

Exercise Science Curriculum Map

- PLOs**
1. Prepared and workplace proficient for first position in the field (ILO 1.3, 2.2, 2.3, 3.2)
 2. Experienced in the use of technology and equipment for assessment and exercise (ILO 1.3, 2.2, 2.3, 3.2)
 3. Develop and implement exercise prescriptions for apparently healthy, increased risk, athletic, and special populations (ILO 1.3, 2.2, 3.2)
 4. Apply a strong natural sciences foundation to concepts in biomechanics, nutrition, research, exercise assessment and prescription, and programming (ILO 2.2, 2.3, 3.1, 4)
 5. Read, comprehend, and critique published research (ILO 2.3, 3.4)

						Course	HIP	Course Learning Outcomes (CLO)
YEAR 1	Fall				I	BSC100 Concepts in Biology		1. Learn and understand the scientific method 2. Learn and understand basic cell chemistry 3. Learn and understand the basic principles of genetics 4. Learn and understand the theory of evolution and its role as the foundation for understanding the biological sciences 5. Learn and understand the basic principles of ecology 6. Gain a greater understanding of the role of biology in students' everyday lives
			I			EXS250 Foundations of Exercise Science		1. Develop a knowledge base for and an understanding of how exercise science relates to health, physical activity, exercise, sport, and athletic performance. 2. Gain knowledge of the various disciplines and subdisciplines of exercise science and relate them to areas of specialization in their respective fields. 3. Gain a comprehensive understanding of the history of exercise science and its continued evolution. 4. Learn about and understand the coursework required to earn a degree in exercise science and related fields. 5. Gain an understanding of the types of research conducted by the various disciplines and subdisciplines of exercise science and its importance to advancing our understanding of human health and disease prevention. 6. Learn about exercise science careers from professionals in the field through guest speaker presentations. 7. Through observation of professionals in the field, students gain first-hand knowledge of and exposure to exercise science careers of interest to the student. 8. Learn what post graduate education and degrees can be pursued with an undergraduate degree in exercise science.
					I	MTH141 Basic Statistics		1. Organize raw data into frequency distribution tables and display the data graphically 2. Calculate and understand descriptive statistics of a data set 3. Solve counting problems using trees and various multiplication rules 4. State the definition of probability and calculate and apply probabilities of events 5. Identify probability distributions and apply scientific distributions 6. Identify the properties of the normal distribution, use the normal distribution in applications, and understand and apply the Central Limit Theorem 7. Compute and interpret confidence intervals 8. Use hypothesis testing 9. Use correlation and linear regression for describing relations between two variables
						GE, Elective, Major Elective, or Minor (3)		
						GE, Elective, Major Elective, or Minor (3)		
Spring				I	CHM100 Concepts in Chemistry		1. Explain the structure and properties of atoms and molecules 2. Describe the interactions of energy with matter as it relates to thermochemistry 3. Describe the formation and behavior of chemical bonding 4. Name chemical compounds using appropriate nomenclature 5. Balance chemical reactions and calculate yields 6. Identify and explain the characteristics and behavior of gaseous, liquid, and solid substances, including hazards 7. Gather and analyze data using appropriate tools, units, and measurements 8. Demonstrate appropriate knowledge and adherence to Lab Safety rules and regulations 8. Describe and calculate pH's for acid-base reactions	
		I		I	EXS240 Nutrition through the Lifecycle		1. Determine calorie, macro and micronutrient needs for each state of the lifecycle 2. Understand the role that nutrition, metabolism, body composition, and ergogenic aids have on the exercise program and the client's goals 3. Develop screening tools for assessment of nutrient status of target populations 4. Use specific counseling techniques and strategies to positively impact exercise adherence and overall health behavior change 5. Understand the relationship between environmental, psychosocial and physiological changes with aging and adequate nutrition	
		I		I	EXS275 Research Methods and Data Interpretation	UR	1. Develop understanding of key terms as they relate to the research process 2. Increase exposure of student to research being conducted in the Exercise Sciences 3. Increase student's understanding of necessary steps surrounding data collection and statistical analysis	
					GE, Elective, Major Elective, or Minor (3)			
					GE, Elective, Major Elective, or Minor (3)			

Milestone #1: Students will be assessed on their ability to evaluate nutritional lifecycle scenarios and will utilize a self-evaluation to explore their ability to read, comprehend, and critique research

						Course	HIP	Course Learning Outcomes (CLO)
YEAR 2	Fall	R	I	I	R	BSC227 Anatomy and Physiology I		
						PE356 Theory and Methods of Coaching Weight Training	RW, LT	1. Students will learn how to analyze components of an activity 2. Students will set up warm up and cool down options for a resistance training session 3. Students will appropriately assess strength, power, muscular endurance, and performance readiness 4. Students will effectively perform resistance training movements 5. Students will program for resistance training workouts
					I	MTH151 College Algebra		1. Identify functions, evaluate functions, and find the domain and range of functions 2. Compute the sum, different, product, quotient, and composition of two functions, and find the domain and range 3. Graph, solve, and find the domain and range of linear functions, functions with absolute value, rational, quadratic, and polynomial functions 4. Graph, solve, and find the domain and range of linear inequalities, compound inequalities, inequalities with absolute value, polynomial inequalities, and use interval notation to express the solution 5. Find the distance between two points in the plane, find the midpoint of a segment, and know the relationship between the equation of a circle, its center, radius, and graph 6. Do long division with polynomials and synthetic division and use the remainder and factor theorems to factor polynomial functions and find the zero 7. Graph and solve exponential and logarithmic functions and their applications 8. Solve systems of equations by graphing, substitution, elimination, back substitution and elementary row operations and do applied problems
						GE, Elective, Major Elective, or Minor (3)		
						GE, Elective, Major Elective, or Minor (3)		
Spring		R			R	BSC228 Anatomy and Physiology II		
					EXS300 Sport and Fitness Administration	RW	1. The students will demonstrate knowledge of terms and definitions in the general field of health and fitness 2. Students will understand the protocol for health appraisals, medical clearance, and risk stratification prior to conducting exercise testing 3. Students will have skills in basic life support and first aid and knowledge of emergency procedures and documentation of incidents related to exercise testing and prescriptions 4. Describe the organizational designs and positions within different types of businesses in the health and fitness industry 5. Understand the critical components involved in hiring and retaining staff 6. Identify components of successful marketing plan 7. Understand and develop a relevant resume for entering the appropriate field 8. Understand and experience how to be successful in the interview process 9. Understand how to properly evaluate and compensate staff based on resources available 10. Understand key financial statements and approaches to budgeting	
					PSY100 Principles of Psychology		1. Demonstrate a basic understanding of scientific method and how it is used to gather information relevant to questions about behavior 2. Summarize key psychological components in core areas of the discipline 3. Describe differences among the various theoretical schools in the field of psychology 4. Demonstrate an awareness of how principles of psychology can be applied to everyday life	
					GE, Elective, Major Elective, or Minor (3)			
					GE, Elective, Major Elective, or Minor (3)			

Milestone #2: Students will be assessed on their communication skills and their exercise programming skills.

						Course	HIP	Course Learning Outcomes (CLO)
YEAR 2	Fall	R	I		R	EXS315/316 Exercise Physiology and Lab	RW	1. Be able to discuss the acute and chronic effects of exercise on human physiological systems 2. Be able to describe expected physiological adaptations that occur inside the human body in response to chronic exercise 3. Understand neural and bioenergetics responses and adaptations in response to acute and chronic exercise exposure 4. Understand the cardiovascular and respiratory system in response to acute and chronic exercise exposure 5. Understand body composition and nutrition in sport
					R	EXS325 Biomechanics		1. Describe physiological theories related to sport biomechanics 2. Describe the phases of walking and running gait cycles using biomechanical principles 3. Identify mechanisms of sport and orthopedic injuries related to common injuries in the running, jumping, and lifting athlete 4. Discuss sport periodization principles for performance and rehabilitation 5. Facilitate injury prevention and explore strength and conditioning methods for the running athlete 6. Design a neuromuscular training program and apply effective rehabilitation strategies using an evidence-based approach
						GE, Elective, Major Elective, or Minor (3)		
						GE, Elective, Major Elective, or Minor (3)		
						GE, Elective, Major Elective, or Minor (3)		

YEAR 3

Spring	R	R	R	R	EXS387/388 Exercise Testing and Lab	RW	<ol style="list-style-type: none"> Administer necessary pre-participation screening, medical history, risk stratification, and determine medical clearance prior to exercise testing. Perform correct protocol for fitness tests on a subject following ACSM guidelines for risk stratification through peer and instructor observation/evaluation. Knowledge of selecting appropriate testing and training modalities according to the age and functional capacity of the individual. Administer field tests and understand norms for evaluating the cardiorespiratory fitness, functional strength, and flexibility for healthy populations. Perform maximal and submaximal graded exercise tests in healthy populations, including treadmill and cycle ergometer ramp protocols. Knowledge and ability to determine energy cost, VO₂, METs, and target heart rates. Skilled in the use of various methods for determining body composition and energy expenditure.
	R			M	R	EXS317 Advanced Exercise Physiology	<ol style="list-style-type: none"> Be able to discuss the acute and chronic adaptations to resistance and aerobic training Be able to describe the expected impact and changes in metabolism and hormones in response to exercise Understand the impact of environmental conditions on health and exercise performance Understand adaptations to training response across the lifespan and differences between genders
							GE, Elective, Major Elective, or Minor (3)
							GE, Elective, Major Elective, or Minor (3)

Milestone #3: Students will be assessed on their proficiency in lab testing skills and in their research comprehension.

YEAR 4

Fall	M	M	R	M	EXS410 Exercise Prescription and Implementation	RW, LT, SL	<ol style="list-style-type: none"> Evaluate client and administer appropriate assessments prior to developing individual's program Administer necessary pre-participation screening and medical history Knowledge and ability to determine energy cost, VO₂, METs, and target heart rates and apply the information to an exercise prescription Develop and implement equipment or fitness logs to track progress and monitor client's personal goals and progress Successfully demonstrate the ability to manage, modify, and re-evaluate the program over a set period of time through peer and instructor observations/evaluation
	M	R	M	M	EXS430 Physical Activity for Specific Populations	RW, SL	<ol style="list-style-type: none"> Identify common health-related diseases and understand the etiology, pathophysiology of the disease, management of complications, and the effects of exercise on medications to treat the disease. Develop exercise prescriptions and recommendations for selected populations through research, case studies, and practical applications. Demonstrate the knowledge of and ability to describe the unique adaptations to exercise training in children, adolescents, older participants, as well as the various chronic diseases and disabilities with regard to strength, functional capacity, and motor skills. Ability to adapt frequency, intensity, duration, mode, progression, level of supervision, and monitoring techniques in exercise programs for patients with chronic disease and disability. Knowledge of the types of exercise programs available in the community and how these programs are appropriate for various populations.
							GE, Elective, Major Elective, or Minor (3)
							GE, Elective, Major Elective, or Minor (3)
Spring	M	M	M	M	EXS440/441 Internships	RW, LT	<ol style="list-style-type: none"> Provide students the opportunities to integrate and apply knowledge, theory, and techniques learned through their exercise science coursework and experiences Provide students with experiences that will expand their knowledge and skills within the field or area of interest To help students evaluate strengths and areas for improvement both personally and professionally. Provide an opportunity for the student to evaluate personal values and professional goals. Provide students with experiences to aid in professional and career development. To prepare students for employment or graduate education.
							GE, Elective, Major Elective, or Minor (3)
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Milestone #4: Students will be assessed on their client programming skills for general and specific populations, internship site supervisor evaluations, and self-efficacy in program learning outcomes.

Program Learning Outcomes (PLO)

- I Introduce
- R Reinforce
- M Mastery

High-Impact Practice (HIP)

- LC Learning Community
- SL Service Learning
- UR Undergraduate Research
- RW Internship / Real World Simulation
- SA Study Abroad
- LT Long Term Project