Reproductive and Cancer Biology – ScM
Department of Biochemistry and Molecular Biology

1. Demonstrate knowledge of the principles of reproductive biology, molecular biology, and biochemistry

Specific Competencies	Learning Opportunities		Evaluation Opportunities: Course Work/Exam	Written Comps	Thesis	Laboratory Research
Describe the biological principles that govern the function of the reproductive tract	120.620 120.621 120.622	Fundamentals of Reproductive Biology Molecular Endocrinology Molecular and Cellular Mechanisms of Reproduction	X	X	X	
Demonstrate familiarity with research methodologies in hypothesis-driven research in the reproductive sciences	120.623	Multidisciplinary Research in the Reproductive Sciences	X	X	X	
Identify the structures of macromolecules and their functions	120.600	Introduction to Biochemistry I	X	X	X	
Describe the principles underlying the molecular regulation of cell function and the control of metabolism	120.601	Introduction to Biochemistry II	X	X	X	
Demonstrate familiarity with the processes of synthesis of DNA and RNA and the processes that regulate gene expression	120.602	Introduction to Molecular Biology	X	X	X	
Describe the principles of molecular genetics, and their use in problems of human disease	120.603 120.615	Molecular Biology of Disease Molecular Biology of Carcinogenesis	X	X	X	

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2. Describe the major problems of public health and the role of the molecular sciences in advancing their solutions

Specific Competencies	Learning Opportunities		Evaluation Opportunities: Course Work/Exam	Written Comps	Thesis	Laboratory Research
Describe human health across the lifespan, identify the major root and proximate causes of morbidity and mortality, and effective strategies for promoting health and preventing disease in human populations	120.603 550.630 550.865	Molecular Biology of Disease Public Health Biology Public Health Perspectives on Research	X	X	X	
Describe the roles of the molecular sciences in modern public health investigations	120.603 550.630	Molecular Biology of Disease Public Health Biology	X	X	X	

3. Demonstrate knowledge of the ethical principles governing research

Specific Competencies	Learning Opportunities		Evaluation Opportunities: Course Work/Exam	Written Comps	Thesis	Laboratory Research
Know and follow the ethical and legal regulations and principles that constitute responsible research conduct	306.665 550.860	Research Ethics and Integrity Research Ethics	X		X	X
Qualify for permission to use radioisotopes, animals, and human materials as appropriate to research	186.645 Animal Care and Use on-line Training Course Committee on Human Research on-line Training Module HIPAA on-line Training	Radiation Safety and Dosimetry	X		X	X

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4. Prepare an acceptable thesis in the area of study based on original research

Specific Competencies	Learning Opportunities	Evaluation Opportunities: Course Work/Exam	Written Comps	Thesis	Laboratory Research
Review the relevant primary literature	Consult with Advisor Thesis		X	X	
Conduct experiments to provide new knowledge in the area	Laboratory Research			X	X
Demonstrate mastery of the technical aspects of the investigation	Laboratory Research			X	X
Submit acceptable ScM thesis	Consult with Advisor and Thesis Committee Thesis			X	