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			Re	equire	d core	cours	ses		Re		cours	es for t ck	the	Sugg		electi SP tra	ves fo ck	r the	Requ	ired r	einfor	cing e	xperie	nces
	Term	F	F	S	F/Sp	F	F/Sp	F/Sp	Sp	F-O	F-E			F										
Theme, Subject and Competency	Credit	1	4	4	2/2	3	1-2/ 1-2	1/1	4	3	3			3.5								1		
*Exempt if PharmD from ACPE accredited University **A total of 4 credits is required Learning Outcome from the				Foundations in PHARM			nent	Matr	Pharmaceutic				owled	PK and Drug Response* p PHARM 5218	biolo	ogical,	chen	nical,	Dissert/Thesis Research	Comprehensive Exam	Manuscripts	Presentations at Scientific Conferences	Seaching Micro-credential	elate
						L	ITERA	TURE	REVI	EW AN	ND EV	LUATI	ON											
Extract literature from appropoibliographic sources.	oriate				х		Х	Х											Х	Х	Х			
Critique clinical and scientific						.,	.,												.,	,,	.,			

				L	ITERA	TURE	REVII	EW AN	D EV	ALUAT	ION								
Extract literature from appropriate bibliographic sources.			Х		х	Х									Х	Х	Х		
Critique clinical and scientific evidence derived from literature.			Х	Х	Х	Х									Х	Х	Х		
Describe the current state of knowledge about a biomedical, clinical, or public health problem.	Х		X		х	Х									X		X		
Interpret primary research literature within the pharmaceutical sciences		X			Х	Х		Х	X			Х					X	X	

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			Re	equire	d core	cours	ses		Red	-	cours SP tra	the	Sugg	electi SP tra	r the	Requ	ired r	einfor	cing e	xperie	nces
	Term	F	F	S	F/Sp	F	F/Sp	F/Sp	Sp	F-O	F-E		F								
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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

					H	1үрот	THESIS	s GEN	ERATI	ON							
Generate a relevant biomedical, clinical, public health, or translational research hypothesis.			х					х	X					Х	Х		
Defend the clinical and public health implications of a given research hypothesis.						Х								Х	X		
				RE	SEAR	сн Ме	THOD	S AND	STU	DY D E	SIGN	 -					
Design appropriate experiments to address generated research questions in the pharmaceutical sciences.		х	х				Х		Х					х	Х		



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	Term	F	F	S	F/Sp	F	F/Sp	F/Sp	Sp	F-O	F-E			F								
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Conduct appropriate experime to address generated research questions.				X	X				Х								Х					
Evaluate possible problems in design and execution of a stuthe pharmaceutical sciences.				X	X		х	X	х	х	X						Х	х				
Describe the drug development process.	nt			Х						Х	Х			Х								
						STATI	STICA	L ME	THOD	S AND	DATA	EVAL	UATIO	ON								
Apply fundamental principles statistical analysis, such as po analysis, correlation, causation regression, and summary statistics.	wer				Х	Х	Х										Х	х	Х			
Select the appropriate statistic approach for the interpretatio preclinical and clinical dataset	n of					X	Х										Х	х				
Develop appropriate conclusion based on results from research data.				X	X		Х	X	Х	X	X						Х	Х				



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	Term	F	F	S	F/Sp	F	F/Sp	F/Sp	Sp	F-O	F-E		F									
Theme, Subject and Competency	Credit	1	4	4	2/2	3	1-2/ 1-2		4	3	3		3.5						Π	П	г	
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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)

						G	RANTS	MANS	SHIP											
Defend a written research proposal describing specific aims, significance, innovation, and approach.			X													X	X			
	PREP	ARATI	ON AN	ID DE	LIVER	Y OF	ORAL	AND V	V RITT	TEN S	CIENT	IFIC I	NFOR	MATIC	ON					
Develop presentations describing proposed research, research in progress, or research findings.					х	Х										Х	Х		Х	
Assess the clinical implications of scientific information.					Х	Х		X								X	X	Х		



			Re	equire	d core	cours	es		Red	quired Ps	cours SP tra	the	Sugg	electi SP tra	ves fo	r the	Requ	ired r	einfor	cing e	xperie	ences
	Term	F	F	S	F/Sp	F	F/Sp	F/Sp	Sp	F-O	F-E		F									
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Prepare publication/presentation quality abstracts, posters and manuscripts.	on				х			Х									х	Х	Х	х		
Develop an appropriate resporto constructive criticism of oral written presentations.					Х			Х									х	Х	Х	Х		



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	Term	F	F	S	F/Sp	F	F/Sp	F/Sp	Sp	F-O	F-E			F										
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			SCIE	NTIFIC	LEAD	DERSH	IIP, M	ANAG	EMEN	T, ANI	D CRO	SS-DI	ISCIPI	LINAR	y Tea	MWOI	RK							
Demonstrate professionalism, interpersonal skills and collegi approaches to teamwork.							х	х						х							Х	Х	Х	
Mentor students in research, clinical, or professional activiti	es.																						Х	
Recognize the strengths and limitations of personal researd skills.	ch							х											Х	Х	Х			



			Re	equire	d core	cours	es		Red		cours SP tra	es for the	е	Sugg	elect SP tra	ives fo	r the	Requ	ired r	einfo	cing e	xperie	ences
	Term	F	F	s	F/Sp	F	F/Sp	F/Sp	Sp	F-O	F-E			F									
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							Етн	ICAL (COND	UCT O	F RES	EARCH											
Recognize scientific misconduand conflict of interest.	ct				Х															Х			