**University of Pittsburgh School of Pharmacy**
**Course Proposal and Syllabus Guidelines (revised 8/09)**

**Required Statement for Every Syllabus**

**Mission of the PharmD Program**
The PharmD Program prepares student pharmacists to be health care practitioners who optimize the health of patients and society through the effective use of medicines and other interventions. The PharmD Program inspires students to advance the profession by fostering collaboration, lifelong learning, leadership, professionalism, and civic engagement.

**Course Title, Course Number, Credit Allowance**
_____________________, Pharm _____, ____ credit

**Professional Year and Terms Offered (Fall, Spring, Summer)**
Professional Year _____, ________Term

**Days, Times, Location**

**Prerequisites/Co-Requisites**

**Participating Faculty**
- Identify the course coordinator and list the names of other faculty who will contribute to the learning process.
- Include the office address, phone number, and E-mail address of each instructor.

**Course Description**
In short paragraphs, provide the purpose of the course, its relationship to the goal of the curriculum (stated above), its relationship to other course offerings in the curriculum (as relevant) and a list of the core concepts that will be included in the course

**Key Words – Identify Curriculum Outcomes Associated with Course (See Appendix 2)**

**Key Words - Identifying Science/Practice Foundation of Course (See Appendix 3)**

**Ability Outcomes of the Course**
Faculty should list course-specific ability outcomes that students must demonstrate in order to pass this course and relate them to the 13 Curriculum Outcomes of the School. (See Appendix 1)

**For example:** Evaluate relative efficacy and safety of non-prescription medications and other self care strategies (Curriculum Outcome #4 - Pharmacotherapy Decision-Making),

**Methods of Learning**
For example: Large group sessions are used to introduce concepts and principles critical to each course component. Students are expected to apply those concepts and principles through a variety of activities including practice exercises, problem-based case studies, and oral presentations in practica sessions and group activities.
**Course Requirements and Grading**

- Learning assessments should reflect a balance between faculty-centered evaluation of student learning (conventional examinations), self-evaluation, and peer-evaluation. Assessments should emphasize mastery of ability outcomes. Students benefit most from feedback that is continuous and constructive. The number of conventional examinations per term should be minimized.

- Include clear statements regarding attendance policies and remedial work (if any) for absences.

- List specific methods and tools that are to be used for student assessment, including numbers, brief descriptions, number and relative %. (For example, written assignments, SOAP notes, problem sets, case summaries, examinations using __________ format, oral Presentations, etc).

**Textbooks and Other Learning Resources**

- Give full citations for textbooks used in the course; distinguish between required and recommended texts.
- Provide a list of relevant readings, references, databases, and description of handouts; distinguish between required and recommended readings.
- Identify the location of the resources and how students can access them. (as applicable)

**Schedule**

For each week in the Term, list topics (sequence, approximate amount of time) as well as assignments and test dates.

**Student Disability Statement – Required Language**

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and Disability Resources and Services, 140 William Pitt Union, 412-648-7890 or 412-383-7355 (TTY) as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.

**Academic Integrity Statement – Required Language**

Students enrolled in the pharmacy program are also considered to be members of the pharmacy profession and must adhere to the same professional, ethical, and legal standards. It is a violation of the School’s code of conduct policy for a student to engage in any act of academic misconduct, such as cheating, plagiarism, deceitful practice, unauthorized collaboration, harassment, or breach of confidentiality. It is also considered to be a violation of the code of conduct policy for a student to tolerate any of the aforementioned acts by other students. Unless authorized by the instructor, use of electronic devices of any kind during examinations is prohibited. Use of a personal digital assistant, palm top computer, cellular telephone or other electronic device during an examination is considered to be an act of academic misconduct.

Rev.6/07
Appendix 1

Resources Required - (Do NOT include in handout to students)
- List use of teaching assistants, lecture hall, meeting rooms for small groups, audiovisual equipment, computer hardware/software, and any other physical facilities or capital equipment required.
- Estimate the faculty time involved to conduct the course each week (exclusive of course development time prior to the actual course offering):

\[
\text{No. of Faculty} \times \text{Hrs/Wk} = \text{Total Hrs/Week}
\]

Large group instruction: \( \text{Faculty} \times \text{Hrs/Wk} = \text{Hrs/Week} \)

Practicums or labs: \( \text{Faculty} \times \text{Hrs/Wk} = \text{Hrs/Week} \)

Student assessment: \( \text{Faculty} \times \text{Hrs/Wk} = \text{Hrs/Week} \)

Other (specify): \( \text{Faculty} \times \text{Hrs/Wk} = \text{Hrs/Week} \)

Total Faculty Hours/Week = \( \text{Hrs/Week} \)

Student Time Budget
- Describe expectations for how students will devote time to the course apart from scheduled class time.
- Indicate the approximate time that will be required of students on a weekly basis, placing reasonable limitations on preparation/study time outside of class:

\[
\text{No. of Hours/Week}
\]

Scheduled in-class time: \( \text{Hours} \)
Projects and assignments: \( \text{Hours} \)
Preparation for exams: \( \text{Hours} \)
Other (specify): \( \text{Hours} \)

Total: \( \text{Hours/Week} \)
Appendix 2 – Review the following and identify those outcomes that describe the expected knowledge, abilities and skills for students during this course

CURRICULAR OUTCOMES—PHARMD PROGRAM
Revised October 2006

GENERAL OUTCOMES

Outcome 1. Critical Thinking
The student should be able to retrieve, comprehend, interpret, apply, analyze, synthesize, and evaluate information. The student should be able to use critical thinking skills to identify, manage, and prevent problems and make appropriate decisions. The student should understand the research process and be able to solve patient and community health problems.

Outcome 2. Development of Knowledge and Skills
The student should comprehend and demonstrate the ability to use the scientific method, and possess the requisite knowledge to demonstrate and utilize scientific knowledge in practice.

Outcome 3. Communication Skills (Oral and Written)
The student should be able to read, write, speak, listen and use multimedia to communicate and collaborate effectively with patients, caregivers, healthcare professionals and the community. The student should be able to counsel and educate patients, caregivers, healthcare professionals and the community about drug therapy and health issues. The student should be able to assess the understanding of oral and written communications and adjust the messages accordingly in order to assure the effectiveness of communication.

Outcome 4. Professional Responsibility and Ethics
The student should take responsibility for the outcomes of medication therapy and make rational and ethical decisions that represent the best interest of the patient and the community. The student should respect the patient, the community, and other health professionals, and the privacy and confidentiality of health information. The student should demonstrate sensitivity to cultural and societal diversity and be able to adapt care plans and practice to meet the needs of a diverse group of patients and patient populations. The student should carry out duties in accordance with legal, ethical, social, economic, and professional guidelines.

Outcome 5. Social Interaction, Citizenship, Leadership, Professionalism
The student should be able to collaborate with patients, caregivers, colleagues, health professionals and members of the community to prevent, identify, and resolve drug-related problems and promote individual and community health. The student should demonstrate a commitment to the profession through professional involvement, community activities, and leadership. The student should collaborate with colleagues, faculty, staff, patients, caregivers, other professionals, and the community with empathy and respect at all times.

Outcome 6. Life-Long Learning
The student should be a life-long learner who is able to recognize knowledge and skill deficits, formulate a learning plan, locate and interpret credible resources, and assess progress toward meeting learning goals. The student should be able to identify and analyze emerging issues, products, and services that may affect public health policy, individual and population-based therapeutic outcomes, medication use systems, and pharmacy benefits.
PRACTICE OUTCOMES

Outcome 1. Patient Assessment
The student should be able to create a patient database utilizing data obtained from the medical record and/or by direct patient assessment. In preparing the database, the student should be able to gather and interpret pertinent information from the medical record that includes data from the: 1) history and physical examination; 2) review of systems; 3) psychosocial, behavioral, cultural, and economic status; 4) laboratory and other diagnostics tests; 5) documented medication history; and 6) interdisciplinary progress notes. The student should be able to perform the following assessments: 1) a medication history; 2) review of systems; and 3) selected elements of a physical examination. The student should be able to interpret the data to create a prioritized drug-related problem list.

Outcome 2. Pharmaceutical Care Plan Development
The student should be able to collaborate with health professionals, caregivers, and the patient to formulate a pharmaceutical care plan that maximizes patient response to drug therapy by preventing or resolving drug-related problems in order to achieve a positive outcome. The pharmaceutical care plan should include therapeutic goals, educational information, and lifestyle changes that are intended to promote general health and prevent or minimize disease progression.

In creating the plan, the student should utilize the patient database and knowledge of the physiochemical, chemical, biopharmaceutical, pharmacokinetic, and pharmacodynamic characteristics of administered medications as well as behavioral, cultural and economic factors that might influence therapy. Recommendations for care should be evidence-based and supported by best practice literature or expert opinion. The student should be able to defend the care plan (verbally or in writing), establish a mechanism for follow-up, and document the impact and value of the services provided.

Outcome 3. Medication Therapy Management
The student should be able to evaluate the success of the pharmaceutical care plan and monitor the patient’s progress in meeting the goals of therapy. The student should be able to modify the plan utilizing knowledge of the physiochemical, chemical, biopharmaceutical, pharmacokinetic, and pharmacodynamic characteristics of administered medications as well as physiological, behavioral, cultural and economic factors that might influence therapy.

Outcome 4. Pharmacodynamic Decision Making
The student should be able to make pharmacotherapy decisions for individual patients or defined patient populations and support those decisions based on knowledge of biomedical, pharmaceutical, administrative, and clinical sciences. Recommendations for care should be evidence-based, supported by best practice literature or expert opinion. The student should be able to recommend patient use of appropriate prescription and non-prescription medications, alternative and complementary therapies and non-drug therapies.

Outcome 5. Pharmaceutical Product Preparation,Dispensing and Administering
The student should be able to compound and/or dispense medications consistent with patient needs and in compliance with local policy, state and federal laws, and the recommendations of regulatory agencies. The student should demonstrate the ability to accurately interpret prescriptions, select appropriate dosage forms, and routes and methods of administration. The student should use appropriate calculations and techniques to prepare, compound, package, label, and dispense prescriptions to assure product quality. The student should demonstrate the ability to administer medications when appropriate.
**Outcome 6. Management**

The student should demonstrate the ability to set personal and professional goals and priorities, effectively plan and manage time, and organize work. The student should demonstrate the ability to contribute as a productive member of a work team and assume a leadership position as appropriate.

The student should be able to work collaboratively with patients, caregivers, prescribers, administrative and supportive personnel, and other health care professionals to manage and use the human, physical, medical, informational, and technological resources of the health care system, including pharmacy systems, to promote health and wellbeing and to optimize the therapeutic outcome of medication use.

**Outcome 7. Public Health**

The student should be able to: 1) interpret population-specific data to assess the health needs of a community or population; 2) develop and participate in wellness and disease prevention initiatives to improve health; 3) promote disease prevention and management across a continuum of care; and 4) contribute to the development of rational health policy.

The student should be able to work with patients, communities, at-risk populations, and other members of the interprofessional health care team to prepare and participate in initiatives to identify and resolve public health problems.
Appendix 3 – Review the following and identify those terms that describe the focus and content of this course

The Science Foundation for the Curriculum (Accreditation Standards and Guidelines for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree; Adopted: January 15, 2006)

Basic Biomedical Sciences

**Anatomy and Physiology** (includes structure and function of major body systems: integumentary, muscular skeletal, cardiovascular, lymphatic, respiratory, digestive, nervous, endocrine, urinary, reproductive, and body fluid and electrolytes, molecular aspects of cell biology, cell physiology and cellular structure and organization)

**Pathology/Pathophysiology** (includes basic principles and mechanisms of disease, including: inflammation and repair, degeneration, disturbances on hemodynamics, developmental defects, neoplasia, pathophysiology of disease states amenable to pharmacist intervention)

**Microbiology** (includes general principles of microbial concepts, principles of infectious disease, host-parasite relationships, pathogenic micro-organisms of man, inflammatory responses to infectious agents, clinical aspects of infection)

**Immunology** (includes human immunity and immune response, principles of antigen-antibody relationships, molecular biology of immune response, genetic basis for antibody synthesis, development, function, and immunopathology)

**Biochemistry/Biotechnology** (includes chemistry of biomacromolecules (proteins, lipids, carbohydrates, and DNA), enzymology and co-enzymes and kinetics, metabolic pathways to energy utilization, nucleic acid metabolism, including DNA replication and repair, RNA, and protein synthesis, recombinant DNA technology)

**Molecular Biology/Genetics** (includes cell structure and components, ion channels and receptor physiology, mitosis and meiosis, chromosomes and DNA, gene transcription and translation processes, recombinant DNA technology)

**Biostatistics** (includes understanding of commonly used statistical tests and their basis, management of data sets, evaluation of statistical results, understanding of statistical versus clinical significance)

Pharmaceutical Sciences

**Medicinal Chemistry** (includes physico-chemical properties of drug molecules in relation to drug absorption, distribution, metabolism, and excretion (ADME), chemical basis of pharmacology and therapeutics, fundamental pharmacophores for drugs used to treat disease, structure activity relationships in relation to drug-target interactions, chemical pathways of drug metabolism, application to making drug therapy decisions)

**Pharmacology** (includes mechanism of action of drugs in various categories, role of pharmacology in drug choice and the treatment of disease, pharmacodynamics of drug action and absorption, distribution, metabolism, and elimination, adverse effects and side effects of drugs, drug-target interactions, drug-drug, drug-food, drug-lab test interactions, drug discovery and development,

**Pharmacognosy and Alternative and Complementary Treatments** (includes concepts of crude drugs, semi-purified, and purified natural products, variability of occurrence of pharmacologically active substances in plants and impact on regulatory aspects of herbal products, overview of classes of pharmacologically active natural products, dietary supplements (vitamins, minerals, and herbs), alternative medical treatments, evaluation of alternative and complementary medicine purity, bioavailability, safety, and efficacy, herbal-drug interactions, Dietary Health Supplement and Education Act and impact on regulation of dietary supplements and herbal products)
Toxicology (includes mechanism of toxicity and toxicokinetics, acute and chronic toxic effect of xenobiotics on the body, including drug or chemical overdose and toxic signs of drugs of abuse, interpretation of drug screens, antidotes and approaches to toxic exposures, functions of poison control centers, bioterrorism and disaster preparedness and management)

Bioanalysis/Clinical Chemistry (includes fundamentals of laboratory medicine and its importance to screening, diagnosis, and evaluation of patients, clinical data relevant to disease state management)

Pharmaceutics/Biopharmaceutics (includes physical-chemical principles of dosage forms, biological principles of dosage forms, principles of drug delivery via dosage forms (e.g., liquid, solid, semi-solid, controlled release, patches, and implants), principles of dosage form stability and drug degradation in dosage forms, materials and methods used in preparation and use of dosage forms)

Pharmacokinetics/Clinical Pharmacokinetics (includes basic principles of in vivo drug kinetics (linear and nonlinear), principles of bioavailability/bioequivalence, physiologic determinates of drug onset and duration, drug, disease, and dietary influences on absorption, distribution, metabolism, and excretion, clinical pharmacokinetics of commonly used and low-therapeutic-index drugs, the pharmacokinetic-pharmacodynamic interface)

Pharmacogenomics/genetics (includes genetic basis for disease and drug action, genetic basis for alteration of drug metabolism, genome and proteomic principles in relation to disease and drug development, genetic basis for individualizing drug doses)

Extemporaneous Compounding/Parenteral/Enteral (includes United States Pharmacopeia guidance on compounding and FDA Compliance Policy Guidelines, techniques and principles used to prepare and dispense individual extemporaneous prescriptions, including dating of compounded dosage forms, liquid (parenteral, enteral), solid, semi-solid, and topical preparations, dosage form preparation calculations, sterile admixture techniques (United States Pharmacopeia (USP) Chapter 997, stability and sterility testing and dating, clean room requirements, infusion devices and catheters)

Social/Behavioral/Administrative Pharmacy Sciences

Health Care Delivery Systems (includes introduction to United States, state, and local health care delivery systems and their interfaces, social, political, and economic factors of the U.S. health care delivery system, principles that influence the distribution of pharmaceutical products and services, role of public and private insurers, pharmaceutical industry, and managed care on health care delivery in the United States, Medicare and Medicaid, Indigent care programs, incidence of and problems associated with drug overuse, underuse, and misuse in the U.S. health care system)

Economics/Pharmacoeconomics (includes economic principles in relation to pharmacoeconomic analysis, concepts of pharmacoeconomics in relation to patient care, applications of economic theories and health-related quality-of-life concepts to improve allocation of limited health care resources)

Practice Management (includes management principles (planning, organizing, directing, and controlling resources) applied to various pharmacy practice settings and patient outcomes, management of staff within the practice setting, including pharmacists, technicians, and other supportive personnel, principles of planning, organizing, directing, and controlling pharmacy resources), tools, including informatics, needed to assess and address change, increase competitiveness, improve quality, and optimize patient services, management of medication use safety systems, strategies to improve continuity of patient care as patients move between health care settings, marketing principles, basic accounting principles, infection control, project management, managing and improving the medication-use process, third-party administration and managed care systems, health care improvement mechanisms at the micro- and macro-system levels)

Pharmacoepidemiology (includes application of principles of epidemiology to the study of drug use and outcomes in large populations, studies that provide an estimate of the probability of beneficial effects in populations, or the probability of adverse effects in populations, and other parameters relating to drug use benefit, methods for continual monitoring for unwanted effects and other safety-related aspects of drugs)
**Pharmacy Law and Regulatory Affairs** (includes legal basis of pharmacy practice, pharmacist’s responsibilities and limits under the law, pharmacist’s role in reducing liability by reducing drug-related misadventure, civil versus criminal liability, business contract law)

**History of Pharmacy** (includes overview of the evolution of pharmacy as a distinct profession, moving from focus on the drug to focus on the patient and the drug, including clinical pharmaceutical care and other aspects of patient-provided pharmacist care, major milestones and contributors in the evolution of pharmacy)

**Ethics** (includes principles of professional behavior, ethical issues related to the development, promotion, sales, prescription, and use of drugs, dealing with ethical dilemmas, conflict of interest, ethical issues in delivery of patient-centered care and clinical research, principles of end-of-life care, ethical issues in teamwork)

**Professional Communication** (includes effective verbal and written interpersonal communication, health literacy, communicating with diverse patients, families, pharmacists, and other health professionals in a variety of settings, both individually and as a member of a team, interviewing techniques, active listening and empathy, assertiveness and problem-solving techniques, cultural influences on communication of health information, group presentation skills, strategies for handling difficult situations, documentation of pharmacist recommendations and consultations, principles of behavior modification)

**Social and Behavioral Aspects of Practice** (includes pharmacy as a patient-centered profession, patient and other health care provider perceptions of pharmacists’ capabilities, role of the pharmacist related to patient care, role of the pharmacist related to interaction with other health care professionals, development of leadership skills, importance of involvement in pharmacy organizational, regulatory, state, and federal issues)

**Clinical Sciences**

**Pharmacy Practice and Pharmacist-Provided Care** (includes overview of the pharmacy profession, issues of contemporary practice, emerging and unique roles for the pharmacist on the health care team, concepts of pharmacist-provided patient care and medication therapy management services, principles of pharmacist-managed, patient-centered pharmacy services, methods of outcome monitoring and assessment techniques, problem identification (e.g., duplication, dosage, drug interactions, adverse drug reactions and interactions, frequency, dosage form, indication mismatches) and resolution, role of pharmacy care plans in patient care, monitoring for positive and negative drug therapy outcomes, evidence-based practice and decisions, principles of clinical management of drug toxicity and overdosage, home diagnostic devices

**Medication Dispensing and Distribution Systems** (includes preparation and dispensing of prescriptions, development and maintenance of patient medication profiles, identification and prevention of medication errors, identification and prevention of drug toxicity, issues of distribution systems associated with all types of practice settings, role of automation and technology in workload efficiency and patient safety, assurance of safety in the medication-use process, medication error reduction programs, continuous quality improvement programs

**Pharmacotherapy** (includes principles of clinical practice guidelines for various disease states and their interpretation in the clinical setting, integration of core scientific and systems-based knowledge in patient care decisions, reinforcement of basic science principles relative to drug treatment protocols and clinical practice guidelines, evaluation of clinical trials that validate treatment usefulness, application of evidence-based decision making to patient care, drug monitoring for positive and negative outcomes, diagnostic tests in the diagnosis, staging, and monitoring of various disease states, concepts of pain management and palliative care, promotion of wellness and nonpharmacologic therapies, disease prevention and monitoring, nonprescription drug therapies, dietary supplements, design of patient-centered, culturally relevant treatment plans, drug-induced disease)

**Pharmacist-Provided Care for Special Populations** (includes pathophysiologic and pharmacotherapy alterations specific for special population patients (e.g., pediatric, geriatric, pregnant, cystic fibrosis, sickle cell anemia, celiac disease, genetic disorders, and others) for prescription and nonprescription medications, dosage calculation and adjustments in special-population patients, drug monitoring for positive/negative outcomes in special-population patients)
Drug Information (includes fundamentals of the practice of drug information, application of drug information skills for delivery of pharmaceutical care, technology of drug information retrieval for quality assurance, the ability to judge the reliability of various sources of information)

Medication Safety (includes causes of medication errors/systems approaches, human factors in errors, strategies for reducing errors, pharmacy leadership in medication safety)

Literature Evaluation and Research Design (includes fundamentals of research design and methodology, principles of evaluation of the primary literature, practical implications of the primary literature, principles of research design and analysis in practicing evidence-based pharmacy)

Patient Assessment Laboratory (includes obtaining a comprehensive patient history, familiarity with basic assessment techniques (inspection, palpation, percussion, auscultation), terminology, and the modifications caused by common disease states and drug therapy, triage and referral skills, knowledge of therapeutic drug concentrations and their interpretation, knowledge of the basis for common clinical laboratory values and diagnostic tests and the influences of common disease states, false positive and false negative results, OTC point-of-care testing devices (e.g., glucometers, pregnancy tests, home testing for HbA1c, drug screening), principles of electrocardiography and common EKG abnormalities, advanced cardiac life support)
Appendix 4 – Provide the following information to list courses in university course system.

Course Title
Brief Description
Instructor(s)
Enrollment Cap (if preferred)
Credits
Component Type (lecture, practicum, etc)
Grading Basis (letter grade, HSU)