirements of the DO program.

Further, students must use secure email when working in a hospital, clinic, or other health care setting if discussion of patient information is involved. MSUNet (msu.edu) email is secure; many web-based email systems including Hotmail, Gmail, and Yahoo are not. <https://osteopathicmedicine.msu.edu/current-students/student-handbook>.

DUTY HOURS AND FATIGUE MITIGATION

The accreditation standards for graduate medical education programs include restrictions on the duty hours of residents. Additionally, institutions are expected to promote a clinical learning environment in which duty hours are monitored and strategies exist to mitigate the effects of fatigue. [Clerkship Duty Hours and Fatigue Mitigation Policy.pdf](#)

STUDENT EXPOSURE PROCEDURE

A protocol has been developed by the University Physician to report incidents of exposure, e.g., needle sticks, mucous membrane exposure, tuberculosis exposure, etc., and it may be found here: <https://osteopathicmedicine.msu.edu/current-students/clerkship-medical-education/injury-and-property-damage-reports>

Contact Associate Dean for Clerkship Education, Dr. Susan Enright (enright4@msu.edu), if exposure incident occurs.

COURSE GRADES

P/Pass – means that credit is granted, and that the student achieved a level of performance judged to be satisfactory by the department according to the student's didactic and clinical performance.

NGR/No Grade Reported – means that a final grade ('Pass' or 'No Grade') cannot be determined due to one or more missing course requirements. The NGR grade will be changed to a final grade once all the completed course requirements have been submitted to and processed by MSUCOM (either to the department or Clerkship Team). An 'NGR' grade will NOT remain on a student's transcript.

N/No Grade – means that no credit is granted, and that the student did not achieve a level of performance judged to be satisfactory by the department according to the student's didactic and clinical performance.

N Grade Policy

Students who fail this rotation will have to repeat the entire rotation and fulfill all (clinical and academic) requirements.

STUDENT ACCOMMODATION LETTERS

Michigan State University is committed to providing equal opportunity for participation in all programs, services, and activities. Requests for accommodations by persons with disabilities may be made by contacting the Resource Center for Persons with Disabilities (RCPD) at 517-884-RCPD, or on the web at www.rcpd.msu.edu. Once a student's eligibility for (clinical and/or testing) accommodation(s) are determined, the student may be issued an Accommodation Letter. Students must present their letter to the Clerkship Team (COM.Clerkship@msu.edu) at the start of the semester in which they intend to use their accommodations (for tests, projects, labs, etc.). Accommodation requests received after the semester onset will be honored whenever possible.

If modifications, updates, or extensions to an existing letter are made after the semester begins, it is the responsibility of the student to submit the newest version to the Clerkship Team if he/she intends to utilize the accommodation going forward.

SUMMARY OF GRADING REQUIREMENTS

Requirement	Submission Method	Pass	No Grade Reported	No Pass
Attending Evaluation of Clerkship Student	Attendings receive an automated email link connecting them to their assigned evaluation(s) within Medtrics, where they may access and submit the electronic form(s) directly	<ul style="list-style-type: none"> • Student may receive “Below Expectations” in up to one (1) subcategory. • Overall categories must receive “Meets Expectations” or “Exceeds Expectations” 	Will be the conditional grade until all requirements of this rotation are met	<ul style="list-style-type: none"> • Receives two (2) or more “Below Expectations” within the subcategory sections. • Receives comments that indicate below expectations of performance. • See Unsatisfactory Clinical Performance above
Student Evaluation of Clerkship Rotation	Can be accessed and submitted electronically by students within the dashboard of their Medtrics profiles	Completed 100% by 11:59 pm the last day of the rotation	Will be the conditional grade until all requirements of this rotation are met.	Failure to complete and submit within 14 days from the end of the rotation