PART B. REQUIRED COURSE FORM	
Course title:	Masters' Colloquium (I through IV)
Sponsoring department or unit:	Medical Education
Name of course director:	Kathryn McMahon, 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 (College Masters)	4

Course Objectives

Are there written objectives for the course? (check)

Yes	**X**	**No**	

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

This course extends through the first two years of the curriculum. The course provides instruction in many of the skills and attributes that could be described as the "art of medicine". The topics stressed in this course relate to the following broad themes: professionalism, ethics, critical thinking and judgment, controversies in medicine, life-long learning, and health care system issues. Diverse teaching methods are employed in this course. The format of the course is to cover the specific topics of the Colloquium in the context of or using examples from the clinical presentation(s) under concurrent discussion in the SPM course.

Course objectives are tied directly to the institutional objectives and the related outcome measures as described in Section II (Educational Program), Statements ED-1 and ED-1A, respectively. Course objectives are:

KNOWLEDGE

- Apply scientific methods for the discovery and interpretation of knowledge and describe how to apply these methods to solve laboratory and clinical problems
- Describe fundamental ethical principles and how they apply in patient care and medical practice
- Describe the components of social structure (e.g., family, neighborhood, community) and the role each plays in health behavior, disease prevention, and the treatment of illness

Course title:	***Masters' Colloquium (I through IV)***

- Describe the components of the national health system and its funding and how this system affects individual and community health
- Discuss financial, political and cultural situations that may present conflicts of interest in the practice of medicine

BEHAVIORS

- Display compassion in interactions with all patients regardless of race, gender, ethnicity, sexual orientation, socioeconomic status and disability
- Communicate clearly, respectfully and compassionately with patients, families, colleagues, and members of the health care team
- Employ the highest ethical principles in interpersonal relationships, patient care, and research
- Identify the need to employ self-initiated learning strategies (problem definition, resource identification, critical appraisal) when approaching new challenges, problems, or unfamiliar situations

ATTITUDES

- Demonstrate respect for the beliefs, opinions and privacy of patients, families, and members of the health care team
- Demonstrate scrupulous honesty in all professional matters
- Provide compassionate and culturally appropriate care in all stages of the life cycle
- Recognize when to take responsibility and when to seek assistance based on one's position, training and experience
- Preserve patient's dignity in all interactions
- Advocate for the interests and needs of the patient over one's own immediate needs

SKILLS

- Identify and critically appraise electronic resources (appropriate to problem under study) for one's own education, patient education, and direct patient care
- Communicate knowledge, interpretation and recommendations orally and/or in writing to a wide range of professional or lay audience in culturally appropriate ways
- Use a variety of educational modalities in pursuit of life-long learning

REQUIRED COURSE FORM (Continued)

Course title:	***Masters' Colloquium (I through IV)***

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?

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 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. 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.

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

REQUIRED COURSE FORM (Continued)

Course title:	***Masters' Colloquium (I through IV)***

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
X	Essay questions or papers	X	Presentations
	Oral exams		Preceptor ratings
	OSCE or standardized patient exam		Other (describe)

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

Written reflective and descriptive essays, if not adequate in their first submission, are returned to the student with comments from the College Master. The student has opportunity to revise the essay and resubmit for evaluation. This iterative process can occur multiple times if need be.

Questions dealing with "testable" content (e.g., questions related to ethical concepts and principles and their application are included as part of the formative weekly assessment process as appropriate. This gives students practice and feedback in responding to USMLE style questions.

Students are given advice from either one or both Masters in an individual (if needed) or group meeting on presentations they are developing for a up-coming or later session.

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

Yes	**X**	**No**	

Narrative feedback is provided in the assessment of student essays and reflection exercises (see above). The College Masters collaborated in the development of a rubric to guide this feedback. A copy of the rubric can be found in the Appendix.

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 curriculum has been designed around the concept of the Medical Student College and the College Master. Each college currently has two full-time college masters. The Medical Education Building includes four areas designated as space for the colleges that include teaching and office space to accommodate the various needs anticipated for this format. The major focus of the college masters is the

Course title:	***Masters' Colloquium (I through IV)***

college, the students assigned to the college, and the instruction, evaluation, and mentoring associated with college activities. Corresponding with the planned expansion of the student body from 40-100 students per year, we will expand the number of Colleges from two to four. At that point each college will be led by a single College Master.

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.

The Masters Colloquium I was evaluated at the end of the semester by students utilizing an anonymous on-line evaluation system. This system employs a 5-point scale with 1 corresponding to strong dissatisfaction and 5 corresponds with strong satisfaction. Because this course is offered within each of the two Colleges (Red and Blue) each was evaluated separately by the students assigned to each of the Colleges. The results of this evaluation are reported for each College. The numbers represent the mean Likert score (standard deviation).

FALL 2009

	Red College (12/20 responses)	Blue College (16/19 responses)
• Clear learning objectives:	4.0 (1.2)	4.3 (0.7)
• Organization of course:	4.0 (1.3)	4.5 (0.6)
• Appropriate instructional methods:	4.1 (1.2)	4.3 (0.7)
• Clinical relevance:	3.9 (1.4)	4.4 (0.9)
• Reasonable workload expectations:	3.9 (1.3)	4.4 (1.0)
• Assessment methods fair	4.2 (1.0)	4.1 (1.1)
• Gained useful knowledge	4.2 (1.3)	4.2 (0.7)
• Valuable learning experience	4.0 (1.3)	4.0 (0.8)
• Colloquium broadens perspective	3.7 (1.2)	3.8 (0.9)

REQUIRED COURSE FORM (Continued)

Course title:	***Masters' Colloquium (I through IV)***

SPRING 2010

	Red College (17/20 responses)	Blue College (14/19 responses)
• Clear learning objectives:	4.0 (1.5)	4.5 (0.7)
• Organization of course:	4.0 (1.5)	4.4 (0.6)
• Appropriate instructional methods:	4.0 (1.5)	4.4 (0.9)
• Clinical relevance:	4.3 (1.0)	4.6 (0.5)
• Reasonable workload expectations:	4.4 (1.1)	4.5 (0.7)
• Assessment methods fair	4.2 (1.3)	4.4 (0.9)
• Gained useful knowledge	4.3 (1.3)	4.5 (0.5)
• Valuable learning experience	3.9 (1.6)	4.4 (0.5)
• Colloquium broadens perspective	3.9 (1.6)	4.4 (0.5)
MEAN LIKERT	4.1	4.3

As can be seen, there is a high level of satisfaction with this course among those who responded to the survey. Moreover, the levels of satisfaction are comparable across the two Colleges.

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

SUCCESSES:

- Establishment of the College as a home for students.
- Establishment of very interactive sessions in which students feel comfortable with each other and the College Masters about topics that do not have definitive answers.
- Laid the ground work of ethics of medicine in the critical evaluation of language and communication.

CHALLENGES/PROBLEMS TO OVERCOME:

- Pressures of other courses, particularly SPM, made it difficult for students to focus on Colloquium assignments or learning objectives at any time outside of session itself.

  NOTE: This has been addressed by learning objectives and reading assignment constraints in the SPM course.
- Coordination between Colleges so students feel the workloads are similar.

  NOTE: This has been addressed by continued College Masters meetings on a weekly basis to attempt to consider common approaches to sessions. Admittedly, this issue continues to be

Course title:	***Masters' Colloquium (I through IV)***

somewhat of a potential problem as the instruction methods used for a given session can vary between colleges.

- Identify a written assignment style other than only reflective writing that allows for personal development of critical thinking and appraisal skills without forcing the student to divulge sensitive information for a grade.

  NOTE: A analytical writing piece assignment style has been developed to be used beginning in the academic year of 2010-2011. It will be used in both Year 1 and Year 2 of the Masters Colloquium courses. The grading rubric is available in the Appendix.

PART B. REQUIRED COURSE FORM	
Course title:	Medical Skills
Sponsoring department or unit:	Department of Medical Education
Name of course director:	Gordon L. Woods, MD, MHPE

List all organizational units (e.g., physiology department, nursing school, and 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
Clinical Skills Simulation Center	2
Department of Medical Education	7
Internal Medicine	5
Family Medicine	2
Emergency Medicine	4
Pediatrics	4
Obstetrics/Gynecology	2
Psychiatry	1
Ophthalmology	1

Course Objectives

Are there written objectives for the course? (check)

Yes	√	**No**	

REQUIRED COURSE FORM (Continued)

Course title:	***Medical Skills I, II, III, IV***

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.	Communication skills
Communicate using language that is clear, understandable, and appropriate to each patient.	Communication skills
Maintain each patient's dignity and modesty during clinical encounters.	Professionalism
Identify the chief reason for the clinical encounter and use questions effectively to find the most pertinent history needed for decision-making.	Clinical skills
Select and perform the most pertinent physical examination maneuvers to search for findings that support or refute likely diagnoses under consideration.	Clinical skills
Concisely, accurately, and legibly record the patient's history in the medical record.	Documentation skills
Use the patient's history, physical examination, and diagnostic studies to generate a list of active medical problems.	Patient care
Orally present a patient's history and physical examination in an organized and concise manner.	Communication skills
List the appropriate indications, potential risks and intended benefits of common procedures such as venipuncture, placement an intravenous catheter, and lumbar puncture.	Clinical decision-making
Proficiently perform several common clinical procedures such as venipuncture, placement of an intravenous catheter, and lumbar puncture.	Procedural skills

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		√

REQUIRED COURSE FORM (Continued)

Course title:	***Medical Skills I, II, III, IV***

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

The Medical Skills Course enlists clinicians from a number of clinical departments, 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 several means:

- Instructional plans and course materials are prepared prior to each session. These are sent to participating clinician instructors in advance of each session for their review. Typically, revisions of these instructional materials are exchanged several times between the participating clinician instructors and the medical skills course faculty, with multiple revisions and suggestions included. These instructional materials typically include objectives for the teaching session.
- In preparation for their teaching, participating clinician instructors are invited to observe medical skills sessions.
- Prior to their sessions, the course faculty meet with participating clinician instructors to review their instructional materials and teaching plan. These preparatory sessions typically include a "walk-through" of the instructional session, during which comments, improvements, and suggestions are provided.

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 Medical Skills Course is taught only at one site; The Clinical Skills Simulation Laboratory at 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

REQUIRED COURSE FORM (Continued)

Course title:	***Medical Skills I, II, III, IV***

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)

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

Introduction: At the beginning of each Medical Skills session, a short introductory discussion is held. During this discussion, and audience response system (ARS) is used to assess student 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 important content that needs to be understood prior to engaging in the session activities.

Standardized Patient Encounters: Students participate in Standardized Patient (SP) encounters on a regular basis throughout the course. The problems scripted into these exercises matched the course content of the SPM course. Students are rated by the 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.

Summative information is available immediately after the SP encounter. This aggregate information is reviewed with the students in small group discussion, and recommendations are made for improvement in performance.

At the end of each SP encounter, medical students write a progress note. These progress notes are printed and distributed to the medical skills faculty members. Handwritten commentary are provided by the faculty members, including suggestions for improvement and documentation, feedback on overlooked questions and physical findings, feedback on this tour inappropriate diagnostic considerations, and feedback regarding management plan.

Clinical skill development sessions: each week, medical students participate in a skill development activity. These activities might include performance of a procedure (such as phlebotomy, lumbar puncture, arthrocentesis), physical examination skills (the abdominal exam, cardiac auscultation, examination of the cranial nerves) or study interpretation (chest x-ray interpretation, EKG interpretation, laboratory test results interpretation).

REQUIRED COURSE FORM (Continued)

Course title:	***Medical Skills I, II, III, IV***

These sessions are typically taught in small groups by clinical faculty members. The presentation/discussions are interactive, and typically include practice examples and discussion cases. Faculty members provide coaching, suggestions, and feedback continuously throughout the sessions.

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

Yes		**No**	√

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

The course director, who is the principal instructor, has 22 years of full-time experience in clinical and medical school teaching, including experience in development of educational instructional materials, development of standardized patient scenarios, bedside clinical teaching, performance assessment, and course evaluation.

The course support staff of the Simulation Center has extensive experience in organizing and presenting a wide variety of instructional sessions and student examinations, and also support curriculum and website management.

The Medical Skills Course is perhaps the most teaching-intensive course in the entire curriculum. The course frequently utilizes the skills of the clinician-educator's from the Department of Medical Education, who are particularly skillful clinical instructors. These clinicians are flexible and adaptable in their

instructional skills, are able to deliver instruction on a broad range of topics, engage students interactively, provide effective coaching and feedback on skills performance, and model exemplary professional behavior as they teach. In addition, physicians from University Medical Center regularly participate in teaching in the course.

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.

At the time of this writing, student feedback is available for the first year of the course. Students completed on-line anonymous evaluations of the Medical Skills Course at the end of each semester. The survey utilized a 5-point scale, with 1 corresponding to a low level of satisfaction and 5 representing high satisfaction. Students rated the course in the following areas.

	First semester	**Second semester**
Survey response rate	29/39 (74.3%)	34/39 (87%)
1. Clearly identified learning objectives	4.48	4.47
2. Learning materials adequately prepared students for each session	4.55	4.59
3. Course organization	4.27	4.56
4. Appropriateness of instructional methods to the material covered	4.41	4.56
5. Accomplishment of learning objectives by instruction provided	4.31	4.53
6. Relevance of the material to the practice of medicine	4.66	4.65
7. Volume of preparatory materials	4.55	4.53
8. Evaluation methods provided fair measures of my effort and learning	4.27	4.32
9. Feedback methods were appropriate and facilitated my learning	4.00	3.41
10. Gained useful knowledge	4.69	4.59
11. Inspired and encouraged toward professional goals	4.52	3.35

Overall, students gave high ratings for clarity of learning objectives, adequacy of learning materials, relevance of the material to practice, and volume of preparatory materials. Between the first and second semesters, a trend toward improvement was seen in course organization, accomplishment of learning objectives, and fairness of evaluation methods. Between the two semesters, student ratings of two items declined: item 9) and item 11). These two items are identified as concerns requiring further study and intervention.

Course title:	***Medical Skills I, II, III, IV***

Item 9) Feedback methods were appropriate and facilitated my learning.

In the past, during the Medical Skills Course sessions in which students have seen a standardized patient, feedback has been provided in four ways:

1. The standardized patients, while still "in character", provide general comments about the students' interpersonal skills.
2. Standardized patients rate each student on a list of 15-20 criteria. These scores are aggregated and a faculty member reviews the aggregate data with students in small group session immediately following the SP encounter.
3. After the session, individual students can make an appointment to meet with a faculty member and review their videotape of the SP encounter.
4. For 72 hours after each session, medical students can review their videotape of the SP encounters over the Internet using the Web SP system.

In the past, each student's individual ratings on the specific performance criteria have not been released to them. On the survey, students specifically requested these ratings. Physicians have not been available to meet individually with students and review their videotapes. On the survey, students have specifically requested feedback from physicians on their performance during the SP encounters.

These issues were reviewed in a meeting of the Curriculum and Education Policy Committee. It was recommended that the course director revise the processes by which students receive feedback so that students should receive individual feedback on their performance during each SP encounter. Responding to this recommendation, the following changes are being implemented.

1. As students see standardized patients in pairs, the second student will function as a peer evaluator. The peer servers will have a list of criteria, and immediately after the encounter will provide feedback to their peer on their performance relative to these criteria.
2. Standardized patients will continue to give general impressions about overall communication skills while still "in character".
3. Students will receive a copy of their individual ratings from their standardized patient.
4. In small groups, students will continue to review aggregate data with a faculty member. During those review sessions, they will be able to reflect their individual ratings against those of the group at large.
5. A panel of faculty members will be recruited to serve as video recording reviewers. A rotating schedule will be used so that all students have the opportunity to have several of their videotapes reviewed with a faculty member during the course of each year.

Item 11) I felt inspired and encouraged toward my professional goals.

During the year, students had particularly high ratings of several sessions that were conducted by guest faculty members from University Medical Center. These sessions included a demonstration of fracture stabilization by a trauma surgeon, a workshop on the lower extremity examination by an orthopedic

surgeon, and a workshop on the heart exam by a cardiologist. The students were particularly impressed by the enthusiasm and commitment of these physicians and the relevance of the lessons covered in the sessions.

In order to enhance the inspirational aspect of the Medical Skills Course, efforts are underway to recruit more exemplary teachers from various clinical disciplines to participate in course instruction. Some of these instructors include:

1. Several obstetrician-gynecologists and a nurse-midwife to provide instruction during Unit 7.
2. Several psychiatrists to provide instruction during Unit 8.
3. An ophthalmologist to teach the eye exam during Unit 9.

The course faculty will continue to search for opportunities to bring in capable and motivated instructors from various disciplines to participate in course instruction.

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

SUCCESSES

After its first year, the Medical Skills Course has been recognized as a highly successful course. The decision to align the Medical Skills Course session topics with the SPM scheme presentations has produced substantial educational benefits that were not anticipated prior to the beginning of the program. Because each Medical Skills session builds directly on content from the prior week of SPM, students have been able to demonstrate sophisticated clinical decision-making quite early in their medical training, and repeat this week after week during the curriculum.

In essence, the Medical Skills Course and SPM have developed educational synergism, with each course reinforcing the other. SPM lays down a foundation of declarative knowledge, organized within the conceptual framework of a common clinical presentation. Following this, the Medical Skills Course provides an opportunity to apply this knowledge in a simulated but highly relevant situation. Then over the weekend, students review the content that has been covered in SPM in order to prepare for the formative exam. Many students comment that after the Medical Skills experience, they view the content from SPM differently, and use the context from the standardized patient encounter to help them reframe and reorganize the basic science content.

A second success in the course has come from the decision to maintain close linkage between instruction and student assessment. Prior to each session, detailed preparatory materials are distributed that provide a step-by-step walk-through of the SP encounter. These materials outline the tasks that must be accomplished during the encounter, the questions that need to be asked, the physical findings that should be sought, and the communication skills that should be demonstrated. During summative OSCE evaluations the very same questions, exam findings, and communication skills are used as assessment criteria. Medical students have expressed appreciation for the clarity of the course expectations, and this has engendered an atmosphere of trust during the sessions and examinations. Ultimately, this has had the effect of promoting learning.

REQUIRED COURSE FORM (Continued)

Course title:	***Medical Skills I, II, III, IV***

PROBLEMS TO OVERCOME

Naturally, there have been problems, too. As the course was developed during the year, there were many times when instructional materials and SP cases were written days before the sessions were actually presented. Not unusually, materials were posted on the student website one or two days prior to the session. Feedback from the medical students clearly indicates that they need these materials further in advance of the sessions, and the course director is working hard to develop materials well ahead of the sessions.

Each SP encounter is videotaped, and medical students are invited to come to the Clinical Simulation Center to review their videotapes. However, only a relatively small number of students have actually availed themselves of the opportunity to review their videotapes. Indeed, both students and faculty members are busy, and it is easy to let these reviews slip by. In the future, a schedule will be developed and posted, so that a number of medical students will be assigned an appointment to review their videotapes with a faculty member. In addition, a small panel of faculty members will be recruited to perform these time-intensive video reviews in order to share the burden of this workload.

PART B. REQUIRED COURSE FORM	
Course title:	Society, Community, and the Individual
Sponsoring department or unit:	Department of Medical Education
Name of course director(s):	Ana Maria Arroyave, MD, MPH, Theresa Byrd, Dr. PH

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	6
Department of Family Medicine	14*
Department of Biomedical Sciences	2
Department of Obstetrics and Gynecology	1
Department of Emergency Medicine	2
Department of Pediatrics	11**
Department of Internal Medicine	1
UTHSC Houston School of Public Health (El Paso)	2

Notes: *This count includes 10 clinical faculty members who precept students in community clinic sites. Clinical preceptor faculty all have faculty appointments at PLFSOM.

**These are clinical faculty who precept students in community clinic sites. These faculty have appointments at the PLFSOM.

Course Objectives

Are there written objectives for the course? (check)

Yes	**x**	**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

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

medical Spanish. As part of this course, students participate in community assessment projects, home visits with "mentor" families in the community, and they are also 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 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:

- Students will acquire an understanding of biostatistical concepts required to critically evaluate the medical literature and practice evidence-based medicine;
- Students will understand modern epidemiological principles for assessing disease processes within populations and know how to apply this knowledge in practice;
- Students will appreciate the role of culturally based beliefs, attitudes, and values in affecting the health and illness behaviors of individuals, groups, and communities;
- Students will understand the concept of community and of systems within communities that impact health seeking behaviors and responses to treatment interventions;
- Students will recognize variations in family structures, organization, values, and expectations as these influence health and illness-related behaviors;
- 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.
- Students will acquire (or expand upon existing) skills in conversational and medical Spanish.

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

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

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?

Residents, Fellows, and Graduate Students do not participate in the delivery of this course.

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.

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 El Paso County. 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 site. This group meets at least quarterly and as needed to discuss the program goals and objectives, logistics, and to solve problems. These dinner meetings are well attended.
2) The course director and senior associate dean for medical education conducted orientation meetings with the clinical faculty and staff at each of the community clinic sites.
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 that is used by the course director to determine whether there are problems with student attitudes or conduct that need to be addressed.

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 two classes:

Year:	n/a	n/a	n/a
Score:			

NBME subject exams are not used in this course.

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	x	Problem-solving written exercises
	Essay questions or papers	x	Presentations
	Oral exams	x	Preceptor ratings
	OSCE or standardized patient exam		Other (describe)

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

There are no practice examinations given in this course. This course is delivered primarily through short intersessions (approximately 2 days per intersession) between each of the units of the Scientific Principles of Medicine course (please see curriculum schematic, page x). Students are given short quizzes (20-25 items) that are aggregated over the course of the semester to serve as a component of the final grade. Students are well aware of their progress. Students who do not do well 75% or higher and are at risk for not passing the course meet individually with the course director who then directs the student to appropriate faculty for additional help. For written exercises related to the community clinic placement and for projects (e.g., mentor family home visits) the course director reads and provides feedback to the students. A passing grade in this P/F course requires that the student pass all components of the course. Students whose work is unsatisfactory in any given component is provided feedback and required to redo the assignment or to take a remedial examination.

REQUIRED COURSE FORM (Continued)

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

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

Yes	**x**	**No**	

Narrative feedback is provided by the course director on written exercises and projects and by preceptors and staff members working with the student in the community clinic placement.

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). If problems have been identified by student evaluations or other data, describe how they are being addressed.

The charter class of 2013 was asked to complete an anonymous electronic survey regarding their experiences in SCI to date in October, 2009. This survey covered the 3 week mini-immersion experience in Border language, culture, and community (July 13-30, 2009) and the first SCI intersession following the completion of Unit 1 (Host-Defense) in the Scientific Principles of Medicine course. Twenty nine of a possible 39 students submitted responses for a response rate of 74.4%.

Overall the students rated the course moderately well during this time frame with a majority of the respondents agreeing or strongly agreeing that the course was:

- Well organized (69%)
- Clear learning objectives (62%)
- Reasonable expectations (69%)
- Appropriate instructional methods (55%)
- Fair methods of evaluation (58%)
- Relevant to the practice of medicine (62%)
- Provided useful information (55%)

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

Free text responses revealed the following student perceived strengths:

- Class material is relevant, helpful, and interesting
- Many students value the emphasis being placed on cultural and linguistic competency (see also comments under course weaknesses and suggestions for change)
- Clinical and community experiences are valuable

Weaknesses and suggestions for change identified in free-text responses:

- Some students feel too much emphasis is being placed on Mexican-American culture and would like the course to provide more exposure to other cultural groups in the El Paso area; others felt too much emphasis was being placed on cultural topics
- Many students commented on a perceived mismatch between published learning objectives and quiz items
- Some students questioned value and efficacy of intermittent instruction in conversational Spanish and requested a greater emphasis on medical Spanish
- Some students found the mentor family home visits to be stressful and worried about this component being intrusive for the families
- Several students questioned the scheduling of the SCI course as intersessions following the stress of a major unit exam. By this point they noted they were fatigued and found it difficult to motivate themselves for SCI

A second anonymous survey was completed by 34/39 students (87% response rate) at the end of the academic year. The results of this survey are summarized below showing the percentage of students agreeing with the survey statements.

- Well organized (41%)
- Clear learning objectives (68%)
- Reasonable expectations (69%)
- Appropriate instructional methods (44%)
- Fair methods of evaluation (56%)
- Relevant to the practice of medicine (53%)
- Provided useful information (64%)
- Additional Questions on end of year course evaluation:
- Community clinic experience worthwhile (94%)
- Host/Mentor experience worthwhile (26.4%)
- Spanish instruction worthwhile (70.6%)

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

Free text comments revealed the following student perceived strengths of the course:

- The community clinic experience was identified by many students as a major course strength
- A number of students commented on the value of Spanish and appreciated the transition from an emphasis on conversational Spanish to Medical Spanish.

Weaknesses and suggestions for change identified in free text responses:

- Consistent with survey results reported above, many students expressed dissatisfaction with the family home visit experience. They cited issues related to scheduling difficulties, feeling that the experience was intrusive and time consuming.
- Several students continued to question the value of intermittent instruction in SCI through the intersession scheduling model. This was particularly problematic for Spanish instruction and epidemiology.
- Some students commented that instruction on environmental and occupational health was overly repetitious.

RESPONSES TO STUDENT EVALUATIONS:

- Course director met with the committee that designed the mentor family experience in order to revise objectives, address logistical issues and students' concerns. Recommendations included to reduce the number of visits to one visit during the second year. This visit will be done with the help and support of a community health worker . The main objectives of this visit will be to get to know the families by drawing a genogram and doing a home assessment.
- Course directors made a proposal to integrate SCI content into SPM schedule in order to facilitate the learning of Spanish and Epidemiology, thus, ending the intersession schedule. This proposal was approved by the Curriculum and Educational Policy Committee for implementation in 2010-2011.
- The medical Spanish will be taught more often and will mirror what is being taught in other courses to facilitate learning and application of the new vocabulary
- Course directors have met with thread directors to provide individual feedback from the students and to discuss ideas for improvement
- Course directors have met with thread directors in order to shift from lecture time to interactive sessions
- Course directors have met with thread directors in order to encourage inclusion of objectives in each session that demonstrate applicability of SCI content to clinical medicine

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

SUCCESSES:

- Community clinic experience

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

- Many students engaged with community projects: i.e., education to women victims of domestic violence in health related topics, participation in community health fairs, food & coat drives during the winter
- Some students published some articles in local journals regarding their community clinic experience
- The participation of the mentor families and their perceived benefit of the family mentor program
- The participation of community organizations and physicians across the border (physicians from New Mexico)

PROBLEMS/CHALLENGES TO OVERCOME:

- Attendance dropped considerably (50%) during second semester
- Family experience: Real logistic problems scheduling visits (10%), sense general resistance to complete this activity. To address this problem : Activity will be moved to the second year, limited to one general visit with a promotora with a family who is established in the community
- Conceptual threads: revision of objectives, target some objectives to clinical applicability, shift lecture time to small group activities (application exercises), end the intersession schedule.
- Community clinics: Attrition of preceptors in the community, we may want to consider some compensation/ recognition of their time. Recommend face to face contact and monthly feedback with course director for first and second year medical students.
- Professionalism: To be evaluated as part of the core competencies. During the fall of 2010, we started collecting information on professionalism from small group activities as well.

PART B. REQUIRED COURSE FORM	
Course title:	Scientific Principles of Medicine: Introduction to Health and Disease*
Sponsoring department or unit:	Medical Education/Internal Medicine/Family Medicine
Name of course director:	Kathryn McMahon, PhD / Rhonda Fleming, MD / Janet Piskurich, PhD

*Host Defense was the previous title. Based on evaluation data from the 2009-2010 academic year, this course was revised and renamed for the 2010-2011 academic year.

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 (Anatomy, Behavioral Science, Biochemistry, Cell and Molecular Biology, Embryology, Genetics, Histology, Immunology, Microbiology, Nutrition, Pathology, Pharmacology, Physiology, and Clinical)	20
Family Medicine	6
Pediatrics	3
Internal Medicine	1
Pathology	1

Course Objectives

Are there written objectives for the course? (check)

Yes	**x**	**No**	

REQUIRED COURSE FORM (Continued)

Course title:	***SPM Unit 1: Introduction to Health and Disease****

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

Topics covered are described in the Topic Appendix (below). Individual 'clinical presentations' provide an overview of the clinical manifestations, etiology, course, and management of common complaints brought to the physician. Each clinical presentation includes specific written objectives that are available in the course syllabus and on site. In addition, clinical presentations serve as the basis for consideration of key basic science concepts that are needed to understand the scientific principles associated with each. The clinical presentations covered are:

2009-2010 Academic Year

1. Work physical
2. Sore throat
3. Periodic health examination
4. Abnormal temperature
5. Hypersensitivity reactions

2010-2011 Academic Year

1. Adult periodic health examination
2. Pediatric periodic health examination
3. Sore throat
4. Fever
5. Wound

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

Key concepts in all of the basic sciences were developed in relationship to the clinical presentation and in an integrated fashion. The content areas by discipline are shown in the Topic Appendix (below). In some instances, the same or related topic is presented from different perspectives. Objectives were thoroughly reviewed as to depth, breadth, and sequencing by the basic science and clinical faculty who deliver the basic science component of the curriculum.

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.

Thus, 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. Gross anatomy and virtual histology laboratories provide the anatomical framework with medical imaging correlations provided by members of the Departments of Radiology and Medical Education through a password-protected medical imaging database called the Medical Imaging Library (MIL).

REQUIRED COURSE FORM (Continued)

Course title:	***SPM Unit 1: Introduction to Health and Disease****

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?

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 course will be 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 two classes:

Year:	-	-	-
Score:	-	-	-

Not Applicable

REQUIRED COURSE FORM (Continued)

Course title:	***SPM Unit 1: Introduction to Health and Disease****

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 exam		Other (describe)

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

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.

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

Yes	**x**		**No**

Course title:	***SPM Unit 1: Introduction to Health and Disease****

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 course is taught as an interdisciplinary course drawing faculty predominantly from the Department of Medical Education, but also from several clinical departments. Department of Medical Education faculty includes both basic science and clinician medical educators. Instructors include both the basic science and clinical faculty. A diversity of teaching space is available for the course, including a sufficient number of small classrooms, lecture space, laboratories, and gross anatomy dissection space. Computers, computer software, library resources, and the personnel needed to support laboratory-based, 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). 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 (academic year 2009-2010: 29/39, 74.3% response rate; academic year 2010-2011: 60/62, 96.8% response rate). 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 (NE = Not Evaluated):

	2009-2010 Academic Year	**2010-2011 Academic Year**
Integration of basic and clinical sciences	3.4	4.1
Relevance to clinical medicine	3.8	NE
Organization	3.0	4.1
Appropriateness of instructional method	3.3	NE
Learning objectives	NE	4.0
Order of clinical presentations	NE	4.0
Usefulness of lectures	NE	3.9
Usefulness of conceptual framework sessions	NE	2.8
Reasonable amount of material/reading	2.7	4.1
Fairness of evaluation	3.5	3.8
Gained useful knowledge	4.0	4.4
Quality of clinical schemes	4.1	NE
Quality of “process worksheets”	3.9	NE
Quality of worked case example sessions	4.8	4.5
Quality of laboratory sessions	2.3	3.2

Course title:	***SPM Unit 1: Introduction to Health and Disease****

For the 2009-2010 academic year, as can be seen from the data summarized above, students felt that they gained useful knowledge from this unit and were particularly satisfied with its clinical aspects. Students indicated they felt somewhat overwhelmed with the amount of reading required for this unit and the number of learning objectives associated with certain sessions. Students also commented on some variability in the success of the unit in providing coherent integration of some of the basic sciences. Finally, as a group, the students did not find the some of the laboratory sessions particularly useful. Some students commented that some of the laboratory sessions addressed concepts and content that could have been acquired more efficiently through other teaching-learning modalities.

For the 2010-2011 academic year, based on evaluations from the previous year, the unit committee undertook a comprehensive revision of the unit. Major changes included: a decrease in the volume of reading, a decrease in the number of learning objectives, and providing clearer description of how learning objectives relate to reading assignments. The unit committee also modified the sequence and nature of several clinical presentations. Faculty also worked in clinical presentation teams to strengthen the integration of instruction so that isolated memorization of factual material was discouraged in favor of large scope understanding. As shown by the data above, changes implemented in the 2010-2011 year resulted in significant improvements in student evaluations in many categories including overall organization, integration, and quality of laboratory sessions.

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

SUCCESSES:

- High level of integration of basic science content in the context of clinical presentation
- Clinical relevance of material recognized by learners
- Wide acceptance of clinical presentation learning model by learners

PROBLEMS TO OVERCOME:

- Incomplete integration of concepts from various disciplines
- Lack of clarity of individual instructor's expectations of depth of understanding
- Inconsistent quality of questions (especially important as students are introduced to vignette style questions for the first time)
- Staffing of laboratory sessions

Course title:	***SPM 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

Course title:	***SPM Unit 1: Introduction to Health and Disease****

- 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

Course title:	***SPM Unit 1: Introduction to Health and Disease****

- 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

Course title:	***SPM Unit 1: Introduction to Health and Disease****

- 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 (SPM): Musculoskeletal and Neurological Systems
Sponsoring department or unit:	Medical Education
Name of course director(s):	Asa C. Black, Ph.D, Richard D. Brower, M.D.

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 (Anatomy, Biochemistry, Cell Biology, Physiology, Pharmacology, Microbiology)	12
Emergency Medicine	8
Internal Medicine (General, Rheumatology)	5
Orthopedic Surgery (and Physical Medicine and Rehabilitation)	3
Neurology	2
Ophthalmology	1
Pathology	5
Radiology	1
College Masters	4

Course Objectives

Are there written objectives for the course? (check)

Yes	√	**No**	

Each of the 13 Clinical Presentations that comprise this course has its own set of written learning objectives that include those focused on an understanding of underlying basic science concepts as well as clinical components of the topic. These written objectives are posted to a curriculum database and accessible through secure intranet portals ("Ilios" for staging, development and storage, and "WebCT/My HSC Blackboard" for access by the students).

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

This course is an integrated presentation of the major basic science concepts related to the musculoskeletal and neurological systems. The course content is organized and explored in the context provided by a sequence of 13 relevant, common and broadly applicable Clinical

Course title:	***SPM Unit 2: Musculoskeletal and Neurological Systems***

Presentations, including orthopedic, rheumatologic, neurologic, and neurosurgical issues. These Clinical Presentations broadly span the musculoskeletal and neurological systems, facilitating a general survey of the scientific foundations of medical practice and progress related to these systems. Each of the course content blocks, thematically defined by the 13 Clinical Presentations, begins with a one-hour didactic session by an experienced clinician. Basic information will be provided for each Clinical Presentation including a definition and a description of its clinical significance. In addition, each of these sessions is based upon a hierarchical diagnostic scheme that descends from the Clinical Presentation through a series of decision points to specific diagnoses or diagnostic categories, emphasizing the scientific knowledge that is necessary at each branch in the scheme. Thus these sessions are specifically and consistently designed to provide a practical framework for the application of scientific concepts in the diagnostic process which flows from the particular problem addressed.

These scientific concepts are then elaborated in an integrated content block consisting of lectures, interactive sessions, demonstrations and labs presented over the next two to six days. Each week of the course culminates in a two-hour small group session (entitled "Worked Case Examples") in which the class divides into groups of up to 10 to present and explore prototypical clinical cases prepared by the clinical faculty and related to the Clinical Presentations covered that week. These sessions are guided by clinical faculty "tutors" and are designed to facilitate the consolidation of basic science course content in the context of the practical diagnostic scheme provided for each Clinical Presentation. The following clinical presentations were addressed in this unit:

1. Bone fractures and dislocations
2. Musculoskeletal lumps and masses
3. Pain
4. Joint pain
5. Numbness, tingling, and altered sensation
6. Gait disturbances
7. Movement disorders
8. Deformity and Limp
9. Headache
10. Seizure and epilepsy
11. Weakness and loss of motion
12. Stroke
13. Altered mental status (delirium, stupor and coma)

The sequence of these Clinical Presentations has been structured so that concepts developed during the study of each topic progressively develop a scientific foundation for the next.

Course title:	***SPM Unit 2: Musculoskeletal and Neurological Systems***

Each Clinical Presentation is associated with a set of basic science learning objectives related to appropriate and progressively ordered scientific concepts of anatomy (including gross, microscopic, and radiographic components), embryology, biochemistry, physiology, genetics, immunology, microbiology, nutrition, pharmacology, and pathology. These objectives are also linked to specific sessions or curriculum elements which are designed and delivered by our basic science faculty (as outlined above).

A listing of the basic science topics addressed in this unit of SPM can be found in the attached topic appendix.

Preparation for Teaching

If graduate students, postdoctoral fellows in the biomedical sciences, or residents teach in the course (as lecturers, small group facilitators, laboratory instructors), describe how they are informed about the course objectives and prepared for their teaching role.

Residents may occasionally participate as small group facilitators during the "Worked Case Examples" sessions described above. They are only permitted to participate as assistants in small groups that are primarily facilitated by an experienced clinical faculty tutor. Any resident or clinical faculty member who facilitates a "Worked Case Examples" session must attend a tutor meeting specifically for that session. During the tutor meeting, the instructional materials and methods are reviewed.

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

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	x	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)

Course title:	***SPM Unit 2: Musculoskeletal and Neurological Systems***

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

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	**x**	**No**	

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 course is taught as an interdisciplinary course drawing faculty predominantly from the Department of Medical Education, but also from several clinical departments. Department of Medical Education faculty includes both basic science and clinician medical educators. Instructors include both the basic science and clinical faculty. A diversity of teaching space is used for the course, including a sufficient number of small classrooms, lecture space, laboratories, and gross anatomy dissection space. Computers, computer software, library resources, and the personnel needed to support laboratory-based, 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). If problems have been identified by student evaluations or other data, describe how they are being addressed.

At the end of the unit, 31/39 (79.5% response rate) students completed an anonymous on-line evaluation 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:

Level of integration of basic and clinical sciences	= 3.0/5
Organization	= 2.8/5
Appropriateness of instructional method	= 3.3/5

Course title:	***SPM Unit 2: Musculoskeletal and Neurological Systems***

Relevance to clinical medicine	= 3.8/5
Reasonable reading expectations	= 3.3/5
Fairness of evaluation	= 2.8/5
Gained useful knowledge	= 4.0/5
Quality of clinical schemes	= 4.1/5
Quality of "process worksheets"	= 3.7/5
Quality of worked case example session	= 4.7/5
Quality of laboratory sessions	= 2.4/5

Free text comments and student input during the implementation of this unit revealed that students found this component of the SPM course very challenging. They reported being overwhelmed by the volume of material, particularly as it related to gross anatomy and neuro-anatomy. Students were somewhat critical of the usefulness of the anatomy laboratory sessions. As can be seen from the results summarized above, however, students were positive about the clinical components of the unit. The unit committee carefully reviewed student concerns and their own experiences delivering this component of SPM. Because this unit provides the first exposure to advanced human neuroanatomy for many of our students, we intend to reduce the complexity and pace of these components, emphasizing foundational concepts of nervous system organization.

Some of the more complex neuroanatomical systems will be reviewed and explored in greater detail when they occur as relevant issues during subsequent clinical presentations. For example, we are considering an expanded discussion of the lower cranial nerve pathways in the context of the clinical presentation of difficulty swallowing (SPM Unit 3—GI/Hem). Another example is further exploration of the central and peripheral elements of oculomotor control during the presentation of eye socket abnormalities (SPM Unit 9—Derm/Special Senses). There are many such opportunities to prioritize and more evenly distribute this especially challenging material, and these opportunities will be actively considered during our regular planning meetings for next year. In this way, a basic elaboration of the nervous system during this course will be followed by more advanced discussion of functional systems as they arise in their clinically relevant context.

For 2010-2011 academic year we will reduce the number of clinical presentations from 13 to 11. This will be accomplished by consolidating two of the clinical schemes:

- "Pain" will be presented as an extension of "Numbness, Tingling and Altered Sensation" (thereby avoiding unnecessary redundancies related to their shared neural substrates).
- The clinical presentation of "Gait Disturbances" will be changed to a self-study component during the week dealing with "Weakness and Loss of Motion". The basic science objectives related to "Gait Disturbances" will be redistributed to the weeks dedicated to the underlying musculoskeletal and neural issues of "Deformity and Limp",

Course title:	*SPM Unit 2: Musculoskeletal and Neurological Systems*

"Numbness, Tingling and Altered Sensation", "Movement Disorders" and "Weakness and Loss of Motion". This should allow for improved understanding of gait disturbances as a complex clinical presentation that may relate to any of these mechanisms.

In addition, the clinical presentations in this unit will be re-sequenced so that all of the predominately musculoskeletal topics will occur in a block at the beginning of the course. This change will improve the organization of the musculoskeletal basic science materials. This will also provide some additional time to introduce basic neuroscience concepts related to membrane physiology and synaptic transmission in anticipation of the primarily neurological clinical presentations and associated neuroscience.

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

SUCCESSES:

- All components of the course were delivered as planned
- The students generally identified the course content as highly relevant and useful
- The students expressed a high level of satisfaction with the clinical components of this course
- As it became apparent that the students were overwhelmed by heavy reading assignments and a challenging combination of intense gross anatomy and neuro-anatomy, we adapted by re-assessing the required readings, consolidating learning objectives, and providing supplemental review sessions

CHALLENGES:

- We need to improve the quality and relevance of the laboratory sessions
- The quantity and pace of the gross and neuro- anatomy content needs to be reduced and prioritized to improve retention
- After this course was completed our primary neuroscience faculty member left the institution. For next year this material will be reassigned to other members of the faculty using a multi-disciplinary approach.

Course title:	***SPM Unit 2: Musculoskeletal and Neurological Systems***

Topic Appendix: Musculoskeletal/Neurology

1.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

Histology

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

Embryology

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

NEUROLOGICAL SYSTEM (in addition to overlapping topics listed above)

Gross anatomy

- Surfaces of the brain and cranial fossae
- Anatomy and functions of the cervical, brachial and lumbosacral plexuses (overlapping with neuroanatomy)

Course title:	***SPM Unit 2: Musculoskeletal and Neurological Systems***

Neuroanatomy

- Introduction to neuroanatomy
  - Anatomical organization and landmarks of the brain, brainstem, cerebellum and spinal cord
  - Spinothalamic,
  - Ventricular system and cerebrospinal fluid pathways
  - Spinal cord and cerebral arteries
  - Cranial nerve 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 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
- Cerebellar and vestibular systems and tracts
- Basal ganglia neuroanatomy
- Anatomical perspectives on radiculopathies, plexopathies and peripheral neuropathies
- Neuroanatomy of headache
- Neuroanatomy of loss of motion
- Neuroanatomy of stroke (brain vasculature and vascular syndromes – including brain and brainstem syndromes, including subarachnoid hemorrhage)
- Neuroanatomy of delirium, stupor and coma (altered mental status)

Embryology

- Nervous system development
  - Development of the myelencephalon, metencephalon, mesencephalon, diencephalon, pituitary gland, and telencephalon
  - Development of the peripheral nervous system
- Clinical embryology of the nervous system
  - Origins of the classic major nervous system malformation syndromes

Course title:	***SPM Unit 2: Musculoskeletal and Neurological Systems***

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

NEUROLOGICAL (in addition to above)

- Biochemistry of thiamine and thiamine deficiency
- Biochemistry of hyper- and hypo- glycemia

3. GENETICS

MUSCULOSKELETAL

- Genetic inheritance and variation
- Detection of genetic variation and genetics of bone disease
- Mendelian inheritance

NEUROLOGICAL

- Mendelian inheritance in the context of gait disorders (Parkinson's disease, ataxia)
- Trinucleotide repeat diseases (including Huntington's disease)
- Mitochondrial disease
- Muscular dystrophies

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

Course title:	*SPM Unit 2: Musculoskeletal and Neurological Systems*

- 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

NEUROLOGICAL

- Immune privilege and surveillance of the brain
- Immune mechanisms of central nervous system disease and, specifically, multiple sclerosis
- Acute meningitis, septic and aseptic
- Infectious myelitis
- Rhabdovirus family (Rabies) and JC virus (progressive multifocal leukoencephalopathy)

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

Course title:	*SPM Unit 2: Musculoskeletal and Neurological Systems*

- Pathology of central nervous system demyelinating disease
- Peripheral nerve disease
- Peripheral nerve and nerve sheath tumors (including neurofibromatosis types 1 and 2)
- Pathology of movement disorders (Parkinsonism, Huntington's disease, tremors, tics, chorea, athetosis and ballism)
- Clinical embryology of the nervous system
    - Origins of the classic major nervous system malformation syndromes (with embryology)
- Pathology of Headache
    - Brain tumors
    - Aqueductal stenosis
- Cerebrospinal fluid composition and analysis
- Pathology of stroke (ischemic and hemorrhagic)

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
- Drug targets in the nigrostriatal tracts
- Drugs for epilepsy
- Pharmacology of the somatic efferent nerves, neuromuscular junction and skeletal muscle

7. PHYSIOLOGY

MUSCULOSKELETAL

- Mechanisms of bone fracture and healing
- Mechanics of skeletal muscle contraction

NEUROLOGICAL

- Proprioception and basic spinal reflexes

Course title:	*SPM Unit 2: Musculoskeletal and Neurological Systems*

8. BEHAVIOR

MUSCULOSKELETAL

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

NEUROLOGICAL (in addition to above)

- Gilles de la Tourette Syndrome

9. NEUROLOGY

NEUROLOGICAL

Neurophysiological basis of clinical electroencephalography

Course title:	***SPM Unit 3: Gastroenterology and Hematology***

PART B. REQUIRED COURSE FORM	
Course title:	Scientific Principles of Medicine: Gastroenterology and Hematology
Sponsoring department or unit:	Department of Medical Education Department of Internal Medicine
Name of course director:	David Osborne, PhD., Kirk Baston, MD., Javier Corral, MD., 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 (Basic Science Educators representing the disciplines of Anatomy, Biochemistry, Cell Biology, Genetics, Histology, Immunology, Microbiology , Nutrition, Physiology, Pharmacology, Pathology)	14
Medical Education (Clinical Medical Educators representing specialties in the areas of Emergency Medicine, Family Medicine, Internal Medicine , Nephrology , Neurology, Pediatrics, and Radiology	8
Internal Medicine (Gastroenterology, Endocrinology, Hematology)	9
Family Medicine	1
Pathology	3
Pediatrics	1

Course Objectives

Are there written objectives for the course? (check)

Course title:	***SPM Unit 3: Gastroenterology and Hematology***

Yes	x	No	

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

This course contains 13 clinical presentations that will correlate the basic science and clinical applications of the basic sciences related to disease states involving the disciplines of Gastroenterology and Hematology. This course builds upon information presented in earlier units of SPM. It expands the discussions of control of organ function by elaborating on neural and endocrine control of the gastrointestinal tract. The hematology portion of this unit serves as an introduction to Cardiology and Pulmonary medicine in the SPM unit that follows. The course content will be presented in the context of 12 clinical presentations. The title and order of the presentations are as follows:

1) Dysphagia
2) Nausea and Vomiting
3) Diarrhea
4) Constipation
5) Abdominal Distension
6) Abdominal Pain
7) Blood from the GI tract
8) Abnormal Hemoglobin
9) Abnormal White Blood Cells
10) Lymphadenopathy
11) Coagulation Abnormalites
12) Abnormal Liver Function Tests and Jaundice

The first 8 clinical presentations are Gastroenterology related. Clinical presentations 1-4 are region specific and follow the general path of food passage through the gastrointestinal tract. Each clinical presentation allows for the presentation of the basic sciences related to the function of the mouth and esophagus, the stomach, the small intestine and the colon. The contributions of the accessory organs are presented within each region as well. Within each of these presentations the pathology and etiologies of the region specific diseases is explained in context of the underlying basic science. Clinical presentations 5-8 are opportunities to expand on the basic information from CP's 1-4 and explore the clinical application of the basic science of the GI tract in a more global "whole body" context. These presentations will highlight the interaction of the GI tract with other organ systems.

Clinical presentations 8-11 are the presentations related to hematology. The same pattern of presentation applies to the hematology section as well. Presentations 9 and 10 allow for the presentation of the normal structure and function of blood correlated with specific blood related clinical problems. Presentations 10

Course title:	***SPM Unit 3: Gastroenterology and Hematology***

and 11 present blood related disorders in the context of whole body abnormalities. Presentation 12 relates hematological and gastrointestinal problems in terms of abnormal liver function and associated liver function tests.

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.

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

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?

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 a single site on the campus of the Paul L. Foster School of Medicine.

Course title:	***SPM Unit 3: Gastroenterology and Hematology***

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		Presentations
	Oral exams		Preceptor ratings
	OSCE or standardized patient exam		Other (describe)

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

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	x	No	

Course title:	***SPM Unit 3: Gastroenterology and Hematology***

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 course drawing faculty from a number of disciplines. We have recruited a significant number of basic science and clinical medical educators to assist current faculty to provide instruction. There is a diversity of teaching space available for the course, including a sufficient number of small 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. The current members of the department of medical education represent 18 disciplines in basic science and clinical medicine. The faculty has considerable experience in all areas of teaching and utilizes a variety of techniques for delivery of the curricular components.

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.

At the end of the unit, 28/39 (72% response rate) students completed an anonymous on-line evaluation of this unit of the SPM course. On a 5 point scale, with 1 representing a low level of agreement and a 5 representing a high level of agreement, students rated the elements of this course as follows:

Level of integration of basic and clinical sciences	= 4.2/5
Organization	= 3.9/5
Appropriateness of instructional method	= 4.1/5
Relevance to clinical medicine	= 4.5/5
Reasonable reading expectations	= 4.5/5
Fairness of evaluation	= 4.5/5
Gained useful knowledge	= 4.7/5
Quality of clinical schemes	= 4.5/5
Quality of “process worksheets”	= 3.9/5
Quality of worked case example session	= 4.8/5
Quality of laboratory sessions	= 3.7/5

Free text comments and student input throughout the implementation of this unit revealed that students found this unit to be well integrated, well organized, and well taught. The main criticism students voiced related to some (unavoidable and non-recurring) scheduling problems. Students also suggested that we

Course title:	***SPM Unit 3: Gastroenterology and Hematology***

include more instruction in normal histology. The course directors agree and this change will be implemented for the coming year.

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

SUCCESSES INCLUDE:

- Implementation of a highly integrated course of instruction with wide participation by basic science and clinician faculty;
- High level of performance by students on end of unit exam.
- High level of student satisfaction with unit.

CHALLENGES INCLUDE:

- Recruitment of additional faculty to accommodate increasing class size;
- The need to increase content related to hematology and coagulation disorders will require an examination of other content areas as the amount of time allotted to this unit is fixed;
- The need to increase content related to normal histology within the confines of fixed time available for instruction.
- Re-sequencing of the clinical presentations to place abnormal level function at the end of the GI portion of the unit and as a bridge to the hematological portion.

The changes listed in the challenges outlined above have been discussed with the course director and SPM course committee and modifications have been approved by this committee and by the Curriculum and Educational Policy Committee for implementation in 2010-2011.

Course title:	***SPM Unit 3: Gastroenterology and Hematology***

Topic Appendix: Gastroenterology and Hematology Unit

GASTROENTEROLOGY TOPICS

Anatomy/Histology/ Embryology

- Anatomy (Gross and Neuro), Embryology (Ontogeny of the listed structures), Histology (microscopic anatomy of the listed structures)
- 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, portal vein drainage
- Stomach, small intestine, colon, rectum and anus structure
- Liver and Pancreas

Biochemistry

- Salivary and Pancreatic amylase
- Zymogen Activation
- Pancreatic Enzymology
- Glycogen Storage and Liver Function
- Bile metabolism
- Digestion and Absorption of Nutrients

Genetics

- Gene Mapping and Linkage analysis
- Genetics of Obesity
- Genetics of Colon Cancer
- Genetics of liver disease and Jaundice

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

Course title:	***SPM Unit 3: Gastroenterology and Hematology***

- Immune mechanisms in Immune-mediated Inflammatory Bowel Disease (IBD)
- Introduction to Tumor Immunology
- Immune mechanisms in Hepatitis
- Immune mechanisms in Primary Biliary Cirrhosis and Primary Sclerosing Cholangitis

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
- Abnormal weight loss in HIV-AIDS

Systemic

- Microbiological causes of food poisoning
- Bacterial overgrowth syndrome (BOS)
- Peritonitis
- Intra-abdominal sepsis

Course title:	***SPM Unit 3: Gastroenterology and Hematology***

Pathology

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

Pharmacology

- Pharmacokinetics in relation to the GI tract
- Prostaglandin inhibitors
- Drugs for Gastric acid control and peptic ulcer disease
- Antiemetics
- Antidiarrheals
- Laxatives

Physiology

- Information related to regulation and control of secretion, motility, digestion and absorption of dietary intake:
- Mastication/Salivary secretion
- Swallowing reflex/ Primary and secondary peristalsis
- Gastric Motility
- Gastric Acid and Enzyme secretions
- Digestion and Absorption of Diet
- Hormonal control of Gut function
- Mass movement vs peristalsis
- Defecation reflex
- Abnormalities associate with each of the above processes

Course title:	***SPM Unit 3: Gastroenterology and Hematology***

HEMATOLOGY TOPICS

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

Course title:	***SPM Unit 3: Gastroenterology and Hematology***

- 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

- Classification and characteristics of anemias
- Myelodysplastic syndromes and polycythemias
- Hemolytic disorders and coagulation abnormalities
- Infectious abnormalities of the blood

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

Course title:	***SPM Unit 3: Gastroenterology and Hematology***

- Relation of blood composition to osmosis/osmotic pressure

PART B. REQUIRED COURSE FORM	
Course title:	Scientific Principles of Medicine: Cardiovascular/Pulmonary Systems
Sponsoring department or unit:	Internal Medicine Medical Education
Name of course director(s):	Nadah Zafar, MD , Jorge Martinez-Lopez, MD, David Osborne, PhD, Herbert 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
Medical Education [Anatomy, Biochemistry, Histology, Physiology, Pharmacology, Genetics, Microbiology, Immunology, Pathology, Embryology, Psychology , Neuroscience, Emergency Medicine, Hematology, Internal Medicine(Infectious Disease, Nephrology General), Neurology]	22
Internal Medicine (Cardiology, Pulmonary and Critical Care, General), Emergency Medicine, Family Medicine	19
College Masters	4

Course Objectives

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

Yes	x	No	

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

Objectives are published for each of the 14 component clinical presentation modules. 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. Each test question will be linked to one or more of the objectives.

In keeping with the design of our highly integrated curriculum, the 14 separate modules discuss cardiovascular and pulmonary conditions and abnormalities. There are 8 cardiovascular modules, 5 pulmonary modules, and 1 combined, although many areas overlap. This unit provides integration between the basic science concepts of the cardiovascular and respiratory systems and provides a seamless

Course title:	***Scientific Principles of Medicine: Unit 4 Cardiovascular/Pulmonary Systems***

learning opportunity for the students. This unit is taught near the end of the MS-1 year. It builds on the preceding units while providing a bridge to the units that follow. The clinical presentations addressed in this unit include the following:

1. Chest Discomfort
2. Mediastinal Mass (self study)
3. Abnormal Heart Sounds
4. Heart Murmurs
5. Syncope
6. Palpitations
7. Abnormal Arterial Pulse
8. Abnormal Blood Pressure: Hypertension
9. Abnormal Blood Pressure: Shock
10. Dyspnea
11. Cough
12. Wheezing
13. Cyanosis
14. Hemoptysis

The basic science topics covered in this unit of SPM are listed in the Topic Appendix at the end of this course description.

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

The faculty teaching in this section include members of the Department of Medical Education at Paul L Foster School of Medicine and members of the Department of Emergency Medicine, Department of Internal Medicine, and Department of Family Medicine. These faculty members have participated in both the development of the objectives and the design of the clinical cases that will be used as examples. Additionally, it is these faculty members who have prepared the assessment questions that will be used on the formative and summative exams.

REQUIRED COURSE FORM (Continued)

Course title:	***Scientific Principles of Medicine: Unit 4 Cardiovascular/Pulmonary Systems***

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 separate campuses), describe how instructional staff at all sites are oriented to the objectives and grading system.

This course will only be taught on the campus of the Paul L. Foster School of Medicine.

REQUIRED COURSE FORM (Continued)

Course title:	***Scientific Principles of Medicine: Unit 4 Cardiovascular/Pulmonary Systems***

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		Presentations
	Oral exams		Preceptor ratings
	OSCE or standardized patient exam		Other (describe)

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

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 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.

REQUIRED COURSE FORM (Continued)

Course title:	***Scientific Principles of Medicine: Unit 4 Cardiovascular/Pulmonary Systems***

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

Yes	X	No	

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 Departments of Emergency Medicine, Family medicine and Internal Medicine will assist in the clinical integration.

There is a diversity of teaching space available for the course, including a sufficient number of small 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.

At the end of the unit, 34/39 (87% response rate) students completed an anonymous on-line evaluation of this unit of the SPM course. On a 5 point scale, with 1 representing a low level of agreement and a 5 representing a high level of agreement, students rated the elements of this course as follows:

Level of integration of basic and clinical sciences	= 3.9/5
Organization	= 3.5/5
Appropriateness of instructional method	= 3.9/5
Relevance to clinical medicine	= 4.3/5
Reasonable reading expectations	= 4.4/5
Fairness of evaluation	= 3.7/5
Gained useful knowledge	= 4.6/5
Quality of clinical schemes	= 3.7/5
Quality of “process worksheets”	= 3.3/5
Quality of worked case example session	= 4.4/5
Quality of laboratory sessions	= 3.1/5

Free text comments and student input throughout the implementation of this unit revealed that students felt this unit to be highly relevant to their futures as physicians; provided knowledgeable, expert level of instruction in both the clinical and basic sciences, and did an excellent job of integrating basic science

topics and content in a clinical context. A number of students commented that the "process worksheets" were perhaps overly long and detailed.

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

SUCCESSES:

- Work Case example sessions: Integration of scheme with basic sciences
- Integrated sessions with clinicians and basic scientists
- Integrated medical skill sessions with clinicians and basic scientists using simulation center
- Integrated cardiac anatomy session with both clinicians and basic science faculty
- High level of integration between Scientific Principles sessions with Medical Skills
- Planned redundancy of difficult topics and concepts

PROBLEMS TO OVERCOME:

- Decrease lecture time and implement more interactive sessions to gradually replace lecture format
- Decrease the length of the process work sheets
- Involve more clinicians form the various departments
- Consolidate some topics into single presentations

The unit committee will implement changes as described above in the next administration of this SPM unit in the spring of 2011.

Course title:	***Scientific Principles of Medicine: Unit 4 Cardiovascular/Pulmonary Systems***

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

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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

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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

Course title:	***Scientific Principles of Medicine: Unit 4 Cardiovascular/Pulmonary Systems***

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

Course title:	***Scientific Principles of Medicine: Unit 4 Cardiovascular/Pulmonary Systems***

- 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

Course title:	***Scientific Principles of Medicine: Unit 4 Cardiovascular/Pulmonary Systems***

- 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

REQUIRED COURSE FORM (Continued)

Course title:	***Scientific Principles of Medicine: Unit 4 Cardiovascular/Pulmonary Systems***

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