## PART B. REQUIRED COURSE FORM

| | |
|---|---|
| **Course title:** | Scientific Principles of Medicine Unit 1: Introduction to Health and Disease |
| **Sponsoring department or unit:** | Medical Education |
| **Name of course director:** | Janet Piskurich, PhD/Nadah Zafar, MD/Kathryn McMahon, PhD/Tanis Hogg, PhD |

***List all organizational units (e.g., physiology department, nursing school, library), including the lead department, with ongoing involvement in the course and the number of instructional staff from each such unit:***

| Organizational Unit | Number of Teaching Staff Involved |
|---|---|
| Medical Education | 16 |
| Family Medicine | 6 |
| Pediatrics | 2 |
| Internal Medicine | 3 |
| Pathology | 1 |
| Emergency Medicine | 1 |

### COURSE OBJECTIVES

***Are there written objectives for the course? (check)***

| Yes | ✓ | No | |
|---|---|---|---|

Specific written learning objectives are provided for each instructional session in this unit. These objectives are available to students electronically through WebCT course management system. A compilation of these objectives are available for on-site inspection. The basic science topics included in this specific unit are listed, by discipline, in the topic appendix at the conclusion of this course description.

***Briefly summarize the objectives/content areas covered in the course.***

Introduction to Health and Disease is a 5 week introductory unit in the two-year longitudinal Scientific Principles of Medicine (SPM) course. The goal of SPM is to provide students foundational knowledge in the basic and clinical sciences organized by organ systems and "clinical presentations" (CPs) illustrating the clinical manifestations, etiology, course, and management of common problems presented to physicians. The CPs associated with this introductory unit include:

1. The Adult Periodic Health Examination
2. The Pediatric Periodic Health Examination
3. Sore Throat
4. Fever
5. Wound

The sequence of the clinical presentations has been structured so that the concepts developed during the study of one topic provide the foundation for subsequent topics. The basic medical science disciplines are interwoven. Basic information is provided for each clinical presentation including its clinical significance and a schematic representation of the relationships of the potential causes. These provide the basis for discussion of each of the underlying basic science principles.

Each clinical presentation includes a set of basic science learning objectives related to the appropriate scientific concepts of anatomy (gross and neuroanatomy, including medical imaging), behavioral science, biochemistry, cell and molecular biology, embryology, genetics, histology, immunology, microbiology, nutrition, pathology, pharmacology and physiology). Discipline experts provide instruction using various teaching methods including lectures, laboratories, and small group discussions. Both basic science and clinical faculty participate in this component of the instructional process.

## Preparation for Teaching

A majority of the instruction in this unit is delivered by faculty members in the department of medical education who participated in the development and planning of the unit. Consequently, they are well aware of the goals and objectives of the unit and how their individual material relates to that presented by other faculty members. Faculty members from the clinical departments who participate in the unit as clinical presentation "scheme presenters" and as facilitators in "Worked Case Example" (WCE) small group sessions are briefed by the unit director(s) regarding the goals and objectives of the session(s) in which they will participate. The unit directors review and give scheme presenters feedback on their particular presentations. WCE facilitators are provided with session materials (power points case material, "process work sheets") and are briefed on the goals and objectives of the given session. Whenever possible, new small group facilitators observe more experienced facilitators to learn about the WCE process.

***Are any of the following involved in the course as lecturers, small group facilitators, and/or laboratory instructors?***

| | Yes | No |
|---|---|---|
| Residents | | ✓ |
| Graduate Students | | ✓ |
| Postdoctoral Fellows | | ✓ |

***If yes, describe how they are informed about the course objectives and prepared for their teaching role.***

Residents, fellows, and graduate students do not participate in the teaching of this unit.

***If the entire course is taught at more than one site (e.g., at geographically separated instructional sites), describe how instructional staff at all sites are oriented to the course objectives and the grading system.***

This course is taught at one site only, the campus of the Paul L. Foster School of Medicine.

| **Course title:** | Scientific Principles of Medicine Unit 1: Introduction to Health and Disease |
|---|---|

## Student Evaluation

***If NBME subject (shelf) examinations are used, give the mean scores for the last three classes:***

Not applicable.

| **Year:** | | | |
|---|---|---|---|
| **Score:** | | | |

***Check all the formats that are used in examinations or other evaluations that students must take in order to pass the course:***

| | | | |
|---|---|---|---|
| ✓ | Multiple-choice, true/false, matching questions | | Laboratory practical items |
| | Fill-in, short answer questions | | Problem-solving written exercises |
| | Essay questions or papers | | Presentations |
| | Oral exams | | Preceptor ratings |
| | OSCE or standardized patient exam | ✓ | Other (describe) Small group tutor assessment |

***Briefly describe any formative assessment activities that occur during the course (practice examinations, quizzes, etc.)***

Is a narrative evaluation of student performance submitted in addition to or as a component of the course grade? (check)

| **Yes** | ✓ | **No** | |
|---|---|---|---|

Students participate in a 25 item formative assessment each week covering material presented in the preceding week. Typically, these items are multiple choice questions written in the USMLE vignette format and are drawn from the item pool that is being developed for each of the Scientific Principles of Medicine units. The formative assessment is delivered electronically in a secure environment and students receive immediate feedback on how many items they answered correctly. They also are able to review each of the items with annotations prepared by the item author explaining the correct (keyed) response. Scores are loaded into the students' e-portfolios for information purposes only. Scores on the formative quizzes are not used for final unit grading purposes. The goal of the formative assessment is to give students a sense of how they are performing and to identify early areas in which they may need to devote additional time or seek additional help from faculty.

## COURSE OUTCOMES/EVALUATION

***Comment on the adequacy of faculty and other resources to teach the course (e.g., educational space, computer hardware and software, support personnel).***

This course, like all of the others in the SPM curriculum is delivered by an interdisciplinary cadre of basic science and clinical faculty. While most of these faculty members are affiliated with the department of medical education, several members of the clinical faculty play an active role as CP lecture presenters and small group tutors or facilitators. Faculty resources are more than adequate to meet the needs of this course. The PLFSOM enjoys excellent educational facilities including state-of-the art lecture halls, laboratories, flexible-use teaching space (e.g., for interactive and Team-Based Learning activities), small group rooms, etc. All units within SPM are supported by full time course coordinators and an assessment coordinator for formative and summative assessment.

***Provide a summary of student feedback on the course (and any other available evaluation data) for the past two academic years; include the percent of students providing evaluation data. If the course is new or has been significantly revised, provide evaluation data for the new version of the course only. If problems have been identified by student evaluations or other data, describe how they are being addressed.***

Students completed an anonymous on-line evaluation at the end of this unit of the SPM course. On a 5 point scale, with 1 representing a low level of agreement and a 5 a high level of agreement, students rated the elements of this course as follows (blanks indicate item was not included on given administration):

| **Unit 1: Introduction to Health and Disease** | | |
|---|---|---|
| **Questions** | **2010-11** | **2011-12** |
| This unit was well organized | 4.1 | 4.0 |
| The learning objectives were clearly identified | 4.0 | 4.0 |
| The course met the identified learning objectives | 4.0 | 3.9 |
| The order of clinical presentations made sense | 4.0 | 3.9 |
| The basic science material was well integrated. | 4.1 | 4.0 |
| The amount of material was reasonable. | 4.0 | 3.8 |
| I knew what I was supposed to be learning and why. | 4.0 | 3.5 |
| Evaluation methods were fair measures | 3.8 | 3.6 |
| The lectures helped me learn the material. | 3.9 | 3.9 |
| Clinical presentation 'schemes' contributed to my learning | NA* | 4.0 |
| The process work sheets contributed to my learning | NA* | 3.7 |
| The Work Case Examples helped me learn | 4.5 | 4.1 |
| Anatomy Labs helped me learn the material. | 3.1 | 3.5 |
| Microbiology Labs helped me learn the material. | 3.2 | 2.6 |
| Overall, I learned useful knowledge and/or skills during this unit. | 4.4 | 4.4 |
| N | 60 | 85 |
| Response rate | 97% | 100% |

*NA = Not Asked

As can be seen by the information provided in this table, students are generally satisfied with this particular Scientific Principles of Medicine unit. Changes that were initiated following the first (2009) iteration of this unit (e.g. decreased volume of reading, revision of learning objectives, modification in the sequence of clinical presentations, improved faculty collaboration to strengthen content integration), resulted in improved student ratings in 2010 that have persisted into the 2011 administration of the course. One outlier in student evaluations during the 2011-12 academic year was the microbiology laboratories. The unit committee met with student representatives to learn more about the student experience and the following changes are being proposed:

- The microbiology labs will be revised to emphasize clinically relevant cases as was done in well received microbiology labs in subsequent units.
- Due to the scheduled expansion in class size from the 2010 -11 to 2011-12, it was necessary to deliver this lab in two sessions by different instructors. A greater effort will be made in the 2012-13 class year to ensure that the two instructors are implementing this lab session consistently.

In addition to the specific changes noted above to improve the microbiology laboratory experience the unit directors are going to provide students with more explicit instruction on how information presented in this unit relates to the clinical presentations. We are hopeful that by doing so, students will have a better understanding of "what they are supposed to learn and why?"

***Identify major successes in the course and problems to be overcome.***

***Strengths:***

- This introductory unit is generally well received by students who appreciate unit organization and the opportunity to apply what they are learning to clinical problem solving in the weekly"Worked Case Example" sessions.
- Free-text comments indicate that students were particularly satisfied with the pathology and immunology instruction.
- Frequent feedback on performance through weekly formative examinations enables students to assess their own learning needs and areas in need of supplementation.

***Challenges:***

- Because this unit serves an introductory function and two of the clinical presentations (periodic health exam in the adult and in the child) are intended to highlight the concept of homeostasis, the direct link between basic science content and the clinical presentations are more difficult to make. We will address this challenge by being more explicit about how the basic science covered during these two weeks relates to the concept of homeostasis in health and illness.
- Students reported that there were some last minute changes to some sessions that they found confusing and stressful. We will reduce such changes to an absolute minimum in the future.

| **Course title:** | Scientific Principles of Medicine Unit 1: Introduction to Health and Disease |
|---|---|

***TOPIC APPENDIX - INTRODUCTION TO HEALTH AND DISEASE:***

## 1. ANATOMY

- Gross anatomy
  - Anatomical terminology
  - Major surface landmarks and subdivisions of the thorax and abdomen
  - Surface anatomy exam of donor cadavers
  - Thoracic and abdominal organs in situ (previous dissections in lab)
  - Overview of the pharynx and larynx (lectures plus previous dissections in lab)
  - Overview of lymph drainage patterns
  - Concept of potential spaces in body cavities and compartments
  - Relationships of surface landmarks to underlying viscera
  - Introduction to medical imaging
- Neuroanatomy
  - Overview of the peripheral nervous system (previous dissections and lecture in lab)
  - Overview of the pharynx
  - Introduced concept of cranial nerves with examples

## 2. BEHAVIORAL SCIENCE

- Introduction to Psychoneuroimmunology
  - Relationship between stress and immune function
  - Stress and the endocrine axes
  - Psychosocial stress and neuro-endocrine-immune pathways
  - Effects of psychosocial stress on infection and allergy
  - Behavioral interventions

## 3. BIOCHEMISTRY

- Biochemical basis of health
  - Common types of chemical bonds
  - Biochemical basis of cell structure and function
  - The genetic code and translation
  - General properties of amino acids

- Protein structure and function
- Post-translational modifications
- pH, pKa, pI
- Protein-ligand interactions
- Structure/composition of major dietary fuels

- Biochemical basis of fever and the inflammatory response
  - Factors affecting protein denaturation
  - NSAIDs: mode of action

## 4. CELL AND MOLECULAR BIOLOGY

- Eukaryotic cell organization and organelles
- Structure and function of the nucleus
- Structural and chemical properties of cell membranes
- Structural and chemical properties of oligosaccharides, glycoproteins, glycolipids and proteoglycans.
- Intracellular compartments
- Membrane and protein trafficking
- Cell biology of macrophages
- Cell signaling and common functional molecules
- Cancer biology, basic principles

## 5. EMBRYOLOGY

- Introduction to ectoderm, mesoderm and endoderm
- Development of the respiratory system
- Development of the pharynx

## 6. GENETICS

- Structure of human genes and chromosomes
  - DNA composition and structure
  - Chromatin/chromosome structure
  - Types of DNA sequences
- Human gene function
  - Central dogma
  - DNA replication
  - DNA transcription
  - RNA processing
  - Genetic code
  - Regulation of gene expression
- Genetic inheritance and variation
  - Cell cycle (meiosis and mitosis)

- Gene mutations

## 7. HISTOLOGY

- Introduction to light, electron and virtual microscopy
- Epithelium: embryology, organization and distribution
- Membrane specializations of epithelia
- Connective tissue, molecular architecture, properties and distribution

## 8. IMMUNOLOGY

- Introduction to innate and adaptive immunity
  - Cardinal features, cells and tissues
  - Complement system
- Adaptive immunity
  - Antigen processing and presentation
  - Antigen receptors and lymphocyte maturation
  - Lymphocyte selection and activation
  - Effector functions and memory
  - Antibody-based laboratory techniques
  - T-dependent and T-independent responses
  - Principles of vaccination
- Overview of immunity to microbes
  - Pyrogens and the immune system
- Introduction to immune deficiencies
- Introduction to hypersensitivity

## 9. MICROBIOLOGY

- General principles of bacteriology: identification and classification, structure, growth and cell wall synthesis, normal flora, routes of infection and virulence factors, bacteremia and sepsis, epidemiology and vaccine preventable diseases
- Bacteria that cause sore throat and fever: Streptococcus species, Staphylococcus species, Neisseria, Corynebacterium diphtheriae, Bordetella pertussis, Clostridium tetani, Haemophilus influenza, Rickettsia rickettsii, Ehrlichia Chaffeinsis, Coxiella burnetii, Treponema pallidum, Borrelia species
- Bacterial genetics: chromosome structure, conjugation, plasmids, transformation, transduction
- General principles of virology: identification and classification, structure, replication, routes of infection and virulence factors, epidemiology and vaccine preventable diseases
- Viruses that cause sore throat and fever: Influenza, Parainfluenza, Coxsackie A, Rhinovirus, Measles, Mumps, Rubella
- General principles of parasitology: identification, protozoans, arthropods, helminths
- Parasites that cause fever: Plasmodium species

- Bacteria that cause wound infections: Staph aureus, Clostridium perfringens (introduction to anaerobes and bacterial toxins)
- Mechanisms of antibiotic resistance
- Laboratory techniques: light and fluorescence microscopy, sterile techniques and safety, gram and acid fast stains, catalase and motility tests, media, antibiotic sensitivity

## 10. NUTRITION

- Nutritional needs and consequences for childhood growth
- Growth charts and parameters of normal growth
- Age-appropriate dietary guidelines
- Protein needs during stress and starvation

## 11. PATHOLOGY

- Cellular responses to stress and toxic insults: adaptation, injury, and death
    - Introduction to pathology
    - Overview of cellular responses
    - Adaptations of cellular growth and differentiation
    - Cellular injury, aging and apoptosis
    - Intracellular accumulations, pathologic calcifications
- Acute and chronic inflammation
    - Mediators
    - Morphologic patterns
    - Outcomes, systemic effects and consequences
- Pathologic aspects of wound healing and repair

## 12. PHARMACOLOGY

- Pharmacokinetics
- Pharmacodynamics
- Antipyretic agents
- Antimicrobials: cell wall synthesis inhibitors

## 13. PHYSIOLOGY

- Homeostasis and homeostatic mechanisms
    - Thermoregulation, cytokines
    - Temperature homeostasis, environmental challenges
    - Homeostasis,  negative and positive feedback
- Transport mechanisms
    - Membrane transport mechanisms and cell volume regulation
- Vascular permeability

- Vascular endothelia, edema, anaphylaxis
- Starlings Law of capillary filtration
- Sepsis and septic mechanisms

- Distribution and composition of bodily fluids
- Basics of chemical signaling and basic reflex arc

## PART B. REQUIRED COURSE FORM

| | |
|---|---|
| **Course title:** | Scientific Principles of Medicine Unit: Musculoskeletal and Integumenatry Systems |
| **Sponsoring department or unit:** | Medical Education |
| **Name of course director:** | Richard Brower, MD/Asa Black, PhD/Elmus Beale, PhD/Dale Quest, PhD |

***List all organizational units (e.g., physiology department, nursing school, library), including the lead department, with ongoing involvement in the course and the number of instructional staff from each such unit:***

| **Organizational Unit** | **Number of Teaching Staff Involved** |
|---|---|
| Medical Education | 16 |
| Internal Medicine | 9 |
| Orthopedic Surgery | 5 |
| Neurology | 1 |
| Family Medicine | 4 |
| Emergency Medicine | 2 |
| Pathology | 3 |
| Psychiatry | 1 |
| Anesthesiology | 1 |
| Dermatology | 1 |

### COURSE OBJECTIVES

***Are there written objectives for the course? (check)***

| | | | |
|---|---|---|---|
| **Yes** | ✓ | **No** | |

Specific written learning objectives are provided for each instructional session in this unit. These objectives are available to students electronically through the WebCT course management system. A compilation of these objectives are available for on-site inspection. The basic science topics included in this specific unit are listed, by discipline, in an appendix attached to this course description.

***Briefly summarize the objectives/content areas covered in the course.***

This unit of the SPM course provides an integrated presentation of major basic science and clinical concepts related to the musculoskeletal and Integumenatry systems ("Skin and Bones"), including information on the peripheral nervous system. The unit is organized and delivered in the context of 8 relevant, common, and broadly applicable Clinical Presentations (CPs) as follows:

1) Bone Fractures and Dislocations
2) Joint Pain
3) Musculoskeletal Lumps and Masses

4) Limp and Deformity
5) Numbness and Pain
6) Weakness and Loss of Motion
7) Skin Lesions: Rash (Macules, Papules, Boils & Blisters)
8) Eczema and Pruritus
9) Hair and Nail Disorders

Typically a CPs is delivered at the beginning of a week long period of instruction in a one hour didactic session presented by an experienced clinician. These presentations include a definition and description of the clinical significance of the CP and the description of a hierarchical diagnostic "scheme" beginning with the problem presentation by the patient (e.g., joint pain) and descending through a series of decision points to specific categories of diagnoses. In discussing the clinical reasoning associated with the scheme, the presenter forecasts basic science topics and concepts necessary for understanding underlying processes at each branch point in the decision tree. These scientific concepts are then elaborated in an integrated week or so of instruction consisting of lectures, interactive problem solving sessions, and laboratory sessions, culminating in a two-hour small group "worked case example" session in which small groups of students and a physician faculty tutor analyze patient cases based on the clinical scheme presented at the beginning of the week and the basic science content presented based on that scheme. These sessions are designed to facilitate the consolidation of basic science knowledge in the context of the practical diagnostic scheme provided for each clinical presentation.

## Preparation for Teaching

A majority of the instruction in this unit is delivered by faculty members in the department of medical education who participated in the development and planning of the unit. Consequently, they are well aware of the goals and objectives of the unit and how their individual material relates to that presented by other faculty members. Faculty members from the clinical departments who participate in the unit as clinical presentation "scheme presenters" and as facilitators in "Worked Case Example" (WCE) small group sessions are briefed by the unit director(s) regarding the goals and objectives of the session(s) in which they will participate. The unit directors review and give scheme presenters feedback on their particular presentations. WCE facilitators are provided with session materials (power points case material, "process work sheets) and are briefed on the goals and objectives of the given session. Whenever possible, new small group facilitators observe more experienced facilitators to learn about the WCE process.

***Are any of the following involved in the course as lecturers, small group facilitators, and/or laboratory instructors?***

| | **Yes** | **No** |
|---|---|---|
| Residents | ✓ | |
| Graduate Students | | ✓ |
| Postdoctoral | | ✓ |

| | | |
|---|---|---|
| Fellows | | |

***If yes, describe how they are informed about the course objectives and prepared for their teaching role.***

Residents may occasionally participate as small group facilitators in "worked case example" sessions. Typically, they do so primarily as "assistants" to experienced faculty members. All participants in worked case example sessions are provided with detailed instructions and session plans including sequenced case materials, questions and answers, illustrative power-point slides, etc. The unit director(s) are also readily available to answer questions. Whenever possible, new worked case example facilitators are encouraged to observe a session prior to participating as the facilitator of record.

***If the entire course is taught at more than one site (e.g., at geographically separated instructional sites), describe how instructional staff at all sites are oriented to the course objectives and the grading system.***

The course will be taught at only one site, the Medical Education Building on the campus of the Paul L. Foster School of Medicine.

**REQUIRED COURSE FORM** (Continued)

| **Course title:** | Musculoskeletal and Integumenatry Systems |
|---|---|

## Student Evaluation

***If NBME subject (shelf) examinations are used, give the mean scores for the last three classes:***

Not applicable.

| **Year:** | | | |
|---|---|---|---|
| **Score:** | | | |

***Check all the formats that are used in examinations or other evaluations that students must take in order to pass the course:***

| | | | |
|---|---|---|---|
| ✓ | Multiple-choice, true/false, matching questions | | Laboratory practical items |
| | Fill-in, short answer questions | | Problem-solving written exercises |
| | Essay questions or papers | | Presentations |
| | Oral exams | | Preceptor ratings |
| | OSCE or standardized patient examination | ✓ | Other (describe) Small group assessment |

***Briefly describe any formative assessment activities that occur during the course (practice examinations, quizzes, etc.)***

Students participate in a 25-30 item formative assessment each week of this unit covering material presented in the preceding week. Typically these items are multiple choice questions written in the USMLE vignette format and they are drawn from the item pool that is being developed for each of the Scientific Principles of Medicine units. The formative assessment is delivered electronically in a secure environment and students receive immediate feedback on how many items they answered correctly. They also are able to review each of the items with annotations prepared by the item author explaining the correct (keyed) response. Scores are loaded into the students' e-portfolios for information purposes only. Scores on the formative quizzes are not used for final unit grading purposes. The goal of the formative assessment is to give students a sense of how they are performing and to identify early areas in which they may need to devote additional time or seek additional help from faculty.

***Is a narrative evaluation of student performance submitted in addition to or as a component of the course grade? (check)***

| **Yes** | ✓ | **No** | |
|---|---|---|---|

Faculty complete small group evaluation forms on the students in their WCE sessions. This form includes a free-text comment section. This form is uploaded into the student's e-portfolio.

## COURSE OUTCOMES/EVALUATION

***Comment on the adequacy of faculty and other resources to teach the course (e.g., educational space, computer hardware and software, support personnel).***

This course, like all of the others in the SPM curriculum is delivered by an interdisciplinary cadre of basic science and clinical faculty. While most of these faculty members are affiliated with the department of medical education, several members of the clinical faculty play an active role as CP lecture presenters and small group tutors or facilitators. Faculty resources are more than adequate to meet the needs of this course. The PLFSOM enjoys excellent educational facilities including state-of-the art lecture halls, laboratories, flexible-use teaching space (e.g., for interactive and Team-Based Learning activities), small group rooms, etc. All units within SPM are supported by full time course coordinators and an assessment coordinator for formative and summative assessment.

***Provide a summary of student feedback on the course (and any other available evaluation data) for the past two academic years; include the percent of students providing evaluation data. If the course is new or has been significantly revised, provide evaluation data for the new version of the course only. If problems have been identified by student evaluations or other data, describe how they are being addressed.***

Students completed an anonymous on-line evaluation at the end of this unit of the SPM course. On a 5 point scale, with 1 representing a low level of agreement and a 5 a high level of agreement, students rated the elements of this course as follows (blanks indicate item was not included on given administration):

| **Unit 2 Evaluation Data: Musculoskeletal and Integumenatry Systems** | **2010-2011 Academic Year** | **2011-2012 Academic Year** |
|---|---|---|
| This unit was well organized. | 3.4 | 2.5 |
| The learning objectives clearly identified. | 3.5 | 3.0 |
| The course met identified learning objectives. | 3.6 | 3.2 |
| The order of clinical presentations made sense. | 3.9 | 3.2 |
| The basic science material was well integrated. | 3.8 | 3.3 |
| The amount of material was reasonable. | 2.9 | 2.7 |
| I knew what I was supposed to be learning and why. | 3.6 | 3.0 |
| The evaluation methods were fair | 3.2 | 3.0 |
| The Clinical presentation "schemes" helped me learn. | 3.9 | 3.3 |
| The process work sheets helped me learn the material. | 3.6 | -- |
| The lectures helped me learn the material. | 3.7 | 3.7 |
| The Work Case Examples helped me learn the material. | 4.4 | 4.2 |
| Anatomy Labs helped me learn the material. | 2.4 | 2.7 |
| Physiology Labs helped me learn the materials | 2.9 | -- |
| Microbiology Labs helped me learn the material. | -- | 2.8 |
| Overall I learned useful knowledge and/or skills during this unit. | 4.2 | 4.1 |
| N | 56 | *64 |
| Response rate | 90% | *76% |

(*Please note: Due to technical difficulties responses from several students were lost, nearly 100% of students made an effort to provide end of course evaluation.)

Previously, this unit was titled Musculoskeletal System and Neurology and included several clinical presentations related to the central nervous system (e.g., Headache, Seizure and Epilepsy, Stroke, Altered Mental Status). Student evaluations of the 2010-11 iteration of the unit suggested that the volume and complexity of the material that needed to be mastered was overwhelming. Unit faculty leaders agreed that this unit should be decompressed and opted to shift most of the predominantly neurological CPs to the year 2 unit on special senses (previously titled Dermatology and Special Senses) and replacing the 5 neurological CPs with 3 CPs dealing with dermatological presentations.

As can be seen from the student evaluation data summarized above, this change did not result in a significant improvement in student perceptions of course quality. While students acknowledged gaining useful knowledge in this unit, students recorded lower evaluations in several areas including course organization, clarity of goals and objectives, order of clinical presentation, and quality of clinical schemes as aids to learning. Importantly, there was no improvement in the level of agreement with the item "The amount of material was reasonable." In aggregate, students were not positive in their evaluation of the quality of the anatomy or microbiology laboratory experiences provided as part of this unit in its revised form.

Free-text responses reveled that many students continued to feel overwhelmed by the volume of information and that the faculty had not provided them with a clear "road map" to assist them in knowing what they needed to learn and why. There was still a considerable volume of material dealing with the central nervous system and some students commented that the dermatological components of the unit felt like "add-on" material. A number of faculty members participating in the delivery of this unit came to the conclusion that the amount of material covered dealing with the central nervous system was excessive, given the fact that the much of this material was intended to be shifted to the special senses unit in year 2.

A number of students also voiced concern about what they felt was less than optimal integration of basic science material. Many noted that anatomy instruction was disorganized and poorly integrated with the CPs. A number of critical comments were made about the role of "self-taught sessions" in pharmacology. A number of students expressed a preference for lecture-based instruction in this discipline because they felt it was difficult to master the material on their own based upon the instructional "monographs" and power point materials provided by the instructor. Plans for improvement are described in the next section.

***Identify major successes in the course and problems to be overcome.***

***Strengths*:**

- An early overview of the nervous system facilitates integration of nervous system topics throughout the other organ systems in the curriculum
- The musculoskeletal content was generally well received despite the overall volume of material covered in this unit
- Students acknowledged the importance of the material and feel they gained valuable knowledge and skills

***Challenges/Problems:***

- Large total amount of new and challenging content covering three systems and much 'foundational' material across disciplines

- Students criticized the unit for poor organization but without a clear consensus as to recommended steps – possibly due to the total content overload and lack of an adequate and early explanation of Unit objectives and rationale

- Labs, especially in anatomy, heavily criticized as inefficient (with "student-teaching-student" system an inconsistent/unreliable method of instruction, and limb anatomy covered too quickly)

***Improvement plan:***

As a result of a pre-planned retrospective unit review ("De-briefing"), including the assessment and evaluation data, the Course and Unit Directors have developed a preliminary unit improvement plan which includes the following basic components:

- Rename the Unit "Neuromusculoskeletal and Integumentary Systems"
- Move the integumentary system clinical presentations to the front of Unit 2, creating a logical 'bridge' from the last clinical presentation of Unit 1 ("Wound")
- Develop specific over-arching "Unit Goals" to be distributed to the students with brief explanatory remarks at the beginning of the Unit (to provide additional context and a 'roadmap')
- Continue to include an overview of the nervous system and detailed coverage of the peripheral nervous system in Unit 2 (limiting the central nervous system materials to a schematic understanding of the functional anatomy of the major pathways for sensation, voluntary movement and autonomic control)
- Re-sequence the anatomy content to provide a better conceptual foundation earlier in the unit, to be followed by lab sessions (expanding the labs by one additional session to allow for two sessions for the lower extremity)

The following steps are planned to improve the quality of the "Students-Teaching-Students" (STS) component of anatomy instruction. This plan is based on a focus group discussion with the students selected to serve as "near peer tutors" for anatomy in 2012-13.

- We are going to increase the number of instructors available for each lab.
- Student tutors will create a repository of effective STS resources (e.g. handouts, lesions plans)
- Faculty will provide a "STS Template"—a recommended sequence of events for the session.
- We will hold a teacher-Tutor pre-lab meeting to review objectives for the upcoming session.
- Look for opportunities to incorporate instruction on simple surgical/diagnostic procedures in as many labs as possible to highlight clinical relevance of session.

## ANATOMY, EMBRYOLOGY, NEUROANATOMY

### MUSCULOSKELETAL SYSTEM

***Gross Anatomy***

- Introduction to the musculoskeletal system and the limbs
- Superficial and intermediate layers of the back
- Nerves and muscles of the face and neck
- Shoulder and deep back regions
- Pectoral region
- Anterior and medial thigh
- Axilla
- Gluteal region and hip
- Form and function of the brachial plexus
- Posterior thigh and knee
- Arm elbow and forearm
- Leg and dorsum of the foot
- Forearm, hand and wrist
- Leg, sole and ankle
- Vasculature/blood supply and lymphatic drainage of the limbs

***Histology***

- Introductory histology of cartilage and bone
- The cytoskeleton
- Cell communication

***Embryology***

- Ontogeny of the musculoskeletal system (normal and abnormal limb formation)
- Genetic regulation of limb formation

### NEUROLOGICAL SYSTEM (in addition to overlapping topics listed above)

***Gross anatomy (overlapping with neuroanatomy)***

- Anatomy and functions of the cervical, brachial and lumbosacral plexuses

***Neuroanatomy***

- Introduction to neuroanatomy
    - Anatomical organization and landmarks of the brain, brainstem, cerebellum and spinal cord
    - Spinal cord and major cerebral arteries

  - Cranial nerve and prototypical brainstem syndromes
  - Location and role of the thalamus
- Sensory tracts
  - Spinothalamic – anterolateral system
  - Dorsal column – medial lemniscus system
  - Trigeminal nerve and the trigeminothalamic system
- Motor tracts
  - Motor cortex, the corticobulbar tract and the corticospinal tract
  - Upper motor neuron and lower motor neuron structures, functions and syndromes
  - Reticulospinal and tectospinal tracts
  - Multidimensional neuroanatomy of locomotion
  - Components of the muscle stretch, Golgi tendon, and flexor withdrawal and crossed extension reflexes
- Anatomical perspectives on radiculopathies, plexopathies and peripheral neuropathies

***Embryology***

- Nervous system development
  - Overview of nervous system development with emphasis on the peripheral nervous system

### INTEGUMENTARY SYSTEM

**Neuroanatomy**

- Dermatomes
- Innervation of the skin

**Histology**

- Histology of the skin, including cell types, layers, glands, sensory receptors and hair

**Embryology**

- Embrology of the skin and its derivatives

## 2. BIOCHEMISTRY

### MUSCULOSKELETAL

- Biochemistry of the extracellular matrix
- Basic enzymology
- Molecular aspects of joint tissue turnover
- Fuel oxidation and ATP generation
- Cell communication (with histology)
- Muscle metabolism and metabolic myopathies
- Biochemistry of collagen diseases
- Disorders of nucleotide metabolism

**NEUROLOGICAL (OVERLAP WITH MUSCULOSKELTAL TOPICS ABOVE)**

**INTEGUMENTARY**

- Biochemistry of scurvy

## 3. GENETICS

### MUSCULOSKELETAL

- Introduction to medical genetics and associated laboratory methods
- Genetic inheritance and variation
- Genetic mapping, measuring genetic distance/linkage
- Detection of genetic variation and genetics of bone disease
- Genetics and molecular biology of the muscular dystrophies
- DNA/Gene repair systems
- Genetic basis of inherited and sporadic tumors

### NEUROLOGICAL

- Trinucleotide repeat diseases (including Huntington's disease)
- Mitochondrial disease

## 4. MICROBIOLOGY/IMMUNOLOGY

### MUSCULOSKELETAL

- Defense against encapsulated bacteria (opsonization)
- Serum protein electrophoresis, normal and abnormal patterns
- Multiple myeloma, fractures and recurrent infections
- Immunology of rheumatoid disease
- Immune-mediated neuromuscular disorders
    - Guillain-Barre syndrome
    - Chronic inflammatory demyelinating polyneuropathy
    - Myasthenia gravis
    - Lambert-Eaton myasthenic syndrome
    - Polymyositis, Dermatomyositis
- Bone infections/osteomyelitis
- Virulence factors (toxins, enzymes), antibiotic resistance, bacteriological differentiation/identification
- Pathogenesis and laboratory diagnosis of bacterial and parasitic forms of myositis
- Infectious arthritis
- Central and peripheral tolerance
- Tuberculosis

- Anergy

### NEUROLOGICAL

- Infections causing weakness and loss of motion (overlap with Musculoskeletal above)
- Immune mediated neuropathies (overlapping with Musculoskeletal topics listed above)
- Immune mediated neuromuscular junction disorders (overlapping with Musculoskeletal topics listed above)
- Molecular mimicry
- Neurotropic viruses

### INTEGUMENTARY

- Microbiology of the skin, including rashes and local skin infections (viral, bacterial, fungal)
- Immune defenses of the skin
- Immune responses to infection affecting the skin
- Autoimmune disorders with cutaneous manifestations

## 5. PATHOLOGY

### MUSCULOSKELETAL

- Pathology of bone fractures
    - Osteopenia
    - Osteoporosis
    - Bone tumors
    - Fracture types
    - Pathological consequences of bone fractures (local and systemic)
    - Stages of fracture repair
- Pathology of osteoarthritis, rheumatoid arthritis, seronegative spondyloarthropathies
- Pathology of infectious arthritis
- Pathology of gout and pseudogout
- Mechanisms and histopathological features of neoplasia
- Pathology of musculoskeletal lumps and masses (including metastatic disease)
- Pathology of muscular dystrophy
- Pathology of non-infectious myosiits
- Metabolic and toxic myopathies

### NEUROLOGICAL

- Pathology of motor neuron disease
- Pathology of neuromuscular junction diseases
- Peripheral nerve disease
- Peripheral nerve and nerve sheath tumors (including neurofibromatosis types 1 and 2)

**INTEGUMENTARY**

- Skin pathology

## 6. PHARMACOLOGY

**MUSCULOSKELETAL**

- Pharmacology of bone turnover and healing
- Chemotherapy concepts: anti-neoplasia
- Pain and analgesics
- Drugs for arthritis
- Aminoglycoside toxicity

**NEUROLOGICAL**

- Pharmacology of peripheral nerve diseases
- Pharmacology of the somatic efferent nerves, neuromuscular junction and skeletal muscle

## 7. PHYSIOLOGY

**MUSCULOSKELETAL**

- Mechanisms of bone fracture and healing
- Cartilage damage and healing
- Mechanics of skeletal muscle contraction
- Bone blood flow
- Hormonal control of calcium and phosphate
- Calcium absorption, metabolism in relation to bone health

**NEUROLOGICAL**

- Basic neurophysiology – membrane and action potentials, nerve conduction, synaptic transmission and neurotransmitters
- Neuron types, supporting cell types and their functions
- Axonal transport
- Proprioception and basic spinal reflexes
- Function of sensory receptors

**INTEGUMENTARY**

- Itch receptors and neural pathways

## 8. BEHAVIOR

**MUSCULOSKELETAL**

- Psychosocial aspect of pain
    - Behavioral theories of pain and suffering
    - Chronic pain and mental health
    - Psychological assessment of pain

- Placebo effect

## 9. NEUROLOGY

- Neurophysiological basis of clinical electroencephalography

## PART B. REQUIRED COURSE FORM

| | |
|---|---|
| **Course title:** | Scientific Principles of Medicine Unit 3: Gastrointestinal System |
| **Sponsoring department or unit:** | Department of Medical Education<br>Department of Internal Medicine |
| **Name of course director:** | Kirk Baston, MD/David Osborne, PhD/Marc Zuckerman, MD |

***List all organizational units (e.g., physiology department, nursing school, library), including the lead department, with ongoing involvement in the course and the number of instructional staff from each such unit:***

| Organizational Unit | Number of Teaching Staff Involved |
|---|---|
| Medical Education | 13 |
| Internal Medicine | 8 |
| Radiology | 1 |
| Surgery | 2 |
| Family Medicine | 1 |
| Emergency Medicine | 1 |
| Pathology | 1 |

### COURSE OBJECTIVES

***Are there written objectives for the course? (check)***

| Yes | ✓ | No | |
|---|---|---|---|

Specific written learning objectives are provided for each instructional session in this unit. These objectives are available to students electronically through WebCT course management system. A compilation of these objectives are available for on-site inspection. The basic science topics included in this specific unit are listed, by discipline, in the topic appendix attached to this course description.

***Briefly summarize the objectives/content areas covered in the course.***

The gastrointestinal unit in SPM consists of the following clinical presentations distributed over a 5 week time frame:

1. Dysphagia
2. Nausea and Vomiting
3. Diarrhea
4. Constipation
5. Abdominal pain
6. GI Bleed

Prior to the 2011-12 AY, this unit was paired with clinical presentations covering hematological disorders in a single, GI/Hem unit. As part of the revision of the sequencing of units related to changes in

Musculoskeletal/Neurology Unit and the Dermatology/Special Senses Unit, described elsewhere in this data base, we re-examined the entire sequencing and pace of all of the units in the Scientific Principles of Medicine course and the decision was made to uncouple the earlier GI/Hematology clinical presentations and offer them in the context of their own units. This also enabled us to end the GI unit prior to the winter break and start the Liver/Hematology unit at the beginning of the second semester of the academic year.

These clinical presentations follow the general path of food passage through the gastrointestinal tract and highlight the basic functions and abnormalities related to motility, secretion, digestion, and absorption by organs associated with the GI tract. Each provides a context for the presentation of basic science content related to the function of the mouth and esophagus, the stomach, the small intestine and the colon. The contributions of accessory organs are also presented. Pathology and etiologies of gastrointestinal disorders and region specific diseases are discussed in the context of the underlying basic science. In addition, this unit provides an introduction to general concepts related to the dual function of the nervous and endocrine systems in controlling organ function. Students are introduced to the differences smooth muscle contraction in contrast to the skeletal muscle contraction that the students encountered in the preceding unit. The themes of organ function control and smooth muscle function are revisited and reinforced is subsequent units of the SPM course based on the foundations laid in the GI unit.

During each presentation, clinician medical educators introduce the clinical presentation and the basic scheme for each presentation. Basic science educators subsequently present the basic science components related to anatomy, biochemistry, cell biology, embryology, histology, genetics, immunology, microbiology, pathology, pharmacology and physiology. At the end of the week, students meet with clinicians in small groups for processing cases using the information gathered during the week. This "deliberate practice" of processing through each scheme for clinical diagnostics reinforces the relationship between the basic sciences and the clinical application of the knowledge. In addition, this practice allows the students to directly apply the knowledge gained during the week to clinical practice.

Examples of the basic science topics addressed in this unit can be found in the Topic Appendix at the end of this course description.

### ***Preparation for Teaching***

A majority of the instruction in this unit is delivered by faculty members in the department of medical education who participated in the development and planning of the unit. Consequently, they are well aware of the goals and objectives of the unit and how their individual material relates to that presented by other faculty members. Faculty members from the clinical departments who participate in the unit as clinical presentation "scheme presenters" and as facilitators in "Worked Case Example" (WCE) small group sessions are briefed by the unit director(s) regarding the goals and objectives of the session(s) in which they will participate. The unit directors review and give scheme presenters feedback on their particular presentations. WCE facilitators are provided with session materials (power points case material, "process work sheets) and are briefed on the goals and objectives of the given session. Whenever possible, new small group facilitators observe more experienced facilitators to learn about the WCE process.

***Are any of the following involved in the course as lecturers, small group facilitators, and/or laboratory instructors?***

| | Yes | No |
|---|---|---|
| Residents* | | ✓ |
| Graduate Students | | ✓ |
| Postdoctoral Fellows | | ✓ |

*Please note: On occasions residents may accompany faculty members from their respective clinical departments to observe the Worked Case Example process and to learn about the scheme inductive approach to clinical reasoning. They do not have responsibility for leading these sessions or for assessing student performance.

***If yes, describe how they are informed about the course objectives and prepared for their teaching role.***

Not applicable.

***If the entire course is taught at more than one site (e.g., at geographically separated instructional sites), describe how instructional staff at all sites are oriented to the course objectives and the grading system.***

This unit of instruction is offered at one site only, the campus of the Paul L. Foster School of Medicine.

**REQUIRED COURSE FORM** (Continued)

| **Course title:** | Scientific Principles of Medicine Unit 3: Gastrointestinal System Unit |
|---|---|

## Student Evaluation

***If NBME subject (shelf) examinations are used, give the mean scores for the last three classes:***

Not applicable.

| **Year:** | | | |
|---|---|---|---|
| **Score:** | | | |

***Check all the formats that are used in examinations or other evaluations that students must take in order to pass the course:***

| | | | |
|---|---|---|---|
| ✓ | Multiple-choice, true/false, matching questions | | Laboratory practical items |
| | Fill-in, short answer questions | | Problem-solving written exercises |
| | Essay questions or papers | | Presentations |
| | Oral exams | | Preceptor ratings |
| | OSCE or standardized patient examination | ✓ | Other (describe) Small group evaluations |

***Briefly describe any formative assessment activities that occur during the course (practice examinations, quizzes, etc.)***

Students participate in a 25-30 item formative assessment each week of this unit covering material presented in the preceding week. Typically these items are multiple choice questions written in the USMLE vignette format drawn from the item pool that is being developed for each of the Scientific Principles of Medicine units. The formative assessment is delivered electronically in a secure environment and students receive immediate feedback on how many items they answered correctly. They also are able to review each of the items with annotations prepared by the item author explaining the correct (keyed) response. Scores are loaded into the students' e-portfolios for information purposes only. Scores on the formative quizzes are not used for final unit grading purposes. The goal of the formative assessment is to give students a sense of how they are performing and to identify early those areas in which they may need to devote additional time or seek additional help from faculty. Students are provided a listing of the objectives associated with missed items on their formative quizzes to facilitate targeted review.

***Is a narrative evaluation of student performance submitted in addition to or as a component of the course grade? (check)***

| **Yes** | ✓ | **No** | |
|---|---|---|---|

Small group tutors complete a brief evaluation of student performance and participation in the Worked Case Examples sessions. Faculty tutors are encouraged to provide brief narrative comments. These narrative comments are reviewed by the senior associate dean for medical education, the associate dean for student affairs and the college masters at the end of the year and a summary narrative is constructed

and provided to the student in their e-portfolios. The summary narratives are intended to be provide formative feedback. However, problems with professionalism (e.g., disruptive or disrespectful behavior) that persist, despite feedback, could be referred to the Grading and Promotion committee for action.

## COURSE OUTCOMES/EVALUATION

***Comment on the adequacy of faculty and other resources to teach the course (e.g., educational space, computer hardware and software, support personnel).***

This course, like all of the others in the SPM curriculum is delivered by an interdisciplinary cadre of basic science and clinical faculty. While most of these faculty members are affiliated with the department of medical education, several members of the clinical faculty play an active role as CP lecture presenters and small group tutors or facilitators. Faculty resources are more than adequate to meet the needs of this course. The PLFSOM enjoys excellent educational facilities including state-of-the art lecture halls, laboratories, flexible-use teaching space (e.g., for interactive and Team-Based Learning activities), small group rooms, etc. All units within SPM are supported by full time course coordinators and an assessment coordinator for formative and summative assessment. Centralized IT and Audiovisual support is also made available to all courses and units of instruction within SPM.

***Provide a summary of student feedback on the course (and any other available evaluation data) for the past two academic years; include the percent of students providing evaluation data. If the course is new or has been significantly revised, provide evaluation data for the new version of the course only. If problems have been identified by student evaluations or other data, describe how they are being addressed.***

Students complete anonymous on-line evaluations at the end of each unit. Results below are based on a 5-point scale with 1 representing “Strongly disagree” and 5 indicating “Strongly Agree.”

| ***Unit 3Gastrointestinal System Evaluation Data*** | ***2010-11: GI/HEM*** | ****2011-12 :GI*** |
|---|---|---|
| This unit was well organized. | 4.5 | 4.1 |
| The learning objectives clearly identified. | 4.4 | 3.9 |
| The course met identified learning objectives. | 4.4 | 3.9 |
| The order of clinical presentations made sense. | 4.3 | 4.2 |
| The basic science material was well integrated. | 4.6 | 4.1 |
| The amount of material was reasonable. | 4.2 | 4.0 |
| I knew what I was supposed to be learning and why. | 4.4 | 3.9 |
| The evaluation methods were fair | 4.1 | 3.6 |
| The Clinical presentation "schemes" helped me learn. | 4.2 | 4.2 |
| The process work sheets helped me learn the material. | 4.0 | 3.9 |
| The Work Case Examples helped me learn the material. | 4.1 | 3.9 |
| Work Case Examples helped me learn the material. | 4.7 | 4.5 |
| The self-taught modules contributed to my learning | NA | 3.5 |
| Anatomy Labs helped me learn the material. | 3.4 | 3.3 |

| | | |
|---|---|---|
| Microbiology Labs helped me learn the material. | 3.5 | 3.0 |
| I learned useful knowledge and/or skills | 4.6 | 4.4 |
| N | 44 | 79 |
| Class size at date | 62 | 85 |
| Response Rate | 71% | 93% |

*Please note: in the 2011-12 Academic Year, the previously offered combine GI/HEM unit was divided into two separate units—GI and Liver/Hematology. This was done for logistical reasons (to avoid having a course/unit span the winter holiday break) and to decompress the SPM course. The content, goals, and objectives of the two units are unchanged.

***Identify major successes in the course and problems to be overcome***.

***Successes:***

- Students like the logical order for the unit. It makes sense to them.
- There is a very strong connection between the basic science and clinical content.
- For the most part students endorse the pace of this unit.

***Challenges***:

- Time is short for the coverage of material with some weeks having two clinical presentations which muddies the order of the material covered in work case examples and formative exams.
- Postponing covering the liver until the next unit is problematic given the status of the liver as a major accessory organ for the gastrointestinal system. However, we appear to have few options given the amount of time available and the timing of the winter holiday break.

We have carefully reviewed these two challenges and feel that student learning is not adversely affected. These problems are due to time constraints and the placement of the winter holiday break. Short of a major change in the academic calendar, which would likely produce other problems, it appears that we will have to live with these minor problems.

Topic Appendix: Gastroenterology Unit

## GASTROENTEROLOGY TOPICS

### Anatomy/Histology/ Embryology

- Anatomy (Gross and Neuro), Embryology (ontogeny of gastrointestinal organs), Histology (microscopic anatomy of the gastrointestinal organs)
- Histology focuses on cross sectional structure of the GI tract proper
- Structure of the oral cavity, parotid region, pharynx and esophagus
- Anterior abdominal wall, Posterior abdominal wall, peritoneum
- Abdominal cavity blood supply and nerve supply
- Lymphatic drainage and spleen, hepatic portal system
- Stomach, small intestine, colon, rectum and anus structure
- Liver and pancreas (focus is on accessory functions for gastrointestinal system)

### Biochemistry

- Glycogen Storage Diseases

### Immunology

- Immune mechanisms of Sjogren's syndrome and systemic sclerosis (Scleroderma)
- Immune defense mechanisms of the GI tract
- Oral vaccination
- Immune mechanisms in Celiac disease
- Immune mechanisms in Immune-mediated Inflammatory Bowel Disease (IBD)
- Introduction to Tumor Immunology

### Microbiology

#### *Regional*

- Introduction to three viral families associated with Gastroenteritis: Reoviridae, Caliciviridae and Astroviridae
- Introduction to Adenovirus with emphasis on the Enteric Adenoviruses 40 and 41
- The role of Helicobacter pylori and Campylobacter species in Gastritis and Enteritis:
- Common bacterial and viral causes of diarrhea
- Pathogenic E. coli and Shigella infections
- How antibiotic use can lead to diarrhea

- Parasitic causes of diarrhea
- Distinct microflora in different regions of the intestinal tract causing peritonitis.
- Clinical manifestations, Life cycles, transmission, microscopic diagnosis of associated with nematodes, cestodes and trematodes which cause abdominal distention and discomfort.
- Abnormal Liver function due to infection: Classification and differentiation between hepatitis A, hepatitis B, Hepatitis C, Hepatitis D , Hepatitis E and Hepatitis G viruses according to viral family, virion architecture, disease characteristics, replication and transmission.
- Infectious etiologies of lymphadenopathy
- Hepatomegaly or Hepatosplenomegaly due to liver parasitic infections
- Effects HIV-AIDS on gastrointestinal functions

***Systemic***

- Microbiological causes of food poisoning
- Peritonitis

**Pathology**

- Congenital abnormalities of the GI tract
- Inflammatory disorders
- Infectious diseases
- Obstructive disorders
- Dysplasia
- Neoplasia

**Pharmacology**

- Gastric absorption of Drugs
- Drugs for Gastric acid control and peptic ulcer disease
- Antiemetics
- Antidiarrheals
- Laxatives

**Physiology**

- Topics related to regulation and control of secretion, motility, digestion and absorption within the gastrointestinal system
- Mastication/salivary secretion
- Swallowing reflex/ primary and secondary peristalsis
- Gastric motility

- Gastric acid and enzyme secretions
- Digestion and absorption of diet
- Hormonal control of gastrointestinal function
- Mass movement vs peristalsis
- Defecation reflex
- Salivary and pancreatic amylase
- Pancreatic zymogen secretion and activation within the small intestine
- Bile metabolism and function
- Digestion and absorption of nutrients
- Adaptations to abnormalities associated with each of the above processes

## PART B. REQUIRED COURSE FORM

| | |
|---|---|
| **Course title:** | Scientific Principles of Medicine Unit 4: Liver/Hematology |
| **Sponsoring department or unit:** | Department of Medical Education<br>Department of Internal Medicine |
| **Name of course director:** | Kirk Baston, MD/David Osborne, PhD/ Marc Zuckerman, MD/Javier Corral, MD |

***List all organizational units (e.g., physiology department, nursing school, library), including the lead department, with ongoing involvement in the course and the number of instructional staff from each such unit:***

| Organizational Unit | Number of Teaching Staff Involved |
|---|---|
| Department of Medical Education | 12 |
| Department of Internal Medicine | 8 |
| Pathology | 2 |
| Family Medicine | 1 |

### COURSE OBJECTIVES

***Are there written objectives for the course? (check)***

| Yes | ✓ | No | |
|---|---|---|---|

***Briefly summarize the objectives/content areas covered in the course.***

As previously noted in the description of the Gastrointestinal unit of the Scientific Principles of Medicine (SPM) course, in past years the Gastrointestinal and Hematological systems were linked in a single, longer unit of instruction. As part of an overall re-structuring of the sequence of units, and to address scheduling difficulties, the decision was reached to separate the GI and Hematology into two separate units. This 6 week unit of SPM consists of the following clinical presentations:

1. Abnormal liver function tests/Jaundice
2. Abdominal Distention
3. Abnormal hemoglobin
4. Abnormal white blood cells
5. Lymphadenopathy
6. Coagulation abnormalities

The abnormal liver function tests/jaundice presentation and the abdominal distention presentation serve as a bridge from the gastrointestinal system. Normal and abnormal aspects of the liver are discussed as well as the clinical findings that can arise in disordered states. The third and fourth clinical presentations center on abnormalities of red blood cells and white blood cells and address normal structure and function as well as the range of diseases that can be seen. Significant emphasis is placed on laboratory medicine and interpretation of peripheral blood smears. The fifth clinical presentation addresses lymph nodes. Normal function is covered with a strong emphasis on the immunological aspects of the lymph node. Clinical evaluation of lymphadenopathy is discussed as well as the range of diseases that can affect the lymph

nodes including Hodgkin and non- Hodgkin lymphomas. Clinical presentation 6 addresses disorders of coagulation. This week is a comprehensive tour of hemostasis and thrombosis. Disorders of bleeding and thrombosis are covered with a strong emphasis on laboratory evaluation of these disorders

Clinician medical educators introduce the clinical presentation and the basic scheme for each presentation. Basic science educators subsequently present the basic science components related to anatomy, biochemistry, cell biology, embryology, histology, genetics, immunology, microbiology, pathology, pharmacology and physiology. At the end of the week, students meet with clinicians in small groups review and analyze cases using the information covered during the week. This "deliberate practice" of processing through each scheme for clinical diagnostics reinforces the relationship between the basic sciences and the clinical application of the knowledge.

The basic science topics addressed in this unit can be found in the Topic Appendix at the end of this course description.

### ***Preparation for Teaching***

A majority of the instruction in this unit is delivered by faculty members in the department of medical education who participated in the development and planning of the unit. Consequently, they are well aware of the goals and objectives of the unit and how their individual material relates to that presented by other faculty members. Faculty members from the clinical departments who participate in the unit as clinical presentation "scheme presenters" and as facilitators in "Worked Case Example" (WCE) small group sessions are briefed by the unit director(s) regarding the goals and objectives of the session(s) in which they will participate. The unit directors review and give scheme presenters feedback on their particular presentations. WCE facilitators are provided with session materials (power points case material, "process work sheets) and are briefed on the goals and objectives of the given session. Whenever possible, new small group facilitators observe more experienced facilitators to learn about the WCE process.

***Are any of the following involved in the course as lecturers, small group facilitators, and/or laboratory instructors?***

| | **Yes** | **No** |
|---|---|---|
| Residents | ✓ | |
| Graduate Students | | ✓ |
| Postdoctoral Fellows | | ✓ |

***If yes, describe how they are informed about the course objectives and prepared for their teaching role.***

An advanced resident participated in worked case example sessions for this unit. The resident was provided the same materials as all other faculty members. The unit director observed this resident and

gave him feedback on group process and is confident in this resident's ability to provide excellent instruction and guidance.

***If the entire course is taught at more than one site (e.g., at geographically separated instructional sites), describe how instructional staff at all sites are oriented to the course objectives and the grading system.***

This course is taught solely on the campus of the PLFSOM.

| **Course title:** | Scientific Principles of Medicine Unit 4: Liver/Hematology |
|---|---|

## Student Evaluation

***If NBME subject (shelf) examinations are used, give the mean scores for the last three classes:***

Not applicable.

| **Year:** | | | |
|---|---|---|---|
| **Score:** | | | |

***Check all the formats that are used in examinations or other evaluations that students must take in order to pass the course:***

| | | | |
|---|---|---|---|
| ✓ | Multiple-choice, true/false, matching questions | | Laboratory practical items |
| | Fill-in, short answer questions | | Problem-solving written exercises |
| | Essay questions or papers | | Presentations |
| | Oral exams | | Preceptor ratings |
| | OSCE or standardized patient examination | ✓ | Other (describe) Small group facilitator assessment |

***Briefly describe any formative assessment activities that occur during the course (practice examinations, quizzes, etc.)***

Students participate in a 25-30 item formative assessment each week of this unit covering material presented in the preceding week. Typically these items are multiple choice questions written in the USMLE vignette format and they are drawn from the item pool that is being developed for each of the Scientific Principles of Medicine units. The formative assessment is delivered electronically in a secure environment and students receive immediate feedback on how many items they answered correctly. They also are able to review each of the items with annotations prepared by the item author explaining the correct (keyed) response. Scores are loaded into the students' e-portfolios for information purposes only. Scores on the formative quizzes are not used for final unit grading purposes. The goal of the formative assessment is to give students a sense of how they are performing and to identify early areas in which they may need to devote additional time or seek additional help from faculty. Students are provided a listing of the objectives associated with missed items on their formative quizzes to facilitate targeted review.

***Is a narrative evaluation of student performance submitted in addition to or as a component of the course grade? (check)***

| **Yes** | ✓ | **No** | |
|---|---|---|---|

Small group tutors complete a brief evaluation of student performance and participation in the Worked Case Examples sessions. Faculty tutors are encouraged to provide brief narrative comments. These narrative comments are reviewed by the associate dean for student affairs, the senior associate dean for

medical education and the college masters at the end of the year and a summary narrative is constructed and provided to the student in their e-portfolios. The summary narratives are intended to be provide formative feedback. However, problems with professionalism (e.g., disruptive or disrespectful behavior) that persist, despite feedback, could be referred to the Grading and Promotion committee for action.

## COURSE OUTCOMES/EVALUATION

***Comment on the adequacy of faculty and other resources to teach the course (e.g., educational space, computer hardware and software, support personnel).***

This course, like all of the others in the SPM curriculum is delivered by an interdisciplinary cadre of basic science and clinical faculty. While most of these faculty members are affiliated with the department of medical education, several members of the clinical faculty play an active role as CP lecture presenters and small group tutors or facilitators. Faculty resources are more than adequate to meet the needs of this course. The PLFSOM enjoys excellent educational facilities including state-of-the art lecture halls, laboratories, flexible-use teaching space (e.g., for interactive and Team-Based Learning activities), small group rooms, etc. All units within SPM are supported by full time course coordinators and an assessment coordinator for formative and summative assessment. Centralized IT and Audiovisual support is also made available to all courses and units of instruction within SPM.

***Provide a summary of student feedback on the course (and any other available evaluation data) for the past two academic years; include the percent of students providing evaluation data. If the course is new or has been significantly revised, provide evaluation data for the new version of the course only.***

Students complete anonymous on-line evaluations at the end of each unit. Results below are based on a 5-point scale with 1 representing "Strongly disagree" and 5 indicating "Strongly Agree."

| Hematology Evaluation Results | 2010-2011: Gastrointestinal/Hematology | *2011-2012: Liver/ Hematology |
|---|---|---|
| Well Organized | 4.5 | 4.4 |
| Learning objectives clearly identified. | 4.4 | 4.3 |
| The course met identified learning objectives. | 4.4 | 4.3 |
| The order of clinical presentations made sense | 4.3 | 4.3 |
| Basic Science material was well integrated. | 4.6 | 4.3 |
| Amount of material presented was reasonable. | 4.2 | 4.1 |
| I knew what I was supposed to be learning and why. | 4.5 | 4.2 |
| Evaluation methods were fair | 4.1 | 4.0 |
| Clinical presentation "schemes" contributed to my learning | 4.2 | 4.2 |
| Process work sheets contributed to my learning | 4.0 | 4.1 |
| Lectures helped me learn the material. | 4.1 | 4.3 |
| Work Case Examples helped me learn the material. | 4.7 | 4.5 |
| Anatomy Labs helped me learn the material. | 3.4 | 3.1 |
| Self-taught modules contributed to my learning | NA | 3.9 |
| I learned useful knowledge and/or skills | 4.6 | 4.5 |
| N | 44 | 82 |
| Class size at date | 57 | 83 |
| Response Rate | 77% | 99% |

*Please note: in the 2011-12 Academic Year, the previously offered combine GI/HEM unit was divided into two separate units—Unit 3: GI, and Unit 4, Liver/Hematology. This was done for logistical reasons

(to avoid having a course/unit span the winter holiday break) and to decompress the SPM course. The content, goals, and objectives of the two units are unchanged.

***Identify major successes in the course and problems to be overcome***.

***Successes:***

- This unit is well received by the students and evaluations are very good
- Well organized
- Student evaluations indicate that work case examples were very strong

***Challenges***:

The unit has a very large proportion of material for the amount of time allotted for its delivery. Some sections such as liver and lymph node need more time. We have been very efficient at placing this large amount of material in the unit but we should continue to discuss this issue in order to maximize student understanding. We will be discussing this further with the SPM directors.

Topic Appendix: Liver/ Hematology Unit

**Anatomy/Histology/ Embryology**

- Structure of Blood
- Bone marrow and blood development
- Lymphatic tissues including spleen

**Biochemistry**

- Iron/ Hemoglobin metabolism
- Erythrocyte metabolism
- Plasma protein synthesis and processing
- Serum markers of disease states
- Hematologic disorders as models of biochemical disorders

**Genetics**

- Genotypes and Allelic Frequency
- Genetics of Sickle Cell Anemia

**Immunology**

- Immune function of the spleen
- Immunology of HIV
- Mechanisms of immune-mediated anemia
- Immunology of blood transfusion
- Agglutination reactions
- Cytokines in leukocyte maturation
- Leukocyte biology
- Immunology of Bone marrow transplantation
- Review of T and B cell activation
- Review of the organization and function of lymph nodes
- Sarcoidosis
- Immune mechanisms of platelet destruction
- Immune mechanisms in Wiskott - Aldrich syndrome
- Antiphospholipid syndrome
- Waldenström’s Macroglobulinemia and Multiple Myeloma

- Significance of + Coombs' test in neonates

**Microbiology**

- Pathogenesis of HIV in terms of transmission, cell entry, genome replication and cell exit.
- Opportunistic infections and/or associated diseases in patients with HIV-AIDS
- Mononucleosis caused by Epstein Barr Virus (EBV): virion structure, genomic architecture, transmission, spread and evasion of the immune system.
- Epstein-Barr Virus-induced lymphoproliferative Diseases
- Infectious etiologies of lymphadenopathy
- Hemoflagellates
- Hepatomegaly or Hepatosplenomegaly due to liver parasitic infections
- Viral hemorrhagic fever
- Platelet levels as a sign of infection
- How disruption of normal flora can lead to depression of Vitamin K levels and bleeding

**Pathology**

- Pathogenesis, morphologic features, clinical manifestations, and diagnosis of liver disorders
- Pathogenesis, morphologic features, clinical manifestations, and diagnosis of red cell disorders
- Pathogenesis, morphologic features, clinical manifestations, and diagnosis of white cell disorders
- Pathogenesis, morphologic features, clinical manifestations, and diagnosis of lymph node disorders
- Pathogenesis, morphologic features, clinical manifestations, and diagnosis of disorders involving coagulation

**Pharmacology**

- Hematopoetic and megakaryocytic growth factors
- Anticoagulant, thrombolytic and antiplatelet drugs
- Chelators and heavy metal therapies

**Physiology**

- General structure and functions of blood
- Hemopoesis/erythropoesis
- Hemostasis
- Relation of blood composition to osmosis/osmotic pressure

## PART B. REQUIRED COURSE FORM

| | |
|---|---|
| **Course title:** | Scientific Principles of Medicine Unit 5: Cardiovascular/Pulmonary |
| **Sponsoring department or unit:** | Department of Medical Education<br>Department of Internal Medicine |
| **Name of course director:** | Nadah Zafar, MD/Herb Janssen, PhD/David Osborne, PhD/George Martinez-Lopez, MD |

***List all organizational units (e.g., physiology department, nursing school, library), including the lead department, with ongoing involvement in the course and the number of instructional staff from each such unit:***

| Organizational Unit | Number of Teaching Staff Involved |
|---|---|
| Department of Medical Education | 17 |
| Department of Internal Medicine | 10 |
| Department of Emergency Medicine | 7 |
| Department of Anesthesiology | 1 |
| Department of Family Medicine | 1 |

### COURSE OBJECTIVES

***Are there written objectives for the course? (check)***

| Yes | ✓ | No | |
|---|---|---|---|

***Briefly summarize the objectives/content areas covered in the course.***

Specific learning objectives are published for each of the 12 component clinical presentations included in this integrated unit. The objectives were developed and reviewed by the clinical and basic science faculty to insure appropriate coverage and integration of the material. The objectives are available online for both the faculty and the students. A list of the basic science topics addressed in this unit can be found in the topic appendix following this description. The clinical presentations addressed in this unit of SPM are:

1. Chest discomfort
2. Mediastinal mass (self-taught unit)
3. Abnormal heart sounds
4. Heart murmurs
5. Syncope
6. Palpitations
7. Abnormal arterial pulse
8. Abnormal blood pressure, hypertension and shock
9. Dyspnea
10. Cough and wheezing
11. Cyanosis
12. Hemoptysis

The sequence of these clinical presentations has been structured so that the concepts developed during the study of one topic provide a foundation for the subsequent topic. The basic medical science disciplines are interwoven. Basic information is provided for each clinical presentation including a brief definition and a statement of its clinical significance. A list of the potential causes for the presentation is provided along with a schematic representation of the relationships of those causal entities. This list of causes and the associated schematic representation provide the basis for discussion of each of the basic science principles, including underlying anatomic, biochemical, and pathophysiological concepts.

## ***Preparation for Teaching***

A majority of the instruction in this unit is delivered by faculty members in the Department of Medical Education who participated in the development and planning of the unit. Consequently, they are well aware of the goals and objectives of the unit and how their individual material relates to that presented by other faculty members. Faculty members from the clinical departments who participate in the unit as clinical presentation "scheme presenters" and as facilitators in "Worked Case Example" (WCE) small group sessions are briefed by the unit director(s) regarding the goals and objectives of the session(s) in which they will participate. The unit directors review and give scheme presenters feedback on their particular presentations. WCE facilitators are provided with session materials (power points case material, "process work sheets) and are briefed on the goals and objectives of the given session. Whenever possible, new small group facilitators observe more experienced facilitators to learn about the WCE process.

***Are any of the following involved in the course as lecturers, small group facilitators, and/or laboratory instructors?***

| | **Yes** | **No** |
|---|---|---|
| Residents | | x |
| Graduate Students | | x |
| Postdoctoral Fellows | | x |

***If yes, describe how they are informed about the course objectives and prepared for their teaching role.***

Not applicable

***If the entire course is taught at more than one site (e.g., at geographically separated instructional sites), describe how instructional staff at all sites are oriented to the course objectives and the grading system.***

This unit is taught on the campus of the PLFSOM.

**REQUIRED COURSE FORM** (Continued)

| **Course title:** | Unit 5: Cardiovascular/Pulmonology |
|---|---|

## Student Evaluation

***If NBME subject (shelf) examinations are used, give the mean scores for the last three classes:***

Not applicable

| **Year:** | | | |
|---|---|---|---|
| **Score:** | | | |

***Check all the formats that are used in examinations or other evaluations that students must take in order to pass the course:***

| | | | |
|---|---|---|---|
| ✓ | Multiple-choice, true/false, matching questions | | Laboratory practical items |
| | Fill-in, short answer questions | | Problem-solving written exercises |
| | Essay questions or papers | | Presentations |
| | Oral exams | | Preceptor ratings |
| | OSCE or standardized patient examination | ✓ | Other (describe) Small group facilitator assessment form |

***Briefly describe any formative assessment activities that occur during the course (practice examinations, quizzes, etc.)***

Students participate in a 25-30 item formative assessment weekly. Typically, these items are multiple choice questions written in the USMLE vignette format and are selected from the item pool that is being developed for each of the Scientific Principles of Medicine units. The formative assessment is delivered electronically in a secure environment and students receive immediate feedback on how many items they answered correctly. They also are able to review each of the items with annotations prepared by the item author explaining the correct (keyed) response. Scores are loaded into the students' e-portfolios for information purposes only. Scores on the formative quizzes are not used for final unit grading purposes. The goal of the formative assessment is to give students a sense of how they are performing and to identify early areas in which they may need to devote additional time or seek additional help from faculty.

***Is a narrative evaluation of student performance submitted in addition to or as a component of the course grade? (check)***

| **Yes** | X | **No** | |
|---|---|---|---|

Small group facilitators complete an evaluation on student participation and performance in WCE sessions. This evaluation includes a free text component for narrative comments. At the end of the year the associate dean for student affairs, the senior associate dean for medical education, and the college masters review all student comments and compile a summary narrative. This is formative feedback. However, if there are serious problems that have not been resolved over the course of the year, the student can be referred to the grading and promotion committee for action.

Academic Year: 2011-12

## COURSE OUTCOMES/EVALUATION

***Comment on the adequacy of faculty and other resources to teach the course (e.g., educational space, computer hardware and software, support personnel).***

We have the faculty members needed to deliver the content of this unit. Educational space is ample with state-of-the-art educational technology resources and a clinical learning and simulation center that is outstanding. The unit is supported by a full-time course coordinator and a full-time assessment coordinator.

***Provide a summary of student feedback on the course (and any other available evaluation data) for the past two academic years; include the percent of students providing evaluation data. If the course is new or has been significantly revised, provide evaluation data for the new version of the course only. If problems have been identified by student evaluations or other data, describe how they are being addressed.***

Students complete anonymous end-of-unit on-line evaluations utilizing a 5 point scale with a 1 indicating disagreement/dissatisfaction and a 5 indicating a high level of agreement/satisfaction.

| Cardiovascular & Pulmonary Evaluation Results | 2010-2011 | 2011-2012 |
|---|---|---|
| This unit was well organized. | 3.9 | 3.8 |
| The learning objectives were clearly identified. | 4.2 | 3.9 |
| The course met the identified learning objectives. | 4.1 | 3.9 |
| The order of clinical presentations made sense to me. | 4.0 | 3.8 |
| The Basic Science material was well integrated. | 4.1 | 4.1 |
| The amount of material presented was reasonable. | 4.1 | 3.6 |
| I knew what I was supposed to be learning and why. | 4.2 | 4.0 |
| The evaluation methods were fair | 4.1 | 3.7 |
| The Clinical presentation "schemes" contributed to my learning. | 4.1 | 3.8 |
| The process work sheets contributed to my learning | 4.1 | 3.8 |
| The lectures helped me learn the material. | 4.0 | 3.9 |
| The Work Case Examples helped me learn the material. | 4.6 | 4.3 |
| The self-taught modules contributed to my learning | -- | 3.3 |
| Anatomy Labs helped me learn the material. | 3.5 | 3.7 |
| Overall, I've learned useful knowledge and/or skills | 4.4 | 4.3 |
| N | 42 | 83 |
| Class size at date | 57 | 83 |
| Response Rate | 74% | 100% |

***Identify major successes in the course and problems to be overcome.***

***Successes:***

- This unit is well received by students and consistent over time.
- USMLE Step 1 scores for class of 2013 were above the national average.

- High level of integration with Medical Skills course reinforces clinical relevance of basic science content.

***Challenges***:

- The cardiopulmonary unit is a long unit and students feel that the amount of material covered on the final examination is challenging. Response: We will discuss unit length with the unit and course committee to consider either dividing the unit as was done last year for GI-Hematology or consider giving a mid-unit and final examination to decompress assessment.
- Student opinion is divided about the sequencing of clinical presentations. Some students recommend shifting the first clinical presentation on chest discomfort to the end of the unit to allow for coverage of both cardiovascular and pulmonary causes. Response: The unit directors feel that there is some merit in this recommendation and will address this with the unit committee and course committee.
- There were a number of free text student comments about the length and complexity of the process work sheets in this unit. Response: The unit directors will review and edit the process worksheets.
- There has been turn-over in the physician leadership of this unit. Response: A new physician unit director is being recruited internally at PLFSOM. The basic science unit directors will provide continuity for the unit.

Topic Appendix: Cardio/Pulmonary Unit

## 1. ANATOMY

### Cardiovascular

- Thoracic wall
- Mediastinum
- Heart & pericardium
- Blood and lymph, vessels, nerves
- Radiological anatomy
- Lymphatic system
- Blood vessels and lymphatic vessels
- Heart
- Heart Valves

### Pulmonary

- Nose, nasal cavity, paranasal sinuses, and mouth
- Pharynx, larynx, trachea and bronchi
- Thoracic wall, pleurae, and lungs
- Thoracic diaphragm
- Pulmonary blood vessels

## 2. BIOCHEMISTRY

### Cardiovascular

- General objectives in cardiovascular biochemistry
- Generation and use of energy by the heart
- Cholesterol metabolism and blood lipoproteins
- Mechanisms of cell injury and cell death
- Origin of cardiac enzymes
- Glycolysis in muscle and liver
- Protein metabolism
- Troponin

### Pulmonary

- Biochemistry of oxygen transport
- Acquired methemoglobinemias

- Hemolysis and heme oxidation

## 3. EMBRYOLOGY

### Cardiovascular

- Congenital malformations of the heart and great vessels
- Development of the heart, great vessels, and primitive circulation
- Angiogenesis
- Development of the heart and great vessels

### Pulmonary

- Embryological development of the respiratory system
- Cardiopulmonary alterations at birth

## 4. GENETICS

### Cardiovascular

- Familial hypercholesterolemia
- Familial dysbetalipoproteinemia
- Marfan syndrome
- Familial hypercholesterolemia
- Long QT syndrome

### Pulmonary

- Cystic fibrosis
- Alpha1-antitrypsin deficiency

## 5. HISTOLOGY

### Cardiovascular

- Tissue comprising the vascular system
- Characteristics of heart tissue
- Cell –cell communication in the heart
- Characteristics of cardiomyocytes

### Pulmonary

- Histology of the pleura, conducting airways, and functional respiratory units
- Characteristics of tissue involved in gas exchange

## 6. IMMUNOLOGY

### Cardiovascular

- Rheumatic heart disease

**Pulmonary**

- Asthma to Type I Hypersensitivity
- Cytokines and chemokines involved in airway inflammation
- Chronic allergen exposure

## 7. MICROBIOLOGY

**Cardiovascular**

- Intravascular infections
- Bacteria associated with septic shock
- Septicemia and bacteremia
- Endocarditis and pericarditis
- Viruses associated with myocarditis
- Rheumatic fever

**Pulmonary**

- Bacteria-associated lung infections
- Viruses causing infections of the respiratory system
- Fungal infections of the lung
- Basic immune mechanisms
- Role of immune mechanisms in respiratory disease

## 8. NEUROANATOMY

**Cardiovascular**

- Areas of brain involved in cardiovascular regulation
- Sympathetic and parasympathetic control of cardiovascular system

**Pulmonary**

- Areas of brain involved in regulation of breathing
- Nerves involved in transmission of afferent and efferent respiration control
- Location and identification of sensory respiratory signals

## 9. NERUOSCIENCE

**Cardiovascular**

- Pacemaker cell
- SA and AV node activity
- Conduction in heart muscle
- EKG analysis
- Fibrillation
- Heart Blocks

- Neural and humeral influences

### Pulmonary

- Respiratory rhythm generator
- Neural control mechanism

## 10. PATHOLOGY

### Cardiovascular

- Pathophysiology of shock and heart failure
- Atherosclerosis
- Ischemic heart disease
- Hypertensive cardiovascular disease
- Cor-pulmonale
- Valvular heart disease
- Myocardial diseases
- Cardiac therapeutic interventions
- Pericardial diseases
- Cardiac neoplasia
- Aneurysms and dissection
- Vasculitis
- Diseases of veins and lymphatics
- Vascular tumors

### Pulmonary

- Normal lung vs. lung with congenital anomalies/disorders
- Atelectasis
- Acute lung injury
- Obstructive airway disease
- Interstitial (restrictive) lung disease
- Diseases of vascular origin
- Pulmonary infections
- Lung transplantation
- Tumors of the lung
- Pleura
- Ear, nose, and air sinuses
- Larynx

## 11. PHARMACOLOGY

### Cardiovascular

- Overview of receptors involved in autonomic pharmacology
- Cholinergic receptor stimulants
- Cholinergic receptor and ganglionic antagonists
- Adrenergic receptor agonists
- Adrenergic receptor antagonists
- Nitric oxide
- Antihypertensive agents
- Drugs used for treatment of myocardial ischemia
- Pharmacological treatment of heart failure
- Phosphodiesterase inhibitors
- Antiarrhythmic drugs
- Agents used in hyperlipidemia
- Diuretics
- Therapy of cardiovascular disease

### Pulmonary

- Interpreting dose-response curves
- Overview of receptors involved in autonomic pharmacology
- Cholinergic receptor stimulants
- Autonomic pharmacology
  - cholinergic receptor and ganglionic antagonists
  - adrenergic receptor agonists
  - adrenergic receptor antagonists
- Nitric oxide and vascular reactivity
- Inhalational anesthetic agents, therapeutic gases and toxic vapors
- Pharmacological therapy of pulmonary disorders
- Antimycobacterial drugs
- Antibacterial drugs used in the treatment of pneumonia
- Histamine and antihistamines
- Kinins and their receptor antagonists
- Adrenocortical steroids and other anti-inflammatory agents
- Cancer chemotherapy

## 12. PHYSIOLOGY

### Cardiovascular

- Cardiovascular circuitry & hemodynamics
- The peripheral circulatory system
- The microcirculation and lymphatics
- Cardiac electrophysiology and the electrocardiogram
- The cardiac pump
- Regulation of arterial pressure and cardiac output
- Cellular physiology of cardiac and smooth muscle
- Special circulations
- Integrated control of the cardiovascular system

### Pulmonary

- Respiratory system structure and function
- Respiratory mechanics
- Gas transport and tissue gas exchange
- Acid-base balance
- Pulmonary gas exchange
- Perfusion of the lung
- Ventilation / perfusion
- Control of breathing
- Respiratory physiology in different environments
- Monitoring respiratory function

| PART B. REQUIRED COURSE FORM | |
|---|---|
| Course title: | Scientific Principles of Medicine Unit 6: Integration of Systems |
| Sponsoring department or unit: | Department of Medical Education and Department of Emergency Medicine |
| Name of course directors: | Elmus G. Beale, PhD, Robert Stump, MD, PhD |

***List all organizational units (e.g., physiology department, nursing school, library), including the lead department, with ongoing involvement in the course, and the number of instructional staff from each such unit:***

| **Organizational Unit** | **Number of Teaching Staff Involved** |
|---|---|
| Department of Emergency Medicine | 9 |
| Department of Medical Education | 3 |

## Course Objectives

***Are there written objectives for the course? (check)***

| **Yes** | **X** | **No** | |
|---|---|---|---|

***Briefly summarize the objectives/content areas covered in the course.***

Integration of Systems is a 2 week "review" unit addressing material covered in the Scientific Principles of Medicine course over the course of the year. This review is conducted in the context of emergency medicine and serves as an introduction to that field.

The eight one hour lecture sessions associated with this integrative unit include the following:

1- Introduction to Emergency Medicine
2- Pharmacology and Emergency Medicine
3-Cardiac Anatomy and Myocardial Infarction
4-Cardiac Dysrhythmias
5- Pulmonary Problems
6-Neurology and Emergency Medicine
7-Infections and Emergency Medicine
8-Antibiotics and Emergency Medicine

In addition to the lectures listed above, students participate in a series of clinical simulation exercises supervised by faculty and residents in emergency medicine—"Coding of the Rich and Famous—utilizing the high fidelity simulator resources of the PLFSOM center for Advanced Teaching and Assessment in

| **Course title:** | **Scientific Principles of Medicine Unit 6: Integration of Systems** |
|---|---|

Clinical Simulation. Assessment is based on a rubric addressing general principles of emergency medicine, application of basic science principles in discussion of simulation experience, and teamwork.

**General objectives:**

- Apply the general principles of the management of the emergent medical or trauma patient, including the ABCs, airway management, and defibrillation.
- Apply knowledge of the characteristics of the autonomic nervous system and the neurotransmitters involved to the pharmacological agents used in Emergency Medicine.
- Analyze the EKG in terms of heart anatomy and physiology to diagnose pathologies, if present.
- Apply knowledge of lung anatomy and physiology to the treatment of asthma and pneumonia.
- Apply knowledge of the classes of common antibiotics to the appropriate diagnosis and treatment of infections.

Specific learning objectives have been developed for each of the instructional sessions included in this unit.

The final integrative component of this unit is "Tank-Side Grand Rounds." Over the course of the year students electronically record findings on their cadavers as SOAP notes utilizing an on-line Donor Electronic Medical Record. These "findings" served as triggers for the development of learning prescriptions and self-directed study. During this unit each dissection team is given 30 minutes to report on their major findings and to answer questions posed by faculty and fellow students. Each member of the team participates in the presentation and are assessed by a rubric to provide feedback on behaviors associated with attitudes, knowledge, presentation skills, and analytic thinking.

## Preparation for Teaching

***Are any of the following involved in the course as lecturers, small group facilitators, and/or laboratory instructors?***

| | Yes | No |
|---|---|---|
| Residents | X | |
| Graduate Students | | X |
| Postdoctoral Fellows | | X |

***If yes, describe how they are informed about the course objectives and prepared for their teaching role?***

Senior residents, under faculty supervision, participate in the "Coding of the Rich and Famous" simulation exercises. To prepare them for their role, the emergency physician unit director reviewed the case scenarios, session goals and objectives, and discussed the assessment rubric designed to evaluate student performance.

| **Course title:** | **Scientific Principles of Medicine Unit 6: Integration of Systems** |
|---|---|

***If the entire course is taught at more than one site (e.g., at geographically separate campuses), describe how instructional staff at all sites are oriented to the objectives and grading system.***

This course is taught at one site—the Paul L. Foster School of Medicine.

## Student Evaluation

***If NBME subject (shelf) examinations are used, give the mean scores for the last two classes:***

| | | | |
|---|---|---|---|
| Year: | NA | NA | NA |
| Score: | NA | NA | NA |

***Check all the formats that are used in examinations or other evaluations that students must take in order to pass the course:***

| | | | |
|---|---|---|---|
| X | Multiple-choice, true/false, matching questions | | Laboratory practical items |
| | Fill-in, short answer questions | | Problem-solving written exercises |
| | Essay questions or papers | X | Presentations |
| | Oral exams | | Preceptor ratings |
| | OSCE or standardized patient exam | X | Other (describe) Simulation performance assessment rubric/Rubric based assessment of Donor Medical Record |

***Briefly describe any formative assessment activities that occur during the course (practice exams, quizzes, etc.) including when during the course they occur.***

A formative DEMR evaluation is given to students at the beginning of Unit 5 in February so that students can better understand what is expected as they begin their final preparations for Tank-side Grand Rounds in Unit 6. In addition, a formative Tank-side Grand rounds evaluation is offered at the beginning of Unit 6 to provide feedback to improve presentations prior to the final presentation. About 1/3$^{rd}$ of the teams take advantage of this opportunity.

**REQUIRED COURSE FORM** (Continued)

| **Course title:** | **Scientific Principles of Medicine Unit 6: Integration of Systems** |
|---|---|

***Is a narrative evaluation of student performance submitted in addition to or as a component of the course grade? (check)***

| | | | |
|---|---|---|---|
| **Yes** | **X** | **No** | |

Students receive narrative feedback on the rubrics employed to assess their performance in the "Coding of the Rich and Famous" exercises, their DEMR entries, and their presentations for "Tanks-side Grand Rounds."

## Course Outcomes/Evaluation

***Comment on the adequacy of faculty and other resources to teach the course (e.g., educational space, computer hardware and software, support personnel).***

We have sufficient faculty and resources to teach this course. This course is taught primarily by faculty and residents from the Department of Emergency Medicine. These faculty members were able to supervise the students in "Coding the Rich and Famous" in shifts with no difficulty. The Paul L. Foster School of Medicine has a state-of-the-art high fidelity simulation center equipped with programmable mannequins that respond in real time in physiologically appropriate ways.

***Provide a summary of student feedback on the course (and any other available evaluation data). If problems have been identified by student evaluations or other data, describe how they are being addressed.***

Students complete anonymous on-line end of unit evaluations employing a 5 point scale with 1 representing dissatisfaction/disagreement and 5 representing high satisfaction/high agreement. Please see results below.

**REQUIRED COURSE FORM** (Continued)

| **Course title:** | **Scientific Principles of Medicine Unit 6: Integration of Systems** |
|---|---|

| ***Unit 6: Integration of Systems*** | ***2010-2011*** | ***2011-2012*** |
|---|---|---|
| This unit was well organized. | 4.1 | 4.4 |
| The learning objectives were clearly identified. | 3.8 | 4.3 |
| The course met the identified learning objectives. | 3.9 | 4.4 |
| The order of clinical presentations made sense to me. | 4.0 | 4.2 |
| The basic science material was well integrated. | 4.2 | 4.4 |
| I knew what I was supposed to be learning and why. | 3.7 | 4.3 |
| The amount of material presented was reasonable. | 3.3 | 4.4 |
| The methods used to evaluate my performance provided fair measures of my effort and learning. | 3.5 | 4.3 |
| The lectures helped me integrate information from prior units. | 4.1 | 4.4 |
| The Clinical presentation "schemes" helped me learn the material. | 3.9 | 3.9 |
| Prior process work sheets were useful in this unit. | 4.2 | 3.7 |
| The self-taught modules helped me integrate information from prior units. | Not asked | 3.8 |
| Tank-side rounds helped me integrate information from prior units. | 3.6 | 3.9 |
| The DEMR caused me to identify gaps in my knowledge relevant to my donor's condition. | 3.6 | 3.8 |
| The DEMR prompted me to research topics relevant to my donor's condition. | 3.9 | 3.9 |
| Simulation Lab helped me integrate information from prior units. | 4.2 | 4.2 |
| Overall I learned useful knowledge and/or skills during this unit. | 4.2 | 4.5 |
| N | 54 | 72 |
| Class size at date | 57 | 83 |
| Response Rate | 96% | 87% |

***Identify major successes in the course to date and problems to be overcome.***

**Success:**

- Students report a high level of satisfaction with this unit and enjoy participating in the simulation exercise “coding the rich and famous.”
- Development of integrated lecture series reviewing host-defense processes, the musculoskeletal and neurological systems, GI-Hematology systems, and cardio-pulmonary systems.

| **Course title:** | **Scientific Principles of Medicine Unit 6: Integration of Systems** |
|---|---|

- Development of simulation protocols to expose students to emergency situations related to the above organ systems.
- Tank-Side Grand Rounds provides students an excellent opportunity to share results of self-directed study based on anomalies observed in their cadavers.

**Problems/Challenges:**

- Some faculty members found the evaluation rubrics for assessing the Tank-side Grand Rounds Presentations and for the Coding of the Rich and Famous exercise complex. We will review and revise as necessary.
- Students report that the amount of effort needed for the preparation of the Tank-side Grand Rounds presentation was disproportionate to the 5% weighting for the final Unit 6 grade. We are discussing increasing this weighting.
- New "Coding of the Rich and Famous" scenarios need to be developed as the content of some of the existing scenarios has been revealed.
- A number of faculty members feel that the Tank-side Grand Rounds exercise should be done in year 2 after students have completed their study of all organ systems. This recommendation is under consideration by the SPM course committee. A recommendation will be forwarded to the CEPC in the fall of 2012.

## PART B. REQUIRED COURSE FORM

| | |
|---|---|
| **Course title:** | Masters' Colloquium (I, II, II, IV) |
| **Sponsoring department or unit:** | Medical Education |
| **Name of course director:** | Stephan Sandroni, MD |

***List all organizational units (e.g., physiology department, nursing school, library), including the lead department, with ongoing involvement in the course and the number of instructional staff from each such unit:***

| **Organizational Unit** | **Number of Teaching Staff Involved** |
|---|---|
| Department of Medical Education | 5 |

### COURSE OBJECTIVES

***Are there written objectives for the course?***

| **Yes** | X | **No** | |
|---|---|---|---|

***Briefly summarize the objectives/content areas covered in the course.***

This is a required course for first and second year students that meet weekly in two hour sessions. Students are divided into 4 equal-sized learning communities, "Colleges," and instruction takes place within each college under the direction of a College Master. The topics addressed in this course relate to the following broad themes: the role of the physician, student acculturation into this role, professionalism, ethics, humanities, history of medicine, critical thinking, problem solving, judgment, communication skills, life-long learning, health care system issues, and controversies in medicine.

Most of the time the topics for the Masters Colloquium are coordinated with the content covered in Scientific Principles of Medicine. The principle instructional method is facilitated group discussion although a variety of instructional modalities are also used including presentation of artistic compositions, review of film and video, reflective writing, critical analysis of readings, and workshop style break-out activities. A list of the topics addressed in the Masters Colloquium in 2011-12 is included in the appendix at the end of this course description.

Course learning objectives, and how they relate to the PLFSOM Institutional Learning Objectives described in Section II (Educational Program) ED-1, 1-A (by alpha-numeric code) are listed below:

### KNOWLEDGE

- Describe fundamental ethical principles and human values, and how these apply in patient care and medical practice (Prof-1)
- Describe the components of the national health system and its funding and how this system affects individual and community health (SPB-2)

- Discuss financial, political and cultural situations that may present conflicts of interest in the practice of medicine (Prof-2)

**BEHAVIORS**

- Display compassion in interactions with all patients regardless of race, gender, ethnicity, sexual orientation, socioeconomic status and disability (Prof-3)
- Communicate clearly and in a civil manner with colleagues and instructors in the medical learning environment (ICS-1)
- Employ the highest ethical principles in interpersonal relationships, patient care, and research (Prof-4)
- Identify the need to employ self-initiated learning strategies (problem definition, resource identification, critical appraisal) when approaching new challenges, problems, or unfamiliar situations (PBL-7)

**ATTITUDES**

- Demonstrate respect for the beliefs, opinions and privacy of peers, colleagues, and instructors in the medical learning environment (Prof-5)
- Hold respect for the values of open-mindedness, awareness of the values of others, and mindfulness of once upon values.
- Provide compassionate and culturally appropriate care in all stages of the life cycle (ICS-1, Prof-3)
- Recognize when to take responsibility and when to seek assistance based on one's position, training and experience (PBL-4)
- Preserve patient's dignity in all interactions (Prof-8)
- Advocate for the interests and needs of the patient over one's own immediate needs (Prof-9)

**SKILLS**

- Identify and critically appraise electronic resources (appropriate to problem under study) for one's own education, patient education, and direct patient care (PBL-5)
- Given an ethics case, be able to identify the key ethical dilemma, identify the ethical principles that are in conflict, formulate arguments both for and against each option, weigh these arguments, and select the best course of action.
- Communicate knowledge, interpretation and recommendations orally and/or in writing to a wide range of professional or lay audience in culturally appropriate ways (ICS-3)
- Use a variety of educational modalities in pursuit of life-long learning (PBL-3, 7)

***Preparation for Teaching***

All teaching is done by the college Masters who meet weekly to plan their sessions, to identify topics and resources, and to make decisions about approach. The college Masters are committed to ensuring that students address comparable issues and employ equivalent methods for assessing student performance (e.g., use of common rubrics for the evaluation of written assignments).

***Are any of the following involved in the course as lecturers, small group facilitators, and/or laboratory instructors?***

| | Yes | No |
|---|---|---|

| | | |
|---|---|---|
| Residents | | X |
| Graduate Students | | X |
| Postdoctoral Fellows | | X |

***If yes, describe how they are informed about the course objectives and prepared for their teaching role.***

Not applicable.

***If the entire course is taught at more than one site (e.g., at geographically separated instructional sites), describe how instructional staff at all sites are oriented to the course objectives and the grading system.***

This course is taught on the campus of the Paul L. Foster School of Medicine in two sections each corresponding to the learning communities (Colleges) that have been established in the school. As described above, the Masters Colloquium is delivered by the college Masters for their respective Colleges. The Colloquium has a single syllabus and the Masters meet weekly to coordinate their teaching. The learning goals and topics addressed are the same for each College, but flexibility is permitted in the manner in which specific objectives are achieved.

| **Course title:** | Masters' Colloquium I, II, III, IV |
|---|---|

## Student Evaluation

***If NBME subject (shelf) examinations are used, give the mean scores for the last three classes:***

| **Year:** | | | |
|---|---|---|---|
| **Score:** | | | |

Not applicable

***Check all the formats that are used in examinations or other evaluations that students must take in order to pass the course:***

| | | | |
|---|---|---|---|
| | Multiple-choice, true/false, matching questions | | Laboratory practical items |
| | Fill-in, short answer questions | | Problem-solving written exercises |
| ✓ | Essay questions or papers | | Presentations |
| | Oral exams | | Preceptor ratings |
| | OSCE or standardized patient examination | | Other (describe) |

***Briefly describe any formative assessment activities that occur during the course (practice examinations, quizzes, etc.)***

College Masters meet individually with students in their respective colleges about their performance in the Masters' Colloquium and they also address issues related to student performance in other components of the curriculum. During the first two years of medical school, the college Masters serve as the primary advisors and mentors to students at the PLFSOM.

***Is a narrative evaluation of student performance submitted in addition to or as a component of the course grade? (check)***

| **Yes** | ✓ | **No** | |
|---|---|---|---|

Narrative feedback is provided on required written reflective exercises and analytic papers. The college Masters also collaborate with the associate dean for student affairs and the senior associate dean for medical education in the drafting of summary narratives based on small group facilitator feedback forms. These summaries are uploaded in the student portfolio.

## COURSE OUTCOMES/EVALUATION

***Comment on the adequacy of faculty and other resources to teach the course (e.g., educational space, computer hardware and software, support personnel).***

With the expansion in class size from 40 students in our charter class (Class of 2013) to the current 80 students, we are increasing the number of colleges—from two-to-four, and increasing the number of Masters from 4-to-8. Three new Masters were selected in the 2011-12 academic year and we are actively recruiting for the final Master as of this writing [May 12, 2012]. This number is adequate to meet the teaching needs of the Colloquium and the mentoring needs of the college. Each college has its own

"commons space" adjacent to the Masters' offices. The Colloquium takes place in two "case study" rooms designed on the Harvard Business School model or in one of two flexible use large seminar rooms. Each setting is appropriate for this discussion-intensive course. IT and audiovisual resources are readily available. The Colloquium has a course coordinator who is assigned to this course full time.

***Provide a summary of student feedback on the course (and any other available evaluation data) for the past two academic years; include the percent of students providing evaluation data. If the course is new or has been significantly revised, provide evaluation data for the new version of the course only. If problems have been identified by student evaluations or other data, describe how they are being addressed.***

Students complete on-line anonymous course evaluations at the end of each semester for this course. A five point scale in employed with 1 indicating the respondent "strongly disagrees" and 5 indicating the respondent "strongly agrees" with the item in question. The results of these evaluations for the past two academic years are listed below:

| MC I | Class of 2014 | Class of 2015 |
|---|---|---|
| Masters Colloquium was well organized. | 3.5 | 4.0 |
| The learning objectives were clearly identified. | 3.2 | 3.4 |
| The course met the identified learning objectives. | 3.3 | 3.7 |
| The amount of material presented was reasonable. | 3.8 | 4.2 |
| I knew what I was supposed to be learning and why. | 3.3 | 3.7 |
| The methods used to evaluate my performance were fair | 3.5 | 3.6 |
| I understand how the Masters' Colloquium content is applicable to the practice of medicine. | 4.0 | 3.9 |
| The course format is appropriate. | 3.7 | 3.8 |
| Master's Colloquium broadens my perspectives | 3.8 | 3.8 |
| Master's Colloquium challenges my assumptions. | 3.3 | 3.7 |
| Master's Colloquium helps me understand what is expected of me as a doctor. | 3.9 | 3.8 |
| Overall, I learned useful knowledge and/or skills during Masters' Colloquium. | 3.6 | 3.8 |
| I feel the Masters Colloquium has been valuable to me | 3.4 | 3.7 |
| Number of Responses | 52 | 78 |
| Class Size | 57 | 83 |
| Response Rate | 91% | 94% |

| MC II | Class of 2014 | Class of 2015 |
|---|---|---|
| Masters Colloquium was well organized. | 3.9 | 3.9 |
| The learning objectives were clearly identified. | 4.0 | 3.8 |
| The course met the identified learning objectives. | 3.9 | 3.8 |
| The amount of material presented was reasonable. | 4.3 | 4.1 |
| I knew what I was supposed to be learning and why. | 4.0 | 3.8 |
| The methods used to evaluate my performance were fair | 4.0 | 3.9 |
| I understand how the Masters' Colloquium content is applicable to the practice of medicine. | 4.3 | 4.0 |
| The course format is appropriate. | 3.9 | 3.9 |

| | | |
|---|---|---|
| Master's Colloquium broadens my perspectives | 4.1 | 4.0 |
| Master's Colloquium challenges my assumptions. | 3.7 | 3.9 |
| Master's Colloquium helps me understand what is expected of me as a doctor. | 4.0 | 3.9 |
| Overall, I learned useful knowledge and/or skills during Masters' Colloquium. | 4.0 | 4.0 |
| I feel the Masters Colloquium has been valuable to me | 3.9 | 3.9 |
| Number of Responses | 42 | 70 |
| Class Size | 57 | 83 |
| Response Rate | 74% | 84% |

| MC III | Class of 2014 | Class of 2015 |
|---|---|---|
| Masters Colloquium was well organized. | 3.9 | 4.0 |
| The learning objectives were clearly identified. | 3.8 | 4.0 |
| The course met the identified learning objectives. | 3.7 | 3.9 |
| The amount of material presented was reasonable. | 4.1 | 3.9 |
| I knew what I was supposed to be learning and why. | 3.7 | 3.9 |
| The methods used to evaluate my performance were fair | 3.7 | 3.9 |
| I understand how the Masters' Colloquium content is applicable to the practice of medicine. | 4.1 | 3.9 |
| The course format is appropriate. | 3.9 | 3.9 |
| Master's Colloquium broadens my perspectives | 3.9 | 3.9 |
| Master's Colloquium challenges my assumptions. | 3.8 | 3.9 |
| Master's Colloquium helps me understand what is expected of me as a doctor. | 3.7 | 3.9 |
| Overall, I learned useful knowledge and/or skills during Masters' Colloquium. | 3.7 | 3.8 |
| I feel the Masters Colloquium has been valuable to me | 3.7 | 3.8 |
| Number of Responses | 27 | 56 |
| Class Size | 37 | 57 |
| Response Rate | 73% | 98% |

| MC IV | Class of 2013 | Class of 2014 |
|---|---|---|
| Masters Colloquium was well organized. | 4.1 | 4.1 |
| The learning objectives were clearly identified. | 3.9 | 4.1 |
| The course met the identified learning objectives. | 3.9 | 4.1 |
| The amount of material presented was reasonable. | 4.4 | 4.1 |
| I knew what I was supposed to be learning and why. | 3.9 | 4.0 |
| The methods used to evaluate my performance were fair | 4.1 | 4.0 |
| I understand how the Masters' Colloquium content is applicable to the practice of medicine. | 3.8 | 4.1 |
| The course format is appropriate. | 4.1 | 4.1 |
| Master's Colloquium broadens my perspectives | 4.1 | 4.1 |
| Master's Colloquium challenges my assumptions. | 4.2 | 4.0 |
| Master's Colloquium helps me understand what is expected of me as a doctor. | 3.9 | 4.1 |

| | | |
|---|---|---|
| Overall, I learned useful knowledge and/or skills during Masters' Colloquium. | 4.1 | 4.1 |
| I feel the Masters Colloquium has been valuable to me | 4.1 | 4.0 |
| Number of Responses | 18 | 55 |
| Class Size | 37 | 57 |
| Response Rate | 49% | 96% |

***Identify major successes in the course and problems to be overcome***.

***Successes:***

**Engagement:** In Spite of the fact that the topics are broad, discussions focus on controversy and ambiguity, and the instructional method relies heavily on student participation, the Masters Colloquium is well attended and the sessions are eagerly engaged by the students.

**Bioethics:** by the end of the second year, the majority of students are able to take an ethics case, identify the key issue, articulate the ethical principles at work in the case, formulate arguments, and weigh the arguments against each other.

**Civil discourse:** an additional success is the respect for open discussion held by all the students. The Colloquium is a forum for open discussion of difficult issues. Some of the topics touch on polarizing issues. Students are encouraged to state their positions while treating others who hold different positions with respect.

**Reflection:** An additional success of the Colloquium is the openness that students demonstrate in their affective writings. The assignments ask the students to self-disclose their past decisions, feelings, and shortcomings. The students have written these essays with remarkable honesty, but many have described a sense of personal growth from these exercises.

***Challenges***:

**Curriculum:** Large group discussion is an inherently unwieldy instructional method, and the Masters Colloquium sessions have been somewhat uneven in quality. Some sessions has stimulated energetic participation by the students, while others fell flat. The College Masters continue to learn how to craft discussion cases and questions that contain the optimal level of ambiguity, challenge, relevance, novelty, and urgency. The weekly session planning meetings of the College Masters has become an important forum for development of these skills.

**Professionalism:** The assessment of professionalism has long been a challenge for medical educators. The current climate in medical education, driven principally by the ACGME, is strongly focused on developing new measures of professional behavior, and using these to assess trainees. The College Masters are responding to this challenge by initiating a collaborative effort to define the domains of professional behavior relevant to pre-clerkship trainees (and subsequently students in the clerkships), and subsequently write developmental descriptors of professional behavior. Once a derivation set of descriptors has been written, the College Masters hoped to prospectively validate these descriptors.

**Students in the clinical years:** Students in the pre-clerkship years have a strong sense of affiliation with their college and College Masters. However, once they leave the medical school and begin working in the

medical center, this affiliation is quickly lost. However, students in their clerkships are experiencing challenges in many domains, including difficult patient decisions, complex family dynamics, working with fatigued residents and attending physicians, ethical dilemmas, socioeconomic constraints, ethnic disparities, unfamiliar cultural norms, and other tough issues. These students would clearly benefit from a discussion forum such as the Masters Colloquium, but there simply is no place in the clerkships scheduled to situate such a forum. In addition, intersessions are not held between the clerkships, so there is no opportunity to bring all of the third-year students together from their various clerkship posts. Extending the work of the colleges into the clerkship year is a particularly important and difficult problem.

**Appendix: Masters Colloquium Topics**

**Year 1 (MC I, II)**

1. Creative composition: the anatomic donor
2. The antibiotic problem: Introduction to ethics
3. Learning principles
4. Narrative in medicine: Common text exercise
5. Economics of health care: Introduction to Medicare, Medicaid
6. The patient's experience of chronic disease
7. Decision-making heuristics
8. Ethics of pain management
9. Honesty and confidentiality
10. Doctors facing their fears
11. Empathy (parts 1,2, 3)
12. Diagnostic imaging: Two edged sword
13. The big picture: Ethical issues in genetic screening of populations
14. The risk-benefit ration of cancer therapy
15. Empathy and ethics
16. The ethics of life sustaining interventions
17. Imelda (film)
18. Reflections on a picture
19. Research Ethics (parts 1 and 2)
20. Ethics of genetic screening of individuals

**Year 2 (MC III, IV)**

1. Review of summer/SARP projects
2. Health care costs and sustainability
3. Awareness of disability: blindness and deafness
4. How doctor's face their fears
5. Professionalism
6. Drug companies and health care
7. Dialysis and transplantation: Access to care
8. Global health issues
9. Systemic barriers to effective therapy
10. Cultural interaction
11. Professionalism: Getting along in the sand box
12. Implications of assisted reproduction
13. Gender issues in medicine
14. Physician errors
15. Patient autonomy and decision-making
16. Career-life balance
17. Pediatric ethical decision-making
18. The chronically ill child: Doctor's sway and optimism
19. Real-time literature searching
20. Orientation to third year: Panel discussion

Academic Year 2011-12

Please note: Medical Skills (I, II, II and IV); Society, Community and the Individual (I, II, II, IV), and the Masters Colloquium (I, II, II, and IV) are courses that span the entire first two years of the curriculum. They are organized as continua as illustrated in Section II ED-5 and as described in the "overview" to the curriculum introducing the Educational Program component of the database. To reduce redundancy, we prepared a single description for these three years 1 and 2 courses. These descriptions are contained in the folder labeled "M1 and 2 Continua Courses."

Academic Year: 2011-12

## PART B. REQUIRED COURSE FORM

| | |
|---|---|
| **Course title:** | Medical Skills I, II, III, and IV |
| **Sponsoring department or unit:** | Department of Medical Education |
| **Name of course director:** | Gordon L. Woods, MD, MHPE<br>Maureen Francis, MD, FACP |

***List all organizational units (e.g., physiology department, nursing school, library), including the lead department, with ongoing involvement in the course and the number of instructional staff from each such unit:***

| Organizational Unit | Number of Teaching Staff Involved |
|---|---|
| Emergency Medicine | 4 |
| Family Medicine | 9 |
| Internal Medicine | 17 |
| Medical Education | 8 |
| Neurology | 2 |
| Obstetrics/Gynecology | 6 |
| Orthopedics | 2 |
| Pathology | 2 |
| Pediatrics | 5 |
| Psychiatry | 4 |
| Radiology | 2 |
| Surgery (Ophthalmology) | 2 |

### COURSE OBJECTIVES

Please note: This course is a required two year course and operates purposefully as a continuum over the first two years of the curriculum.

***Are there written objectives for the course?***

| | | | |
|---|---|---|---|
| **Yes** | √ | **No** | |

***Briefly summarize the objectives/content areas covered in the course.***

| Upon completion of the course, students will be able to: | Content area |
|---|---|
| Communicate with patients, family members, staff, and peers in a respectful and diplomatic manner. (ICS-1, 3, Prof-2)* | Communication skills |
| Communicate using language that is clear, understandable, and appropriate to each patient. (ICS-1,3, Prof-5,7) | Communication skills |
| Maintain each patient's dignity and modesty during clinical encounters. | Professionalism |

| | |
|---|---|
| (Prof-8) | |
| Identify the chief reason for the clinical encounter and use questions effectively to find the most pertinent history needed for decision-making. | Clinical skills |
| (PC-6) | |
| Select and perform the most pertinent physical examination maneuvers to search for findings that support or refute likely diagnoses under consideration. | Clinical skills |
| (PC-4,6) | |
| Concisely, accurately, and legibly record the patient's history in the medical record. (ICS-2, PC-3) | Documentation skills |
| Use the patient's history, physical examination, and diagnostic studies to generate a list of active medical problems. (PC-6) | Patient care |
| Orally present a patient's history and physical examination in an organized and concise manner. (ICS-1) | Communication skills |
| List the appropriate indications, potential risks and intended benefits of common procedures such as venipuncture, placement an intravenous catheter, and lumbar puncture.(MK-3) | Clinical decision-making |
| Proficiently perform several common clinical procedures such as venipuncture, placement of an intravenous catheter, and lumbar puncture. (PC-4) | Procedural skills |

*Note: Alpha-numeric codes correspond with institutional learning objectives documented in database section II, ED-1A.

The Medical Skills course is tightly integrated with the organ system units and clinical presentations in the course Scientific Principles of Medicine (SPM). During each Medical Skills session, students interview and examine a standardized patient presenting with a problem from the clinical presentation being covered that week in SPM. Students use focused histories and physical examinations modeled after the practices of expert clinicians to identify the underlying pathologic process and reason their way to the most likely diagnosis. During this process, students apply concepts learned in SPM to relevant clinical cases, and extend their knowledge of basic science by applying what they have learned to clinical decision-making.

## ***Preparation for Teaching***

***Are any of the following involved in the course as lecturers, small group facilitators, and/or laboratory instructors?***

| | **Yes** | **No** |
|---|---|---|
| Residents | √ | |
| Graduate Students | | √ |

| | | |
|---|---|---|
| Postdoctoral Fellows | | √ |

***If yes, describe how they are informed about the course objectives and prepared for their teaching role.***

The Medical Skills Course enlists clinicians from twelve clinical departments including clinician educators from the Department of Medical Education and chief residents from the residency training programs. These individuals are prepared for their teaching sessions through the following process:

- Instructional plans and course materials are prepared prior to each session. These are sent to participating clinician instructors in advance of their session. These instructional materials include learning objectives for the session.
- In preparation for their teaching, participating clinician instructors are invited to observe medical skills sessions and discuss the instructional plan with the course directors.
- Prior to their sessions, the course directors meet with participating clinician instructors for an optional instructors briefing on the teaching plan and review of the course materials. These briefings typically include a verbal "walk-through" of the session, during which comments, improvements, and suggestions are provided.
- Periodically, course directors will personally observe the instruction of clinician educators during the session. During breaks between sessions, the course directors will offer observations, suggestions, and feedback on the clinician educators' instruction.

***If the entire course is taught at more than one site (e.g., at geographically separated instructional sites), describe how instructional staff at all sites are oriented to the course objectives and the grading system.***

The Medical Skills course is taught on campus at the Paul L. Foster School of Medicine in the Western Refining Company Advanced Teaching and Assessment in Clinical Skills center.

**REQUIRED COURSE FORM** (Continued)

| **Course title:** | Medical Skills I and II |
|---|---|

## Student Evaluation

***If NBME subject (shelf) examinations are used, give the mean scores for the last three classes:***

| **Year:** | | | |
|---|---|---|---|
| **Score:** | | | |

Not Applicable.

***Check all the formats that are used in examinations or other evaluations that students must take in order to pass the course:***

| | | | |
|---|---|---|---|
| √ | Multiple-choice, true/false, matching questions | | Laboratory practical items |
| | Fill-in, short answer questions | | Problem-solving written exercises |
| √ | Essay questions or papers | | Presentations |
| | Oral exams | | Preceptor ratings |
| √ | OSCE or standardized patient examination | √ | Other (describe) Standardized patient assessments |

***Briefly describe any formative assessment activities that occur during the course (practice examinations, quizzes, etc.)***

**Introduction:** At the beginning of each Medical Skills session, a short introductory briefing is held. During this briefing, students take a readiness-assurance quiz using the audience response system (ARS). This quiz is designed to assess each student's readiness to engage in the learning activity. Multiple-choice questions taken from the preparatory materials for the session are presented, and the responses to these questions are used to fill in critical knowledge caps prior to starting the learning activities.

**Standardized Patient Encounters:** Students regularly participate in Standardized Patient (SP) encounters throughout the course. The problems scripted into these SP exercises are aligned with the course content of the SPM course. Each student is rated by their SP using a checklist of performance criteria. After each SP encounter, students personally meet with the SP for one-on-one feedback on their verbal communication, demeanor, and nonverbal communication.

After the SP encounter, each medical student writes a progress note in the SOAP format. These progress notes are immediately printed and given back to the medical student as a hard copy. Students then meet as a group with a faculty member to write a group SOAP note. With one student typing on a computer that is displayed on a projection screen, the students craft a consensus SOAP note. The faculty member facilitates the students as they select the elements they would include in the Subjective and Objective sections. Then, the faculty member guides the students as they come to their Assessment and craft a Plan. During this process, each student compares their own progress note to the consensus note written by their classmates. The reason for including each element of history and physical exam is reviewed, and the steps in arriving at the correct diagnosis are discussed. As a student driven activity, this exercise has proven to be a powerful learning and motivating experience for the students. Most notably, students early in their education can participate in discussions at a fairly high-level of diagnostic sophistication.

**Clinical skill development sessions:** in addition to a standardized patient encounter, each week medical students also participate in a skill development activity. These activities might include performance of a procedure (such as phlebotomy, lumbar puncture, arthrocentesis), physical examination skills (the fine points of the abdominal exam, cardiac auscultation, examination of the cranial nerves) or basic study interpretation (chest x-ray, electrocardiogram, laboratory test results). Skill development sessions are typically taught in small groups (4-5 students) and are interactive. After an initial demonstration of the skill, students perform the procedure while the faculty member provides coaching, suggestions, and feedback on performance.

**Hospital patient visits and written H&P (second year only):** On two occasions, students accompany one of the course directors to University Medical Center for a Hospital patient interview. With consent, students interview and examine a hospitalized patient, using a data gathering form to guide their questioning and physical exam. Students write up the information gathered in the standard admission history and physical format and submit these to a course director. They subsequently receive back their history and physical with handwritten comments, suggestions, and feedback.

***Is a narrative evaluation of student performance submitted in addition to or as a component of the course grade?***

| | | | |
|---|---|---|---|
| **Yes** | √ | **No** | |

In addition to check sheet ratings, standardized patients provide written narrative comments on each student's performance during each learning sessions, and also for after each OSCE testing station.

## COURSE OUTCOMES/EVALUATION

***Comment on the adequacy of faculty and other resources to teach the course (e.g., educational space, computer hardware and software, support personnel).***

The Medical Skills Course is presented in the Clinical Simulation Center, a state-of-the-art instructional facility located within the Paul L. Foster School of Medicine. Resources available within the Clinical Simulation Center include:

- a teaching classroom with multimedia, smart board, and audience response system
- small conference / discussion rooms
- 10 fully furnished and equipped examination rooms with videotaping and audio taping
- a real-time video processing system for recording multiple SP encounters
- a web-based SP encounter database system for student evaluation
- a simulation laboratory with six Human Patient Simulators that can simulate a wide range of medical, emergency medicine, surgical, pediatric, and obstetric clinical scenarios
- two practice rooms equipped with a wide variety of partial task simulators
- A computerized haptic simulator using force feedback simulation for computerized procedural practice
- A flexible case discussion room equipped with exam table, smart board, flat screen video, multimedia computer, and movable seating for up to 20 students.

The two course directors, who are the principal course instructors, have together over 35 years of experience as full-time medical educators, including experience in the development of educational instructional materials, development of standardized patient scenarios, bedside clinical teaching, performance assessment, and course evaluation.

The members of the Simulation Center support staff have extensive experience in organizing and presenting a wide variety of instructional sessions and student examinations. They support curriculum administration, training and maintaining a panel of standardized patients, and website management.

The Medical Skills Course is perhaps the most teacher-intensive course in the entire curriculum. The course frequently utilizes clinician-educators from the Department of Medical Education; a small group of well experienced clinical instructors. In addition, physicians from University Medical Center who have clinical appointments to Texas Tech University regularly participate in teaching in the course. Physicians are selected for each session based on their clinical experience and credentials as well as their demonstrated skill in providing small group instruction.

***Provide a summary of student feedback on the course (and any other available evaluation data) for the past two academic years; include the percent of students providing evaluation data. If the course is new or has been significantly revised, provide evaluation data for the new version of the course only. If problems have been identified by student evaluations or other data, describe how they are being addressed.***

Students complete an on-line anonymous evaluation of this course at the end of each semester. The survey employs a 5 point scale with 1 indicating a low level of satisfaction and 5 corresponding with a high level of satisfaction. Course evaluations are conducted by the Office of Curriculum, Evaluation and Accreditation.

| MEDICAL SKILLS<br>Semester I | Class of 2014 | Class of 2015 |
|---|---|---|
| This unit was well organized. | 4.3 | 4.3 |
| The learning objectives were clearly identified. | 4.3 | 4.2 |
| The course met the identified learning objectives. | 4.4 | 4.3 |
| I knew what I was supposed to be learning and why. | 4.3 | 4.0 |
| The amount of material presented was reasonable. | 4.5 | 4.4 |
| The materials posted on WebCT adequately prepared me for the learning sessions. | 4.4 | 4.1 |
| The methods used to evaluate my performance during this unit provided fair measures of my effort and learning. | 4. 2 | 4.1 |
| The material covered is relevant to the practice of medicine. | 4.6 | 4.6 |
| The preparation materials helped me learn the material. | 4.4 | 4.3 |
| The Standardized Patient Encounters helped me learn the material. | 4.6 | 4.4 |
| The group skill building activities helped me learn the material. | 4.0 | 4.1 |
| The feedback I received helped me learn the material. | 3.7 | 4.1 |
| This course encourages me. | 4.2 | 4.3 |
| Overall, I learned useful knowledge and/or skills during this unit of Medical Skills. | 4.6 | 4.6 |
| N completing Survey | 56 | 80 |
| Class size | 62 | 85 |
| Response rate | 90.3% | 94.1% |

| MEDICAL SKILLS<br>Semester II | Class of 2014 | Class of 2015 |
|---|---|---|
| This unit was well organized. | 4.5 | 4.3 |
| The learning objectives were clearly identified | 4.5 | 4.3 |
| The course met the identified learning objectives. | 4.5 | 4.3 |
| I knew what I was supposed to be learning and why. | 4.4 | 4.3 |
| The amount of material presented was reasonable. | 4.5 | 4.3 |
| The materials posted on WebCT adequately prepared me. | 4.5 | 4.2 |
| The methods used to evaluate my performance were fair. | 4.2 | 4.1 |
| The material covered is relevant to the practice of medicine. | 4.6 | 4.6 |
| The preparation materials helped me learn the material. | 4.5 | 4.3 |
| The Standardized Patient Encounters helped me learn the material. | 4.5 | 4.3 |
| The group skill building activities helped me learn the material. | 4.3 | 4.3 |
| The feedback I received helped me learn the material. | 3.9 | 4.0 |
| This course encourages me. | 4.3 | 4.3 |
| Overall, I learned useful knowledge and/or skills | 4.6 | 4.5 |
| N completing Survey | 41 | 83 |
| Class size | 57 | 83 |
| *Response rate | 72% | 100% |

*Please note: response rate low due to technical problems with on-line student evaluation application. This problem has been corrected.

| Medical Skills Semester III | Class of 2013 | Class of 2014 |
|---|---|---|
| This unit was well organized. | 4.2 | 4.1 |
| The learning objectives were clearly identified | 4.2 | 4.0 |
| The course met the identified learning objectives. | 4.3 | 4.0 |
| I knew what I was supposed to be learning and why. | 4.2 | 3.9 |
| The amount of material presented was reasonable. | 4.2 | 4.2 |
| The materials posted on WebCT adequately prepared me. | 4.3 | 3.4 |
| The methods used to evaluate my performance were fair. | 4.3 | 3.8 |
| The material covered is relevant to the practice of medicine. | 4.5 | 4.5 |
| The preparation materials helped me learn the material. | 4.2 | 3.7 |
| The Standardized Patient Encounters helped me learn the material. | 4.5 | 3.9 |
| The group skill building activities helped me learn the material. | 4.2 | 4.1 |
| The feedback I received helped me learn the material. | 4.3 | 3.9 |
| This course encourages me. | 4.4 | 3.9 |
| Overall, I learned useful knowledge and/or skills | 4.5 | 4.3 |
| N completing Survey | 25 | 57 |
| Class size | 37 | 62 |
| Response rate | 67.6% | 91.9% |

| Medical Skills IV | Class of 2013 | Class of 2014 |
|---|---|---|
| This unit was well organized. | 3.6 | 4.2 |
| The learning objectives were clearly identified | 3.6 | 4.3 |
| The course met the identified learning objectives. | 3.6 | 4.2 |
| I knew what I was supposed to be learning and why. | 3.5 | 4.3 |
| The amount of material presented was reasonable. | 3.8 | 4.3 |
| The materials posted on WebCT adequately prepared me. | 3.6 | 3.9 |
| The methods used to evaluate my performance were fair. | 3.8 | 4.2 |
| The material covered is relevant to the practice of medicine. | 4.2 | 4.4 |
| The preparation materials helped me learn the material. | 3.8 | 4.0 |
| The Standardized Patient Encounters helped me learn the material. | 4.0 | 4.2 |
| The group skill building activities helped me learn the material. | 3.7 | 4.3 |
| The feedback I received helped me learn the material. | 3.8 | 4.1 |
| This course encourages me. | 3.7 | 4.3 |
| Overall, I learned useful knowledge and/or skills | 3.9 | 4.4 |
| N completing Survey | 14 | 55 |
| Class size | 37 | 57 |
| Response rate | 37.8% | 96.5% |

***Identify major successes in the course and problems to be overcome***.

As can be seen from the evaluation results reported above, students are highly satisfied with the Medical Skills Course. Data provided by the Office of Curriculum, Evaluation, and Accreditation reveals that Medical Skills is the highest rated course in the pre-clerkship curriculum. The consistency of these high ratings over semesters and years is also noteworthy.

Students in the charter class were dissatisfied with the level and quality of feedback they received in the Medical Skills course. This issue was reviewed in a meeting of the Curriculum and Educational Policy Committee and the recommendation was made to the course director to revise the procedures for providing feedback. Responding to this recommendation, the following changes have been implemented.

1. As students see standardized patients in pairs, the second student now functions as a peer evaluator. The peer observers are provided with a list of performance criteria that are customized to each individual clinical presentation. Immediately after the encounter, the student observer provides feedback to their peer on their performance relative to these criteria.
2. Immediately after each test can counter, the standardized patients continue to give their impressions about the students verbal and nonverbal communication skills directly to the student.
3. Students receive a copy of their individual ratings from their standardized patient immediately following each SP encounter.
4. The facilitating faculty member receives aggregate data regarding the SP checklist ratings. During the small group debriefing following the SP encounter, the group receives general feedback on their performance.

5. During the SP encounter debriefing session, students write a consensus group SOAP note (see above). During this exercise, each student has a hard copy of their own individual SOAP note for comparison with the note being written by the group. In this way, students can compare their own performance with that of the best performing students in the group.

These changes have resulted in a considerable improvement in student satisfaction with this component of the course.

***Successes:***

**Integration:** A particular success of the Medical Skills Course has been the close integration of the course curriculum with topics covered in Scientific Principles of Medicine. This integration allows each medical skills session to build on basic sciences learning presented during the previous days. Through the application of basic sciences learning to clinical problems, the Medical Skills Course has enhanced the students understanding of principles learned in SPM. In this way, the two courses as have developed synergism, with each course supporting the learning goals of the other.

**Communication skills and professional deportment:** During the preclinical years, each medical student participates in 32 standardized patient encounters, and is the leading interviewer in at least half of these encounters. As a result, students have multiple observations of their bedside demeanor and communication skills, and receive feedback on their communication and professionalism after each of these encounters. As a result, by the end of the second year students have improved their bedside communication skills and professionalism. We have observed that virtually all of the students conduct themselves with patients in a considerate, articulate, and diplomatic manner.

**Clinical decision-making:** Each Medical Skills session is situated within a week of focused curriculum on a clinical topic. This has allowed the course directors have to present fairly complex clinical problems to the pre-clerkship students in the course. The course directors have seen that the students are consistently able to engage in medical decision-making at a sometimes surprisingly high level of sophistication. As a result, the Medical Skills Course has been particularly effective in preparing students for the third year clerkships.

***Challenges***:

**Feedback:** Changes in the processes for providing feedback to students have improved each students understanding of their individual performance. However, a missed opportunity persists. Each student is videotaped doing their SPM counters, and one-on-one review of these videotaped encounters is a powerful means of improving performance in a number of learning domains. Unfortunately, limited faculty availability has been a barrier to developing regular, one-on-one review of these videos with students. A potential solution is developing with recruitment of an additional clinical College Master. This faculty member would serve as a third co-director of the Medical Skills Course. With this additional faculty member, course administrative work can be distributed, opening time for clinical faculty members to begin regular reviews of video tapes with students.

**Assessment of professionalism:** Long an elusive goal of medical education, individual medical students have occasionally deported themselves unprofessionally. Some of these incidents have been dealt with and in an ineffective manner because of the lack of a clear description of appropriate professional behavior. The College Masters have begun the process of developing descriptors of professional behavior, with the intention of using these in the assessment of professional behavior. These descriptors will be applicable to student conduct in the Medical Skills Course sessions and will enhance the faculties ability to identify unprofessional behavior and deal with it effectively.

Academic Year _____

## PART B. REQUIRED COURSE FORM

| | |
|---|---|
| **Course title:** | Society, Community, and the Individual I, II, III, IV |
| **Sponsoring department or unit:** | Department of Medical Education |
| **Name of course director:** | Theresa Byrd, Dr. PH/Tania Arana, PhD |

Society, Community, and the Individual (SCI) is a two-year long course spanning the first four semesters of medical school.

***List all organizational units (e.g., physiology department, nursing school, library), including the lead department, with ongoing involvement in the course and the number of instructional staff from each such unit:***

| Organizational Unit | Number of Teaching Staff Involved |
|---|---|
| Department of Medical Education | 3 |
| Department of Biomedical Science | 1 |
| Department of Family Medicine | 43* |
| Department of Internal Medicine | 11* |
| Department of Pediatrics | 9* |
| Department of Obstetrics and Gynecology | 2* |
| Department of Psychiatry | 3* |

*Please note: These numbers include volunteer community faculty members serving as preceptors in the community-clinic experience component of SCI.

### COURSE OBJECTIVES

***Are there written objectives for the course? (check)***

| | | | |
|---|---|---|---|
| **Yes** | ✓ | **No** | |

***Briefly summarize the objectives/content areas covered in the course.***

Society, Community, and the Individual (SCI) is a required course spanning the MS1 and MS 2 years. The overall goal of this course is to provide students with a population perspective on health, illness, and care. This perspective is conveyed by weaving the following threads throughout the course: epidemiology, biostatistics, culture, community, family, environmental and occupational health, and medical Spanish. As part of this course, students participate in community assessment projects and they are assigned to community clinics where they spend approximately one-half day per month during the school year. During their clinic placements they are given opportunities to interact with patients under the supervision of physicians who have clinical appointments in the School of Medicine and they also complete a series of exercises designed to help them understand the organization of the practice, and the roles and relationships among the various members of the health care team (e.g., nurses, medical assistance, pharmacy, social work, community outreach workers).

The overall course goals include the following (alpha-numeric code refers to Institutional Learning Objectives described in Section II, ED-1, 1-A):

1. Students will understand the ecological model of health and how political/social, community, organizational, and family systems influence individual health (PBL-2, SBP-1, SBP-2, Prof-9);
2. Students will acquire an understanding of biostatistical concepts required to critically evaluate the medical literature and practice evidence-based medicine (MK-3, MK-4);
3. Students will understand modern epidemiological principles for assessing disease processes within populations and know how to apply this knowledge in practice (MK-3, MK-4);
4. Students will appreciate the role of culturally based beliefs, attitudes, and values in affecting the health and illness behaviors of individuals, groups, and communities (ICS-1, ICS-2, ICS-3, Prof-5,Prof-7);
5. Students will understand the concept of community and of systems within communities that impact health seeking behaviors and responses to treatment interventions (SPB-1, SPB-2);
6. Students will recognize variations in family structures, organization, values, and expectations as these influence health and illness-related behaviors (ICS-1, ICS-2, ICS-3, Prof-5,Prof-7);
7. Students will recognize the impact of environmental and occupation factors on the health of individuals and populations within communities and they will be able to identify and apply effective strategies for promoting health and reducing illness at the level of the individual and the community (ICS-3, SBP-1, SPB-2).
8. Students will acquire (or expand upon existing) skills in conversational and medical Spanish (ICS-1, ICS-3).

Specific learning objectives and expectations are made available prior to, or at the time of, each individual learning activity.

### ***Preparation for Teaching***

A majority of the lecture sessions in this course have been developed and delivered by faculty members who participated in the initial planning and design of the course. Consequently they are well aware of course goals and objectives and have developed their teaching materials to meet these goals and objectives. For small group sessions, facilitators are provided with detailed small group facilitator guides, lesson plans, and all needed materials. Further, faculty members facilitating small group sessions meet in "faculty huddles" prior to the scheduled session to review the goals, objectives, and methods of the session and to ask and answer questions. Community-based preceptors are provided opportunities for in-person orientation and faculty development. All are provided with detailed session guides and outlines.

Academic Year _____

***Are any of the following involved in the course as lecturers, small group facilitators, and/or laboratory instructors?***

| | Yes | No |
|---|---|---|
| Residents | | X |
| Graduate Students | | X |
| Postdoctoral Fellows | | X |

***If yes, describe how they are informed about the course objectives and prepared for their teaching role.***

Residents, Fellows, and Graduate Students do not teach in this course.

***If the entire course is taught at more than one site (e.g., at geographically separated instructional sites), describe how instructional staff at all sites are oriented to the course objectives and the grading system.***

Didactic/classroom components of this course are taught at a single location on the campus of the school of medicine. Students are, however, assigned to one of several community clinic sites for early clinical experiences located throughout the area. A variety of methods are employed to orient staff and clinical faculty to the goals and learning objectives of the course and the evaluation of the student. These include the following:

1. The creation of a community clinic advisory group with a representative from each major community-based site. This group meets two-three times a year, and as needed, to discuss the program goals and objectives, logistics, and to solve problems. These dinner meetings are well attended.
2. The course directors and coordinators hold orientation meetings with the clinical faculty and staff at each of the community clinic sites at the beginning of each academic year.
3. Each participating community clinic faculty member is provided a copy of the course syllabus and with a set of written materials outlining course objectives and learning activities.
4. Community clinic faculty do not grade the student per se, but complete a behavioral feedback form, including narrative comments, that is used by the course director to determine whether there are problems with student attitudes or conduct that need to be addressed.

Academic Year _____

**REQUIRED COURSE FORM** (Continued)

| **Course title:** | Society, Community, and the Individual |
|---|---|

## Student Evaluation

***If NBME subject (shelf) examinations are used, give the mean scores for the last three classes:***

| **Year:** | | | |
|---|---|---|---|
| **Score:** | | | |

Not applicable.

***Check all the formats that are used in examinations or other evaluations that students must take in order to pass the course:***

| | | | |
|---|---|---|---|
| ✓ | Multiple-choice, true/false, matching questions | | Laboratory practical items |
| ✓ | Fill-in, short answer questions | ✓ | Problem-solving written exercises |
| ✓ | Essay questions or papers | ✓ | Presentations |
| | Oral exams | ✓ | Preceptor ratings |
| | OSCE or standardized patient examination | ✓ | Other (describe) Small group facilitator evaluations |

***Briefly describe any formative assessment activities that occur during the course (practice examinations, quizzes, etc.)***

Practice exam questions are provided for biostatistics.

***Is a narrative evaluation of student performance submitted in addition to or as a component of the course grade? (check)***

| **Yes** | ✓ | **No** | |
|---|---|---|---|

Small group tutors complete a brief evaluation of student performance in SCI small group sessions and they are encouraged to provide brief narrative comments. Similarly, community preceptors complete an assessment on each student at the time of each encounter. They too are encouraged to provide narrative comments. These narrative comments are reviewed by the senior associate dean for medical education, the associate dean for student affairs and the college masters at the end of the year and a summary narrative is constructed and provided to the student in their e-portfolios. The summary narratives are intended to provide formative feedback. However, problems with professionalism (e.g., disruptive or disrespectful behavior) that persist, despite feedback, would be referred to the associate dean for student affairs and if necessary to the Grading and Promotion committee for action.

## COURSE OUTCOMES/EVALUATION

***Comment on the adequacy of faculty and other resources to teach the course (e.g., educational space, computer hardware and software, support personnel).***

The SCI course has excellent space, excellent IT/Educational technology support, and a full time course coordinator to assist the course director. We also have more than adequate faculty resources to meet the didactic course goals and learning objectives. Our challenge for the future will be in recruiting sufficient numbers of community clinic physicians for the experiential components of this course. We have adequate numbers now to meet our needs for the next 2 years, but as our class size grows, we'll need to expand capacity. Steps are being taken to identify additional clinical faculty in the community and additional sites to meet future needs.

***Provide a summary of student feedback on the course (and any other available evaluation data) for the past two academic years; include the percent of students providing evaluation data. If the course is new or has been significantly revised, provide evaluation data for the new version of the course only. If problems have been identified by student evaluations or other data, describe how they are being addressed.***

Students are asked to complete anonymous on-line evaluations of this course at the end of the three-week, "mini-immersion" experience on language, culture, and community on the border, which serves as the PLFSOM introduction to the education program for first year students, and then again at the end of each semester. Students are asked to respond to evaluation items using a 5-point scale with 1 indicating "strong disagreement" with the item and 5 indicating "strong agreement." Results for the last two years are presented below.

| **SCI Immersion Block** | Class of 2014 | Class of 2015 |
|---|---|---|
| The SCI Immersion was well organized | 4.0 | 3.4 |
| The learning objectives were clearly identified | 4.0 | 3.5 |
| The SCI Immersion met the identified learning objectives | 4.0 | 3.6 |
| The community assessment gave me a good feel for the El Paso community. | 4.4 | 4.1 |
| The amount of material presented was reasonable. | 4.2 | 3.6 |
| I improved my Spanish speaking skills | 4.2 | 4.0 |
| The lectures helped me learn the material. | 3.8 | 3.5 |
| The small group learning activities helped me learn the material. | 4.1 | 3.7 |
| The community assessment helped me learn the material | 4.0 | 3.7 |
| The interactive sessions helped me learn the material | 4.2 | 3.7 |
| I understand how the SCI Immersion is applicable to the practice of medicine. | 4.1 | 4.0 |
| Overall, I learned useful knowledge and/or skills | 4.0 | 3.7 |
| N completing Survey | 60 | 82 |
| Class size | 62 | 84 |
| Response rate | 97% | 98% |

Academic Year _____

| **SCI I (Semester)** | 2014 | 2015 |
|---|---|---|
| SCI was well organized. | 3.7 | 3.0 |
| The learning objectives were clearly identified. | 3.8 | 3.5 |
| The course met the identified learning objectives. | 3.9 | 3.5 |
| The amount of material presented was reasonable. | 3.9 | 3.8 |
| I knew what I was supposed to be learning and why. | 3.9 | 3.0 |
| The methods used to evaluate my performance were fair | 3.9 | 3.2 |
| SCI broadens my perspectives. | 3.5 | 3.0 |
| The material covered by SCI is relevant to the practice of medicine. | 4.0 | 3.3 |
| The lectures helped me learn the material. | 3.2 | 2.8 |
| The community clinic experience is a worthwhile component of the curriculum. | 4.2 | 3.9 |
| Spanish is a worthwhile component of the curriculum. | 3.7 | 3.3 |
| Overall, I learned useful knowledge and/or skills during SCI. | 3.7 | 3.2 |
| Number of Responses | 51 | 79 |
| Class Size | 60 | 83 |
| Response Rate | 85% | 95% |

| **SCI II** | 2014 | 2015 |
|---|---|---|
| SCI was well organized. | 3.5 | 3.0 |
| The learning objectives were clearly identified. | 3.5 | 3.2 |
| The course met the identified learning objectives. | 3.7 | 3.1 |
| The amount of material presented was reasonable. | 3.9 | 3.4 |
| I knew what I was supposed to be learning and why. | 3.6 | 3.1 |
| The methods used to evaluate my performance were fair | 3.7 | 3.0 |
| SCI broadens my perspectives. | 3.6 | 3.0 |
| The material covered by SCI is relevant to the practice of medicine. | 3.7 | 3.3 |
| The lectures helped me learn the material. | 3.3 | 3.1 |
| The community clinic experience is a worthwhile component of the curriculum. | 3.9 | 3.6 |
| Spanish is a worthwhile component of the curriculum. | 3.6 | 3.4 |
| My community preceptor understood the learning objectives. | -- | 3.5 |
| My community preceptor ensured that the learning objectives were met. | -- | 3.5 |
| Overall, I learned useful knowledge and/or skills during SCI. | 3.7 | 3.2 |
| Number of Responses | 43 | 79 |
| Class Size | 57 | 83 |
| Response Rate | 75% | 95% |

Academic Year _____

| **SCI III** | 2013 | 2014 |
|---|---|---|
| SCI was well organized. | 2.5 | 2.9 |
| The learning objectives were clearly identified. | 2.9 | 2.9 |
| The course met the identified learning objectives. | 2.7 | 2.9 |
| The amount of material presented was reasonable. | 2.5 | 3.3 |
| I knew what I was supposed to be learning and why. | 2.6 | 2.9 |
| The methods used to evaluate my performance were fair. | 2.4 | 2.9 |
| SCI broadens my perspectives. | 2.8 | 3.1 |
| The material covered by SCI is relevant to the practice of medicine. | 3.3 | 3.1 |
| The lectures helped me learn the material. | 2.2 | 2.6 |
| The community clinic experience is a worthwhile component of the curriculum. | 4.2 | 3.5 |
| Spanish is a worthwhile component of the curriculum. | 3.4 | 3.5 |
| Overall, I learned useful knowledge and/or skills during SCI. | 3.3 | 3.0 |
| Number of Responses | 27 | 57 |
| Class Size | 37 | 57 |
| Response Rate | 73% | 100% |

| **SCI IV** | 2013 | 2014 |
|---|---|---|
| SCI was well organized. | 2.4 | 2.4 |
| The learning objectives were clearly identified. | 2.4 | 2.5 |
| The course met the identified learning objectives. | 2.2 | 2.6 |
| The amount of material presented was reasonable. | 2.3 | 3.2 |
| I knew what I was supposed to be learning and why. | 1.8 | 2.2 |
| The methods used to evaluate my performance were fair | 1.8 | 2.4 |
| SCI broadens my perspectives. | 2.7 | 3.0 |
| The material covered by SCI is relevant to the practice of medicine. | 2.8 | 3.2 |
| The lectures helped me learn the material. | 1.6 | 2.2 |
| The community clinic experience is a worthwhile component of the curriculum. | 4.1 | 3.5 |
| Spanish is a worthwhile component of the curriculum. | 3.7 | 3.5 |
| Overall, I learned useful knowledge and/or skills during SCI. | 3.2 | 3.0 |
| Number of Responses | 19 | 55 |
| Class Size | 37 | 58 |
| Response Rate | 51% | 95% |

Academic Year _____

***Identify major successes in the course and problems to be overcome***.

***Successes:***

The SCI course has provided students with the opportunity to learn more about the ecological model of health and to connect the social, cultural, community and family determinants to individual health. Anecdotally, several third year students have commented that the content they learned in SCI has been helpful in the clinical setting. They especially feel they are skilled at patient-centered interviewing, and that they can better communicate with Spanish Speaking patients. We have also had some success in integrating more with the clinical and basic sciences content, by scheduling SCI content to coincide with other courses such as Scientific Principles of Medicine, Medical Skills and Master's colloquium topics as much as possible. In the Spanish course, students study the vocabulary associated with the SPM unit they are working in. Students have been very happy with the community clinic experience in general.

***Challenges***:

There have been several challenges that we have been working to overcome. The course has received low evaluations, in part because the content has been provided in a sporadic manner, and because students have not always seen the connection of SCI to medical practice. Generally, students tell us that they think the content is important for future interactions with patients, but they sense that it is not content that is covered on the USMLE Step 1 exam, so they feel uncomfortable about having to learn it in the first 2 years of medical school. In order to better understand the issues, and to get input from students and faculty from the other courses, we held an SCI planning summit in January 2012. We received good feedback on how to improve the course. In response to the feedback, we have changed the course for Fall of 2012 so that Spanish meets weekly for one hour (instead of once every 2 weeks) and SCI class meets weekly for one hour. We are changing our Spanish faculty from a health science based faculty to a language and arts based faculty to improve language instruction. Spanish will be assessing students OSCEs with Spanish Speaking standardized patients. We have tried to make clearer links between SCI content and SPM, Medical Skills and Masters Colloquium through scheduling sessions so that they integrate better with the other courses. We have removed most of the epidemiology content from year one, and moved it into a more integrated course with biostatistics in year 2. The second half of the second year will be focused on how to read and critique the medical literature, applying epidemiology and biostatistics knowledge they have learned in the previous semester. This will enhance the applicability of biostatistics and epidemiology to medicine. We are adding online content so that students can prepare for class ahead of time, and do mostly hands-on practical and application exercises during class time.

## PART B. REQUIRED COURSE FORM

| | |
|---|---|
| **Course title:** | Scientific Principles of Medicine Unit 10: Reproduction |
| **Sponsoring department or unit:** | Department of Obstetrics and Gynecology<br>Department of Medical Education |
| **Name of course director:** | Sanja Kupesic, MD/ Dale Quest, PhD |

***List all organizational units (e.g., physiology department, nursing school, library), including the lead department, with ongoing involvement in the course and the number of instructional staff from each such unit:***

| Organizational Unit | Number of Teaching Staff Involved |
|---|---|
| Department of Medical Education | 15 |
| Department of Obstetrics and Gynecology | 6 |
| Department of Family and Community Medicine | 1 |
| Department of Pathology | 1 |

### COURSE OBJECTIVES

***Are there written objectives for the course?***

| Yes | ✓ | No | |
|---|---|---|---|

***Briefly summarize the objectives/content areas covered in the course.***

This unit of Scientific Principles of Medicine addresses human reproduction, pregnancy, and illnesses associated with the reproductive system and process. This course of instruction is organized around the following clinical presentations:

1. Infertility
2. Male reproductive system
3. Abnormal menstrual cycle
4. Contraception
5. Menopause
6. Pelvic floor relaxation
7. Screening and prevention
8. Sexually transmitted diseases
9. Abnormal genital track bleeding
10. Pelvic mass
11. Pelvic pain
12. Normal pregnancy
13. Pregnancy complications
14. Pregnancy loss

The sequence of these clinical presentations has been structured so that the concepts developed during the study of one topic lay down a foundation for subsequent topics. Students are provided with a brief

definition and a statement of clinical significance for each clinical presentation. This serves as the foundation for presentations of both clinical and basic science information. Gross, microscopic, and radiographic normal and abnormal anatomy are presented in laboratory and small group discussions (with "process worksheets" and "worked examples" as previously described).

Physical signs and symptoms associated with particular disease processes are provided along with a schematic representation of the relationships of causal entities. This list of causes and the associated schematic representation provide the basis for discussion of basic science principles including underlying anatomic, biochemical, and pathophysiological concepts. Basic science learning objectives are covered for each clinical presentation. Examples of the basic science content of this unit of SPM are listed in the topic appendix at the end of this course description.

***Preparation for Teaching***

A majority of the instruction in this unit is delivered by faculty members in the department of medical education who participated in the development and planning of the unit. Consequently, they are well aware of the goals and objectives of the unit and how their individual material relates to that presented by other faculty members. Faculty members from the clinical departments who participate in the unit as clinical presentation "scheme presenters" and as facilitators in "Worked Case Example" (WCE) small group sessions are briefed by the unit director(s) regarding the goals and objectives of the session(s) in which they will participate. The unit directors review and give scheme presenters feedback on their particular presentations. WCE facilitators are provided with session materials (power points case material, "process work sheets") and are briefed on the goals and objectives of the given session. Whenever possible, new small group facilitators observe more experienced facilitators to learn about the WCE process.

***Are any of the following involved in the course as lecturers, small group facilitators, and/or laboratory instructors?***

| | **Yes** | **No** |
|---|---|---|
| Residents | | ✓ |
| Graduate Students | | ✓ |
| Postdoctoral Fellows | | ✓ |

***If yes, describe how they are informed about the course objectives and prepared for their teaching role.***

***If the entire course is taught at more than one site (e.g., at geographically separated instructional sites), describe how instructional staff at all sites are oriented to the course objectives and the grading system.***

This course is taught at only a single site, the campus of the PLFSOM.

| **Course title:** | Scientific Principles of Medicine Unit 10: Reproduction |
|---|---|

## Student Evaluation

***If NBME subject (shelf) examinations are used, give the mean scores for the last three classes:***

Not applicable.

| **Year:** | | | |
|---|---|---|---|
| **Score:** | | | |

***Check all the formats that are used in examinations or other evaluations that students must take in order to pass the course:***

| | | | |
|---|---|---|---|
| ✓ | Multiple-choice, true/false, matching questions | | Laboratory practical items |
| | Fill-in, short answer questions | | Problem-solving written exercises |
| | Essay questions or papers | | Presentations |
| | Oral exams | | Preceptor ratings |
| | OSCE or standardized patient examination | ✓ | Other (describe) Small group assessment |

***Briefly describe any formative assessment activities that occur during the course (practice examinations, quizzes, etc.)***

Students participate in a 25-30 item formative assessment each week of this unit covering material presented in the preceding week. Typically these items are multiple choice questions written in the USMLE vignette format and they are drawn from the item pool that is being developed for each of the Scientific Principles of Medicine units. The formative assessment is delivered electronically in a secure environment and students receive immediate feedback on the number of items they answered correctly. They also are able to review each of the items with annotations prepared by the item author explaining the correct (keyed) response. Scores are loaded into the students' e-portfolios for information purposes only. Scores on the formative quizzes are not used for final unit grading purposes. The goal of the formative assessment is to give students a sense of how they are performing and to identify early areas in which they may need to devote additional time or seek additional help from faculty.

***Is a narrative evaluation of student performance submitted in addition to or as a component of the course grade? (check)***

| **Yes** | ✓ | **No** | |
|---|---|---|---|

Small group facilitators complete assessments on student performance in WCE sessions. These include space for narrative comments. Rating forms are uploaded into the student e-portfolio and are reviewed by the associate dean for student affairs, senior associate dean for medical education, and college masters who collaborate in formulating a summary narrative at the end of the year.

## COURSE OUTCOMES/EVALUATION

***Comment on the adequacy of faculty and other resources to teach the course (e.g., educational space, computer hardware and software, support personnel).***

This course, like all of the others in the SPM curriculum is delivered by an interdisciplinary cadre of basic science and clinical faculty. While most of these faculty members are affiliated with the department of medical education, several members of the clinical faculty play an active role as CP lecture presenters and small group tutors or facilitators. The PLFSOM enjoys excellent educational facilities including state-of-the art lecture halls, laboratories, flexible-use teaching space (e.g., for interactive and Team-Based Learning activities), small group rooms, etc. All units within SPM are supported by full time course coordinators and an assessment coordinator for formative and summative assessment. Centralized IT and Audiovisual support is also made available to all courses and units of instruction within SPM.

In general we have sufficient faculty for this unit. There is a high level of support in the Department of Obstetrics and Gynecology for this unit and many participated in WCE small group sessions.

***Provide a summary of student feedback on the course (and any other available evaluation data) for the past two academic years; include the percent of students providing evaluation data. If the course is new or has been significantly revised, provide evaluation data for the new version of the course only. If problems have been identified by student evaluations or other data, describe how they are being addressed.***

Students complete anonymous on-line evaluations at the end of each unit. Results below are based on a 5-point scale with 1 representing "Strongly disagree" and 5 indicating "Strongly Agree."

| Reproduction Unit Evaluation Results | 2010-2011 | 2011-2012 |
|---|---|---|
| This unit was well organized. | 3.8 | 4.3 |
| The learning objectives were clearly identified. | 4.1 | 4.3 |
| The unit met the identified learning objectives. | 4.0 | 4.4 |
| The order of clinical presentations made sense to me. | 4.1 | 4.1 |
| The Basic Science material was well integrated. | 2.9 | 4.2 |
| The amount of material presented was reasonable. | 4.2 | 4.0 |
| I knew what I was supposed to be learning and why. | 3.8 | 4.1 |
| The methods used to evaluate my performance were fair. | 4.1 | 4.0 |
| The Clinical presentation "schemes" contributed to my learning. | 4.3 | 4.3 |
| The process work sheets contributed to my learning. | 4.3 | 4.1 |
| The lectures helped me learn the material. | 3.8 | 4.2 |
| The Work Case Examples helped me learn the material. | 4.1 | 4.4 |
| The self-taught sessions helped me learn the material | NA | 3.7 |
| Anatomy Labs helped me learn the material. | 2.8 | 3.5 |
| Female Infertility Integrative Lab helped me learn the material. | 3.5 | NA |
| Overall, I learned useful knowledge and/or skills during this unit. | 4.4 | 4.5 |
| N | 32 | 55 |
| Class size at date | 37 | 57 |
| Response Rate | 86% | 96% |

***Identify major successes in the course and problems to be overcome***.

***Successes:***

- Students have highly valued the organization of the Unit and integration of basic and clinical science content.
- In 2011/12 male reproductive system was successfully incorporated in Reproduction Unit.
- Students' evaluations indicate that integration of scheme presentations with worked case examples and Medical Skills has facilitated mastering Reproduction Unit learning objectives.

***Challenges***:

- Improvements are to be made to self-taught sessions and Anatomy Lab activities to better fit the clinical science learning objectives.
- Improve the consistency of small group sessions. The clinician unit director will meet with the other small group facilitators to review goals, objectives and approach and give them an opportunity to ask questions and seek clarification.

## Topic Appendix: Reproduction Unit

## 1. ANATOMY / HISTOLOGY / EMBRYOLOGY

### Gross Anatomy

- Structure of the pelvis, bones and joints
- The inguinal region: structure, nerve supply
- Blood supply of the spermatic cord, and scrotum
- Nerve supply and blood supply of the male internal genitalia
- Urogenital region
  - Urogenital triangle
  - Urogenital diaphragm
  - Superior and inferior fasciae
  - Superficial and deep perineal pouches
  - Pudendal nerve and internal pudendal artery, pudendal canal
  - Superior pubic ligament and the arcuate pubic ligament
  - Lymphatic drainage and the structures of the male pelvis
- Visual learning objectives for gross anatomy
- Ovary and the female reproductive system
- Pelvis, bones and joints of the pelvis, the walls and floor of the pelvis
- Pelvic diaphragm and the levator ani
- Nerves of the pelvis including the pudendal nerve the pudendal canal
- Arteries of the pelvis, vaginal arteries
- Pelvic autonomic nerves
- Urogenital region
  - Urogenital triangle
  - Urogenital diaphragm
  - Associated musculature
  - Superior and inferior fasciae of diaphragm
  - Superficial and deep perineal spaces
  - Female internal genital organs
- Structure, blood supply, and nerve supply of the vagina, uterus, uterine tubes, and ovaries
- Vaginal anatomy
  - Relationship of the vagina to the perineal body
  - Sphincters of the vagina

        - Vaginal artery
    - Uterus and ovaries
        - Uterine artery and internal pudendal artery
        - Anastomosis between ovarian branch of uterine artery and the ovarian artery
        - Broad ligaments, round ligaments
        - Suspensory ligament of the ovary, and the uterosacral ligament
        - Pelvic fascia, peritoneum, bladder, uterus, and rectum
    - Retropubic space and female perineum
    - External genitalia
        - Blood supply and nerve supply of the mons pubis
        - Labia majora and minora
        - Vestibule of the vagina
        - External urethral orifice and Bartholin's gland
        - Lesser vestibular glands
        - Clitoris and the bulbs of the vestibule
    - Lymphatic drainage of the structures of the female pelvis
    - Anatomy and lymphatic drainage of the breast
    - Visual learning objectives for gross anatomy

**Histology**

- Ovary and female reproductive system
    - Histogenesis and histological organization of the ovary
    - Oogenesis and comparisons with spermato/spermiogenesis
    - Organization, function and development of the ovarian follicle
    - Histophysiology of the ovarian follicle
    - Cells producing steroid hormones and sources of steroid precursors
- Target cells of pituitary gonadotropins
    - Trophic action of gonadotropins
    - Apoptosis upon diminished gonadotropin secretion
- Generic structure of visceral canals, layers of the oviduct and vagina
- Histological organization of the uterus
- Implantation, formation, development and structure of the human placenta
- Mammary gland during and after lactation
- Hormones and the gonadostatic function of the pineal gland.

**Embryology**

- Ovary and female reproductive system
  - Development of the gonads
  - Absence of the Y-chromosome gene on female reproductive system
  - Derivation of the primordial follicles
  - Müllerian ducts
    - Development of the female reproductive system
    - Uterovaginal primordium
  - Uterine and associated tissue
    - Fallopian tubes
    - Uterus
    - Superior portion of the vagina
  - Formation of the broad ligaments, rectouterine pouch, and vesicouterine pouch
  - Inferior two-thirds portion of the vagina
  - Development of the auxiliary genital glands and external genitalia
- Female reproductive cycle with emphasis on the ovarian cycle
  - Gametogenesis and oogenesis
  - Origin of the corpus luteum from the remaining granulosa and thecal cells
  - Origin of the placenta, beginning at implantation, developing through parturition
  - Parturition, stages of labor, and hormonal control

## 2. BIOCHEMISTRY

- Estrogens, progesterone and the female reproductive system
  - Synthesis and secretion pathways for the synthesis of estradiol and progesterone and their tissue location
  - Transport and metabolism of the steroid hormone carrier proteins and their sites of synthesis
  - Signal transduction, mechanism by which estrogens and progesterone exert their effects on tissues
  - Menstrual cycle and pregnancy hormonal changes that take place during pregnancy and the function of the various hormones
  - Parturition and lactation, hormonal changes that occur during and after parturition, and the function of the individual hormones, hormones that participate in lactation, and their individual roles

## 3. GENETICS

- Genetics of gender

- Genetic disorders of endocrine function

## 4. NUTRITION

- Special nutritional needs during pregnancy, parturition, and lactation
  - Potentially deleterious nutritional deficiencies
    - Methods of and rationale for the nutritional assessment of the pregnant woman
    - Recommended dietary allowances for pregnancy and lactation
    - Vitamins and minerals important prevention of anemia during pregnancy and their functional biochemistry
    - Nutritionals important for prevention of birth defects
  - Potentially deleterious nutritionals, teratogens and toxicants
    - Nutritional supplements, caffeine, alcohol, drugs and exercise in pregnancy
    - Risk factors for abnormal fetal birth weight
    - Fetal alcohol syndrome and other developmental abnormalities

## 5. PATHOLOGY

- Female genital system and breast
  - Female genital tract
    - Clinical, gross and microscopic features of the neoplasms
    - Relationship of in utero exposure to diethylstilbestrol in vaginal adenosis and adenocarcinoma
    - Role of human papillomavirus (HPV) in carcinoma of the cervix
    - Cervix and cervical dysplasia, squamous carcinoma - in-situ, invasive squamous carcinoma and adenocarcinoma
    - Histologic appearance of the endometrium
      - Anovulatory cycles
      - Prolonged oral contraceptive use
      - Ingestion of progestational agents
      - Endometrial hyperplasia
      - Endometrial adenocarcinoma
    - Gross and microscopic features
      - Leiomyoma
      - Leiomyosarcoma
      - Adenomyosis
      - Endometriosis

- Endometrial hyperplasia
- Etiologies and potential complications of pelvic inflammatory disease
- Ectopic pregnancy
- Major features of polycystic ovary syndrome
- Chronic endometriosis
- Ovarian neoplasms
- Placenta and pathology of placentation
- Gestational trophoblastic disease

- The breast
  - Clinical findings and dominant histological features of acute mastitis and breast abscess, plasma cell mastitis (duct ectasia), fat necrosis of the breast
  - Fibrocystic disease of the breast
  - Breast neoplasms: patterns of presentation, gross and microscopic features, patterns of metastasis (if any), and prognosis
  - Staging and prognostic factors (molecular, microscopic, clinical) that influence the clinical outcome of breast cancer
  - Significant abnormalities of the male breast, gynecomastia and carcinoma

## 6. PHARMACOLOGY

- Ovary and female reproductive system
  - Natural and synthetic estrogens
    - Selective estrogen receptor modifiers
    - Antiestrogens
    - Estrogen synthesis inhibitors
  - Natural and synthetic progestins
    - Anti-progestins
    - Combination oral contraceptives
  - Therapeutic uses of estrogens and progestins
    - Hypogonadism
    - Postmenopause
    - Contraception
    - Osteoporosis
    - Cancer
  - Ovulation induction
    - GnRH agonists and antagonists

- Gonadotropins
- Osteoporosis: prevention and treatment
- Agents that cause contraction and relaxation of the uterus
- Prostaglandins in obstetrics

## 7. PHYSIOLOGY

- Ovary and female reproductive system
  - Secretion and chemical nature of female sex steroid hormones
  - Function of the hypothalamic-pituitary-gonadal axis and “feedback” in males
  - Regulation of synthesis and secretion
    - LH, FSH, prolactin
    - Female sex steroid hormones
    - Gonadotropin releasing hormone
- Endocrine influences on the function of the female reproductive system
  - Uterine endometrium and the menstrual cycle
    - Changes in the ovaries
    - FSH and LH
    - Estrogens and progesterone
    - Normal ovulatory menstrual cycles
    - Anovulatory menstrual cycle
    - Consequence of androgen production in the female
  - Pregnancy
    - Estrogen and progesterone
    - Human chorionic gonadotropin
    - Human placental lactogen
  - Endocrine functions of the placenta
  - Factors responsible for initiation and control of parturition
  - Hormones in breast development, milk synthesis, and milk release
  - Functions of the primary and accessory reproductive structures in the female
  - Physiological changes which occur during pregnancy for both the mother and the fetus

Academic Year _____

## PART B. REQUIRED COURSE FORM

| | |
|---|---|
| **Course title:** | Scientific Principles of Medicine Unit 11:The Mind and Human Development |
| **Sponsoring department or unit:** | Departments of Medical Education, Pediatrics and Psychiatry |
| **Name of course director:** | Tania Arana, PhD, Richard Brower, MD, Blanca Garcia, MD |

***List all organizational units (e.g., physiology department, nursing school, library), including the lead department, with ongoing involvement in the course and the number of instructional staff from each such unit:***

| Organizational Unit | Number of Teaching Staff Involved |
|---|---|
| Department of Medical Education | 15 |
| Department of Pediatrics | 12 |
| Department of Psychiatry | 7 |
| Department of Family and Community Medicine | 2 |
| Department of Internal Medicine | 1 |
| Department of Biomedical Science | 1 |

**COURSE OBJECTIVES**

***Are there written objectives for the course? (check)***

| Yes | ✓ | No | |
|---|---|---|---|

***Briefly summarize the objectives/content areas covered in the course.***

The Mind and Human development unit of SPM addresses normal and abnormal bio-behavioral developmental process across the life span beginning at birth through old age and senescence. This unit builds on the foundation laid by the unit on human reproduction which precedes it. The following clinical presentations have been assigned to Unit 11:

1. Developmental Health and Disease: Infant –Toddler (ages 0-2)
2. Sudden Infant Death Syndrome and Acute Life Threatening Events (Self-Taught Module)
3. Development Health and Disease in Early Childhood (ages 2-8)
4. Developmental Health and Disease in the Pre-Teen Years (ages 8-12)
5. Developmental Health and Disease in Adolescent Patients (ages 13+)
6. Oral Health (Self-Taught module)
7. Mood Disorders
8. Anxiety and Panic Disorders
9. Psychosis-Disordered Thought
10. Falls in the Elderly (Self-Taught Module)
11. Substance Abuse, Dependence, and Withdrawal
12. Dementia
13. Sleep and Circadian Rhythm Disorders

As with all of the units that fall under the Scientific Principles of Medicine (SPM) course umbrella, the sequence of clinical presentations have been structured so that concepts developed during the study of one topic provides a foundation for subsequent topics. The basic science content and concepts addressed in this unit are those that the faculty deems are essential for understanding a given presentation. Example basic science topics addressed in this unit of SPM are included in the appendix at the end of this course description. This content is provided to students through lecture, laboratory sessions, problem solving small group interactions, and self-study modules.

## ***Preparation for Teaching***

A majority of the instruction in this unit is delivered by faculty members in the department of medical education who participated in the development and planning of the unit. Consequently, they are well aware of the goals and objectives of the unit and how their individual material relates to that presented by other faculty members. Faculty members from the clinical departments who participate in the unit as clinical presentation "scheme presenters" and as facilitators in "Worked Case Example" (WCE) small group sessions are briefed by the unit director(s) regarding the goals and objectives of the session(s) in which they will participate. The unit directors review and give scheme presenters feedback on their particular presentations. WCE facilitators are provided with session materials (power points case material, "process work sheets) and are briefed on the goals and objectives of the given session. Whenever possible, new small group facilitators observe more experienced facilitators to learn about the WCE process.

***Are any of the following involved in the course as lecturers, small group facilitators, and/or laboratory instructors?***

| | **Yes** | **No** |
|---|---|---|
| Residents | | ✓ |
| Graduate Students | | ✓ |
| Postdoctoral Fellows | | ✓ |

***If yes, describe how they are informed about the course objectives and prepared for their teaching role.***

Not applicable

***If the entire course is taught at more than one site (e.g., at geographically separated instructional sites), describe how instructional staff at all sites are oriented to the course objectives and the grading system.***

This course is taught at only one site—the campus of the PLFSOM.

Academic Year _____

**REQUIRED COURSE FORM** (Continued)

| **Course title:** | Mind and Human Development |
|---|---|

## Student Evaluation

***If NBME subject (shelf) examinations are used, give the mean scores for the last three classes:***

| **Year:** | | | |
|---|---|---|---|
| **Score:** | | | |

Not applicable

***Check all the formats that are used in examinations or other evaluations that students must take in order to pass the course:***

| | | | |
|---|---|---|---|
| ✓ | Multiple-choice, true/false, matching questions | | Laboratory practical items |
| | Fill-in, short answer questions | | Problem-solving written exercises |
| | Essay questions or papers | | Presentations |
| | Oral exams | | Preceptor ratings |
| | OSCE or standardized patient examination | ✓ | Other (describe) Small group assessment |

***Briefly describe any formative assessment activities that occur during the course (practice examinations, quizzes, etc.)***

Students participate in a 20-30 item formative assessment each week of this unit covering material presented in the preceding week. Typically these items are multiple choice questions written in the USMLE vignette format and they are drawn from the item pool that is being developed for each of the Scientific Principles of Medicine units. The formative assessment is delivered electronically in a secure environment and students receive immediate feedback on how many items they answered correctly. They also are able to review each of the items with annotations prepared by the item author explaining the correct (keyed) response. Scores are loaded into the students' e-portfolios for information purposes only. Scores on the formative quizzes are not used for final unit grading purposes. The goal of the formative assessment is to give students a sense of how they are performing and to identify early areas in which they may need to devote additional time or seek additional help from faculty.

***Is a narrative evaluation of student performance submitted in addition to or as a component of the course grade? (check)***

| **Yes** | ✓ | **No** | |
|---|---|---|---|

Small group tutors complete a brief evaluation of student performance and participation in the Worked Case Examples sessions. Faculty tutors are encouraged to provide brief narrative comments. These narrative comments are reviewed by the senior associate dean for medical education, the associate dean for student affairs and the college masters at the end of the year and a summary narrative is constructed and provided to the student in their e-portfolios. The summary narratives are intended to provide

formative feedback. However, problems with professionalism (e.g., disruptive or disrespectful behavior) that persisted, despite feedback, could be referred to the Grading and Promotion committee for action.

## COURSE OUTCOMES/EVALUATION

***Comment on the adequacy of faculty and other resources to teach the course (e.g., educational space, computer hardware and software, support personnel).***

This course, like all of the others in the SPM curriculum is delivered by an interdisciplinary cadre of basic science and clinical faculty. While most of these faculty members are affiliated with the department of medical education, several members of the clinical faculty play an active role as CP lecture presenters and small group tutors or facilitators. Faculty resources are more than adequate to meet the needs of this course. The PLFSOM enjoys excellent educational facilities including state-of-the art lecture halls, laboratories, flexible-use teaching space (e.g., for interactive and Team-Based Learning activities), small group rooms, etc. All units within SPM are supported by full time course coordinators and an assessment coordinator for formative and summative assessment.

***Provide a summary of student feedback on the course (and any other available evaluation data) for the past two academic years; include the percent of students providing evaluation data. If the course is new or has been significantly revised, provide evaluation data for the new version of the course only. If problems have been identified by student evaluations or other data, describe how they are being addressed.***

At the end of the unit students complete anonymous on-line course evaluations employing a 5 point scale with a 1 representing dissatisfaction/disagreement with an item and a 5 representing a high level of satisfaction/agreement.

| Mind & Human Development Evaluation Results | 2010-2011 | 2011-2012 |
|---|---|---|
| This unit was well organized. | 3.2 | 2.9 |
| The learning objectives were clearly identified. | 3.2 | 3.3 |
| The unit met the identified learning objectives. | 3.4 | 3.2 |
| The order of clinical presentations made sense to me. | 3.6 | 3.3 |
| The Basic Science material was well integrated. | 3.4 | 3.3 |
| The amount of material presented was reasonable. | 3.1 | 3.7 |
| I knew what I was supposed to be learning and why. | 3.4 | 2.9 |
| The methods used to evaluate my performance were fair. | 3.0 | 3.2 |
| The Clinical presentation "schemes" contributed to my learning. | 3.6 | 3.3 |
| The process work sheets contributed to my learning. | 3.4 | 3.2 |
| The lectures helped me learn the material. | 3.5 | 3.0 |
| The Work Case Examples helped me learn the material. | 3.5 | 3.9 |
| The self-taught modules helped me learn the material | NA | 3.1 |
| Anatomy Labs helped me learn the material. | 3.0 | NA |
| Overall, I've learned useful knowledge and/or skills during this unit. | 3.7 | 3.5 |
| N | 12 | 55 |
| Class size at date | 37 | 57 |
| Response Rate | 32% | 96% |

Academic Year _____

***Identify major successes in the course and problems to be overcome***.

***Successes:***

- This unit of SPM was modified following the AY 2010-11 to place more emphasis on developmental themes. This enabled us to reduce redundancy that students did not find particularly helpful despite the intended goal of review in a pediatric context.

***Challenges***:

- Students perceived this unit as being somewhat disorganized. We agree. Some of this disorganization can be attributed to the substantial changes required to highlight development as the organizing theme of the unit.
- The self-taught modules on Sudden Infant Death and Acute Life Threatening Evens, Oral Health, and Falls in the Elderly were not particularly well received by students and may have contributed to the perception that they were not well integrated with other components of the unit.
- The Psychosis-Disordered Thought and Substance-Abuse clinical presentations need improvement.

***Improvement Plan:***

- To improve how the organization and flow of the unit are perceived the Unit co-directors plan to unify the efforts of the clinical medical educators/scheme presenters. They will be asked to coordinate their efforts to create threads that stream through the human development presentations such that each presenter identifies the unique features of the physical , sexual , emotional and cognitive development for each stage.

- Unit directors have identified the need to improve exam items. In particular each item must be unique and not identifiable from available learning resources. All items will be reviewed by the authors and vetting teams for uniqueness as the unit progresses this year.

- Certain psychiatry topics had not received the appropriate attention and will emphasis will be increased. In particular, efforts will be made to include the topics of Personality Disorders and Defense Mechanisms.

- The Department of Medical Education will be adding an experienced clinician medical educator in July 2012. He will play a major role in the planning and implementation of this unit in the future.

## Appendix: Topic List for Mind and Human Development

### 1. BEHAVIORAL SCIENCE

- Characterization and assessment of human behavior
  - Development
  - Psychological assessment
  - Personality
  - Learning and memory
  - Psychosocial determinants of behavioral and cognitive health
- Established disorders of human behavior
  - Structure and use of the DSM-IV-TR
  - Autism spectrum disorders
  - Stress and coping mechanisms
  - Personality disorders
  - Anxiety disorders
  - Mood (affective) disorders
  - Attention disorders and disruptive behavior in children
  - Disorders of thought and psychotic disorders, including schizophrenia
  - Dementia and delirium
  - Circadian rhythms and sleep, normal and abnormal states/conditions
- Relationship of organic illness or physiologic changes on human behavior
  - Pregnancy
  - Cardiovascular risk
  - Pain and coping mechanisms
  - HIV and the individual
- Interpersonal relationships and human behavior
  - Families, relationships, and health
  - Violence and suicide
  - Sexuality & sexual dysfunction
- Human behavior and pharmacologically active agents
  - Adherence to medical regimens
  - Substance abuse, addiction and withdrawal
  - Consequences of maternal/prenatal substance abuse

### 2. BIOCHEMISTRY

- Metabolism of the brain and central nervous system in health and disease
  - Glucose and carbohydrates
  - Nitrogen, ammonia and the urea cycle
  - Amino acid categorization, metabolism and metabolic disorders
  - Fatty acid metabolism
  - Lipolysis, beta-oxidation, gluconeogenesis and ketogenesis
  - The TCA cycle and the respiratory/electon-transport chain
  - Organic acids and organic acidurias
  - Lipids and myelin
  - Serotonin and neuroactive transmitters
  - Thiamine and thiamine deficiency
- Biochemical mechanisms in degenerative diseases
  - Alzheimer disease
  - Amyloidosis
  - Prion diseases

**3. GENETICS**

- Genetic aspects of newborn screening
- Genetic aspects of behavioral and cognitive disorders

**4. NUTRITION**

- Nutrition, malnutrition and development
- Psychosocial and behavioral aspects of nutrition
- Eating disorders
- Nutritional rehabilitation

**5. PHARMACOLOGY** (uses, mechanisms of action, pharmacokinetics, and adverse effects)

- Pharmacology and human development
  - Developmental aspects of pharmacokinetics
  - Steroids and sexual development
- Pharmacology and behavior, mental health and cognition
  - Stimulant drugs
  - Cholinergic drugs
  - Anticholinergic drugs
  - Indirect-acting sympathomimetic agents
  - Indirect-acting sympatholytic agents
  - Serotonergic drugs
  - Dopamine antagonists
  - Antipsychotic agents
  - Sedatives, hypnotics and anxiolytics
  - Drugs used to treat ADHD
  - Drugs used to treat affective disorders
  - Drugs of abuse
  - Pharmacology of tobacco dependence
  - Drugs used in dementias
  - Antiepileptic drugs as mood stabilizers
  - Prescribing CNS drugs for the elderly

**6. PHYSIOLOGY**

- Physiology of human development
  - Lung maturation and surfactant
  - Circulatory system maturation
  - Maturation of liver function
  - Control of sexual development
  - Control of linear growth and body mass
- Physiology and neuroscience of behavior, mental health and cognition
  - Physiology of circadian rhythms and sleep
  - Physiology of stress
  - Physiology of substance abuse\
  - The limbic system
  - Neuroscience of mood disorders
  - Neuroscience of psychosis and schizophrenia
  - Neuroscience of dementia

**7. ANATOMY/NEUROANATOMY**

- Development of the nervous system (review and elaboration)
- Anatomy of the limbic system and Papez circuit

**8. MICROBIOLOGY**

- Developmental aspects of infectious disease
- Infectious diseases of the premature and newborn infant
- TORCH infections

**9. IMMUNOLOGY**

- Prematurity and the immune system
- Development of the immune system
- Primary and secondary immune deficiencies
- Childhood allergies
- Aging and the immune system

## PART B. REQUIRED COURSE FORM

| | |
|---|---|
| **Course title:** | Scientific Principles of Medicine Unit 7: Central Nervous System/ Special Senses |
| **Sponsoring department or unit:** | Department of Medical Education |
| **Name of course director:** | Richard Brower, MD/Dale Quest, PhD/Debra Bramblett, PhD/Asa Black, PhD |

***List all organizational units (e.g., physiology department, nursing school, library), including the lead department, with ongoing involvement in the course and the number of instructional staff from each such unit:***

| Organizational Unit | Number of Teaching Staff Involved |
|---|---|
| Department of Medical Education | 13 |
| Department of Surgery | 7 |
| Department of Emergency Medicine | 3 |
| Department of Internal Medicine | 1 |
| Department of Family Medicine | 1 |
| Department of Neurology | 2 |
| Department of Radiology | 1 |

### COURSE OBJECTIVES

***Are there written objectives for the course? (check)***

| Yes | ✓ | No | |
|---|---|---|---|

***Briefly summarize the objectives/content areas covered in the course.***

This unit is organized into three major components: neurological, with an emphasis on the central nervous system (the peripheral nervous system is integrated into the musculoskeletal/integumentary system unit in year 1), ophthalmology, and otolaryngology. This unit of SPM, the first unit of year 2, includes the following clinical presentations:

1. Gait disturbance
2. Movement disorders
3. Headache
4. Seizures
5. Stroke and Aphasia
6. Delirium, Stupor, and Coma
7. Red Eye
8. Diplopia/Strabismus
9. Smell/Taste
10. Hearing loss
11. Dizziness/Vertigo

This unit presents an integrated approach to the structure, function, and organization of the central nervous system in the context of major neurological abnormalities affecting vision, hearing, smell and

taste. As previously described for the other units in the Scientific Principles of Medicine course, each clinical presentation includes a schematic representation illustrating a clinical approach to the presentation as a device for organizing thinking about the problem and for organizing foundational science content and concepts necessary for understanding underlying pathophysiological processes. The clinical reasoning processes are incorporated into a process work sheet based on the scheme that can be used as a resource for analyzing cases presented in small group "worked case example" sessions. Each of the basic science disciplines provides learning objectives related to the appropriate scientific concepts of anatomy (including gross and microscopic anatomy, embryology, neuroanatomy and radiographic anatomy), biochemistry, physiology, genetics, immunology, microbiology, pharmacology, and pathology related to the organ systems and clinical problems addressed in the unit. Example basic science topics included in this unit can be found in the appendix at the end of this course description.

### ***Preparation for Teaching***

A majority of the instruction in this unit is delivered by faculty members in the department of medical education who participated in the development and planning of the unit. Consequently, they are well aware of the goals and objectives of the unit and how their individual material relates to that presented by other faculty members. Faculty members from the clinical departments who participate in the unit as clinical presentation "scheme presenters" and as facilitators in "Worked Case Example" (WCE) small group sessions are briefed by the unit director(s) regarding the goals and objectives of the session(s) in which they will participate. The unit directors review and give scheme presenters feedback on their particular presentations. WCE facilitators are provided with session materials (power points case material, "process work sheets) and are briefed on the goals and objectives of the given session. Whenever possible, new small group facilitators observe more experienced facilitators to learn about the WCE process.

***Are any of the following involved in the course as lecturers, small group facilitators, and/or laboratory instructors?***

| | **Yes** | **No** |
|---|---|---|
| Residents | | X |
| Graduate Students | | X |
| Postdoctoral Fellows | | X |

***If yes, describe how they are informed about the course objectives and prepared for their teaching role.***

Not applicable.

***If the entire course is taught at more than one site (e.g., at geographically separated instructional sites), describe how instructional staff at all sites are oriented to the course objectives and the grading system.***

The course is taught at only one site, the campus of the Paul L. Foster School of Medicine.

## Student Evaluation

***If NBME subject (shelf) examinations are used, give the mean scores for the last three classes:***

| | | | |
|---|---|---|---|
| **Year:** | | | |
| **Score:** | | | |

Not Applicable.

***Check all the formats that are used in examinations or other evaluations that students must take in order to pass the course:***

| | | | |
|---|---|---|---|
| ✓ | Multiple-choice, true/false, matching questions | | Laboratory practical items |
| | Fill-in, short answer questions | | Problem-solving written exercises |
| | Essay questions or papers | | Presentations |
| | Oral exams | | Preceptor ratings |
| | OSCE or standardized patient examination | ✓ | Other (describe) Small group facilitator assessment |

***Briefly describe any formative assessment activities that occur during the course (practice examinations, quizzes, etc.)***

Students participate in a 25-30 item formative assessment each week of this unit covering material presented in the preceding week. Typically these items are multiple choice questions written in the USMLE vignette format and drawn from the item pool that is being developed for each of the Scientific Principles of Medicine units. The formative assessment is delivered electronically in a secure environment and students receive immediate feedback on how many items they answered correctly. They also are able to review each of the items with annotations prepared by the item author explaining the correct response. Scores are loaded into the students' e-portfolios for information purposes only. Scores on the formative quizzes are not used for final unit grading purposes. The goal of the formative assessment is to give students a sense of how they are performing and to identify early areas in which they may need to devote additional time or seek additional help from faculty. To facilitate this review, students are also provided copies of the learning objectives associated with items they missed on the formative exam.

***Is a narrative evaluation of student performance submitted in addition to or as a component of the course grade? (check)***

| | | | |
|---|---|---|---|
| **Yes** | ✓ | **No** | |

Small group "worked case example" facilitators complete a brief assessment of student performance in the small group session and they are encouraged to provide written comments on each student in their groups. These assessments and comments are uploaded to the student's e-portfolio. In addition, on an

annual basis, the college masters, associate dean for student affairs, and the senior associate dean for medical education, review all small group evaluation forms and comments and based on this information they draft a summary narrative noting student strengths and areas for further growth and development.

This is provided primarily as formative feedback. However, if serious problems are detected that persist despite feedback and advisement, the student may be referred to the Student Grading and Promotion Committee for discussion with the student and the determination of appropriate remedial action.

## COURSE OUTCOMES/EVALUATION

***Comment on the adequacy of faculty and other resources to teach the course (e.g., educational space, computer hardware and software, support personnel).***

This interdisciplinary unit is taught by faculty drawn from a number of clinical departments as well as the basic science and clinical faculty members in the department of medical education. We have sufficient faculty to implement this unit in the SPM course. As class size expands over the next few years to an eventual class of 100 students, we will need to enlarge our pool of potential small group facilitators.

There is ample teaching space available for the course, including a small classrooms, lecture space, laboratories, clinical simulation laboratories, and gross anatomy dissection laboratories. Computers, computer software, library resources, and the personnel needed to support computer-based and library-based instruction are adequate to meet the teaching needs.

***Provide a summary of student feedback on the course (and any other available evaluation data) for the past two academic years; include the percent of students providing evaluation data. If the course is new or has been significantly revised, provide evaluation data for the new version of the course only. If problems have been identified by student evaluations or other data, describe how they are being addressed.***

Students complete anonymous on-line evaluations at the end of each unit. Results below are based on a 5-point scale with 1 representing "Strongly disagree" and 5 indicating "Strongly Agree."

| Special Senses Evaluation Results | 2010-2011 | 2011-2012 |
|---|---|---|
| This unit was well organized. | 3.3 | 3.6 |
| The learning objectives were clearly identified. | 3.2 | 3.8 |
| The unit met the identified learning objectives. | 3.2 | 3.9 |
| The order of clinical presentations made sense to me. | 3.5 | 3.8 |
| The Basic Science material was well integrated. | 3.2 | 3.8 |
| The amount of material presented was reasonable. | 3.4 | 4.0 |
| I knew what I was supposed to be learning and why. | 3.2 | 4.0 |
| The evaluation methods were fair | 3.6 | 3.8 |
| The Clinical presentation "schemes" contributed to my learning | 3.1 | 3.3 |
| The process work sheets contributed to my | 2.6 | 3.0 |
| The lectures helped me learn the material. | 3.6 | 3.9 |
| The Work Case Examples helped me learn the material. | 3.6 | 3.8 |
| Anatomy Labs helped me learn the material. | 2.8 | 3.6 |
| Overall, I learned useful knowledge and/or skills | 3.7 | 4.1 |
| N | 18 | 62 |
| Class size at date | 37 | 62 |
| Response Rate | 49% | 100% |

***Identify major successes in the course and problems to be overcome*.**

***Successes:***

- This Unit fulfills its essential educational objectives. In addition to our typical combination of full-time MS1-2 Medical Educators and faculty recruited from the clinical departments, this success has been achieved through creative utilization of community-based faculty resources in the clinical specialties of ophthalmology and otolaryngology. Given their high value, this approach will remain essential even as the school develops and recruits full-time faculty in these disciplines.

***Challenges:***

- Maintaining the commitment and enthusiasm of our non-salaried community-based faculty in the relatively high value specialties of ophthalmology and otolaryngology will require substantial effort, as will development and integration of full-time faculty in these disciplines.
- This Unit currently received substantial faculty support from the Department of Neurology and that Department is undergoing re-development due to natural/expected levels of attrition. Although this creates some minor challenges, there remains adequate support for the neurological components of the MS1-2 curriculum and substantial growth of the Department of Neurology is anticipated. Despite these challenges, we will be able to deliver this unit in the future.
- Compared to other Units, the clinical schemes and process worksheets for this Unit received less favorable student evaluations. The Unit Co-Directors and faculty presenting the Clinical Schemes have reviewed these materials and consider them adequate. As our faculty resources expand and new contributors with relevant expertise are identified, these materials will undergo review and revision. If deemed necessary through the centralized/CEPC-led course review process, external consultants may be engaged to review and suggest improvements for these materials

**Topic Appendix: CNS and Special Senses Unit**

## 1. ANATOMY / HISTOLOGY / EMBRYOLOGY

### Gross Anatomy

- Spinal Cord
- Brainstem and Cerebellum
- Brain
- Orbit and oculus
- Tongue and papillae
- Vestibular and auditory anatomy
- Larynx
- Radiographic (visual) anatomy (X-rays, CTs, MRIs, etc.)

### Microscopic anatomy/histology

- Nervous tissues
- Eye
- Tongue and papillae

### Embryology

- Development of the nervous system and special senses
- Nervous system teratology

### Neuroanatomy

- Spinal cord
- Brainstem and cranial nerves
- Cerebellum
- Basal ganglia
- Retina
- Optic chiasm
- Optic tract
- Visual cortex
- Lateral geniculate nucleus
- Taste and Olfaction
- Cochlea
- Vestibular apparatus
- Vestibulocochlear nerve, medial geniculate nucleus, auditory pathway
- Blood supply/vasculature of the central nervous system

## 2. MICROBIOLOGY/IMMUNOLOGY

- Infectious etiologies of myelitis, meningitis and encephalitis (bacteria, viruses and fungi)
- Infectious etiologies of eye disease (bacteria, viruses and fungi)
- Infectious etiologies of ear disease (bacteria, viruses and fungi)

## 3. NUTRITION

- Sensory disorders associated with vitamin deficiency
- Sensory disorders associated with vitamin excess
- Role of nutrition in selected sensory disorders

## 4. PATHOLOGY

- Central nervous system pathology
- Cerebrospinal fluid analysis
- Eye and visual system pathologies
- Ear, auditory and vestibular system pathologies
- Gustatory and Olfactory disorders

## 5. PHARMACOLOGY

- Drugs for ophthalmic indications
    - mydriatics and miotics
    - reduce intraocular pressure
    - treat infections
    - treat retinal degenerative disorders
- Pharmacology of movement disorders
- Drugs for ear, nose and throat infections
- Drugs for epilepsy

## 6. PHYSIOLOGY

- Regulation of intracranial pressure
- Cerebrospinal fluid production, circulation and elimination
- Neuroscience
    - Receptor functions of the retina and photo-transduction
    - Central visual pathways
    - Visual neurophysiology
    - Pupillary reflexes and control of eye movements
    - Auditory and vestibular neurophysiology
    - Gustatory neurophysiology
    - Function of the cerebellum and its pathways

- Neuroscience of movement disorders
- Physiological basis of electroencephalography
- Neuroplasticity

## 7. GENETICS

- Mitochondrial diseases
- Trinucleotide repeat diseases

## 8. MOLECULAR AND CELLULAR BIOLOGY

- Amyloid diseases
- Inborn errors of metabolism
- Toxic and metabolic mechanisms of delirium, stupor and coma

## 9. BEHAVIOR AND PSYCHOLOGY

- Delirium
- Somatoform disorders
- Neuropsychology of learning and memory
- Neuropsychology of language

## PART B. REQUIRED COURSE FORM

| | |
|---|---|
| **Course title:** | Scientific Principles of Medicine Unit 8: Renal System |
| **Sponsoring department or unit:** | Medical Education |
| **Name of course director:** | Stephen Sandroni, MD/Amy Trott, PhD/Herb Janssen, PhD |

***List all organizational units (e.g., physiology department, nursing school, library), including the lead department, with ongoing involvement in the course and the number of instructional staff from each such unit:***

| Organizational Unit | Number of Teaching Staff Involved |
|---|---|
| Department of Medical Education | 13 |
| Department of Internal Medicine | 5 |
| Department of Emergency Medicine | 1 |

### COURSE OBJECTIVES

***Are there written objectives for the course? (check)***

| Yes | ✓ | No | |
|---|---|---|---|

***Briefly summarize the objectives/content areas covered in the course.***

In prior years the renal and endocrine systems were joined in a single unit of the Scientific Principles of Medicine course. However, as described elsewhere in this database, a general review of the timing, sequence, and organization of the organ system units resulted in the decision to "uncouple" the renal and endocrine systems and make these systems independent units within the overall course. However, the content and the clinical presentations that had previously been included in the joined unit remain largely unchanged.

The 6-week renal unit focuses on fluids, electrolytes, homeostatic mechanisms, and the role of the kidney in the process of regulation. The clinical presentations associated with this unit include the following:

1. Abnormalities of renal function
2. Disorders of serum sodium
3. Intrinsic renal disease
4. Abnormalities of hydrogen ion concentration
5. Renal failure: acute injury
6. Renal failure: chronic renal disease

This unit and the endocrine unit which follows are presented as model homeostatic systems with an emphasis of content related to biochemistry and physiology. Gross and microscopic anatomy is integrated with gross and microscopic anatomic pathology and is also correlated with radiographic anatomy. Microbiological, immunological and pharmacological content are also addressed. The sequence of clinical presentations has been structured so that the concepts developed during the study of

one topic provide a foundation for the subsequent topic. As with the other courses in the SPM sequence, basic information is provided for each clinical presentation including a brief definition, a statement of its clinical significance, and a list of the potential causes for the presentation. “Process worksheets” and “worked case examples” are employed by the small groups as in previous SPM units. The major clinical emphasis is on adult conditions, but pediatric renal conditions are also presented.

A list of basic science topics that are covered in this unit can be found in the attached Topic Appendix at the end of this course description.

### ***Preparation for Teaching***

A majority of the instruction in this unit is delivered by faculty members in the department of medical education who participated in the development and planning of the unit. Consequently, they are well aware of the goals and objectives of the unit and how their individual material relates to that presented by other faculty members. Faculty members from the clinical departments who participate in the unit as clinical presentation “scheme presenters” and as facilitators in “Worked Case Example” (WCE) small group sessions are briefed by the unit director(s) regarding the goals and objectives of the session(s) in which they will participate. The unit directors review and give scheme presenters feedback on their particular presentations. WCE facilitators are provided with session materials (power points case material, “process work sheets) and are briefed on the goals and objectives of the given session. Whenever possible, new small group facilitators observe more experienced facilitators to learn about the WCE process.

***Are any of the following involved in the course as lecturers, small group facilitators, and/or laboratory instructors?***

| | **Yes** | **No** |
|---|---|---|
| Residents | | X |
| Graduate Students | | X |
| Postdoctoral Fellows | | X |

***If yes, describe how they are informed about the course objectives and prepared for their teaching role.***

Not applicable.

***If the entire course is taught at more than one site (e.g., at geographically separated instructional sites), describe how instructional staff at all sites are oriented to the course objectives and the grading system.***

This unit of instruction is offered at a single site on the campus of the Paul L. Foster School of Medicine.

| **Course title:** | Scientific Principles of Medicine: Unit 8 Renal |
|---|---|

## Student Evaluation

***If NBME subject (shelf) examinations are used, give the mean scores for the last three classes:***

| **Year:** | | | |
|---|---|---|---|
| **Score:** | | | |

Not applicable.

***Check all the formats that are used in examinations or other evaluations that students must take in order to pass the course:***

| | | | |
|---|---|---|---|
| X | Multiple-choice, true/false, matching questions | | Laboratory practical items |
| | Fill-in, short answer questions | | Problem-solving written exercises |
| | Essay questions or papers | | Presentations |
| | Oral exams | | Preceptor ratings |
| | OSCE or standardized patient examination | X | Other (describe) Small group facilitator assessment |

***Briefly describe any formative assessment activities that occur during the course (practice examinations, quizzes, etc.)***

Students participate in a 25-30 item formative assessment each week of this unit covering material presented in the preceding week. Typically these items are multiple choice questions written in the USMLE vignette format and they are drawn from the item pool that is being developed for each of the Scientific Principles of Medicine units. The formative assessment is delivered electronically in a secure environment and students receive immediate feedback on how many items they answered correctly. They also are able to review each of the items with annotations prepared by the item author explaining the correct (keyed) response. Scores are loaded into the students' e-portfolios for information purposes only. Scores on the formative quizzes are not used for final unit grading purposes. The goal of the formative assessment is to give students a sense of how they are performing and to identify early areas in which they may need to devote additional time or seek additional help from faculty. To facilitate this process, students are provided a list of learning objectives associated with items they missed on the formative assessment.

***Is a narrative evaluation of student performance submitted in addition to or as a component of the course grade? (check)***

| **Yes** | X | **No** | |
|---|---|---|---|

Small group facilitators for weekly Worked Case Example sessions are asked to complete an assessment form on each student in the group. This form includes space for narrative comments. These assessment forms are posted in each student's e-portfolio.

## COURSE OUTCOMES/EVALUATION

***Comment on the adequacy of faculty and other resources to teach the course (e.g., educational space, computer hardware and software, support personnel).***

The unit is taught as an interdisciplinary component of the Scientific Principles of Medicine course drawing faculty from different departments in the Paul L Foster School of Medicine. The basic science faulty and many of the clinical faculty teaching in the course are members of the Medical Education Department. Other clinical faculty members from the Department of Internal Medicine assist in the clinical integration. A course coordinator and assessment coordinator for year 2 courses/units provides logistical assistance and assistance with the day-to-day management of the delivery of the unit. In addition IT and Audiovisual staff are available to assist course directors and faculty. There is ample teaching space available for the course, including a sufficient number of small group classrooms, lecture space, laboratories, clinical simulation laboratories, and gross anatomy dissection space. Computers, computer software, library resources, and the personnel needed to support computer-based and library-based instruction are adequate to meet the teaching needs.

***Provide a summary of student feedback on the course (and any other available evaluation data) for the past two academic years; include the percent of students providing evaluation data. If the course is new or has been significantly revised, provide evaluation data for the new version of the course only. If problems have been identified by student evaluations or other data, describe how they are being addressed.***

Students complete anonymous on-line evaluations at the end of each unit. Results below are based on a 5-point scale with 1 representing "Strongly disagree" and 5 indicating "Strongly Agree."

| Unit 8 Evaluation Data | 2010-2011 Renal/ Endocrine | *2011-2012 Renal |
|---|---|---|
| This unit was well organized. | 3.5 | 3.6 |
| The learning objectives were clearly identified. | 3.9 | 4.0 |
| The unit met the identified learning objectives. | 3.9 | 4.0 |
| The order of clinical presentations made sense to me. | 3.5 | 3.7 |
| The Basic Science material was well integrated. | 3.5 | 3.7 |
| The amount of material presented was reasonable. | 3.7 | 4.2 |
| I knew what I was supposed to be learning and why. | 4.0 | 3.9 |
| The methods used to evaluate my performance were fair | 3.9 | 3.7 |
| The Clinical presentation "schemes" contributed to my learning. | 3.9 | 3.7 |
| The Process Worksheets contributed to my learning. | 3.7 | 3.5 |
| The lectures helped me learn the material. | 4.1 | 3.6 |
| The Work Case Examples helped me learn the material. | 3.9 | 4.0 |
| The Anatomy labs helped me learn the material. | 2.7 | 3.5 |
| Overall, I've learned useful knowledge and/or skills during this unit. | 4.3 | 4.2 |
| N | 24 | 57 |
| Class size at date | 37 | 58 |
| Response Rate | 65% | 98% |

*Please note: In 2011-12, the renal and endocrine components of the curriculum were divided into two units rather than being integrated into one. The content for each discipline remained the same.

***Identify major successes in the course and problems to be overcome***.

***Successes:***
Student performance on renal questions on the USMLE Step 1 was among the two best areas in our curriculum. Informal feedback from clinical clerkship faculty has indicated that our third year students are performing as well as residents in areas of acid-base and electrolyte abnormalities.

***Challenges***:
Optimal delivery of our core physiology and pathology remains a challenge. Student evaluations favor passive delivery modes over more active engagement on their part, but their performance has not suffered from more active modes. Our informal survey of student knowledge of renal pathology, done a few months after the course ended, suggested that students were not yet able to use their knowledge in a successful analytic way. Apparently their own additional study later in the year helped them to reach a higher level of learning. Our experience mirrors that of other schools we are in contact with via a renal teaching listserve that we subscribe to. We lean toward reduced formal lecturing with increased use of problem-solving sessions supervised by faculty. Specifically we are looking to accumulate additional teaching cases that are more complex than our Worked-Case Examples, and use these as a springboard for sessions requiring higher level problem solving on the part of the students.

Topic Appendix: Renal Unit

## 1. ANATOMY / HISTOLOGY / EMBRYOLOGY

- Evolution of the nephron from marine life to terrestrial mammals
- Urinary system
- Visual anatomy
- Radiological anatomy
- Embryological development of the urogenital system
- Histology of kidneys and urinary tract

## 2. BIOCHEMISTRY

- Renal metabolism
- Hormonal regulation of salt and water balance

## 3. GENETICS

- Renal disease of genetic origin

## 4. MICROBIOLOGY/IMMUNOLOGY

- Urinary tract infections
- Sexually transmitted diseases
- Bacteriology, virology, and parasitology
- Transplantation, tumor immunity and immunotherapy

## 5. NUTRITION

- Nutrients and kidney function
- Nutritional and metabolic consequences of chronic renal failure
- Dietary management of chronic renal disease
- Sodium, diet and hypertension

## 6. PATHOLOGY

- Kidney
- Lower urinary tract

## 7. PHARMACOLOGY

- Autonomic pharmacology and the urogenital tract
- Drug pharmacokinetics and renal effectors
    - Nonsteroidal anti-inflammatory agents
    - Adrenocortical steroids – renal effects
    - Agents that affect calcium and phosphate homeostasis
    - Diuretics and renal function
    - Cancer chemotherapy
    - Penicillins and cephalosporins

- Aminoglycosides
- Tetracyclines, azithromycin and erythromicin
- Sulfonamides, trimethoprim and quinolones
- Urinary antiseptics
- Anti-schistosomal drugs

- Gout and purine metabolism
- Immunosuppressive agents

## 8. PHYSIOLOGY

- Renal structural-functional relationships, glomerular filtration and renal blood flow.
- Solute and water transport along the nephron, including mechanisms of secretion and absorption
- Urine concentration and dilution
- Regulation of acid base balance

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**PART B. REQUIRED COURSE FORM**

| | |
|---|---|
| **Course title:** | Scientific Principles of Medicine Unit 9: Endocrine |
| **Sponsoring department or unit:** | Department of Medical Education<br>Department of Internal Medicine |
| **Name of course director:** | Stephen Sandroni, MD/Curt Pfarr, PhD/Amy Trott, PhD /Elmus Beale, PhD/Tamis Bright, MD |

***List all organizational units (e.g., physiology department, nursing school, library), including the lead department, with ongoing involvement in the course and the number of instructional staff from each such unit:***

| **Organizational Unit** | **Number of Teaching Staff Involved** |
|---|---|
| Medical Education | 15 |
| Internal Medicine | 9 |
| Family Medicine | 2 |
| Biomedical Sciences | 1 |

## COURSE OBJECTIVES

***Are there written objectives for the course? (check)***

| **Yes** | ✓ | **No** | |
|---|---|---|---|

***Briefly summarize the objectives/content areas covered in the course.***

This six week unit of Scientific Principles of Medicine addresses glucose, lipids, intermediary metabolism of these entities, and diseases processes associated with their abnormalities in the context of the following clinical presentations:

1. Hypertension
2. Hypothalamus/Pituitary Axis
3. Disorders of thyroid function
4. Diabetes and obesity

The sequence of these clinical presentations has been structured so that the concepts developed during the study of one topic provide a foundation for the subsequent topic. As with the other courses in the SPM sequence, basic information is provided for each clinical presentation including a brief definition, a statement of its clinical significance, and a list of the potential causes for the presentation. “Process worksheets” and “worked case examples” are employed by the small groups as in previous SPM units.

Basic information is provided for each clinical presentation, including a brief definition and a statement of its clinical significance. A list of the potential causes for the presentation is addressed along with a schematic representation of the relationships of those causal entities. This list of causes and the associated schematic representation provides the basis for discussion of basic science principles including underlying anatomic, biochemical, and patho-physiological concepts. Management concerns including appropriate

pharmacology are discussed. A list of basic science topics covered in this unit can be found in the attached Topic Appendix.

### ***Preparation for Teaching***

A majority of the instruction in this unit is delivered by faculty members in the department of medical education who participated in the development and planning of the unit. Consequently, they are well aware of the goals and objectives of the unit and how their individual material relates to that presented by other faculty members. Faculty members from the clinical departments who participate in the unit as clinical presentation "scheme presenters" and as facilitators in "Worked Case Example" (WCE) small group sessions are briefed by the unit director(s) regarding the goals and objectives of the session(s) in which they will participate. The unit directors review and give scheme presenters feedback on their particular presentations. WCE facilitators are provided with session materials (power points case material, "process work sheets) and are briefed on the goals and objectives of the given session. Whenever possible, new small group facilitators observe more experienced facilitators to learn about the WCE process.

***Are any of the following involved in the course as lecturers, small group facilitators, and/or laboratory instructors?***

| | **Yes** | **No** |
|---|---|---|
| Residents* | | ✓ |
| Graduate Students | | ✓ |
| Postdoctoral Fellows | | ✓ |

***If yes, describe how they are informed about the course objectives and prepared for their teaching role.***

*On occasions a resident may accompany a faculty member to observe and participate in WCE sessions. The faculty member, however, is responsible for conducting the session and evaluating student participation.

***If the entire course is taught at more than one site (e.g., at geographically separated instructional sites), describe how instructional staff at all sites are oriented to the course objectives and the grading system.***

Instruction in this course takes place at one site only, the campus of PLFSOM.

**REQUIRED COURSE FORM** (Continued)

| **Course title:** | Scientific Principles of Medicine: Endocrine Unit |
|---|---|

## Student Evaluation

***If NBME subject (shelf) examinations are used, give the mean scores for the last three classes:***

Not applicable.

| **Year:** | | | |
|---|---|---|---|
| **Score:** | | | |

***Check all the formats that are used in examinations or other evaluations that students must take in order to pass the course:***

| | | | |
|---|---|---|---|
| ✓ | Multiple-choice, true/false, matching questions | | Laboratory practical items |
| | Fill-in, short answer questions | | Problem-solving written exercises |
| | Essay questions or papers | | Presentations |
| | Oral exams | | Preceptor ratings |
| | OSCE or standardized patient examination | ✓ | Other (describe) Small group assessment |

***Briefly describe any formative assessment activities that occur during the course (practice examinations, quizzes, etc.)***

Students participate in a 25-30 item formative assessment each week of this unit covering material presented in the preceding week. Typically these items are multiple choice questions written in the USMLE vignette format and they are drawn from the item pool that is being developed for each of the Scientific Principles of Medicine units. The formative assessment is delivered electronically in a secure environment and students receive immediate feedback on how many items they answered correctly. They also are able to review each of the items with annotations prepared by the item author explaining the correct (keyed) response. Scores are loaded into the students' e-portfolios for information purposes only. Scores on the formative quizzes are not used for final unit grading purposes. The goal of the formative assessment is to give students a sense of how they are performing and to identify early areas in which they may need to devote additional time or seek additional help from faculty.

***Is a narrative evaluation of student performance submitted in addition to or as a component of the course grade? (check)***

| **Yes** | ✓ | **No** | |
|---|---|---|---|

Small group tutors complete a brief evaluation of student performance and participation in the Worked Case Examples sessions. Faculty tutors are encouraged to provide brief narrative comments. These narrative comments are reviewed by the senior associate dean for medical education, the associate dean for student affairs and the college masters at the end of the year and a summary narrative is constructed and provided to the student in their e-portfolios. The summary narratives are intended to be provide formative feedback. However, problems with professionalism (e.g., disruptive or disrespectful behavior) that persist, despite feedback, could be referred to the Grading and Promotion committee for action.

## COURSE OUTCOMES/EVALUATION

***Comment on the adequacy of faculty and other resources to teach the course (e.g., educational space, computer hardware and software, support personnel).***

This course, like all of the others in the SPM curriculum is delivered by an interdisciplinary cadre of basic science and clinical faculty. While most of these faculty members are affiliated with the department of medical education, several members of the clinical faculty play an active role as CP lecture presenters and small group tutors or facilitators. The PLFSOM enjoys excellent educational facilities including state-of-the art lecture halls, laboratories, flexible-use teaching space (e.g., for interactive and Team-Based Learning activities), small group rooms, etc. All units within SPM are supported by full time course coordinators and an assessment coordinator for formative and summative assessment. Centralized IT and Audiovisual support is also made available to all courses and units of instruction within SPM.

In general we have sufficient faculty for this unit, but did experience some challenges in finding enough tutors for the small group "Worked Case Example" sessions. It was necessary on a few occasions to combine into larger groups. (See challenges section below.)

***Provide a summary of student feedback on the course (and any other available evaluation data) for the past two academic years; include the percent of students providing evaluation data. If the course is new or has been significantly revised, provide evaluation data for the new version of the course only. If problems have been identified by student evaluations or other data, describe how they are being addressed.***

Students completed an anonymous on-line evaluation at the end of this unit of the SPM course. We used a 5-point scale with 5 indicating a high level of agreement/satisfaction.

| Endocrine Unit Evaluation Results | 2010-2011 Renal/ Endocrine | 2011-2012 *Endocrine |
|---|---|---|
| This unit was well organized. | 3.5 | 3.5 |
| The learning objectives were clearly identified. | 3.9 | 4.1 |
| The unit met the identified learning objectives. | 3.9 | 4.1 |
| The order of clinical presentations made sense to me. | 3.5 | 3.1 |
| The Basic Science material was well integrated. | 3.5 | 3.9 |
| The amount of material presented was reasonable. | 3.7 | 4.1 |
| I knew what I was supposed to be learning and why. | 4.0 | 4.1 |
| The methods used to evaluate my performance were fair. | 3.9 | 4.0 |
| The Clinical presentation "schemes" contributed to my learning. | 3.9 | 4.1 |
| The Process Worksheets contributed to my learning. | 3.7 | 4.2 |
| The lectures helped me learn the material. | 4.1 | 4.1 |
| The Worked Case Examples helped me learn the material. | 3.9 | 4.1 |
| The self-taught modules helped me learn the material. | NA | 2.8 |
| The Anatomy labs helped me learn the material. | 2.7 | NA |
| Overall, I've learned useful knowledge and/or skills. | 4.3 | 4.2 |
| N | 24 | 58 |
| Class size at date | 37 | 58 |
| Response Rate | 65% | 100% |

*Please note: In the 2011-12 Academic Year Endocrine was treated as a separate unit and evaluated separately.

***Identify major successes in the course and problems to be overcome***.

***Successes:***

- Students performed well in this unit and performed well on NBME Comprehensive Basic Science Exam on items linked to the endocrine system.
- Students are generally quite satisfied with this unit.

***Challenges***:

- Students expressed concern about the order of the clinical presentations. The faculty is considering re-sequencing of presentations to address diabetes and obesity earlier in the unit.
- Students expressed dissatisfaction with the "self-taught" approach to pharmacology. We are recruiting an additional pharmacologist to reduce teaching burden and will schedule more face-to-face contact time next year.
- We do not have enough Endocrinologists on faculty to serve as facilitators of small groups (n=10) with expanding class size. Next year we will expand our invitation to family physicians and general internists. Faculty in these specialties are well prepared to serve as tutors for second year medical students being introduced to common endocrine problems.

Topic Appendix: Renal/Endocrine Unit

## 1. ANATOMY / HISTOLOGY / EMBRYOLOGY

***GROSS***

- Neuroendocrinology - hypothalamus/pituitary
- Thyroid and parathyroid
- Adrenal gland

***HISTOLOGY***

- Pancreatic islets
- Neuroendocrinology & hypothalamus/pituitary
- Thyroid and parathyroid glands
- Adrenal gland
- Amine precursor uptake and decarboxylase (APUD) cells

***EMBRYOLOGY***

- Pancreatic islets
- Neuroendocrinology - hypothalamus/pituitary
- Thyroid and Parathyroid
- Adrenal gland
- Amine precursor uptake and decarboxylase (APUD) cells
- Pineal gland

## 2. BIOCHEMISTRY

- Pancreatic islet hormones
  - Glucagon
  - Insulin
  - Somatostatin
  - Pancreatic polypeptide
- Hypothalamus and pituitary
- Thyroid gland and parathyroid
- Adrenal
  - Cortex
  - Adrenal medulla
  - Enterochromafin cells
- Regulation of fuel homeostasis

## 3. GENETICS

- Genetic disorders of endocrine function

## 4. MICROBIOLOGY/IMMUNOLOGY

- Immune modulators of pancreatic islets
- Thyroid and immune function

## 5. NUTRITION

- Diabetes, insulin deficiency and fuel homeostasis
- Fuel metabolism review and overview
- Hormones and nutrient metabolism
- Biological determinants of appetite regulation
- Glucose management and diabetes

## 6. PATHOLOGY

- Pancreatic islets
- Neuroendocrinology - hypothalamus/pituitary
- Thyroid and parathyroid
- Adrenal
    - Cortex
    - Medulla

## 7. PHARMACOLOGY

- Pancreatic islet hormones
- Neuroendocrinology and the hypothalamus/pituitary
- Thyroid replacement therapy
- Parathyroid dysfunction and calcium – phosphorus balance
- Adrenal
    - Dysfunction and therapeutics
    - Adrenal cortex and pharmacologic adjuncts
- Growth and development deficits and growth hormone
- Energy production and metabolism as affected by therapeutics

## 8. PHYSIOLOGY

- Pancreatic islets and modulation of alpha, beta, and delta cells
- Neuroendocrinology - hypothalamus/pituitary
- Thyroid function – iodine, thyroglobulin, T3, T4, rT3, TBG

- Parathyroid modulation of bone homeostasis
- Adrenal modulation of corticosteroids and glucocorticoids
- Growth and development deficits and the role of growth hormone
- Energy production and metabolism in health and disease
- Adaptation to hostile environments
- Composition and volume of extracellular fluid

## PART B. REQUIRED COURSE FORM

[update, May 30 2012]

| | |
|---|---|
| **Course title:** | **Capstone** |
| **Sponsoring department or unit:** | Department of Medical Education |
| **Name of course director:** | John MacKay |

***List all organizational units (e.g., physiology department, nursing school, library), including the lead department, with ongoing involvement in the course, and the number of instructional staff from each such unit:***

| Organizational Unit | Number of Teaching Staff Involved |
|---|---|
| Department of Medical Education | 1 |
| GME ( includes residents) | 10 |
| Radiology | 2-3 |
| Emergency Medicine | 2-3 including course director |
| Other clinical departments with residencies | 2 |

**Course Objectives**

***Are there written objectives for the course? (check)***

| | | | |
|---|---|---|---|
| **Yes** | x | **No** | |

***Briefly summarize the objectives/content areas covered in the course.***

This is a one week, required course for MS IV students designed to assist them in make the transition from being a medical student to being a first year house officer.
The course will be structured with a combination of lecture and small group activities over a 5 day period of time. It will include activities focused on the preparation of the student to begin residency. It will cover general resident issues and discipline specific issues. Each activity is selected to improve the preparation of the student for residency. It will include technical areas,cognitive areas, communication and life preparation activities. All feedback is formative and designed to provide content areas for the student to identify his or her needs for improvement as they begin residency. Each activity will have particular goals and objectives which will reflect the general goals for the entire experience.

Overall Goals:

- Provide the student with final preparation for the transition of the student to the role of the resident
- Provide the student with the technical skill set requisite to beginning residency

- Provide the student formative feedback in the basics of patient/family communication and patient evaluation

    Provide students and introduction to the atmosphere of Graduate Medical Education, the regulatory environment and wellness of the resident and their family during residency

Example topics to be included in this 1-week experience include the following:

- Student-Resident Transition
- Licensing and prescribing
- Billing and coding
- Ethics
- Health Care Economics
- Legal issues
- Wellness
- Communication skills
- Clinical simulations
- EKG
- Imaging cases

## Preparation for Teaching

***Are any of the following involved in the course as lecturers, small group facilitators, and/or laboratory instructors?***

| | Yes | No |
|---|---|---|
| Residents | x | |
| Graduate Students | | x |
| Postdoctoral Fellows | | x |

***If yes, describe how they are informed about the course objectives and prepared for their teaching role?***

Several of the Capstone sessions will include residents as teachers. They will participate in a variety of ways depending on the specific activity. The activity entitled, “Discipline Specific Lab” will have resident participation defined by the Individual Discipline. Course objectives will be communicated by the Department with review by the Course Director, Clinical Rotation Director for the Discipline and the Discipline Program Director. The activities entitled, “Residency Fair” and “Student to Resident Transition” will be coordinated through the Resident’s Association and the Chief Residents for each Department or their representative. The Course Director will meet with these individuals to communicate the goals for the rotation and refine them further. Residents may also volunteer to participate in other individual sessions. It will be up to the Course Director to insure that any resident who participates has had the goals and objectives communicated to them and understand their role in the activity. The Course Director will discuss with the individual resident’s Program Director to enable their participation to be considered as a portion of their academic goals for the residency’s requirements. The course director will also provide education relevant to general and discipline specific duties of the resident as teacher.

***If the entire course is taught at more than one site (e.g., at geographically separate campuses), describe how instructional staff at all sites are oriented to the objectives and grading system.***

The entire course will be taught at the main site. With future classes having more students the Residency simulation center will need to be utilized for Simulation based sessions. The instructional staff will have the objectives as the basis for design of individual simulation exercises. All grades will be based on participation. All feedback will be formative.

| **Course title:** | Capstone |
|---|---|

## Student Evaluation

If NBME subject (shelf) examinations are used, give the mean scores for the last two classes:

| **Year:** | | | |
|---|---|---|---|
| **Score:** | | | |

Not applicable.

***Check all the formats that are used in examinations or other evaluations that students must take in order to pass the course:***

| | | | |
|---|---|---|---|
| | Multiple-choice, true/false, matching questions | | Laboratory practical items |
| | Fill-in, short answer questions | | Problem-solving written exercises |
| | Essay questions or papers | | Presentations |
| | Oral exams | | Preceptor ratings |
| | OSCE or standardized patient exam | X | Other (describe) Attendance and participation |

The student will receive a Pass/Fail for this course based on their participation in the activities of the Capstone.

***Briefly describe any formative assessment activities that occur during the course (practice exams, quizzes, etc.) including when during the course they occur.***

The activities entitled,"Communication assessment", "Simulation Cases" and "Telling Bad News" will have formative assessment based on the specific modeled activity. The residents will be critiqued in group and will participate in the small group review of their performance by their peers controlled by the Moderator for that session.

***Is a narrative evaluation of student performance submitted in addition to or as a component of the course grade? (check)***

| **Yes** | | **No** | x |
|---|---|---|---|

This is strictly a P/F course based on attendance and participation.

## Course Outcomes/Evaluation

***Comment on the adequacy of faculty and other resources to teach the course (e.g., educational space, computer hardware and software, support personnel).***

We have ample classroom facilities(including 2 simulation facilities), faculty, and staff support for this 1 week capstone experience.

***Provide a summary of student feedback on the course (and any other available evaluation data). If problems have been identified by student evaluations or other data, describe how they are being addressed.***

This is a new course and has not been reviewed relative to performance.

***Identify major successes in the course to date and problems to be overcome***

***Successes:***

- None to date. This course will be offered for the first time in May, 2013.

***Challenges***

- This course, though short, is complex and will require a lot of coordination and planning. The planning committee consists of the course director, who is being supported as a 0.1 FTE to plan and coordinate this course, the associate dean for student affairs, and the senior associate dean for medical education. These individuals have experience and access to resources that will enable us to implement a successful experience for our graduating students.