PLEASE READ THE INTRODUCTORY PAGES VERY CAREFULLY.

THEY CONTAIN IMPORTANT POLICY STATEMENTS.

Curriculum guides are subject to revision. Updated versions of the Curriculum Guide will be posted on the School of Medicine website: http://asp.med.wayne.edu/curriculum-guides/year1-curriculum-guide.pdf

Revised June 27, 2016
Wayne State University, School of Medicine
Medical Student Competencies and Institutional Learning Objectives

The Wayne State University School of Medicine has established a comprehensive set of competencies and institutional objectives to prepare students for practicing medicine in the 21st century. The following table summarizes the general competencies and institutional learning objectives. The first row defines the general competency. The second row refers to the specific learning objective associated with each competency and the cognitive domain (knowledge, skill, attitude/behavior) being evaluated for each objective.

The six general clinical competencies for medical students (identical to the general competences of postgraduate training) include

- Integration of the Basic Sciences in Medicine
- Integration of Clinical Knowledge and Skills to Patient Care
- Interpersonal and Communication Skills
- Professionalism
- Organization and Systems-Based Approach to Medicine
- Life Long Learning and Self-Improvement

As you progress through the basic science curriculum of medical school, periodically review these competencies and educational objectives. They provide valuable guides to the organization of the knowledge, skills and attitudes you will learn during this phase of your professional growth.
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<table>
<thead>
<tr>
<th>Competency</th>
<th>Institutional Learning Objectives:</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1</td>
<td>Knowledge of the normal structure of the human body (cell tissues and organs).</td>
</tr>
<tr>
<td>K2</td>
<td>Knowledge of the normal function of the human body (cell tissues and organs).</td>
</tr>
<tr>
<td>K3</td>
<td>Knowledge of the nature of agents and mechanisms that produce alterations in structure and function of the body.</td>
</tr>
<tr>
<td>K4</td>
<td>Knowledge of the nature and course of alterations in function produced by etiological agents and mechanisms (Pathophysiology) of the body.</td>
</tr>
<tr>
<td>K5</td>
<td>Knowledge of the nature and course of alterations in structure produced by etiological agents and mechanisms (Pathological Anatomy) of the body.</td>
</tr>
<tr>
<td>K6</td>
<td>Knowledge of the appropriate use of laboratory techniques in identifying diseases or health problems.</td>
</tr>
<tr>
<td>K7</td>
<td>Knowledge of the action, metabolism, and toxic effects of drugs.</td>
</tr>
<tr>
<td>K8</td>
<td>Knowledge of the therapeutic use of drugs.</td>
</tr>
<tr>
<td>K9</td>
<td>Knowledge of normal growth and development.</td>
</tr>
<tr>
<td>K10</td>
<td>Knowledge of the principles and concepts underlying normal behavior and mental illness.</td>
</tr>
<tr>
<td>K11</td>
<td>Knowledge of the aging process.</td>
</tr>
</tbody>
</table>
### Competency
Integration of Clinical Knowledge and Skills to Patient Care

<table>
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<tr>
<td>K=Knowledge S=Skill AB=Attitude/Behavior</td>
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</table>

| S1 | The ability to perform a satisfactory physical exam. |
| S2 | The ability to take a satisfactory medical history including psychosocial, nutritional, occupational and sexual dimensions. |
| S3 | The ability to utilize data from the history, physical exam and laboratory evaluations to identify the health problem. |
| S4 | The ability to formulate an appropriate differential diagnosis. |
| S5 | The ability to formulate effective management plans (diagnostic, treatment, and prevention strategies) for diseases and other health problems. |
| S6 | The ability to monitor the course of illnesses and to appropriately revise the management plan. |
| S7 | The ability to perform routine technical procedures specified by the medical school and clerkship. |
| S8 | The ability to document the clinical encounter. |
| S9 | The ability to apply the principles and concepts underlying normal behavior and mental illness. |
| S10 | The ability to diagnose and participate in the management of mental illnesses. |
| S11 | The ability to apply the therapeutic use of drugs in patient care. |
| S12 | The ability to recognize normal growth and development. |
| S13 | The ability to recognize the relationship between health and illness, the patient and the patient’s environment. |
| S14 | The ability to apply psychosocial principles and concepts in the delivery of health care. |
| S15 | The ability to apply preventive and health maintenance principles and techniques in the delivery of health care. |
| S16 | The ability to apply the appropriate use of laboratory methods in identifying diseases or health problems. |
| S17 | The ability to recognize patients with immediately life threatening conditions. |
| K12 | Knowledge about relieving pain and ameliorating the suffering of patients. |
| S18 | The ability to apply Translational Medicine principles to clinical decision making. |
### Competency
**Interpersonal and Communication Skills**

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</tr>
<tr>
<td><strong>S19</strong></td>
<td>The ability to demonstrate effective physician-patient interaction skills.</td>
</tr>
<tr>
<td><strong>S20</strong></td>
<td>The ability to utilize appropriate communication skills to obtain a history, diagnosis, and deliver an effective treatment plan to patients.</td>
</tr>
<tr>
<td><strong>S21</strong></td>
<td>The ability to effectively communicate with peers and members of the healthcare team in the care of patients and their families.</td>
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### Competency
**Professionalism**

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</tr>
<tr>
<td><strong>AB1</strong></td>
<td>The ability to apply humanistic values in the delivery of health care.</td>
</tr>
<tr>
<td><strong>AB2</strong></td>
<td>The ability to work cooperatively with other health care workers in the delivery of health care.</td>
</tr>
<tr>
<td><strong>AB3</strong></td>
<td>The ability to respect the patients’ dignity, privacy, and confidentiality in the delivery of health care.</td>
</tr>
<tr>
<td><strong>AB4</strong></td>
<td>The ability to effectively interact with patients, peers and other healthcare workers from diverse cultural backgrounds.</td>
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</tbody>
</table>
**Competency**

**Organization and Systems-Based Approach to Medicine**

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</tr>
<tr>
<td>S22</td>
<td>The ability to apply the concepts and principles of primary care and Family Medicine in the delivery of health care.</td>
</tr>
<tr>
<td>S23</td>
<td>The ability to apply cost containment principles and techniques in the delivery of health care.</td>
</tr>
<tr>
<td>K13</td>
<td>Knowledge of the health care delivery systems including social, economic and political dimensions.</td>
</tr>
<tr>
<td>K14</td>
<td>An understanding of the need and value of consultations and referrals in the delivery of health care.</td>
</tr>
</tbody>
</table>

**Competency**

**Life Long Learning and Self-Improvement**

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<td></td>
</tr>
<tr>
<td>AB5</td>
<td>Recognize the need to engage in lifelong learning to stay abreast of relevant scientific advances.</td>
</tr>
<tr>
<td>AB6</td>
<td>The ability to recognize personal educational needs and to select and utilize appropriate learning resources.</td>
</tr>
<tr>
<td>S24</td>
<td>The ability to critically appraise the medical literature.</td>
</tr>
</tbody>
</table>

Modifications to the School of Medicine competencies and educational objectives were approved by the Curriculum Committee in April, 2012.
GENERAL ORGANIZATION OF THE CURRICULUM

The Year 1 Curriculum for 2015-2016 will consist of eight courses: Gross Anatomy, Histology/Embryology, Clinical Medicine, Physiology, Biochemistry, Clinical Nutrition, Genetics and Neuroscience.

ACADEMIC AND STUDENT PROGRAMS OFFICE

Vice Dean for Medical Education Maryjean Schenk, M.D., M.P.H. mmschenk@med.wayne.edu
Associate Dean for Medical Education Patrick Bridge, Ph.D. pbridge@med.wayne.edu
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Assistant Dean for Clinical Sciences Kendra Schwartz, M.D. kensch@med.wayne.edu
Supervisor Records and Registration JaEsta Jones, jejones@med.wayne.edu
Director of Assessment and Education Research Jason Booza, Ph.D. jbooza@med.wayne.edu

YEAR 1 COURSE DIRECTORS

Gross Anatomy Mark Ireland, Ph. D. (Co-Director) mireland@med.wayne.edu
Histology/Embryology Rodney Braun rbraun@med.wayne.edu
Biochemistry Sharon Ackerman, Ph.D. sackerm@med.wayne.edu
Physiology Robert Lasley, Ph.D. rlasley@med.wayne.edu
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Gerald Feldman, MD, PhD gfeldman@med.wayne.edu
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Mary Width, M.S., RD marywidth@wayne.edu
Neurosciences Jose Rafols, Ph.D. jrafols@med.wayne.edu
Clinical Medicine I Joel Appel, MD jappel@med.wayne.edu
Translational Medicine I James Meza, MD jmeza@med.wayne.edu
ACADEMIC PROGRAM

The Year 1 program is primarily devoted to understanding normal structure and function. In the course of achieving this objective, the curriculum is designed to help the student prepare himself/herself for his/her role as a problem solver. This will involve acquiring basic information, but, more importantly, it will also involve understanding concepts and relationships. The lecture is one important method we have to help you learn. It is used to define part of what you are expected to know. It should be supplemented and reinforced by reading your assigned text readings, lecture notes, conferring with faculty and fellow students, and participating in the laboratories, computer assisted and problem solving sessions, and use of the web-based resources.

ACADEMIC COMMUNICATION

Official Student Notices, Curricular Updates and Other Communications

The E-mail provided by the University for every student is a powerful communications tool. As described below, each class has a Class Listserv established to allow students to talk to their class members, for faculty to provide course information to the class, and for administration to communicate with the class. Please check your E-mail on a regular basis.

Information which Academic and Student Programs and the Office of Student Affairs need to communicate to the class will be provided through the Class Listserv to all members of the class and will also be posted outside of Conjoint Teaching and on the class bulletin boards and inside the Student Affairs Office. Such communications will include the testing logistics memos, official schedule changes and information regarding meetings among others. Immediate, critical information will continue to be communicated to the class with a paper memo in students’ mailboxes in addition to the Listserv communication.

UNIVERSITY CLOSURE

In the event that Wayne State University closes due to severe weather then the School of Medicine will be closed. All classes, small group activities, and exams schedule during the closure will be cancelled. A revised schedule will be sent out via the list-serve.

Sign up for WSU broadcast messages here: http://computing.wayne.edu/broadcast/

E-MAIL ADDRESS AND CLASS LISTSERVS

Faculty and Academic staff use a variety of methods to communicate with students. One of these methods is electronic mail (e-mail). All incoming medical students will be issued two e-mail addresses. The primary address, created and supported by the school of medicine will be issued during registration. The University will also issue an address that will allow you free access to the Internet and other on-line University services. This address will be mailed to you after classes begin by the University's computing services division. Students who were undergraduates at Wayne State will continue to use their undergraduate addresses and will not receive new e-mail accounts or passwords.

A class listserv will be created for students, faculty and academic administration to communicate general announcements to the class. Students should read their e-mail daily for important curriculum information. If you have any question regarding your e-mail address or the listserv contact the Medical
HONOR CODE
Wayne State University School of Medicine has an Honor Code expressed in the Oath of Academic Integrity presented to and signed by the Year 1 students during Orientation. Students, faculty and administration believe that academic and professional integrity is an important component in the training and practice of medicine.

Oath of Integrity

As a part of a community of medical students, I know that my instructors and fellow students have placed their trust in my academic and professional integrity. I recognize the importance of helping each other as we struggle. Dishonesty within a medical school, however, affects not only the student, but also the reputation of the institution, and potentially our future patients.

In view of this, I hereby vow to pursue my studies with integrity and conscience. I will not accept dishonesty among my peers and pledge to honor that trust that my instructors and fellow classmates have placed in me.

As a future physician, my patients and colleagues will entrust to me matters of a sensitive and confidential nature. In some circumstances, their very lives will depend upon my integrity. I will respect their faith in me and will maintain the level of dignity and honesty that medicine demands. From this day foreword, I will keep honor in this profession.

ATTENDANCE
Participation in instructional activities reveals a student's attitude toward his/her professional preparation. Consequently, attendance is expected. Attendance is mandatory for laboratories, Clinical Medicine small groups, conferences, case studies, demonstrations, patient panels and clinic days. Attendance will be monitored using OneCard readers or sign-in sheets for off-campus activities.

MISSING ASSIGNMENTS Failure to complete all assignment, including make-up assignments for missed activities, by the end of a course could result in any of the following consequences:

- Being excluded from participation in any scheduling processes for the following year
- Being prevented from registering for the following year
- Having registration for the following year cancelled

LECTURE HALL ETIQUETTE
The following items highlight elements of common courtesy expected of all medical students who attend lectures:

- Silence all cell phones and pages in the lecture hall.
- If you attend lectures, plan to stay. Sit close to an exit if you think you may have to leave a lecture early.
- Do not engage in activities during lecture that have nothing to do with the class.
- Keep whispering to a minimum.
Your compliance with these issues is an indicator of professionalism and will be greatly appreciated by
the School of Medicine faculty and your fellow student/peers.

STUDENT DISABILITIES
Services for students with disabilities are coordinated by the Student Disability Services (SDS) Office
located on the first floor of the David Adamany Undergraduate Library at 5155 Gullen Mall. Detailed
information about SDS, the Americans with Disability Act (ADA), SDS policies and procedures,
documentation guidelines, and types of accommodations can be found on the SDS website
http://studentdisability.wayne.edu/index.php. The medical school encourages you to refer to the SDS
website if you have a documented disability or suspect you have a disability that will impact your
medical school performance. The SDS office can be contacted at 313-577-1851. Office hours are
Monday-Friday 8:30-5:00 with extended evening hours on Monday and Thursday evenings until 7:00
during the fall and winter. For further information on the Student Disability Services, please refer to the

COURSE EXAMINATIONS
There will be two types of examinations, promotional and non-promotional. The purpose of promotional
examinations is to determine whether students have acquired the necessary knowledge and skills.
Faculty can also administer examinations to enable students to assess their grasp of the material.
Promotional examinations will NOT be returned to the students. Academic and Student Programs has
instituted a Protected Examination Policy. Students are permitted, and strongly encouraged to use the
Examination Question Citation process. Details of the Question Citation process will be presented to
students at a separate Testing and Evaluation meeting prior to the first scheduled examination. For
further information on the course examination process, please refer to the Policy and Procedures Manual.

A comparable examination will be administered for students who have an excused absence. It will be
comparable in content to the original examination and it will have the same pass-fail level. The exam
will NOT be retained by the student. Students cannot cite questions on a makeup examination. Make-
up exam will be administered every month during the academic term. Students who receive excused
absences will be automatically scheduled for an exam at the next available make-up date. Exam
schedules may found in the online Year 1 course schedule.

GRADING POLICIES
When the process for determining the student's final grades for courses, clerkships, electives or years is
completed, one of the following grades will be placed on the student's transcript, i.e., I = Incomplete, U
= Unsatisfactory, S = Satisfactory, and H = Honors for each course, clerkship, elective or year. Students
that feel their grade is incorrect have the right to appeal the grade. For further information on the
Grading Policy, please refer to the Policy and Procedures Manual.

PROMOTION
The Promotions Committee is the medical school decision-making body with regard to the promotions
process and has the prerogative of determining the student's fitness and suitability for the study and
practice of medicine. The Promotions Committee makes decisions relative to the retention, promotion,
and readmission of students. It also has the responsibility of assuring that the rules of the School and
rights of the individuals involved have been fairly met. The Promotions Committee will formally provide
instructions for the exit interview with students who have been dismissed. For further information on the promotion process, please refer to the Policy and Procedures Manual.

ACADEMIC STANDING
Enrolled students are designated to be in good academic standing unless they are officially placed on probation or are suspended. For further information on the Academic Standing, please refer to the Policy and Procedures Manual.

MODIFIED (DECELERATED) PROGRAM
A modified curriculum is offered that permits students to reduce their academic load in basic science courses and more effectively manage their time. The modified program will permit students to complete year 1 and year 2 courses in three years rather than the traditional two. This is a 5-year program that will change the graduation date for students who select it.

Students will be offered the modified program following exam failures in Anatomy and Histology. A student may accept or decline the offer and first year students are permitted to self-select the modified program. The deadline for the decision to modify is until all positions are filled or the day prior to winter recess, whichever occurs first.

A sample curriculum for the first year of the modified program would include: Histology, Biochemistry, Clinical Nutrition, and Genetics. A sample second year curriculum would be: Anatomy, Physiology, Neurosciences, and Clinical Medicine 1. Modified students who successfully complete the requirements for year 1 course will matriculate to a standard second year curriculum.

Modified program students will be considered part-time by the Medical School for both of the modified years. Therefore, the appropriate University policy for tuition assessment and federal regulations for financial aid for students carrying less than a full load will apply. It is the responsibility of the student to discuss the implications of modifying to part-time status with the Financial Aid Office.

MANDATORY DIRECTED STUDY FOR YEAR 1 AND YEAR 2 STUDENTS REPEATING COURSEWORK
Students who are repeating coursework in Years 1 or 2 must also enroll in and complete a directed study course. This is a mandatory requirement of the Promotions Committee designed to enhance a student’s study and test-taking skills with the goal of successful completion of remediation and to provide an educational foundation for advancement to the next level of training. For further information on the Directed Study Program, please refer to the Policy and Procedures Manual.

LEAVE OF ABSENCES
Students are expected to complete assignments as scheduled and pursue the course of study in the prescribed medical school sequence. On occasion a student’s normal progression may be interrupted by – illness, pursuance of another course of study or research, or personal reasons. All requests for a leave of absence from the School of Medicine must be made in writing to the Assistant Dean for Student Affairs. Leaves should be discussed with the student’s counselor and the Student Affairs Dean, prior to submitting a formal written request. For further information on requesting a Leave of Absence, please refer to the Policy and Procedures Manual.

POLICY REGARDING EXCUSED ABSENCES
The School of Medicine’s policy for absences from scheduled course/clerkship examinations is as follows:
• If you are ill on the day of a scheduled examination or have an unavoidable emergency and need to defer taking the examination to a later date, you are required to contact the Office of Student Affairs (313-577-1463) to report the nature of your medical emergency and request permission to defer taking the examination to a later date.

For further information on the Excused Absence Policy, please refer to the Policy and Procedures Manual.

ACADEMIC SUCCESS
To help students succeed a series of academic success programs have been developed through the Office of Academic and Student Programs, Academic Support Services. The programs are open to all students, some or all of these programs may be required for students in remediation. Students will be required to attend these sessions in person. For further information on the Academic Success Program, please refer to the Policy and Procedures Manual.

STUDENT EVALUATION OF THE CURRICULUM
Evaluation is considered a course requirement. Students have input into the evaluation of the curriculum through two different processes.

• Wayne State University requires that all students evaluate all faculty using a standard question form. This is both a privilege and a responsibility for you as a WSU student. Students who have not turned in their evaluation for a course will not have their course grade posted. It is recognized that not all students attend all lectures (or have the comparable experience of viewing the streaming video or listening to audiotape of the session). However, all students are required to evaluate each course, and evaluate the appropriate items for all faculty regardless of attendance. For example, students can evaluate the quality of the lecture notes whether or not they listened to, or viewed (in person or through streaming video), the lecturer.

• The School of Medicine provides students a unique opportunity to give constructive feedback to faculty. Students participating in the Medical Education Evaluation Co-curricular program will conduct focus groups. The focus group leaders present a summary of their evaluation and suggested changes to the Course Director and the Assistant Deans for Evaluation and Basic Science Education. This is an opportunity for students and faculty to engage in meaningful dialog.

REGISTRATION GUIDELINE
All Year 1 students will be required to register for Year 2 as scheduled by the Office of Records and Registration. The tentative time for registration is immediately after the final exam for the year.

INJURIES, NEEDLESTICKS AND EXPOSURES TO BODY FLUIDS
During the course of a medical student’s education, he or she will come into contact with occupational hazards as a natural consequence of certain laboratory exercises. Medical students are at particular risk for needlestick injuries and other sharp injuries, since because they are in training they may not be skilled in specific procedures being performed. At all times, if a student is uncomfortable performing an assigned procedure because of the perception that his or her skills are inadequate or that supervision will not be adequate, then that student MUST refrain from doing the procedure and report to the instructor.
It is the obligation of the School of Medicine to formally educate its students regarding the prevention of occupational injuries. In addition, the school has developed programs by which students who are injured or exposed in the course of their training have the knowledge to properly seek care. Such programs are formally presented to students in the first, second and third years of the medical school curriculum.

In the event that a student is injured, stuck with a needle or other sharp instrument, or sustains exposure to a body fluid on mucus membranes or non-intact skin while engaged in coursework, the student must report the incident to the instructor immediately. A written report must be completed detailing the circumstances of the exposure. The student should also notify his or her counselor of the reported incident.

A student who sustains an injury or exposure to blood and/or body fluids while participating in medical school coursework must go to the Occupational Health Services Section at UHC-4K if the event of a non-emergency injury and if the injury occurs between 8:00 am and 4:00 pm Monday-Friday. In the event of an emergency or if the injury occurs after hours or on a weekend, the student must go to the DRH emergency room. If medical treatment is required, the students’ medical insurance co-payments or deductibles will be waived for the first treatment. Follow-up medical appointment(s), if necessary, will be the responsibility of the student.

For further information on the Injuries, needle stick and exposure policy, please refer to the Policy and Procedures Manual.

YEAR 1 GENERAL INSTRUCTIONS AND LABORATORY RULES
During this year, you will be working in a laboratory used by other students who will be working with pathogenic micro-organisms, which are capable of causing infections, and you will be working with serum and blood products that might contain viral agents. For the protection of all individuals working in the laboratory, the following rules must be strictly observed:

1. Always wear a knee length laboratory coat when working in the laboratory. DO NOT wear this laboratory coat outside the laboratory.

2. No food or drink should be consumed in the laboratory. FOOD should be stored ONLY in the refrigerators labeled "FOOD ONLY" in the inner lab. Students are responsible for keeping this refrigerator clean.

3. Students must refrain from eating, smoking, or putting anything in their mouths.

4. Before beginning any work in the laboratory, wipe the bench top with a sponge which has been moistened with a disinfectant solution found in the inner lab.

5. At the end of the laboratory period, the sink must be cleared of all debris. Materials must be put away in their proper drawer and waste materials must be disposed of into the appropriate container. All equipment must be removed from the top of the workbench and the area wiped with disinfectant solution.

6. Before leaving the laboratory, during or after an experimental session, students must wash their hands thoroughly with soap and water. Anti-bacterial soap is provided at the large sink in each
inner laboratory.

7. Report anything which might be hazardous to you or your fellow students to your laboratory instructor. Your laboratory instructor should report anything that he/she cannot handle to Conjoint Teaching Services.

8. Report any spilled or broken material that you think may be infectious to your laboratory instructor.

9. In case of any accident report first to your laboratory instructor and then to Conjoint Teaching Services.

10. Always use the equipment and drawers indicated for your use.

11. Laboratory supplies and materials will be clearly indicated for your use. **DO NOT** use any Year 2 materials.

12. Store any materials to be used or observed at a later class period in a drawer in the inner lab or refrigerator, as required.

13. Discards:
   - Discard all disposable materials such as tubes, etc., and any material contaminated with blood or serum in the cans marked "**Microbiological Discards**". These materials will be picked up and sterilized once a week.
   - Slides, Pasteur pipettes, berel pipettes should be placed in the small white containers on the bench top.
   - Large pipettes should be discarded in the white and red pipette jars provided.
   - All syringes and needles must be discarded in the "**SHARPS**" container provided.
   - **NEVER** discard materials used in the laboratory experiments in the **WHITE CANS** labeled "**PAPER ONLY**".

**DRESS CODE**
We do not have a dress code, but we expect you to have an appearance that inspires confidence in you and your school when working with patients and dealing with the public.

**STUDENT SENATE**
The Student Senate is asked to appoint a representative from each class to the Curriculum Committee and the Promotions Committee. It is through these committees as well as through discussions with the individual faculty members, Course Directors, Assistant Deans of Academic and Student Programs, and the Executive Vice Dean, that your perspective can be presented effectively and our program can be improved. Students also play an important role in evaluating each course.
THE VERA P. SHIFFMAN MEDICAL LIBRARY
The Vera P. Shiffman Medical library welcomes WSU School of Medicine students, faculty and staff to its newly renovated permanent location in the Mazurek Medical Education Commons. The hours of service are: 8:00 a.m. – midnight, Monday – Thursday; 8:00 a.m. -8:00 p.m. Friday, noon-8 p.m. Saturday and noon – midnight Sunday. In addition to open reading areas study rooms are available and can be reserved during the library’s service hours. When not in use other Mazurek classrooms are available for study purposes when the library is closed. Your WSU One Card provides you with access to the library and should be presented on entry.

Library services including circulation/reserves and reference are now located on the main floor of Mazurek along with books and journals published after 1980. A collection of books and DVDs for ‘class reserve’ and some of the more popular examination review books are located behind the service desk. While reserve materials are restricted to three hours, books in the circulating collection may be signed out for one month; journals do not circulate. You may find more materials in our library catalog that can be accessed from any location. Our online catalog gives the location of library resources and links to online materials including several thousand electronic journals. The library’s web site at http://www.lib.wayne.edu/shiffman directs students to the online catalog, databases and more. Shiffman also provides One Card operated photocopiers and printers for both desktop and wireless printing.

In addition to wireless access for WSU students, faculty and staff in all areas, the library houses a ten seat computer training lab that is available to students when it is not in use. Off campus access to many library resources including electronic textbooks and examination review materials, MEDLINE, online journals and web resources will require student’s WSU Access ID (ab1234). For more details about computer labs and remote access please see www.lib.wayne.edu/shiffman or send questions or suggestions to askmed@wayne.edu

MEDICAL EDUCATION SUPPORT GROUP
The Medical Education Support Group (room 231 Mazurek Medical Education Commons) offers students support services for BlackBoard and PDA applications.

SCHOOL OF MEDICINE LEARNING RESOURCES
Two 40-seat computer labs on the third floor (rooms #325 and #324) are made available by the School of Medicine for students.

CLINICAL EQUIPMENT AND SUPPLIES
Clinical equipment necessary for Year 1 (Introduction to the Patient) includes:

- Short white jacket
- Stethoscope with bell and diaphragm
The purchase of textbooks is the responsibility of each student. The following books are required as recommended:

I. GROSS ANATOMY

Required:


Highly Recommended:


Recommended:


II. HISTOLOGY

Required/Highly Recommended textbook:


Recommended atlases (an atlas of some kind is highly recommended):

   https://www.clinicalkey.com/#!/browse/book/3-s2.0-C20090600258


Useful (alternative books and atlases):

   https://www.clinicalkey.com/#!/browse/book/3-s2.0-C20130002782


III. EMBRYOLOGY

Required:


Recommended or useful alternative textbooks:


Or available as E-Book free online on “ebrary” through Shiffman Library: http://site.ebrary.com/lib/wayne/docDetail.action?docID=10648607
CLINICAL MEDICINE 1

Recommended equipment: Stethoscope (good quality – comparable to Littman Cardio 3), Oto-ophthalmoscope kit, tuning forks – 128 Hz and 512Hz, reflex hammer, penlight, sphygmomanometer (BP cuff)

Required reading materials:
- Course syllabus, additional lecturer handouts
- Blackboard assignments

Recommended textbooks:

Recommended websites:
- http://www.usersguides.org/ (JAMA or “Users Guide textbook supported online access)
- The Institute for Healthcare Improvement, a patient care quality and safety resource: http://www.ihi.org*
- You may also find a medical dictionary such as Stedman’s useful for this course, as well as for other courses during the first two years.

V. BIOCHEMISTRY

Required textbook:
- None

VI. PHYSIOLOGY

Required:

Useful:


VII. NEUROSCIENCE

Required:


Recommended:


Self-study Teaching Tools (available in electronic Blackboard)

• Rafols, J. A. *Interactive Neuro Quiz (Parts I and II)*. 2012
• Rafols, J. A. *Ten CNS functional Circuits (from receptors to conscious awareness)*. 2012

VIII. MEDICAL GENETICS

Recommended:

EQUIPMENT AND SUPPLIES

YOU ARE REQUIRED TO OBTAIN THE FOLLOWING FOR GROSS ANATOMY:

1 white laboratory coat (long) or surgical scrubs

1 scalpel (#4 or #5 handle) with large disposal blades (Bard-Parker #20 or #22, for example)

1 pair of large surgical scissors (6 inch straight with one sharp and one blunt point)

1 pair of Iris scissors (4-1/2 inch)

2 hemostats (straight)

1 Halstead mosquito clamp (curved, 4-1/2 inch)

1 double ended dissecting probe (heavy Metal)

1 large-tooth forceps (broad point, CV-78 Thumbs forceps, 4-1/2 inch)

1 small, fine pointed forceps (4-1/2 inch)

2 locks for assigned lockers

1 opaque (non-see through) clip board
HUMAN GROSS ANATOMY COURSE DESCRIPTION

The purpose of Human Gross Anatomy in the medical curriculum is to enable the medical student to acquire knowledge of the normal structure and organization of the human body as a basis for understanding normal function. This knowledge allows the student to acquire the skills for detection of abnormal structures. This is accomplished through a combination of lectures, small group presentations, radiologic anatomy sessions and the experience of dissection of the entire human body.

The sequence of lectures and dissections follows the natural regional organization of the human body: Upper Limb and Back, Head and Neck, Thorax and Abdomen, Pelvis and Perineum, and Lower Limb. The use of radiological (X-rays), computed tomography (CT-scans), magnetic resonance imaging (MRI), ultrasonography (US), and cross-sectional anatomical preparations complement dissection in helping the student achieve and retain a three-dimensional image of the appropriate regions. Written examinations covering materials presented during lectures will be based on information contained in course notes and presented during lecture.

PART 1: UPPER LIMB AND BACK

The lecture presentations and dissections for these regions are designed to enable the student to acquire knowledge of the anatomy and function of the upper limb and back, including the structural contents and anatomical relations of the anterior thoracic wall, axilla, arm, forearm, wrist, hand, and back. The structural components and movements of upper limb joints are covered. The student is specifically instructed on the anatomical basis of the diagnosis of upper limb nerve lesions, and introduced to patients with representative lesions. The laboratory experience allows the student to acquire the skill of dissection in a relatively uncomplicated region of the body as a basis for the complexities encountered later in other regions.

PART 2: HEAD AND NECK

The lecture presentations and dissections of the anatomy of the head and neck are potentially one of the most important in the regional approach. Initially, the student is expected to acquire knowledge of the structural features of the skull, scalp and cranial cavity. The student is then expected to achieve familiarity with the distribution and functional components of the cranial nerves, as a basis to gain an understanding of their peripheral distribution as followed in later dissection of other body regions. The subdivisions of the neck are systematically studied and dissected. The face and its musculature, and the parotid gland are dissected in conjunction with the seventh cranial nerve. The student is finally expected to acquire knowledge of the structural contents and anatomical relations of the infratemporal fossa, pterygopalatine fossa, nasal cavity, pharynx, larynx, eye, orbit, and ear. The distribution and components of the autonomic nervous system of the head and neck are also covered.
PART 3: THORAX AND ABDOMEN

The presentation of these two regions as an integrated unit follows their morphologically natural relationship. The acquisition of an intimate knowledge of the anatomical organization of these regions forms the basis for the later acquisition of skills in physical diagnosis, and is essential to the correct interpretation of current technological biomedical visualizations of these regions. The lymphatic drainage of these regions is presented, and emphasis placed on the distribution of the autonomic nervous system components. A systematic anatomical approach is employed for the lectures and dissections of the thoracic cavity, pleura, lungs, mediastinum, and heart.

The student is expected to gain a three-dimensional knowledge of the anterior abdominal wall and inguinal structures, and of the structural features, and anatomical relations of the stomach, small and large intestines, spleen, liver, pancreas, kidneys, and suprarenal glands.

PART 4: PELVIS, PERINEUM, AND LOWER LIMB

The integration in the presentation of these three regions is necessitated by the vascular and nervous components, which functionally link them. The student is expected to gain a basic knowledge of the interrelation of these regions to facilitate the student’s future understanding of the potential postoperative complications involving defecation, urination, parturition, the sexual functions of pelvic organs, and of functional deficits in the biomechanical movements of the lower limbs. The sequence of study and dissections consists of the anatomy of the male and female perineum and external genital organs, pelvic genital organs, urinary bladder, rectum, and anal canal. Special attention is given to the blood supply, innervation, and lymphatic drainage of the region.

The format in the presentations of the lower limb is similar to the upper limb (ie. a series of lectures and followed by laboratory dissections). This dissection parallels that of the upper limb, and is complemented with a clinical correlation session. Appropriate emphasis is employed in the study of the lower limb joints, particularly the hip and knee joints, as these represent such frequent deficits in the biomechanics of lower limb movement. The student is expected to acquire knowledge of the anatomical contents and organization of the gluteal region, thigh, popliteal fossa, knee, leg, ankle, and foot.
Code of Conduct in Gross Anatomy Laboratories

The Uniform Anatomical Gift Law of the State of Michigan permits the dissection of the human body. The Body Bequest Program of Wayne State University provides the bodies for your education, prior to their final interment.

The following Code of Conduct will apply at all times in the Human Gross Anatomy Laboratories:

1. Dissection of the human body shall be performed with dignity and respect.

2. Students assigned to a cadaver will be responsible for the proper conduct of the dissection according to the dissection guide and faculty instruction.

3. All identifying information about the cadaver is confidential.

4. Students may not dissect or alter cadavers assigned to other students.

5. Human tissues, including prosections, bones, and skeletons, may not be removed from the laboratories.

6. Neither the cadaver nor any part thereof may be photographed or videotaped.

7. Neither the cadaver nor any parts thereof are to be positioned or displayed in an inappropriate, comical or obscene manner.

Mark E. Ireland, Ph.D.
Associate Professor of Anatomy
Course Co-Director

Jack Sobel, M.D. Dean
School of Medicine
INTRODUCTION

Knowledge of the structure of the human body is the foundation of the practice of scientific medicine. It is therefore appropriate that you begin your preparation to become a physician with the study of gross anatomy. At the conclusion of the course you will have dissected the entire human body and have a basic understanding of its structure. This knowledge will be relevant to some degree to virtually all your future course work. Obtaining a thorough knowledge of gross anatomy now will pay major dividends in the future.

Gross anatomy is unlike any other course you have ever taken. The dissection experience is unique and no other prior life experience has prepared you for it.

Dissecting the human body and working with the dead will be a radically new experience. To experience anxiety and to feel trepidation is normal. Confronting and conquering the emotional challenges presented by gross anatomy is the beginning of your professional development. In the laboratory you will see first-hand incontrovertible evidence of your own mortality. You will encounter proof of the reality of disease, aging and death. Your professional development requires that you come to intellectual and emotional terms with these unpleasant realities.

You will learn much more in gross anatomy than just terminology, concepts, and facts.

You will learn to cultivate emotional detachment; to set your feelings aside when circumstances require that you be objective and rational.

You will learn to feel your humanity; to feel empathy and to experience compassion.

As you develop professionally, you will learn to strike the appropriate balance between clinical objectivity and emotional involvement. The foundation for this essential skill will be rooted in your experience in gross anatomy lab.

You will learn the value of active observation; the habit of looking with an inquiring mind. You will come to appreciate the difference between perfunctory, passive looking and actively making observations. This skill will serve you well in the examining room.

You will gain practice in deductive reasoning. While attempting the identification of an anatomical structure or relationship, you will marshal the facts you know to eliminate possibilities and confirm your surmises. This skill will serve you well in differential diagnosis.

You will learn to “speak anatomy.” You will learn the language of anatomy and become able to communicate anatomical knowledge and understanding correctly and effectively.

You will learn to appreciate the importance of normal variation. Awareness of normal variation will serve you well in the clinics.

You will learn to “toughen up.” Dissection will require you to do some rather unpleasant things and to encounter some messy circumstances. Such experiences will season you for far more unpleasant situations in the hospital.
You will learn the habit of having a reason for every statement you make. This will help prepare you for the practice of evidence based medicine.

Most students find that gross anatomy is the most challenging and growth stimulating course in medical school. Resolve to experience it as the great adventure it is and take pride in the privilege of participating in this time honored rite-of-passage.

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6. Neither the cadaver nor any part thereof may be photographed or videotaped.

7. Neither the cadaver nor any parts thereof are to be positioned or displayed in an inappropriate, comical or obscene manner.

**DISSECTION IS MANDATORY**

Dissection is a privilege and is mandatory. Every student is required to dissect. Attendance will be taken. Anyone not attending laboratory and dissecting will be called to account and required to explain how they think not dissecting advances their medical education and prepares them to take responsibility for the health and lives of their future Patients.
PREPARING FOR THE FIRST DAY OF DISSECTION

Reserve a locker: Reserve a locker by placing a lock on the locker of your choice. Women’s lockers are located in Rooms 118, 331 and 344; men’s lockers are in Room 114.

Obtain lab supplies: You will need a dissection guide, an atlas, rubber gloves, a dissecting kit and a lab coat. Lab apparel is optional; it can be scrubs or regular clothing. Mask and goggles are not necessary but are permissible. Hypo-allergenic gloves are available if you have a latex allergy. Once you change into lab attire, you should remain in the basement – lab attire is not appropriate in any other part of Scott Hall.

Familiarize yourself with the Laboratory: Inspect the gross anatomy laboratory and adjacent areas. Immediately outside the main laboratory entrance note the Gross Anatomy Bulletin Board. Important course information, updates and policies are posted on the Board. Note that each laboratory has x-ray view boxes, sinks, paper towel dispensers and first aid kits. One or more central tables are for display of pro-sections, special tools, watering bottles, and sharp disposal containers. Frequently used tools are stored in the drawer of each table. Note the waste containers. Electrical outlets are suspended from the ceiling: use a hook to pull them down - DO NOT stand on chairs or tables to reach them.

A representative assortment of bones for study will be found in the drawer of your table. Bones may not be removed from the laboratory. One or more skeletons will be available in each laboratory.

A considerable body of folklore has developed around gross anatomy. Myths of events in the gross lab are perpetuated by misinformed laypersons and upperclassmen playing mind games with new students. Disregard such nonsense and don’t let it color your expectations. Also, you will find statements regarding the odor of the gross anatomy laboratory greatly exaggerated; patients with gangrene and autopsy rooms can smell far worse.

YOUR CADAVER

The age and cause of death of your donor is posted on the door of each laboratory. Always be cognizant of the fact that your cadaver is the body of someone’s loved one: treat it as you would wish your own body, or that of a member of your family, to be treated. Virtually any procedure is appropriate if your motivation is to learn in order to be able to help others.

The privilege of dissection is made possible by the generosity of donors and their families. It is their intent that you make full use of the opportunity to learn from their gift. Fulfill their expectations and honor their wishes by dissecting with purpose and respect.
LABORATORY RULES

Students are to abide by the “Code of Conduct in Gross Anatomy Laboratory” at all times.

No eating, drinking or smoking at any time.

Absolutely **NO VISITORS ARE ALLOWED**. Only medical students, faculty and staff are permitted in the laboratory.

No radios during regular laboratory hours.

Prosections are to be kept moist and wrapped up after use.

Wear clean clothing and behave professionally at all times,

**THE BODY BEQUEST PROGRAM**

All bodies utilized in our anatomy program are donated. A brochure providing information on the Body Bequest Program is posted in each laboratory. At the end of the course, each donor’s body in cremated and their ashes placed in a canister. The ashes are, depending on the wishes of the family, returned to the family or interred at the WSU - SOM burial site during the annual Memorial Service.

**MEMORIAL SERVICE FOR DONOR’S AND FAMILIES**

You will have an opportunity to express your gratitude to the donors and their families for their contribution to your medical education at the annual memorial service and interment of ashes. The service takes place in May and is a fitting close to your first year of medical school.

**EMBALMING**

Bodies prepared for dissection are not given the cosmetic treatments typical of those prepared for viewing at funerals. Upon receipt, donor’s body is given an identification number (do not remove the numbered tag), bathed and the head shaved. The right carotid artery is exposed and an injection tube inserted. The entire body is perfused via the vasculature with embalming fluid. Ten to 15 gallons of fluid is injected under pressure. This results in the body appearing somewhat distended; erectile tissues may fill and the scrotum typically becomes ballooned. A hole is placed in the calvaria to open the superior sagittal sinus to improve perfusion of the brain.
HEALTH CONCERNS

There is no extraordinary health risk associated with dissection of embalmed cadavers. Bodies of individuals known to have had serious infectious diseases such as tuberculosis, hepatitis, AIDS, etc. are not accepted. The concentrated embalming fluid used contains formaldehyde and phenol and is toxic to bacteria, viral pathogens and most fungus. In addition, bodies are cured for at least three months prior to use.

Should you sustain a laceration or puncture wound in gross laboratory simple treat it as you would any other cut. Wash out the wound, encourage bleeding, apply antiseptic and a band-aid. If it is more serious, consult an instructor. First Aid kits are on the wall opposite the doors of each laboratory.

Formaldehyde levels encountered in the gross anatomy laboratory are far below the level deemed by the EPA to pose a health hazard. Levels have been monitored in previous years and are well within acceptable levels. If you have respiratory problems, special masks are available. See your counselor to arrange a fitting.

Some students have reported that wearing soft contact lenses in lab may result in eye irritation.

If you are pregnant or think you may be, you should advise Dr. Ireland and consult your obstetrician. At the time of this writing, there are no known health risks to pregnant women or the embryo/fetus from exposure to formaldehyde or other components of embalming fluid at the concentrations encountered during dissection. However, to be on the safe side, you will still need to have permission from your physician to continue in the course. After consultation with your physician and Environmental Services, you may opt to wear a mask or other type of respirator.

If you have a health condition that you think might be a problem in lab, please see Dr. Ireland.

In case of a medical emergency, call WSU police at 577-2222. For all other non-emergency medical situations, follow directions posted on laboratory doors or inform your laboratory instructors.

Security may be called at 7-2222 from telephone in the hall opposite the elevator.

LABORATORY PROCEDURES & POLICIES

Attire & rubber gloves: Rubber gloves are not to be worn outside of the laboratory. Remove and dispose of prior to leaving the laboratory. Do not dispose of used gloves in the locker rooms; custodians will not deal with them. Wash your lab attire frequently.

The regular custodial staff does not clean the laboratories. Therefore it is your responsibility to keep the laboratories clean and orderly. Pick up and sweep up around your table at the end of each dissection.

All used scalpel blades (sharps) are placed in the Sharps containers for disposal. Do not place them in the regular trash.

You are encouraged to examine and review dissections other than your own. The more examples you see, the better. However, you are to dissect only the body assigned to you and no other. When you have finished reviewing someone else’s dissection, put everything back in place, make certain the
dissection is moist and wrap the body properly. Follow the Golden Rule and treat the cadavers of other students as you would want them to treat yours.

The faculty is present during regular laboratory hours to instruct, advise and demonstrate, but not to do the dissection for you. The names of your instructors for the unit will be posted on the door of each laboratory.

It is permissible to go to a table where an instructor is holding forth, but excessive shadowing of faculty is discouraged because it can interfere with instruction.

CARE OF BODIES

At the end of each session, water down or wrap the dissection in moist paper towels and replace the skin flaps. Cover with the plastic wrap and put the body cover in place. The body cover should conceal the entire body; no parts should be visible.

If you study a cadaver other than your own, be certain to wrap it up properly after use.

If there is mold or other problems with preservation, please call it to the attention of Barbara Norgan in Room 525.

DISSECTION ASSIGNMENTS

Dissections are numbered. Consult the class schedule to determine dissection assignments. Typically, most dissections can be completed within the assigned laboratory session. The efficiency of dissection is greatly enhanced by reading the assignment and reviewing the atlas in advance. You are expected to KNOW all structures MENTIONED in the dissecting guide and to DISSECT all structures appearing in BOLD PRINT unless otherwise indicated by your instructors. It is required that students take turns dissecting. At the end of lab, review together your major findings. Expect to complete details and conduct intensive reviews during non-scheduled times. The laboratory is typically open when there are no conflicts with other lectures or labs and from 5:00 - 10:00 PM weekdays and 9:00 - 5:00 on weekends. During after hours, laboratory guards are on duty in Room 121 to oversee the laboratory; they do not provide instruction.
LABORATORY PARTNERS

Laboratory partners are randomly assigned so the odds are you will not be paired with someone you know. The delivery of health care depends on teamwork. Gross anatomy laboratory will provide you with an opportunity to develop your team-work skills. Just as in the clinics, differences in style and approach will have to be worked out through effective communication. Work as a team by dividing tasks. Slow times, (remove adipose tissue or when space constraints limit dissection to one person), need not be down times. The non-dissector can conduct reviews, conduct verbal quizzes or read the dissection instructions.

As a physician you will be obligated to provide equal care to all patients. You must be able to relate in a constructive and effective manner to any person who comes under your care regardless of your personal feelings about them. You can begin developing this capacity at the dissecting table. You are expected to develop an effective working relationship with your lab partners. Requests for a change in table assignment are granted only in exceptional circumstances.

The gross anatomy laboratory is virtually the only time in your medical education that your class will be together. Take this opportunity to make friends. Your professional development will be enhanced by sharing experiences with colleagues; they are sources of information, intellectual stimulation and emotional support. The medical school experience is too intense and demanding to “go it alone.”

You will be given your table assignment and meet your dissection partners on the first day of class.

DISSECTION SKILLS

Before taking up your instruments, you should have reviewed the dissection and:

- Have a clear mental picture of the region to be dissected.
- Have specific objectives.
- Be aware of key structures that can be inadvertently lost or damaged.
- As in surgery, don’t cut what you can’t see.

Your primary instruments for dissection will be scalpel, forceps, scissors, probe and fingers. A video will be shown prior to the first laboratory demonstrating basic dissection techniques. Information is also provided in your dissection guide and your instructors can demonstrate methods. Treat scalpel blades with care. Attach and remove blades from the handle as illustrated in the video. Place used blades in the Sharps Container. Always use a sharp blade to obtain a good dissection. Use your scalpel sparingly; once beyond the skin, you can separate most structures by “blunt dissection” with your fingers by working along natural planes of separation.
If the space is too small for your fingers, then practice the spreading technique with your scissors: the scissors tip is inserted into a plane of separation and the tips spread to effect separation of tissues. Under no circumstances should you tear tissues, not only does it result in a messy unclear dissection, but it is disrespectful. Similarly, it is disrespectful to stick scalpels or probes in the donor’s body pin-cushion fashion.

Other tools used in dissection include mallets, chisels, saws and bone cutters. These will be found in the drawer of your table. Striker saws (electric autopsy saws) will be issued for removal of calvaria and other special procedures.

**RADIOLOGICAL ANATOMY SESSIONS**

The objective of the Radiological Anatomy Group Sessions is to familiarize you with the common radiological modalities encountered in the clinics (x-rays, MRI, CT, etc.), to learn to relate anatomical knowledge gained by dissection to the interpretation of radiological images, and to introduce images as a tool to study anatomical relationships. There are Radiological Anatomy Sessions in all Units. Sessions meet in Jaffar Auditorium as posted in your class schedule. Identification keys are included in Blackboard and in Room 107. You are expected to know all the structures indicated. The same images presented in the sessions will also be on view in Room 107 and are also available on Blackboard. You will see these, and similar images, on practical examinations. Written and practical examinations may include questions regarding structures not included in the identification keys.

**NERVE CONFERENCE**

The objective of the Nerve Conference is to provide you with an opportunity to apply your recently acquired knowledge of the anatomy of the brachial plexus in diagnosing nerve lesions of the upper limb and to develop skills in interviewing patients. You will take a brief history and examine patients with actual nerve injuries. Start developing your professionalism by being on time, having clean hands and fingernails and a clean lab coat. Be courteous and thank the patient for their time at the end of examination. The patients are volunteers and are taking time to participate in the conference to advance your medical education. Prior to meeting the patients, there will be a lecture on the basic principles of conducting a neurological examination. After the conference, surgeons will provide the correct diagnosis and discuss each case. The Nerve Conference is held in the Mazurek Commons; schedules will be posted.

**SKULL AND EAR SELF STUDY**

The objective of these interactive self-study materials is to review the anatomy of the skull and ear. Both skull and ear images can be accessed through Blackboard. Lists of structures to be learned are provided in your lecture notes. This information may be tested in both written and practical examinations.

**FACULTY**

Faculty teaching in the entire course includes Drs. Bagchi, Ettinger, Goebel, Ireland, Maisel, Peduzzi-Nelson, Walker and Wood. This core faculty is augmented by additional staff teaching in one laboratory and generally do not provide instruction in adjacent labs. Instructors are available during regular

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laboratory hours to answer your questions and to provide information and advice concerning your dissection. If you require additional assistance, e-mail an instructor with your question, make an appointment to see an instructor or consult with the Year I Counselor for availability of tutors. You need not wait for instructors to come to your table; feel free to call them over. Have your questions well thought out in advance so as to not monopolize faculty time.

VISITING SURGEONS AND RESIDENTS

From time to time, surgeons and residents will visit the laboratory to share their knowledge of applied anatomy and clinical experience with you. Feel free to invite them to your table for discussion.

PRACTICAL EXAMINATIONS

The logistics of the practical examinations will be explained prior to the first examination. Practical examination questions are generally either “identification” or “thought” in format. In identification questions you are required to name the tagged structure; in thought questions you are required to answer some question regarding the tagged structure. You have approximately 60 seconds in which to examine the tagged structure. Tags may be attached to dissections, bones, prosections, radiographic images, cross section images, anatomical models or other appropriate examples. Unless indicated otherwise, the structure to be identified is at the end of an arrow or a string attached to the clamp (not the clamp itself). Only normal, representative examples are used for questions. SPECIMENS MAY NOT BE TOUCHED. Specimens are never purposely placed in unusual positions; however, it is sometimes necessary in order to provide the best view. Always check the orientation of the specimen before answering the question. If you have a question regarding a tag, call the nearest instructor.

Prior to entering the laboratory you will be given an examination answer sheet. Place your name and ID number where indicated. Upon entering the lab, you will be given a copy of the examination; print your name in the upper right hand corner of the first page. You may make notes, diagrams, etc. on the exam but it must be returned at the end of the examination. Only answers entered on the answer sheet will be counted.

Upon entering the laboratory go to the question number indicated on your answer sheet. If “RS” appears go to any vacant rest stop (A chair labeled “Rest Stop”). Await instructions. A series of tones will indicate when to move to the next position (question or rest stop). You are not allowed to return to a question. Use your time at each rest stop to read questions in advance, or attempt to determine the best answers to previously unanswered questions.
It is your responsibility to bring two or more sharpened No. 2 pencils, and an opaque clip board. A lab coat and rubber gloves are suggested. Wear comfortable shoes and visit the rest room prior to the examination. Books and notes are not allowed. Talking or communicating with other students is not allowed. Bathroom breaks are permitted only in cases of extreme urgency; time lost out of lab will cost you points.

Announcements and instructions will be provided before the examination. The faculty and their lecture handouts will be used as the ultimate sources of information in adjudication of disputes regarding acceptable answers on practical examinations.

**COURSE MATERIALS AND STUDY AIDS**

Study aids are located in the laboratory, Room 107, or the Shiffman Library (located on the 1st floor of the Mazurek Commons)

**Laboratory**
- Cadavers
- Prosections
- Bones
- Models
- Radiographic Images

**Blackboard**
- Cross sections and keys (electronic version)
- Radiologic images and keys (electronic version)
- Course notes
- Powerpoint presentations
- Streaming lecture videos
- Practice written and practical examinations
- Netter Flash Card Muscle charts
- Net Anatomy
- Ultrasound Training Sessions
- Skull and Ear presentations

**Room 107**
- Cross sections and keys (hard copy version)
- Radiologic images and keys (hard copy version)
- Various reference books and atlases

**Shiffman Library**
- Skulls
- Models
- Acland’s DVD Atlas of Human Anatomy (6 disc set)
  - Also available on Blackboard
- Acland’s Video Atlas of Human Anatomy
  - (2 tapes of upper and lower limb)
- Human Anatomy Videotape Series
(9 tapes of pelvis/perineum and lower limb)
Videotape of upper limb innervation
Videotapes of ACL surgery
Past Examinations (on file at the desk)
A.D.A.M. V.2.3 (Text)
A.D.A.M. V.2.3 CD (Mac) and V.3.06 CD (PC)
Radiological Anatomy V. 4.0 CD (PC and Mac)
Radiographic Anatomy V.1.0 CD (PC)
Cross-sectional Anatomy Tutor CD
The Dissectable Human CD
CardioViewer 3D CD
Anatomy Timesaver (http://guides.lib.wayne.edu/anatomy) (on-line resources, some are free)

Apps
Pocket Body (from the App Store)
Visible Body (from the App Store)

STUDY SKILLS

In order to assimilate a large volume of knowledge in a short period of time you must PREVIEW & REVIEW laboratory assignments and lecture notes. To complete dissections efficiently and on time you must come to laboratory prepared: ie., you must have read over the dissection and looked at the atlas in advance. You must have at least a general idea of what structures you are looking for and where to find them.

Learning styles differ. Organize information to facilitate recall. Among the techniques found useful are:
  Preparing flash cards
  Making simple sketches
  Making outlines/tables
  Drawing diagrams (arteries eg.)
  Making a list of all structures to be dissected
  Using mnemonics
  Teach each other at table side

It is highly recommended that you join a study group.

Your time will be best spent studying the materials related specifically to the course: eg., lecture notes, Dissection Guide (Grant’s), Atlas, textbook (Gray’s), cross sections, bones, and models. Many resources are available on the internet, etc. However, if you are not careful, you spend a lot of time on material that is not “on target” for the course.
SUMMER PROECTORSHIPS

The pro-sections you will be using were prepared by Year II students selected to participate in the Summer Pro-sector Program. Pro-sectors prepare anatomical specimens, set up the gross anatomy laboratories for the incoming class, and prepare instructional materials. Funding comes from the Financial Aid Office; therefore applicants must qualify for the College Work Study Program. Information on the program will be made available during Unit 4. Pro-sectors may elect to be gross anatomy lab guards.

ANATOMICAL WEB SITES

Numerous sites and always changing

DISCIPLINE: GROSS ANATOMY
COURSE CO-DIRECTORS:
MARK IRELAND, Ph.D.
P AUL WALKER, Ph.D.

<table>
<thead>
<tr>
<th>PARTICIPANTS</th>
<th>E-MAIL</th>
<th>OFFICE</th>
<th>TELEPHONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIHIR BAGCHI</td>
<td><a href="mailto:mbagchi@med.wayne.edu">mbagchi@med.wayne.edu</a></td>
<td>8105 Scott Hall</td>
<td>577-1312</td>
</tr>
<tr>
<td>ELIZABETH BERGER</td>
<td><a href="mailto:eberger@med.wayne.edu">eberger@med.wayne.edu</a></td>
<td>8263 Scott Hall</td>
<td>577-0286</td>
</tr>
<tr>
<td>ANNA ETTINGER</td>
<td>not available</td>
<td>527 Scott Hall</td>
<td>577-1037</td>
</tr>
<tr>
<td>DENNIS GOEBEL</td>
<td><a href="mailto:dgoebel@med.wayne.edu">dgoebel@med.wayne.edu</a></td>
<td>9345 Scott Hall</td>
<td>577-8724</td>
</tr>
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HISTOLOGY/CELL BIOLOGY COURSE OBJECTIVES

Goal: The overall goal of the Year 1 Histology/Cell Biology Course is to engage the medical student in learning the key concepts related to recognizing the normal appearance of human cells, tissues, and organs, as well as relating the structure and histological organization of the cells, tissues, and organs to their functional role in the human body. The systematic application of this knowledge will be applied to pathological examples in Year II.

Overall Course Objectives: At the end of the Histology/Cell Biology Course, the students will:

- Demonstrate the ability to identify the cells, tissues, and organs of the human body at the light microscopic level.
- Demonstrate the ability to identify significant fine structural features of cells or tissues as viewed with transmission electron microscopy, scanning electron microscopy, freeze-fracture electron microscopy, immunocytochemistry, or other selected research techniques.
- Demonstrate the ability to correlate the specialized or unique histological structural features at the light and electron microscopic levels with their normal function in the human body.

Specific Course Objectives: At the end of the Histology/Cell Biology Course, the students will be able to:

1. Define the morphology and function of cellular organelles and their components.
2. Define the morphology and function of the components of epithelial tissue and glands.
3. Define the morphology and function of connective tissue proper and cartilage.
4. Define the morphological organization and formation of bone.
5. Define the morphology and function of blood components.
6. Define the morphology and function of hemopoietic cells and the components of bone marrow.
7. Define the morphology and function of the components of nervous tissue.
8. Distinguish among the types of muscle and define the morphology and function of the components of muscle tissue.
9. Define the morphology and function of blood vessels (vascular system).
10. Define the morphology and function of the components of the integument.
11. Define the morphology and function of the components of the oral cavity.
12. Define the morphology and function of endocrine glands.
13. Define the morphology and function of the components of the eye.
14. Define the morphology and function of the components of the inner ear.
15. Define the morphology and function of the components of the lymphatic system.
16. Define the morphology and function of the components of the respiratory system.
17. Define the morphology and function of the components of the heart.
18. Define the morphology and function of the components of the upper alimentary canal: the esophagus and stomach.
19. Define the morphology and function of the components of the lower alimentary canal: the intestines and anal canal.
20. Define the morphology and function of the organs associated with the digestive system: the liver, gallbladder, and pancreas.
21. Define the morphology and function of the components of the urinary system.
22. Define the morphology and function of the components of the male reproductive system.
23. Define the morphology and function of the components of the female reproductive system.

**Detailed Learning Objectives:** accompany each lecture

**Methods:** Material will be presented in lecture and laboratory format to highlight the normal structural and functional relationships in particular cells, tissues, and organs. Laboratory sessions will be a mix of faculty-led small group virtual microscopy image reviews and interactive virtual microscopy labs, in which students work independently in small groups with faculty assistance. The interactive labs will foster teamwork and student-to-student interactions. Knowledge will be assessed using verbal and image-based multiple-choice examinations.

**DISCIPLINE:** HISTOLOGY/CELL BIOLOGY  
**COURSE DIRECTOR:** ROD D. BRAUN  
8/03/2015 – 11/10/2015

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* Lab instructor only
EMBRYOLOGY COURSE OBJECTIVES

Goal: The overall goal of the Year 1 Embryology Course is to engage the medical student in learning the key concepts related to the development of human cells, tissues, and organs.

Overall Course Objectives: At the end of the Embryology Course, the students will:

- Demonstrate knowledge of the sequence of development of the human body from fertilization through the establishment of the major organ systems and continuing through birth to adulthood.
- Demonstrate understanding of the contribution of various germ layers and precursors to definitive structures, including the role of cell interactions, induction, growth, and differentiation.
- Be able to correlate developmental events with the structural organization of the human body as observed in the study of gross anatomy and histology.
- Describe the origin of commonly occurring malformations in terms of abnormal developmental processes.

Specific Course Objectives: At the end of the Embryology Course, the students will be able to:

1. Define basic terms in embryology and describe the stages of embryological development.
2. Describe the process of fertilization.
3. Describe the bilaminar embryo and the embryological changes that occur during week 2 of development.
4. Describe the trilaminar embryo and the embryological changes that occur during week 3 of development.
5. Describe neurulation and embryo folding and the embryological changes that occur during weeks 4-8 of development.
6. Describe the process of placentation.
7. Describe the development of the pharyngeal apparatus and face.
8. Describe the development of the skeletal system.
9. Describe the development of the eye, ear, and the olfactory mucosa.
10. Describe the associated dysmorphology and dysfunction, diagnosis, and prevention of Fetal Alcohol Spectrum Disorders.
11. Describe the development of the respiratory system.
12. Describe the development of the cardiovascular system.
13. Describe the development of the gastrointestinal system.
14. Describe the development of the urogenital system.

Detailed Learning Objectives: accompany each lecture

Methods: Material will be presented in lecture format with various clinical examples and presentations to highlight the normal cell, tissue, and organ development. Knowledge will be assessed using verbal and diagram-based multiple-choice examinations.
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CLINICAL MEDICINE 1

Key Personnel/Contact Information:

Course Director          Dr. Joel Appel  jappel@med.wayne.edu  313.577.9329
Course Coordinator       Gini Gilchrist  ggilchri@med.wayne.edu  313.577.9329
Clinical Skills          Simone Brennan  skbrenna@med.wayne.edu  313.577.1024

Clinical Medicine Course offices are located at 225 Mazurek Education Commons, in the Kado Clinical Skills Center (Suite 206).

Introduction:

Clinical Medicine 1 differs from most other courses taught in the first year because it is case-based and includes physician-led small group sessions. It is an interdisciplinary course, incorporating the fields of Family Medicine, Internal Medicine, Pediatrics, Obstetrics and Gynecology, and Emergency Medicine, and includes both University faculty and community-based physicians. The intent of this course is to introduce students to the important components of the practice of medicine, including taking an organized medical history while demonstrating appropriate medical interviewing skills, learning the basics of the medical record, and modeling professional behaviors.

By the end of CM1, students will be able to:
1. Demonstrate taking a focused and organized medical interview
2. Demonstrate appropriate skills in analytical reasoning
3. Demonstrate knowledge of the organization of the medical record and demonstrate basic recording skills including writing a complete SOAP note
4. Describe the Patient-Centered Clinical Method
5. Demonstrate professional behaviors
6. Describe the basic tenets of medical ethics and apply them to case scenarios
7. Demonstrate knowledge of key components of clinical prevention and population health
8. Demonstrate familiarity with current topics in clinical practice, including complementary and alternative medicine, environmental and occupational exposures, geriatrics, human sexuality, interpersonal violence, and substance use.

Overview:

Clinical Medicine 1 is the first part of a four-year longitudinal curriculum, and consists of 7 multi-session units in Year 1. It includes case-based small group sessions (9-11 students with one physician instructor), large group lectures, panels and web-based instruction, as well as site visits to the office of a board-certified physician.

In the small group setting, students will learn to communicate effectively with patients, learn the proper way to obtain an organized and concise medical history, and demonstrate professional behaviors including preparation, participation, punctuality, and respect for team members. The SG sessions incorporate simulated patient cases involving members of the fictional “Samples” family. Attendance is required. Small Groups meet at the clinical sites of the faculty instructors, which are located throughout
metro Detroit. Students are responsible for coordinating transportation to their respective sites on 15 Thursday mornings from October through April. Sites will be determined through a fair lottery run in September, and small group preceptor information and site details will be distributed via Blackboard.

Large group sessions include instruction on topics essential to the practice of clinical medicine, including History Taking and the Medical Record, Clinical Prevention and Population Health, Complementary and Alternative Medicine, and Human Sexuality. Attendance is strongly recommended. Large group sessions take place in the Jaffar Auditorium of Scott Hall.

Additional content will be presented as web-based instruction and self-study assignments. Completion of self-study assignments and supplemental readings are required, and will be examined during the unit quizzes. These materials can be accessed via Blackboard.

**Course Requirements:**

Timeliness and attendance are considered professionalism issues, since these behaviors are essential to good patient care in the practice of medicine. Since a major goal of this course is demonstrating professional behavior, attendance is a serious concern. Attendance is REQUIRED at orientation, all small group sessions, and large group PANEL presentations. Any absences must be reported immediately to the course director, course coordinator, and small group instructor. Attendance is monitored closely, and absences from required sessions may result in disciplinary action or course failure, at the discretion of the Course Director. Similarly, tardy arrival may be counted as absence, at the discretion of the small group instructor.

There are 7 required Blackboard quizzes administered throughout the academic year. These are listed in the Outlook calendar, and email reminders are provided. The quizzes will be open on Blackboard 72 hours prior to each small group session on Thursday morning. Students must take each quiz with appropriate documentation or their final grade will be incomplete.

The year-end OSCE is administered in May, and students must have a minimum score of 75% on this exam to pass the course.

Students must also receive satisfactory feedback on the small group instructor midpoint and year end evaluations.

**Evaluation, Feedback, and Grading:**

Clinical Medicine is evaluated differently than other courses in Year 1 and 2 that primarily rely on test results for grading. CM evaluation is more similar to Years 3 and 4 where subjective evaluation of your performance by an experienced clinician will determine a significant portion of your final grade.

Grading for Clinical Medicine 1 is pass/fail, with a minimum 75% pass rate. Students must score a cumulative 75% on the Blackboard quizzes, 75% on the year-end OSCE, and have satisfactory small group instructor feedback on the midpoint and year-end evaluations. Formative feedback for the OSCE will be provided in the fall of Clinical Medicine 2 during the OSCE video review session. Students must exhibit professional conduct throughout the small group and site visit experiences, and attend all required sessions in order to pass the course.
Grade Appeal Process:

All grade appeals should be directed to the Course Director. Students should not contact their small group instructor to discuss grade appeals.

Required/Recommended Equipment, Textbooks:

Recommended equipment: Stethoscope (good quality – comparable to Littman Cardio 3), Oto-ophthalmoscope kit, tuning forks – 128 Hz and 512Hz, reflex hammer, penlight, sphygmomanometer (BP cuff)

Required reading materials:
- Course syllabus, additional lecturer handouts
- Blackboard assignments

Recommended textbooks:

Recommended websites:
- http://www.usersguides.org/ (JAMA or “Users Guide textbook supported online access)
- The Institute for Healthcare Improvement, a patient care quality and safety resource: http://www.ihi.org*
- You may also find a medical dictionary such as Stedman’s useful for this course, as well as for other courses during the first two years.
PHYSIOLOGY COURSE OBJECTIVES

Physiology is a study of normal cellular, tissue and organ function, multiple aspects of which require core knowledge of biochemistry and anatomy. All of the knowledge presented in the physiology curriculum is of fundamental importance to your understanding and dealings with human disease. Your comprehension of physiology will play an important role in your ability to understand and recognize pathophysiology.

OBJECTIVES
At the end of this course, you are expected to:

1. Describe basic mechanisms of normal cell, tissue, and organ function in the human body.
2. Know the basic facts, concepts and scientific principles of physiology that are required for the practice of medicine.
3. Apply knowledge of fundamental mechanisms of organ function to the understanding of disease processes and to the selection of therapies.
4. Recognize the relationship between the basic facts and concepts of physiology and the function of the whole organism.
5. Demonstrate the rudiments of skills in clinical observation and measurement and the application of these findings towards making a diagnosis.

Material is presented in lecture format, four laboratories and three small-group case based learning endocrine conferences. Attendance for both the laboratories and conferences is mandatory.

For the laboratories half of the class will be assigned to a morning session; half to an afternoon session. Students will be assigned to one of four rooms and will be divided into the same groups of 6 used for the Gross Anatomy labs to promote teamwork and peer-to-peer instruction. Faculty will act as facilitators during the lab. Muscle, ECG, and cardiovascular labs will be held in Unit 1; a pulmonary lab in Unit 2. Prior to the labs, students will be required to take a short pre-lab quiz and to view a preview of the laboratory. Time will be provided in the daily schedule prior to the labs for these exercises. During the labs students will first collect and analyze physiological data on student volunteers. Students will then work through a patient case study related to the topics covered in the lectures and labs.

Students will be assigned to groups of 7-8 for the Unit 3 case-based learning endocrine conferences. Six groups will be assigned to a specific room where the conferences will be held; an instructor in each room will facilitate student-led discussions. The conferences are scheduled such that pertinent material for each case study will have been presented in lecture. Two case studies will be discussed during each session for a total of 6 cases. Student groups within each room will be assigned to lead the discussion for a specific case. Time is also included in the schedule prior to each conference for the student groups to meet to go over the cases and formulate answers to specific questions.

To be judged successful in the course, students must pass written multiple-choice exams with 75% accuracy.
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PHYSIOLOGY
Introduction

The course is divided into 3 Units, each of which concludes with a 90 question exam. At the conclusion of Unit 3, students will take the Physiology NBME comprehensive exam. The final grade = sum of three grades, plus 10% of final grade will be from comprehensive exam.

Unit 1
November 23 – December 18
Exam I: December 18

1. **Cell Physiology (Yingst)**
   - Movement of molecules across cell membranes
   - Electrical properties of cell membranes
   - How neurons communicate with other nerve cells and with muscles

2. **Muscle Physiology (Cala)**
   - How the three muscle types contract
   - and develop force

3. **Cardiovascular Physiology (Lasley and O’Leary)**
   - Electrical properties of cardiac muscle cells and cardiac conduction
   - Cardiac muscle contraction and the development of blood pressure
   - Circulation of the blood and control of blood pressure

4. **Blood Physiology (Callaghan)**
   - Plasma and cellular components of blood
   - Blood coagulation and fibrinolysis

EXAMINATION QUESTIONS

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<th>Number of Questions</th>
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Unit 2
January 4 – January 26
Exam 2: January 26

1. **Respiratory Physiology (Mateika)**
   - Lung volumes
   - Pulmonary circulation
   - How oxygen and carbon dioxide are carried in the blood

2. **Kidney Physiology and Acid Base Balance (Rossi)**
   - Renal function: plasma filtration and tubular reabsorption and secretion
   - Renal respiratory components
   - Acidosis and alkalosis

3. **Gastrointestinal Physiology (DiCarlo)**
   - Secretion
   - Digestion
   - Absorption
   - Motility

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Unit 3
January 27 – February 18
Exam 3: February 18
Physiology Comprehensive NBME Exam: February 19

1. **Endocrinology and Neuroendocrinology (Leff, Jena, Rydstedt)**
   - Pituitary
   - Hypothalamus
   - Thyroid, parathyroid
   - Pituitary clinical correlation

2. **Control of Metabolism (Leff, York)**
   - Adrenal glands
   - Pancreas
   - Obesity

3. **Reproductive Physiology (Pancharatnam, Drewlo, Gomez-Lopez)**
   - Puberty
Male and female reproductive systems
Pregnancy

4. Integrative Physiology (Mueller, Rossi)
   Energy balance
   Diabetes
   Congestive heart failure and hypertension

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YEAR I BIOCHEMISTRY AND MOLECULAR BIOLOGY OBJECTIVES

The two principal objectives of this course are to provide every student with a solid background in basic, medically relevant biochemistry, in preparation for his/her future medical training and the best possible preparation for the USMLE Step 1 Examination. The latter is based on the curriculum outline shown below.

Structure and function of proteins
- principles of protein structure and folding
- enzymes: kinetics, reaction mechanisms
- structural and regulatory proteins: ligand binding, self-assembly regulatory properties

Energy metabolism (metabolic sequences and regulation) and disorders
- generation of energy from carbohydrates, fatty acids, and essential amino acids; glycolysis, pentose phosphate pathway, tricarboxylic acid cycle, ketogenesis, electron transport and oxidative phosphorylation, glycogenolysis
- storage of energy: gluconeogenesis, glycogenesis, fatty acid and triglyceride synthesis
- thermodynamics: free energy, chemical equilibria and group transfer potential, energetics of ATP and other high-energy compounds

Metabolic pathways of small molecules and associated diseases
- biosynthesis and degradation of amino acids (eg, homocystinuria) biosynthesis and degradation of purine and pyrimidine nucleotides (eg, gout, Lesch-Nyhan syndrome).
- biosynthesis and degradation of lipids (eg, dyslipidemias, carnitine deficiency, adrenogenital syndromes) biosynthesis and degradation of porphyrins.
- biosynthesis and degradation of other macromolecules and associated abnormalities, complex carbohydrates (eg, lysosomal storage disease), glycoproteins, and proteoglycans.

Gene expression: DNA structure, replication, and exchange
- DNA structure: single- and double-stranded DNA, stabilizing forces, supercoiling analysis of DNA: sequencing, restriction analysis, PCR amplification, hybridization
- DNA replication, mutation, repair, degradation, and inactivation
- gene structure and organization; chromosomes; centromere, telomere recombination, insertion sequences, transposons

Gene expression: transcription (including defects)
- transcription of DNA into RNA, enzymatic reactions, RNA, RNA degradation
- regulation: cis-regulatory elements, transcription factors, enhancers, promoters, silencers, repressants, splicing
Gene expression: translation (including defects)
- the genetic code
- structure and function of tRNA
- structure and function of ribosomes
- protein synthesis
- regulation of translation
- post-translational modifications (phosphorylation, addition of CHO units)
- protein degradation

Physiological biochemistry (including defects)
- Glucose homeostasis and Diabetes
- pH, water, and electrolyte regulation.
- Heme metabolism
- Cell cycle and cancer
- Aging
- Protein folding disorders
- HIV/AIDS

Examinations
Each of the three units of the BMB course will have a 2hr examination, with the number of questions determined according to the following formula: 3 questions per lecture

Retake Examination
The retake examination will consist of questions selected evenly from the examinations for each of the three units of the BMB course.

**DISCIPLINE: BIOCHEMISTRY and MOLECULAR BIOLOGY**
**COURSE DIRECTOR: SHARON ACKERMAN**

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Objectives:

At the end of the Clinical Nutrition course, students will:

- Know terminology commonly used in clinical nutrition.
- Understand how the nutrients in food are made available to the body through digestion, absorption and metabolism.
- Identify the specific functions for each of the nutrients, and apply the functional role of each nutrient to diseases involving both inadequate and excessive nutrient intake.
- Know the techniques and methods used in nutritional assessment.
- Be familiar with nutrition throughout the lifespan.
- Understand the role of nutrition in the prevention and management of chronic diseases.
- Understand methods of nutrition support, including enteral and parenteral nutrition.

Material will be presented in lecture format and in patient panels that includes topics of clinical interest. To judge course competency, students must pass a written examination with a minimum score of 75%.

**DISCIPLINE: CLINICAL NUTRITION**
**COURSE DIRECTOR: TONIA REINHARD & MARY WIDTH**

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DISCIPLINE: NEUROSCIENCE
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NEUROSCIENCE COURSE OBJECTIVES

The Neuroscience course provides a series of lectures and laboratories on the anatomical, physiological, biochemical and behavioral foundations of Neuroscience upon which the student will build clinical knowledge and skills in Pathology, Neurology and Psychiatry in subsequent years. There are two main objectives in the course: First that the student comprehends the neurobiology of nervous tissue, and secondly understands the organization of the major centers and nerve pathways in the human central nervous system.

The Neuroscience course is divided into four subject areas: 1) morphological/functional correlates of neuronal activity, 2) sensory systems, 3) motor and sensorimotor integrating systems and 4) forebrain systems. For each area, the student is expected to correlate specific neuroanatomical, neurophysiological and biochemical parameters in order to understand how a given system operates and how that system integrates with the rest of the nervous system. To accomplish this goal, it is necessary for the student to become proficient with certain concepts while mastering the details supported by those concepts. The first subject area includes the anatomical, functional and biochemical organization of the neuron. Using the single neuron as a model, the student relates basic anatomical and functional properties to more complex neural circuits concerned with sensory and motor processing. In the former case, the student determines how systems of related neurons maintain a constant flow of externally and internally derived information to higher brain centers. For the motor systems, the student correlates the various supraspinal motor centers with specific somatic and visceral motor activity and sensory processing. The final subject heading, the forebrain system, introduces the student to areas of the brain dealing with mentation and instinctual behavior. The student is expected to know what types of intellectual and behavioral activities are most common in the normal individual and what types of neural integration can most likely explain these functions.

Clinical material has been included in the course. This is accomplished by a series of lectures by invited clinical faculty, their lectures serving as an introduction to clinical Neurology and Neurosurgery, as well as to highlight some of the clinical aspects of Neuroscience. Patient panel are also added to give the student a first-hand perspective of the effects of spinal cord injury or movement disorders in the patient population.

At the end of the Neuroscience course the student will:

1. Demonstrate fundamental knowledge of the structure, function and chemical organization of neurons and supporting cells in the central nervous system.

2. Understand the tridimensional organization of centers and nerve pathways that bear significant clinical relevance.

3. Understand the anatomical relationships between nerve centers and pathways at different brain levels, which will be useful to identify clinical central nervous systems disorders.

4. Demonstrate ability to correlate anatomical features from histological preparations and computerized images (MRIs, CT-scans).
COMPETENCY

Students demonstrate competency by their performance in two (Neuro I and II) exams which are equally weighted in determining their final grade. Each exam consists of 100 MC/SA questions where both lecture and image-based laboratory components are represented. However whereas 20% (straight identification) of the questions in Neuro I come from the Lab portion of the course, 30% (problem solving) lab questions are included in Neuro II. Students are also tested on context of clinical correlation material presented in lecture.

NEUROSCIENCE LABORATORY

The laboratory component of the course comprises eleven laboratory exercises which are conducted in the Mazurek Education Commons (MEC) Labs. MEC (double) Labs are manned by seven faculty (Drs. Rafols, Goebel, Goshgarian, Ichinose, Pan, Peduzzi and Walker), with an approximate ratio of 50 students per instructor. While the context of each lab is primarily designed around the CNS functional circuits presented in lecture, the subject matter presented is broad and includes presentation of images (both histologic and MRIs) pertinent to the circuits, discussion of anatomically focal lesions and neurologic signs/symptoms derived from the same lesions. Discussion and student participation in the labs are encouraged. A Laboratory Manual (designed by Drs. Peduzzi and Rafols) with descriptive text and image sequence ensures uniformity of instruction delivered by instructors in the labs. Attendance to the laboratories is required.

LABORATORY OBJECTIVES/GUIDELINES

Each of the eleven laboratory exercises is self-contained in that its context can be learned independently from the others. With the exception of the first (Lab 1, “Blood Supply, Ventricles/CSF, and Topography of the Spinal Cord and Brainstem”), each exercise focuses on descriptive anatomical relationships of CNS centers and pathways underlying well-established functional circuits (e.g., somatosensory, auditory, vestibular, visual, etc.). This focus has dual objectives: 1) to reinforce didactic material previously presented in lecture, and 2) gain a tridimensional understanding on the organization of CNS centers and pathways in relation to images of presented cross-sectional levels. In register with the second objective is the presentation of forty-six anatomically-restricted (i.e., focal) lesions that recapitulate the structure/function of CNS structures. While contrived, such lesions often mimic real clinical experience. In addition the lesions are helpful to illustrate to, and discuss with the student, what clinical signs/symptoms may result from either direct destruction of a given center or interruption of its related pathways. The students are encouraged to ask questions throughout the exercise.

The Manual is intended to be used together with the “Atlas of the Human Brain” (also part of the course package provided by Conjoint Teaching Services), the images of which are to be consulted with instructors. Images are projected in the assigned sequence found in the Manual. Each instructor first calls an image number (designated in the Manual as Atlas Fig. #, left column), followed by a descriptive text (Description, center column) which dovetails with the structures (List of Terms, right column) that need to be learned for that particular image. For each presented image, lab instructors have been encouraged to neither deviate from the assigned sequence of terms, nor add terms unlisted for the image in question. In fact, for any image, provided the instructor adheres to the Description text, each and all of the listed terms should be easily covered.
For approximately the first half of the exercises, special emphasis will be made by the instructor in identifying a set of structures that unequivocally characterizes a particular cross-sectional level of the brainstem and spinal cord (e.g., rostral midbrain is identified by the presence of the oculomotor nuclear complex and the superior colliculus). This sets the stage for two further objectives met later during the Course: 1) identification of a lesion’s level based on signs/symptoms from damage to structures found only at that level, and 2) correlation of a given structure in both histological and MRI images at comparable brain levels. This last objective is essential in learning to identify CNS structures in CT scans and MRIs, and therefore deemed important in preparing the student for a successful clinical career.

(Sample of) NEUROSCIENCE LABORATORY SCHEDULE FOR 2014

<table>
<thead>
<tr>
<th>LAB</th>
<th>DAY</th>
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<th>TIME</th>
<th>TITLE</th>
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<tbody>
<tr>
<td>1</td>
<td>Friday</td>
<td>March 7</td>
<td>9:00AM-12:00 Noon</td>
<td>Blood Supply, Ventricles/CSF, Topography of Spinal Cord and Brainstem.</td>
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<tr>
<td>2</td>
<td>Friday</td>
<td>March 14</td>
<td>9:00AM-12:00 Noon</td>
<td>Spinal Cord &amp; Medulla (X-sections). Review of Somato-Sensory Pathways. Atlas Lesions # 2, 4, 6.</td>
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<tr>
<td>3</td>
<td>Wednesday</td>
<td>March 19</td>
<td>9:00AM-12:00 Noon</td>
<td>Pons &amp; Midbrain (X-sections). Review of Trigeminal Pathways. Atlas Lesion # 32.</td>
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<td>4</td>
<td>Friday</td>
<td>March 21</td>
<td>9:00AM – 12:00 Noon</td>
<td>Auditory &amp; Vestibular Circuits. Vestibulo-Ocular Reflexes. Atlas Lesions # 10, 16, 25.</td>
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<td>5</td>
<td>Wednesday</td>
<td>March 26</td>
<td>9:00AM-12:00 Noon</td>
<td>Visual Pathway. Lesions of Visual Pathway. Visual Reflexes. Atlas Lesions # 21, 30, 31, 37, 43.</td>
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<td>6</td>
<td>Friday</td>
<td>March 28</td>
<td>9:00AM-12:00 Noon</td>
<td>Upper (UMN) and Lower (LMN) Motor Neurons. Atlas Lesions # 1, 3, 7, 9, 14, 15, 17, 18, 19, 22, 27, 34.</td>
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<td>7</td>
<td>Friday</td>
<td>April 11</td>
<td>9:00AM-12:00 Noon</td>
<td>Cerebellum: Afferents/Efferents. Atlas Lesions # 5, 8, 11, 12, 13, 20, 23, 26, 28.</td>
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<td>8</td>
<td>Wednesday</td>
<td>April 16</td>
<td>9:00AM-12:00 Noon</td>
<td>Basal Ganglia: Centers and Pathways. Introduction to Horizontal Sections (optional). Atlas Lesions # 29, 33.</td>
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<td>9</td>
<td>Friday</td>
<td>April 18</td>
<td>9:00AM-12:00 Noon</td>
<td>Cerebral Cortex: Topography and Functional Areas. Atlas Lesions # 39, 40, 41, 42, 44, 45, 46.</td>
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<td>10</td>
<td>Wednesday</td>
<td>April 23</td>
<td>9:00AM-12:00 Noon</td>
<td><strong>Chemosenses: Taste and Olfactory Circuits. Correlation of MRIs/Histological Sections (new).</strong></td>
<td>61</td>
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<td>11</td>
<td>Friday</td>
<td>April 25</td>
<td>9:00AM-12:00 Noon</td>
<td><strong>Limbic System and Hypothalamus. Atlas Lesions # 24, 35, 36, 38.</strong></td>
<td>68</td>
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<tr>
<td>12</td>
<td>Wednesday</td>
<td>April 30</td>
<td>9:00AM-12:00 Noon</td>
<td><strong>MRIs. Final Lab Review. Practice Practical Exam. Dr. Peduzzi-Nelson (in Jaffar Auditorium)</strong></td>
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MEDICAL GENETICS AND GENOMICS COURSE OBJECTIVES

You are at the forefront of a new model of medicine. The future paradigm will be preventative in nature instead of curative. This will be accomplished by utilizing one’s genome to guide the physician. Precision medicine is in its infancy, but won’t be there for long. The field of human genetics (the study of biological variation in humans) is spurring the field of medical genetics (the study of biological variation in humans as it relates to health and disease). Advancement in molecular technology is the driving force behind this new form of medicine, which has applications in all disciplines. It is crucial that every clinician obtain knowledge of genetics and genomics as well as guidance in staying on top of the latest technology in this field.

The purpose of this course is to lay the genetics/genomics foundation for you to continue to learn and integrate basic genetic/genomic principles and the tools of molecular genetics into your clinical practice. It will provide you with key concepts in genetics that are necessary for all clinicians. Whenever possible, these concepts will be demonstrated using clinical cases. With this form of teaching, we hope to assist you in seeing the importance of genetics/genomics in your future practice.

Physicians need to be cognizant of the social, legal, and ethical issues that come with discoveries in medical genetics and genomics. These issues will be touched upon throughout the course and open discussion during small groups will be encouraged.

The course contains 21 lectures, one self-study, five small group Team-Based Learning (TBL) sessions with team quizzes, two patient panels, a clinic day, a class review, and a final exam. The TBL’s conducted during the small group sessions are designed to enable you to apply in a clinically relevant way information presented in the lectures. These small group sessions are an essential component of the course and will be led by genetics professionals.

At the end of this introductory medical genetics and genomics course, you should understand the following broad objectives based upon recommendations set forth by the Association of Professors of Human and Medical Genetics and the National Coalition for Health Professional Education in Genetics:

- Identify how the organization of the genome and regulation of gene expression, environment, and behavior are related to medical genetic diagnoses
- Recognize general genetics terminology
- Recognize the genetics professionals who may be consulted or act as referral sources for patients at risk for genetic disease
- Compare and contrast how genetic variation is related to normal phenotype and disease phenotype, identifying common genetic conditions
- Identify principles of inheritance patterns through constructing and interpretation of pedigrees obtained from family and medical histories and calculate recurrence risks for families based on inheritance patterns and/or the Hardy Weinberg principle
- Evaluate the clinical, ethical, legal, and social implications for genetic diagnosis, family health, prediction, and precision medicine
- Distinguish when genetic testing/genetic screening/population screening is employed, which testing modality to order, and how to interpret the findings of such tests
- Identify treatment/interventions for genetic conditions in patients and their families
Genetics will not be like any of your other first year courses. It is more clinically based and will act as an introduction to your Year 2 courses. We do not expect you to memorize every detail of every disease, instead we would like you to understand the main concepts and how they apply to clinical practice. The learning objectives listed before each lecture in your class notes will help you to know what areas to focus on during your study. The exam and quizzes are based off of these learning objectives. All of the information should be in the notes, but if there is something new in the lecture and it fits one of the learning objectives then you should know it.

**DISCIPLINE: GENETICS**

**COURSE DIRECTORS: Gerald Feldman, MD, PhD & Michelle Cichon, MS CGC**

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Translational Medicine, Evidence Based Practice

The core concept of Translational Medicine is to maximize the benefits of science and research to improve the health of Americans. This includes a synthesis of basic science, clinical science and social science.

This fundamental concept was described by Sackett, Haynes, et al in Clinical Epidemiology: a basic science for clinical medicine, Second Edition, Little Brown and Company, Boston, 1991. By applying the label A Basic Science for Clinical Medicine, Sacket, Haynes, et al demonstrate how to use research performed on a population and apply it to individual patient care. Loosely described and practiced in a multitude of ways, this has been referred to as “Evidence-based medicine.” Although their book was published a decade ago, it foreshadowed both the NIH’s concern to ground clinical practice of medicine in the basic sciences, but also to acknowledge the environment or context of care.

The Translational Medicine paradigm described by the National Institute of Health’s Translational Research Roadmap has been critiqued for stopping short of achieving the stated goal of improved health because “…super-structural factors like society, economy and culture play a determinant role in disease recognition, production and embodiment; [and] the medical encounter or relationship [is] recognized as a preferred site for the production of meaning about health and illness.”¹ Thus, Translational Medicine can be viewed as a series of interrelated “social practices” that begins with basic science research, continues with clinical research, and extends through the clinical encounter into the world in which people make decisions pertaining to their health.

The purpose of the Translational Medicine, Evidence-based Practice Course is to highlight the interconnectedness of all of these activities and to help medical students gain an appreciation of how the doctor-patient relationship is affected by both the construction of medical knowledge as well as context of medical care. Translation Medicine and Evidence Based Practice emphasize that both perspectives affect the health of the patient. This is a longitudinal course with some unique content, but depends heavily upon making relationships between differing types of knowledge explicit.

The goal of this course is to introduce the concepts of Translation Medicine as defined by the NIH; teach basic research design, threats to validity, and analysis; teach and practice the basic skills of Clinical Epidemiology; and help students situate themselves within this network of social practices to be effective clinicians.

Learning Objectives for Longitudinal Curriculum:

Knowledge
1. Demonstrate an understanding of the ethics involved in subscribing to the principles of good clinical practice in research with human participants
2. Understand the importance of the scientific method to determine causation in health and sickness
3. Explore the “meaning response” (placebo) and its role in health and sickness
4. Possession of a working knowledge of seminal clinical research findings and their patient care applications

Skills
1. Demonstrate the ability to assess and critique research as it is reported in major medical journals, based on how data are derived
2. The ability to translate current clinical research into lay language for patients
3. The ability to assess on-line medical information and to assist patients and their families with these tools
4. The ability to highlight important clinical research questions, stemming from a presented case or patient interaction

Attitudes
1. Articulate sensitivity and awareness of issues related to potential conflicts of interest
2. An understanding of the need to engage in lifelong learning to stay abreast of relevant scientific advances
3. An appreciation for the role of uncertainty in clinical medicine
4. An appreciation of how the body of medical knowledge is built and advanced

Grading
Translational Medicine is a longitudinal pass/fail course; student assessment is based on a series of reading and BlackBoard assignments. In addition to BlackBoard assignments, second year students will be required to participate in small group discussions with a faculty facilitator. Small group assignments will be distributed by e-mail.

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