Competency Requirements for a PhD in Pharmaceutical Sciences – Medicinal Chemistry, University of Pittsburgh School of Pharmacy

Theme, Subject and Competency *Exempt if PharmD from an ACPE accredited University **A total of 4 credits is required		Required Core Courses							Required Courses for the MedChem track					Suggested electives for the MedChem track				Experiences				
	Term	F	F	Sp	F/Sp	F	F/Sp	F/Sp	Sp	F	F			Sp								
	Credit	1	4	4	2/2	3	1-2/ 1-2	1/1	4	3	3			3								
		Principles of Biochem* PHARM 3011	**Pharmacology and Ther*** PHARM 3028	**Foundations in Pharm Sci** PHARM 3071	**Grant Writing** PHARM 3038	**Statistics** PHARM 3040 or equivalent	**Journal Club**** Student/mentor choice	**Seminar**** PHARM 3024	**Pharmaceutical Analysis** PAHRM 2001	**Medicinal Chemistry** PHARM 3032	**Adv Organic Chemistry I** Chem 2310			**Adv Organic Chemistry 2** Chem 2320				**Dissert/Thesis Research**	**Comprehensive Exam**	**Manuscripts**	**Presentations at Scientific Conferences**	**Teaching Microcredential**
Learning Outcome from the Graduate Program Assessment Matrix: Acquire expert knowledge of biological, chemical, and analytical processes related to pharmaceutical sciences. Master a field of scholarship related to a specific research topic.																						
LITERATURE REVIEW AND EVALUATION																						
Extract literature from appropriate bibliographic sources.					X		X	X		X								X	X	X		X
Critique clinical and scientific evidence derived from literature.					X	X	X	X		X								X	X	X		
Describe the current state of knowledge about a biomedical, clinical, or public health problem.			X		X		X	X										X		X		
Interpret primary research literature within the pharmaceutical sciences					X		X	X		X										X	X	
Learning Outcome from the Graduate Program Assessment Matrix: Use the scientific method to generate, analyze, and interpret scientific data relevant to the identification, analysis, and use of therapeutic agents. • Generate mechanistic hypotheses based on prior evidence • Derive specific predictions that are hypothesis-driven • Plan detailed experimental procedures that test specific predictions • Gather data via experimentation • Appropriately analyze and interpret data																						
HYPOTHESIS GENERATION																						
Generate a relevant biomedical, clinical, public health, or translational research hypothesis.					X			X		X								X	X			

Theme, Subject and Competency ***Exempt if PharmD from an ACPE accredited University** ****A total of 4 credits is required**		**Required Core Courses**							**Required Courses for the MedChem track**					**Suggested electives for the MedChem track**				**Experiences**				
	Term	**F**	**F**	**Sp**	**F/Sp**	**F**	**F/Sp**	**F/Sp**	**Sp**	**F**	**F**			**Sp**								
	Credit	**1**	**4**	**4**	**2/2**	**3**	**1-2/ 1-2**	**1/1**	**4**	**3**	**3**			**3**								
		Principles of Biochem* PHARM 3011	**Pharmacology and Ther*** PHARM 3028	**Foundations in Pharm Sci** PHARM 3071	**Grant Writing** PHARM 3038	**Statistics** PHARM 3040 or equivalent	**Journal Club**** Student/mentor choice	**Seminar**** PHARM 3024	**Pharmaceutical Analysis** PAHRM 2001	**Medicinal Chemistry** PHARM 3032	**Adv Organic Chemistry I** Chem 2310			**Adv Organic Chemistry 2** Chem 2320				**Dissert/Thesis Research**	**Comprehensive Exam**	**Manuscripts**	**Presentations at Scientific Conferences**	**Teaching Microcredential**
Defend the clinical and public health implications of a given research hypothesis.					X			X										X	X			
RESEARCH METHODS AND STUDY DESIGN																						
Design appropriate experiments to address generated research questions in the pharmaceutical sciences.				X	X				X	X								X	X			
Conduct appropriate experiments to address generated research questions.				X	X				X	X								X				
Evaluate possible problems in the design and execution of a study in the pharmaceutical sciences.				X	X		X	X	X	X								X	X			
Describe the drug development process.				X					X													
STATISTICAL METHODS AND DATA EVALUATION																						
Apply fundamental principles of statistical analysis, such as power analysis, correlation, causation, regression, and summary statistics.					X	X	X											X	X	X		

Competency Requirements for a PhD in Pharmaceutical Sciences – Medicinal Chemistry, University of Pittsburgh School of Pharmacy

Theme, Subject and Competency *Exempt if PharmD from an ACPE accredited University **A total of 4 credits is required		Required Core Courses							Required Courses for the MedChem track					Suggested electives for the MedChem track				Experiences				
	Term	F	F	Sp	F/Sp	F	F/Sp	F/Sp	Sp	F	F			Sp								
	Credit	1	4	4	2/2	3	1-2/ 1-2	1/1	4	3	3			3								
		Principles of Biochem* PHARM 3011	**Pharmacology and Ther*** PHARM 3028	**Foundations in Pharm Sci** PHARM 3071	**Grant Writing** PHARM 3038	**Statistics** PHARM 3040 or equivalent	**Journal Club**** Student/mentor choice	**Seminar**** PHARM 3024	**Pharmaceutical Analysis** PAHRM 2001	**Medicinal Chemistry** PHARM 3032	**Adv Organic Chemistry I** Chem 2310			**Adv Organic Chemistry 2** Chem 2320				**Dissert/Thesis Research**	**Comprehensive Exam**	**Manuscripts**	**Presentations at Scientific Conferences**	**Teaching Microcredential**
Select the appropriate statistical approach for the interpretation of preclinical and clinical datasets.						X	X											X	X	X	X	
Develop appropriate conclusions based on results from research data.				X	X		X	X	X	X								X	X	X	X	
Learning Outcome from the Graduate Program Assessment Matrix: Communicate scientific facts, research results and ideas in a clear and compelling way in both oral and written form. • Write a scientific paper of sufficient quality to be published in a nationally recognized peer reviewed journal • Apply knowledge and understanding of ethical research practices (e.g., ownership of data, authorship, falsification and misrepresentation of data, ethical use of animals in research, use of copyrighted material, plagiarism) • Prepare a lecture or seminar that has focus and depth, and that presents information in a clear and informative way • Write a meritorious grant proposal (i.e., one that is hypothesis-driven, scientifically justified, and appropriately analyzed and interpreted)																					
GRANTSMANSHIP																						
Defend a written research proposal describing specific aims, significance, innovation, and approach.					X													X	X			
PREPARATION AND DELIVERY OF ORAL AND WRITTEN SCIENTIFIC INFORMATION																						
Develop presentations describing proposed research, research in progress, or research findings.							X	X		X								X	X		X	

Competency Requirements for a PhD in Pharmaceutical Sciences – Medicinal Chemistry, University of Pittsburgh School of Pharmacy

Theme, Subject and Competency *Exempt if PharmD from an ACPE accredited University **A total of 4 credits is required		Required Core Courses							Required Courses for the MedChem track					Suggested electives for the MedChem track				Experiences				
	Term	F	F	Sp	F/Sp	F	F/Sp	F/Sp	Sp	F	F			Sp								
	Credit	1	4	4	2/2	3	1-2/ 1-2	1/1	4	3	3			3								
		Principles of Biochem* PHARM 3011	**Pharmacology and Ther*** PHARM 3028	**Foundations in Pharm Sci** PHARM 3071	**Grant Writing** PHARM 3038	**Statistics** PHARM 3040 or equivalent	**Journal Club**** Student/mentor choice	**Seminar**** PHARM 3024	**Pharmaceutical Analysis** PAHRM 2001	**Medicinal Chemistry** PHARM 3032	**Adv Organic Chemistry I** Chem 2310			**Adv Organic Chemistry 2** Chem 2320				**Dissert/Thesis Research**	**Comprehensive Exam**	**Manuscripts**	**Presentations at Scientific Conferences**	**Teaching Microcredential**
Assess the clinical implications of scientific information.							X	X										X	X	X		
Prepare publication/presentation quality abstracts, posters and manuscripts.					X			X										X	X	X	X	
Develop an appropriate response to constructive criticism of oral and written presentations.					X			X										X	X	X	X	
SCIENTIFIC LEADERSHIP, MANAGEMENT, AND CROSS-DISCIPLINARY TEAMWORK																						
Demonstrate professionalism, interpersonal skills and collegial approaches to teamwork.							X	X												X	X	X
Mentor students in research, clinical, or professional activities.																						X
Recognize the strengths and limitations of personal research skills.								X										X	X	X		
ETHICAL CONDUCT OF RESEARCH																						
Recognize scientific misconduct and conflict of interest.					X													X	X	X		