

# **MECHANISMS of HUMAN DISEASE COURSE**

## **2017-18**

### **COURSE RATIONALE**

The **MECHANISMS OF HUMAN DISEASE COURSE** is a learning experience for second year medical students that integrates concepts from various medical disciplines. The science of **PATHOLOGY** forms the core of the course and it is offered in conjunction with relevant topics in **MICROBIOLOGY** and with **CLINICAL MEDICINE CORRELATES**.

The overall purpose of the course is to establish a basic science foundation for the practice of medicine. A secondary purpose of the course is to create an environment that fosters active, independent learning and enables the students to acquire problem-solving skills.

**PATHOLOGY**, in the broadest sense, is the study of disease. It is that branch of the biological sciences which is concerned with the nature of disease and the effects of those diseases on structure and function of the body organs and tissues.”<sup>1</sup>

As the foundation of clinical medicine, Pathology bridges the gap between the basic sciences and the practice of medicine. “Pathology occupies a pivotal position in the medical curriculum. Anatomy, biochemistry, physiology and bacteriology are prerequisites. Clinical medicine and surgery follow it. In pathology the student must learn to apply the facts and theories of anatomy, biochemistry, physiology, and bacteriology to an elucidation of the course, processes, and effects of disease. He/she must learn to study the causes of disease with a view to prevention and control. Finally, the students must gain a clear understanding of the alternations in form and disturbances in function that take place in disease, so as to be ready for the next step in his/her medical education – the so called ‘clinical years’.”<sup>2</sup>

In other words, to become a competent physician, capable of making the correct diagnosis and prescribing the correct therapy, one must understand the nature of disease. “Pathology should form the basis of every physician’s thinking about his/her patients.”<sup>3</sup>

With this aim in mind, the **MECHANISMS OF HUMAN DISEASE** course helps students understand the pathogenesis of disease and learn the structural and functional changes which occur in cells and organs as a result of disease. A firm grasp of the concepts and facts of Pathology will allow you to proceed successfully through the next phase of your medical education, the clinical clerkships.

The **MECHANISMS OF HUMAN DISEASE** course also introduces students to basic concepts and applied principles in microbiology and the medical subspecialty of infectious diseases. As a physician you will see many patients with diseases caused by infectious agents.

The MECHANISMS OF HUMAN DISEASE course features presentations of selected clinical topics by primary care and specialty physicians. While basic science knowledge is the foundation of medical practice, these concepts are more meaningful when they are presented in the context of clinical problems.

**REFERENCES:**

<sup>1</sup>Pathology, “The Oxford Companion to Medicine, 1988. Vol. 2, p. 1012

<sup>2</sup>Robert Alan Moore, A Textbook of Pathology (Philadelphia and New York: W.B. Saunders Company, 1951), p. vii.

<sup>3</sup>W.A.D. Anderson Pathology (St. Louis: The C.V. Mosby Company, 1971), p.x.

**COURSE GOALS**

**Medical Knowledge**

Demonstrate knowledge of the principal pathologic processes, including neoplasia, inflammatory mechanisms, immunological mechanisms, tissue renewal, regeneration and repair, and adaptation and cell death.

Demonstrate knowledge of the epidemiology, etiology and pathogenesis of common and prototypic diseases including the genetic and molecular basis of disease.

Demonstrate knowledge of common and prototypic bacteria, viruses, fungi and parasites with respect to their classification, epidemiology, pathogenesis, diagnosis and clinical manifestations of infection and prevention.

Demonstrate basic knowledge of the morphology (gross and histopathologic) of normal organs.

Demonstrate knowledge of the morphology (gross and histopathologic) and abnormal function (pathophysiology) of diseased organs.

Demonstrate ability to correlate the pathology of disease with its clinical manifestations.

Demonstrate ability to develop basic diagnostic and treatment strategies for common diseases.

Identify factors which may lead to disparities in the diagnosis and management of common and prototypic diseases.

Demonstrate an understanding of how findings of basic biomedical and translational research are applied to advance knowledge of the pathogenesis of disease.

**Patient Care**

Develop a differential diagnosis and diagnosis and explain the pathogenesis of a disease and clinical course when provided with a patient clinical history, physical exam, pertinent diagnostic data, and/or morphologic (gross and histologic) findings.

**Interpersonal and Communication Skills**

Communicate effectively and collaborate effectively about common and prototypic disease entities with student peers and faculty during laboratory case presentations and small group case discussions.

Contribute to the education of peers by actively engaging in small group sessions.

Contribute to the education of peers by diligently preparing for and clearly presenting assigned cases during laboratory sessions.

**Practice Based Learning and Improvement**

Critically evaluate one's performance in the course to identify strengths and personal limitations in either knowledge of course content or study methods; develop learning goals to address any deficiencies and actively seek out assistance from appropriate and available resources to successfully remediate deficiencies.

Identify a learning need by developing a clinical question based on a small group clinical scenario and locate, evaluate, and effectively use the information found from appropriate resources and relevant information technology to answer the question.

**Professionalism**

Demonstrate professionalism by interacting with course staff and faculty and peers in a courteous and respectful manner at all times.

Demonstrate responsibility and accountability by punctually attending all required course activities, including small group sessions, laboratory sessions and exams.

Demonstrate professional behavior by requesting any absences from required course activities as outlined in the SSOM Academic Policy Manual.

Complete course evaluations in a timely manner and provide constructive feedback to course faculty and the course director in a professional manner.

Demonstrate professional behavior by reading course-related Outlook email communications on a regular basis and responding to direct communication from the Course Director and Course Coordinator in a timely fashion.

Demonstrate professional and ethical behavior by honestly completing course examinations and assignments without attempting to seek advantage by unfair means and by reporting any unethical behavior of peers to the course administration.

**Systems Based Practice**

Summarize the role of autopsy services in furthering knowledge of disease and improving disease management decisions.

**Inter-professional Collaboration**

Develop an understanding of the practice of anatomic and clinical pathology and how this field can contribute to patient care.

**Professional and Personal Development**

Engage with required and non-required course activities and resources to develop necessary knowledge and skills related to the course.

**COURSE DESIGN**

The MECHANISMS OF HUMAN DISEASE course begins with a two week period devoted to general principles and concepts of pathology. The remainder of the course focuses on systemic or organ pathology and microbiology.

The course is designed to engage students in four learning situations: lecture, small group sessions, clinico-pathologic-correlation laboratory sessions, and independent-study which includes the Histology for Pathology on-line modules.

Lectures will be presented in lecture hall **390**.

Small group sessions will take place in the learning clusters.

Laboratory sessions will take place in the case method rooms (360, 460), unless otherwise noted.

**PLEASE NOTE:** Small group sessions, lectures and laboratories are offered at different times during the week; therefore, you are responsible to check the schedule on the LUMEN for date, time and location. **Variations in the schedule do occur. Check your Outlook email DAILY for updates.**

**LECTURE:**

The purpose of the lectures is to present concepts and facts relating to general and systemic pathology, microbiology and related topics in clinical medicine. Each lecturer provides objectives that serve as guide to the most important concepts. Reading assignments expand upon and enhance the lecture/handouts.

**HISTOLOGY FOR PATHOLOGY:**

The key normal histology of organs and systems is introduced via the “Histology for Pathology” modules on Sakai available through a link on the MHD LUMEN site. Students are **STRONGLY ENCOURAGED** to view the designated videos at the start of each organ block or section. Self-assessment quizzes help students gauge

their understanding of the material. The pertinent histology and histopathology of organs will be reinforced during lectures and laboratory sessions.

There are “**active learning**” or “**flipped classroom**” sessions throughout the year that take place in the lecture hall and are specifically designed for students to a) prepare BEFORE for the session by completing an assignment (ie reading a book section or article) b) complete a short set of self-assessment questions based on the assignment; and c) during the live classroom session, participate in problem solving and case-discussions which build upon the concepts learned via the preparatory assignment. Student maximally benefit from these “active learning” or “flipped classroom” sessions only if they COME PREPARED by having completed the assignments before the session.

### **SMALL GROUPS:**

Small group case sessions afford students the opportunity for active learning and synthesis of concepts presented during lectures. Students must be prepared for each session by reading each case and formulating their own answers to the case questions which then guide the session discussions. This format allows students to engage one another and the faculty facilitator in an in-depth analysis of the pathology and the clinico-pathologic correlations concerning each case. Additionally, the student will begin to develop the critical skill of solving a clinical problem.

In addition, for many sessions there will be “unknowns” (questions; tables; USMLE type questions, etc) that students will not have until the session meets. Via these unknowns students will problem solve and learn to “think on your feet”, akin to what they will be doing in their clerkships.

Small group sessions are often intentionally scheduled toward the end of an organ system block to allow students to SYNTHESIZE material delivered during the entire block.

Each student will participate in the “Asking a Clinical Question” assignment during the MHD I small group sessions. The goal is to develop a specific, answerable question which arises during the small group case discussions; Perform a search of the medical literature for an answer to the question; Identify the type and credibility of resource used to answer the question; Share the information to the question with small group colleagues and facilitator; Receive feedback on the information seeking strategy.

**This exercise will simulate what you will be doing on a regular basis during your clinical clerkships and beyond.**

Scheduling: MHD small group sessions have a designated time on the course calendar. Alternatively, small group sessions may meet at 7am. The time for each session is determined by the faculty member facilitating the session. Faculty facilitators will provide students a schedule of the dates/times when their small group will meet.

**LABORATORY SESSIONS:**

The laboratory sessions facilitate correlation of the morphologic changes that occur in common or prototypic diseases. During the laboratory sessions, gross photographs of diseased organs and histologic images will be used as visual aids to enhance the student's understanding of a disease and to correlate clinical manifestations with structural changes. Four students in each case method room will be assigned to each lab case and are expected to come prepared to describe the characteristic pathology of the disease(s) highlighted and correlate with clinical data provided via a case history, physical exam laboratory results and radiographic images.

During each lab session, a "Jeopardy Case" will be included. Four students (not already assigned to present a case during the designated session) will be called upon to discuss key morphologic findings and clinical correlates of the case.

MHD I and II will offer "Gross Specimen Labs". These provide an opportunity for hands-on examination of patient organ specimens procured via autopsy or surgical pathology and for correlation with clinical data and histopathology. The sessions will be held in the anatomy bays.

**INDEPENDENT STUDY:**

Independent study is critical for the professional success of all physicians. In the MHD Course, students are expected to complete the assignments and educational objectives cited for each course session. **Self-directed learning, independent study and problem solving are integral components for success in a career in medicine and for success in the Mechanisms of Human Disease Course.**

**ATTENDANCE**

Attendance and active engagement at lectures is strongly encouraged. Some lectures are not recorded per faculty request; students will be informed ahead of time.

**Attendance at EACH Small Group and Laboratory Session**  
**is a**  
**Course Requirement**

Each student is responsible for attending the small group to which they have been assigned and for signing the designated attendance sheet for each session before the session ends.

Each small group will select a student who will be responsible for turning the attendance sheet in to the course coordinator after each session.

Each student is responsible for attending the lab session to which they have been

assigned and for signing the designated attendance sheet for each session before session ends. The laboratory facilitators will turn the attendance sheet in to the course coordinator after each session.

## EXAMS

**Block exams:** Multiple choice exams will be delivered after each designated MHD block. The total number of questions containing MHD material will vary from exam to exam and will depend on the total number of MHD lectures, Histology for Pathology Modules, and Laboratory Sessions during that period of the course. All exams will be computerized and will be administered in the Sit-Down Labs.

**Final End of Semester Cumulative Exams:** There will be a final end of semester cumulative exam at the end of MHD I and MHD II. The exam covers ALL LECTURE material from the beginning to the end of the semester **AND** the content covered in ALL of the LABORATORY SESSIONS in the semester. There will be multiple-choice questions as well as free-text questions on the cumulative exam. All exams will be computerized and will be administered in the Sit-Down Labs.

## ABSENCE FROM REQUIRED COURSE ACTIVITIES

As per the SSOM Academic Policy Manual:

### **Unexpected/Emergency Absences from Required Activities**

“Examinations or other required academic activities (*in MHD small group and laboratory sessions*) missed due to illness or other legitimate, serious, extenuating reasons may be made up only if the Course Director and Associate Dean for Student Affairs or designate have received notice of the absence, in advance if non-emergent or as soon as possible if emergent, and granted permission for an excused absence. Absence due to illness requires written documentation from the Student Health Service and/or the physician caring for the student submitted to the Office of Student Affairs”.

### **Non-Emergent Absences from Required Activities**

“Petitions for approved absences for serious but non-emergent reasons from activities in which attendance is mandatory (i.e., examinations, *and in MHD small group and lab sessions*) must be submitted in writing to the Course Director, Course Coordinator, and Associate Dean or Assistant Dean for Student Affairs at least thirty days prior to the start of the course in which the absence will occur. A student must have a serious reason for an excused absence or request for a change in an exam date. The petition should detail the nature of the conflict and available supporting documentation should be attached (e.g., copy of a jury summons or invitation to present a poster). **A petition for permission to be absent is a request, requires review, and is not automatically approved simply by submission.** In granting permission, the logistics and feasibility of rescheduling the missed academic activity are weighed and the student is notified of the decision.

Approval to reschedule an examination specifies a date later than the original test date on which the test must be taken. An examination cannot be rescheduled to a date earlier than the original exam date.

Non-emergency absences not requested at thirty days in advance of the start of the course may not be able to be accommodated and may be denied.”

For any MHD small group or laboratory session that is not attended, in addition to following the SSOM policy outlined above, students must submit their answers to the small group and/or laboratory case questions to the course director within 5 days of the missed session.

## ASSESSMENT

### **Medical Knowledge Competency/Course Grade:**

Assessment of the Medical Knowledge Competency and the final course grade will come from the sum of the exam scores.

<u>GRADES</u>	<u>% of Final Grade</u>
<b>Multiple Choice Block Exams</b>	90%
<b>Final End of Semester Cumulative Exam*</b>	<u>10%</u>
Total	100%

\*the final end of semester cumulative exam covers ALL LECTURE material from the beginning to the end of the semester **AND** the content covered in ALL of the LABORATORY SESSIONS in the semester.

### **GRADES:**

The final course grade will be calculated based on the following formula:

$$[(\text{Sum of Multiple Choice Block Exams Points}/\text{Total Number Points}) \times 0.9] + [(\text{Final End of Semester Cumulative Exam Points}/\text{Total Number Points}) \times 0.1]$$

Grades are assigned according to the following ranges:

<b>HONORS:</b>	≥ 91.5
<b>HIGH PASS:</b>	≥ 84.5 – 91.5
<b>PASS:</b>	≥70.0– 84.5
<b>FAIL:</b>	Less than 70



Note: Scores within 0.5 percentage points of a grade cut off will be rounded up to the higher grade

**Small Group Assessment:**

The competencies of Interpersonal and Communication Skills; Professionalism; Patient Care; and Practice Based Learning and Improvement are assessed in the MHD small groups.

Facilitators in the small groups will note attendance; punctuality; satisfactory preparation; active participation; respectful and courteous interaction with peers and faculty; ability to synthesize pertinent facts from small group case histories, physical exam findings and diagnostic data; and an investigatory and analytic thinking approach to course work during small group discussions. Failure to initiate comments or answers throughout a session, repeated inability to answer questions, and lack of preparedness for a session are unacceptable.

Faculty will complete the Small Group Sessions Competency Assessment and note whether a student “Meets Expectations”, “Meets Expectations with Concerns”, or “Does Not Meet Expectations” for the relevant competencies and will provide narrative comments.

Attendance sheets for small group sessions will be reviewed. Repeated absences will result in a “Concern” being noted within the “Professionalism” Competency Assessment. A pattern of excessive absences will result in a “Does Not Meet Expectations” for the “Professionalism” Competency.

Signing in for a session and leaving before its completion OR having a student sign an attendance sheet for another student are considered forms of academic dishonesty and will result in a “Does Not Meet Expectations” for the “Professionalism” Competency.

Asking a Clinical Question Assignment:

Students must present the report on their clinical question during their designated small group session.

In addition, each student will submit a summary of their question, search strategy, articles/references identified to answer the question, relevance of the references to answering the precise clinical question and a concise answer to the clinical question to the MHD Course Coordinator. The MHD Course Director or a faculty designate will review the material and provide feedback to the student.

Failure to present and submit materials on the day of the small group session will result in a “Meets with Concerns” for the Professional Competency.

Evidence of the student not fulfilling the goals of the exercise will result in a “Meets with Concerns” for the Practice-Based Learning and Improvement Competency.

**Laboratory Session Assessment:**

The competency of Professionalism is assessed via the MHD Laboratory Sessions.

Failure to come prepared and participate in the assigned presentations will result in a “Concern” being noted within the “Professionalism” Competency Assessment. Repeated poor preparation for assigned cases will result in a “Does Not Meet Expectations” for the “Professionalism” Competency. Similarly, failure to demonstrate preparation for the “Jeopardy Case” will result in a “Concern” being noted within the “Professionalism” Competency Assessment.

Attendance sheets for the Laboratory sessions will be reviewed. Repeated absences will result in a “Concern” being noted within the “Professionalism” Competency Assessment. A pattern of excessive absences will result in a “Does Not Meet Expectations” for the “Professionalism” Competency.

Signing in for a session and leaving before its completion OR having a student sign an attendance sheet for another student are considered forms of academic dishonesty and will result in a “Does Not Meet Expectations” for the “Professionalism” Competency.

## **REMEDIATION**

### **Remediation of “Does Not Meet” Competency Evaluation**

**Medical Knowledge Competency:** Students who do not meet expectations for the Medical Knowledge Competency and receive a failing grade for MHD I and/or MHD II will be required to remediate as per the SSOM Academic Policy Manual.

Prior to sitting for the MHD remediation examination, a student should engage in a supervised review period under the direction of the Course Director and the Academic Center for Excellence. The purpose of the remediation exam is for the student to demonstrate competence of the material presented in the course. The composition of the exam will be decided by the course director and will consist of representative multiple choice questions reflecting material that was presented throughout the semester. Students must earn at least a 75% score to pass the remediation exam. The course director will notify the student of the remediation exam grade.

### **Professionalism; Interpersonal and Communication Skills; Patient Care; Practice Based Learning and Improvement Competencies**

As per the SSOM Academic Policy Manual: “A *Does Not Meet* assessment in any course or any competency WILL result in a U grade for that course. A plan to address these deficiencies is determined by the Academic Review and Intervention Committee (ARIC) and the Student Promotion Committee with input from the appropriate Course Director(s) to determine the form and format of the remediation”

### **Remediation of “Meets with Concern” Competency Evaluation**

As per the SSOM Academic Policy Manual: “Students who receive a *Meets with Concern* assessment in one or more competencies in one or more courses are subject to review by the Academic Review and Intervention Committee with input from the appropriate Course Director(s) to determine if a remediation process is necessary”.

## **MHD COURSE TEXTBOOKS and Resources For Learning**

### **Required Textbooks**

#### **Robbins Basic Pathology, 10th Edition, 2017**

Editors: Kumar, Abbas, Aster

Publisher: Elsevier Saunders

#### **Medical Microbiology, 8th Edition, 2015**

Editors: Murray, Rosenthal, & Pfaller

Publisher: Elsevier

### **The following texts are recommended as valuable resources:**

For the histology curriculum:

#### **Atlas of Histology with Functional and Clinical Correlations, 2010**

Editors: Cue, D., et al.

Publisher: Wiley Lippincott Williams & Wilkins

OR

#### **Wheater's Functional Histology : A Text And Colour Atlas , 2014**

Editors: Young, Barbara; O'Dowd, Geraldine; Woodford, Phillip

Publisher: Churchill Livingstone/Elsevier

(Available on line through Loyola Health Science Library E-Books)

For small group discussion and clinical correlations:

#### **Scientific American Medicine, 2017**

Editors Singh, Ajay K, et al

Publisher: Decker Intellectual Properties

(Available through Loyola Health Science Library E-Books – Stat!Ref)

**Pathophysiology of Disease: An Introduction to Clinical Medicine, 7th Edition, 2014**

Editors: Stephen J. McPhee, Gary D. Hammer

Publisher: Mc Graw Hill

(Available on line through Loyola Health Science Library E-Books)

For the Psychopathology block

**Diagnostic and Statistical Manual of Mental Disorders, 5th ed.**

American Psychiatric Association, 2013

(Available on line through Loyola Health Science Library E-Books)

For ongoing review of histology and pathology:

**The Internet Pathology Laboratory for Medical Education  
(Web Path)**

<http://library.med.utah.edu/WebPath/webpath.html>

*The WebPath® computer-aided instructional resource contains over 2700 images with text that illustrate gross and microscopic pathologic findings along with radiologic imaging associated with human disease conditions. For self-assessment and study there are over 1300 examination items*

**ADMINISTRATIVE COMMENTS**

A goal of the **MECHANISMS OF HUMAN DISEASE** course is to foster learning in a challenging and stimulating, yet enjoyable, environment. To this end, the faculty, course directors and course coordinator will assist students in whatever way we can.

Course Director:

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Course Coordinator

Caterina Goslawski

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Should you have questions or need for academic counseling we welcome the opportunity to assist you. If you have any questions concerning a particular topic in pathology, microbiology, or clinical medicine, we suggest that you contact and meet with the faculty

member who is responsible for that lecture. The course coordinator is available to assist you in contacting and making an appointment with the faculty member if necessary. If the above are not successful, contact the course directors who will arrange for assistance.

Throughout the course each student is expected to behave in a professional manner with course faculty, course leadership and peers. Any forms of academic or professional dishonesty will not be tolerated and will be dealt with according to Stritch Academic Policies.

We wish you a successful M2 year!