

# EXERCISE SCIENCE

## Program Overview

This program prepares students for both entry level positions in health, fitness, and exercise science and as pre-professional training for a variety of healthcare related programs (i.e., athletic training, physical therapy, occupational therapy). Graduates of this program will be prepared to assess, design, and implement individual and group exercise and fitness programs for both healthy individuals and those with controlled disease. In addition to knowledge and skills associated with physiology, exercise science professionals also must be knowledgeable and skilled in evaluating health behaviors and behavior modification and motivation techniques necessary to promote and maintain positive lifestyle behaviors. Rider achieves this through small class and laboratory sizes allowing direct, hands-on instruction, and faculty accessibility. Students also have opportunities to do research with faculty via work study or independent study. Each student is assigned a faculty advisor who provides academic advice and career guidance tailored to the student's needs. Students completing this program will have the knowledge, skills, and abilities necessary for entry-level exercise science employment in the public and private industries and/or graduate study in related areas.

Students may be eligible for a number of nationally recognized certifications in the field (i.e., American College of Sports Medicine Certification (<https://www.acsm.org/get-stay-certified/get-certified/>), National Strength and Conditioning Association, (<https://www.nscs.com/certification/certification-overview/>) National Academy of Sports Medicine (<http://www.nasm.org/>)) and may pursue employment in various healthcare and/or public health settings in and around exercise and healthy lifestyle interventions. Students will also be able to use their degree as a platform for a wide range of graduate degree programming including, but not limited to: physical therapy, exercise physiology, physician's assistant, occupational therapy, nutrition, strength and conditioning, and public health.

## Curriculum Overview

The curriculum is designed to allow flexibility to customize the program by selecting courses in both foundational and core content areas based on the individual's personal and professional goals. Rider's science faculty are research-oriented and encourage students to take advantage of opportunities to engage in independent research. Two concentrations are identified, each with a selected set of courses which prepare students for their intended career path: Four career paths are identified, each with a selected set of courses which best meets that program:

- **Practitioner Concentration:** designed for those wanting to pursue careers as fitness professionals, corporate health and wellness specialists, and strength and conditioning professionals.
- **Pre-Professional Concentration:** designed for students wanting to pursue additional training in Physical Therapy, Athletic Training, Occupational Therapy, or other healthcare related programs. Students should consult with their faculty advisor regarding the requirements for each career path option.

## Student Learning Outcomes

After completing this program, graduates will be able to:

1. Demonstrate knowledge in foundational concepts of exercise science

2. Demonstrate competency in the following domains for both healthy and clinical populations: pre-participation risk stratification, fitness assessment and evaluation, evidence based exercise prescription, and safe/appropriate exercise technique.
3. Articulate the importance of interprofessional collaboration in the delivery of evidence based exercise programming in contemporary health care.
4. Communicate effectively in both the written and spoken word, commensurate with expectations in the field.
5. Act within the ethical and legal parameters of Exercise Science.

## Degree Offered:

- B.S. in Exercise Science

## Contact

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**Program Website:** Exercise Science (<https://www.rider.edu/academics/colleges-schools/college-arts-sciences/science-technology-math/undergraduate/exercise-science/>)

**Associated Department:** Health Sciences & Nursing (<https://www.rider.edu/academics/colleges-schools/college-arts-sciences/science-technology-math/faculty-departments/health-nursing/>)

## Related programs:

- Behavioral Neuroscience (<http://catalog.rider.edu/undergraduate/colleges-schools/arts-sciences/majors-minors-certificates/behavioral-neuroscience/>)
- Biology (<http://catalog.rider.edu/undergraduate/colleges-schools/arts-sciences/majors-minors-certificates/biology/>)
- Chemistry (<http://catalog.rider.edu/undergraduate/colleges-schools/arts-sciences/majors-minors-certificates/chemistry/>)
- Health Sciences (<http://catalog.rider.edu/undergraduate/colleges-schools/arts-sciences/majors-minors-certificates/healthsciencesbs/>)
- Physics (<http://catalog.rider.edu/undergraduate/colleges-schools/arts-sciences/majors-minors-certificates/physics/>)

## Exercise Sciences Program Requirements

Code	Title	Credits
<b>Exercise Science Foundation (40-43 credits)</b>		
BIO 221 & 221L	Human Anatomy & Physiology I and Human Anatomy & Physiology I Lab	4
BIO 222 & 222L	Human Anatomy & Physiology II and Human Anatomy & Phys II Lab	4
EXS 115 & 115L	Introduction to the Science of Exercise and Introduction to the Science of Exercise Lab	4
EXS 121	Exercise Injury Control and Management	3
HSC 105	Introduction to Health Professions	1
HSC 110	Introduction to Human Nutrition	3

HSC 302 & HSC 303	Kinesiology and Kinesiology Lab	4
EXS 320 & EXS 321	Exercise Physiology and Exercise Physiology Laboratory	4
PSY 100 or PSY 110	Introduction to Psychology <sup>3</sup> Psychology: The Science of Well-being	3
PSY 283 or PSY 345	Sport Psychology Health Psychology	3
MTH 105	Algebra and Trigonometry (or a higher level MTH course)	4
<b>Statistics (3-6 credits)</b>		<b>3-6</b>
Select one of the following:		
BNS 250 & 250L	Biostatistics and Biostatistics Lab	
PSY 201	Statistics and Research Design (requires PSY 105 as a prerequisite)	
MTH 120	Introduction to Applied Statistics	
ENV 200	Statistical and Computer Applications in the Natural Sciences	
<b>Practitioner Concentration EXS Professional (27-29 credits)</b>		
(strength and conditioning, corporate fitness, wellness, personal training, exercise professional)		
CHE 110 & 110L	Survey of General Chemistry and Survey of Gen Chemistry Lab	4
HSC 210	Nutrition for Exercise and Physical Activity	3
EXS 291	Exercise Science Practicum 1	1
EXS 340 & EXS 341	Exercise Testing & Prescription and Exercise Testing & Prescription - Lab	4
EXS 360 & EXS 361	Foundations of Strength and Conditioning and Foundations of Strength and Conditioning Lab	4
EXS 391	Exercise Science Practicum 2	2
EXS 401	Organization and Administration in Exercise Science	3
EXS 405	Special Populations & Considerations	3
EXS 491	Internship in Exercise Science	3-4
<b>Pre-Professional Concentration (Pre PT, AT, OT, PA)(40-44 credits)</b>		
BIO 115 & 115L	Principles of Biology I and Principles of Biology I Lab (Core Requirements)	4
BIO 116 & 116L	Principles of Biology II and Principles of Biology II Lab	4
HSC 210 or CHE 211 & 211L	Nutrition for Exercise and Physical Activity Organic Chemistry I and Organic Chemistry I Lab	3-4
EXS 405 or BIO 260 & 260L	Special Populations & Considerations Principles of Biology: Evolution, Diversity, and Biology of Cells and Principle of Biology: Cells Lab	3-4
EXS 401 or BIO 215 & 215L	Organization and Administration in Exercise Science Medical Microbiology and Microbiology Lab	3-4
EXS 340 & EXS 341	Exercise Testing & Prescription and Exercise Testing & Prescription - Lab	4

or EXS 360 & EXS 361	Foundations of Strength and Conditioning and Foundations of Strength and Conditioning Lab	
<b>Complete one of the following Physics course sequences:</b>		<b>8</b>
<b>A.</b>		
PHY 100 & 100L	Principles of Physics I and Principles of Physics I Lab	
PHY 101 & 101L	Principles of Physics II and Principles of Physics II Lab	
<b>or B.</b>		
PHY 200 & 200L	General Physics I and General Physics I Lab	
PHY 201 & 201L	General Physics II and General Physics II Lab	
<b>Complete one of the following Chemistry course sequences:</b>		<b>8</b>
<b>A.</b>		
CHE 120 & CHE 121	Principles of Chemistry and Principles of Chemistry Lab <sup>1</sup>	
CHE 122 & CHE 123	Intro to Chemical Systems and Quantitative Methods Lab <sup>1</sup>	
<b>or B.</b>		
CHE 110 & 110L	Survey of General Chemistry and Survey of Gen Chemistry Lab	
CHE 225 & 225L	Introduction to Organic and Biochemistry and Introduction to Organic and Biochemistry Lab	
EXS 490 or EXS 491	Independent Study: Research and Creative Expression Internship in Exercise Science	3-4
<b>Total Credits: Foundation and Practitioner Concentration</b>		<b>67-71</b>
<b>Total Credits: Foundation and Pre-Professional Concentration</b>		<b>80-87</b>

Note: CAS General Education Scientific Perspective and Mathematical Reasoning requirements will be fulfilled within this major.

<sup>1</sup> If Organic Chemistry is required as prerequisite, students should complete CHE 120 & CHE 121. If Organic Chemistry is not required as a prerequisite, students should complete CHE 110 & CHE 110L.

<sup>2</sup> PSY 110 may also be used to satisfy the CAS Social Perspectives core requirement.

## Department of Health Sciences and Nursing Course Repeat Policy

The following guidelines apply to courses offered by the Department of Health Sciences and Nursing. Students may repeat any health sciences (HSC) or exercise science (EXS) course **once** without special permission unless they received an unsatisfactory grade (C-, D, F). With an unsatisfactory grade, students need permission from the dean's office to repeat a class. They can not register on their own on myRider. Students should email [casdean@rider.edu](mailto:casdean@rider.edu) and the department chair to request permission to repeat a course. A course will be considered repeated if the student has previously earned a letter grade in the course, or if the student has previously withdrawn from the course after the Friday of the seventh week of classes (previously Withdrawal II or Withdrawal III). To take a health science, or exercise science course for a third time, written permission must be obtained from the dean's office and the department chair before the registrar will allow the student to enroll in that course.

## Academic Plans of Study

The following educational plan is provided as a sample only. Rider students who do not declare a major during their freshman year; who are in a Continuing Education Program; who change their major; or who transfer to Rider may follow a different plan to ensure a timely graduation. Each student, with guidance from their academic advisor, will develop a personalized educational plan.

### Exercise Science: Practitioner Concentration Plan of Study (p. 3) Exercise Science: Pre-Professional Concentration Plan of Study (p. 3)

#### Exercise Science: Practitioner Concentration

Course	Title	Credits
<b>Year 1</b>		
<b>Fall Semester</b>		
CMP 120 or BHP 100	Seminar in Writing and Rhetoric or Honors Seminar: Great Ideas I	3
EXS 115 & 115L	Introduction to the Science of Exercise and Introduction to the Science of Exercise Lab	4
MTH 100 or MTH 105	Intermediate Algebra or Algebra and Trigonometry	3-4
CAS General Education		3
<b>Semester Credit Hours</b>		<b>13-14</b>
<b>Spring Semester</b>		
EXS 121	Exercise Injury Control and Management	3
CMP 125 or BHP 150 or CMP 203	Seminar in Writing and Research or Honors Seminar: Great Ideas II or Literature and Composition	3
HSC 105	Introduction to Health Professions	1
PSY 100 or PSY 110	Introduction to Psychology or Psychology: The Science of Well-being	3
CAS General Education		3
CAS General Education		3
<b>Semester Credit Hours</b>		<b>16</b>
<b>Year 2</b>		
<b>Fall Semester</b>		
BIO 221 & 221L	Human Anatomy & Physiology I and Human Anatomy & Physiology I Lab	4
CHE 110 & 110L	Survey of General Chemistry and Survey of Gen Chemistry Lab	4
CAS General Education		3
CAS General Education		3
<b>Semester Credit Hours</b>		<b>14</b>
<b>Spring Semester</b>		
BIO 222 & 222L	Human Anatomy & Physiology II and Human Anatomy & Phys II Lab	4
HSC 110	Introduction to Human Nutrition	3
HSC 302 & HSC 303	Kinesiology and Kinesiology Lab	4
CAS General Education		3

EXS 291	Exercise Science Practicum 1	1
<b>Semester Credit Hours</b>		<b>15</b>
<b>Year 3</b>		
<b>Fall Semester</b>		
HSC 210	Nutrition for Exercise and Physical Activity	3
EXS 320 & EXS 321	Exercise Physiology and Exercise Physiology Laboratory	4
Elective/CAS General Education		3
Elective/CAS General Education		3
Elective/CAS General Education		3
<b>Semester Credit Hours</b>		<b>16</b>
<b>Spring Semester</b>		
EXS 340 & EXS 341	Exercise Testing & Prescription and Exercise Testing & Prescription - Lab	4
EXS 360 & EXS 361	Foundations of Strength and Conditioning and Foundations of Strength and Conditioning Lab	4
EXS 391	Exercise Science Practicum 2	2
Elective/CAS General Education		3
Elective/CAS General Education		3
<b>Semester Credit Hours</b>		<b>16</b>
<b>Year 4</b>		
<b>Fall Semester</b>		
EXS 405	Special Populations & Considerations	3
EXS 491	Internship in Exercise Science <sup>2</sup>	3
Elective/CAS General Education		3
Elective/CAS General Education		3
Elective/CAS General Education		3
<b>Semester Credit Hours</b>		<b>15</b>
<b>Spring Semester</b>		
EXS 401	Organization and Administration in Exercise Science	3
Elective/CAS General Education		3
Elective/CAS General Education		3
Elective/CAS General Education		3
Elective/CAS General Education		3
<b>Semester Credit Hours</b>		<b>15</b>
<b>Total Credit Hours for Graduation</b>		<b>120-121</b>

<sup>1</sup> For course placement information see <https://www.rider.edu/student-life/first-year-experience/orientation/placement-testing> (<https://www.rider.edu/student-life/first-year-experience/orientation/placement-testing/>)

<sup>2</sup> EXS 491 may be taken Fall, Spring, Or Summer (see advisor for requirements and planning)

#### Exercise Science: Pre-Professional Concentration

Course	Title	Credits
<b>Year 1</b>		
<b>Fall Semester</b>		
CMP 120 or BHP 100	Seminar in Writing and Rhetoric or Honors Seminar: Great Ideas I	3

EXS 115 & 115L	Introduction to the Science of Exercise and Introduction to the Science of Exercise Lab	4
MTH 105	Algebra and Trigonometry <sup>1</sup>	4
PSY 100 or PSY 110	Introduction to Psychology <sup>3</sup> or Psychology: The Science of Well-being	3

**Semester Credit Hours 14**

### Spring Semester

CMP 125 or BHP 150 or CMP 203	Seminar in Writing and Research or Honors Seminar: Great Ideas II or Literature and Composition	3
PSY 100 or PSY 110	Introduction to Psychology (If taken in Fall, choose another CAS General Education Course) <sup>3</sup> or Psychology: The Science of Well-being	3

EXS 121	Exercise Injury Control and Management	3
HSC 105	Introduction to Health Professions	1
Foreign Language I <sup>1</sup>		3
CAS General Education Course		3

**Semester Credit Hours 16**

### Year 2

#### Fall Semester

BIO 115 & 115L	Principles of Biology I and Principles of Biology I Lab	4
BIO 221 & BIO 222L	Human Anatomy & Physiology I and Human Anatomy & Phys II Lab	4
HIS 150	Pre-Modern World: Evolution to Revolution	3
PSY 283 or PSY 345	Sport Psychology or Health Psychology	3
Foreign Language 2 <sup>1</sup>		3

**Semester Credit Hours 17**

#### Spring Semester

BIO 116 & 116L	Principles of Biology II and Principles of Biology II Lab	4
BIO 222 & 222L	Human Anatomy & Physiology II and Human Anatomy & Phys II Lab	4
HIS 151 or HIS 152 or HIS 153	World in the Modern Era: Exploration to Globalization or Contemporary World: Historical Perspectives or Cold War: A Global History	3

CAS General Education Course		3
CAS General Education Course		3

**Semester Credit Hours 17**

### Year 3

#### Fall Semester

CHE 110 & 110L	Survey of General Chemistry and Survey of Gen Chemistry Lab	4
EXS 320 & EXS 321	Exercise Physiology and Exercise Physiology Laboratory	4
Statistics Course		3-4
CAS General Education Course		3

**Semester Credit Hours 14-15**

### Spring Semester

CHE 225 & 225L	Introduction to Organic and Biochemistry and Introduction to Organic and Biochemistry Lab	4
HSC 110	Introduction to Human Nutrition	3
HSC 302 & HSC 303	Kinesiology and Kinesiology Lab	4
CAS General Education Course		3
CAS General Education Course (Philosophical perspective; recommend Ethics or Medical Ethics)		3

**Semester Credit Hours 17**

### Year 4

#### Fall Semester

EXS 490 or EXS 491	Independent Study: Research and Creative Expression <sup>2</sup> or Internship in Exercise Science	3
EXS 405 or BIO 260 <b>and</b> BIO 260L	Special Populations & Considerations or Principles of Biology: Evolution, Diversity, and Biology of Cells <b>and</b> Principle of Biology: Cells Lab	3-4
HSC 210 or CHE 211 <b>and</b> CHE 211L	Nutrition for Exercise and Physical Activity or Organic Chemistry I <b>and</b> Organic Chemistry I Lab	3-4
PHY 100 & 100L	Principles of Physics I and Principles of Physics I Lab	4

**Semester Credit Hours 13-15**

#### Spring Semester

EXS 340 & EXS 341 or EXS 360 <b>and</b> EXS 361	Exercise Testing & Prescription or Foundations of Strength and Conditioning <b>and</b> Foundations of Strength and Conditioning Lab	4
EXS 401	Organization and Administration in Exercise Science	3
PHY 101 & 101L	Principles of Physics II and Principles of Physics II Lab	4

Elective Credits 1-3

**Semester Credit Hours 12-14**

**Total Credit Hours for Graduation 120-125**

<sup>1</sup> For course placement information see <https://www.rider.edu/student-life/first-year-experience/orientation/placement-testing> (<https://www.rider.edu/student-life/first-year-experience/orientation/placement-testing/>)

<sup>2</sup> EXS 490/491 may be taken Fall, Spring, Or Summer (see advisor for requirements and planning)

<sup>3</sup> PSY 100 or PSY 110 may be taken in Fall or Spring of Freshman year.

## Courses and Descriptions

### **BCH 225 Introduction to Organic and Biochemistry 4 Credits**

An introductory course describing the basic principles of organic chemistry and biochemistry as they relate to human metabolism and disease. The nature of the chemical structure and reactivity of organic functional groups such as alcohols, aldehydes, ketones, carboxylic acids and amines will be presented with biological processes in mind. The biochemistry of the macromolecules DNA, RNA, proteins, carbohydrates and lipids will be discussed leading to a discussion of some of the more important metabolic pathways. This course is intended for science majors who do not take the full two semester sequence of organic chemistry and two semesters of biochemistry and desire a background in biochemistry. Non-science major students who have had one semester of general chemistry and one semester of biology may also enroll in the course. Three hours of lecture and one three-hour lab per week. Prerequisite(s): (CHE 110 UG D and CHE 110L) or (CHE 122 UG D and CHE 123) and BIO 115 with a minimum grade of D  
**Corequisite(s):** BCH 225L.

### **BCH 225L Introduction to Organic & Biochemistry Lab 0 Credits**

This lab is a co-requisite and must be taken with the corresponding course. Prerequisite(s): (CHE 110 UG D and CHE 110L) or (CHE 122 UG D and CHE 123) and BIO 115.  
**Corequisite(s):** BCH 225.

### **BIO 115 Principles of Biology I 4 Credits**

An introductory biology course focusing on major themes of biology: what is life?; Cells as fundamental structure and functional unit of life; information transmission, storage and retrieval; Diversity and unity of life explained by evolution. Three hours of lecture and one three-hour lab per week.  
**Corequisite(s):** BIO 115L.

### **BIO 115L Principles of Biology I Lab 0 Credits**

This lab is a co-requisite and must be taken with the corresponding course.  
**Corequisite(s):** BIO 115.

### **BIO 116 Principles of Biology II 4 Credits**

An introductory biology course focusing on major themes of biology: Energy and matter to carry out life's essential functions; Interdependent relationships characterize biological systems (homeostasis, growth & development); Behavior of living things; Ecology and the environment. Three hours of lecture and one three-hour lab per week.  
**Corequisite(s):** BIO 116L.

### **BIO 116L Principles of Biology II Lab 0 Credits**

This lab is a co-requisite and must be taken with the corresponding course.  
**Corequisite(s):** BIO 116.

### **BIO 221 Human Anatomy & Physiology I 4 Credits**

A comprehensive survey of the structure and function of musculo-skeletal systems, neuroendocrine systems and related tissues and cellular interactions. Physiological applications include homeostasis, muscle dynamics, and cell activities. Laboratory exercises complement lecture material through the use of animal dissections, wet labs, computer-assisted investigations, microscopy, and models. Exams, case histories, personal investigations, and lab practicums assess learning. Course emphasis supports allied health and pre-professional training. Three hours of lecture and one three-hour lab per week. Designed for allied health students; does not satisfy requirements for the biology major. Prerequisite(s): HSC major ONLY or Permission of instructor.  
**Corequisite(s):** BIO 221L.

### **BIO 221L Human Anatomy & Physiology I Lab 0 Credits**

This lab is a co-requisite and must be taken with the corresponding course.  
**Corequisite(s):** BIO 221.

### **BIO 222 Human Anatomy & Physiology II 4 Credits**

A comprehensive survey of the organ systems of the body including special senses, cardiovascular, respiratory, digestive, excretory, reproduction and development. Physiological components include electrolytes, metabolism, nutrition, and the mechanisms of homeostasis and cell reception. Lab studies support lecture material through dissections, wet labs, computer-assisted learning, microscopy, and models. Assessment includes lab practicums, exams, and reports. Course emphasis supports allied health and pre-professional training. Designed for allied health students; does not satisfy requirements for the biology major. Prerequisite(s): BIO 221.  
**Corequisite(s):** BIO 222L.

### **BIO 222L Human Anatomy & Phys II Lab 0 Credits**

This lab is a co-requisite and must be taken with the corresponding course. Prerequisite(s): BIO 221L.  
**Corequisite(s):** BIO 222.

### **BNS 250 Biostatistics 4 Credits**

This course will assist students with acquiring the skills necessary to design, conduct, and interpret research studies. Emphasis will be on learning how to develop experimental designs to translate theoretical concepts into testable hypotheses. Experiments conducted during laboratory sessions will use laboratory mice and will use equipment for measuring animal behavior. Students will gain experience collecting, analyzing, writing and orally presenting their research results. Three hours of lecture and one three-hour lab per week. Prerequisite(s): MTH 105 or higher or placement into MTH 210, grade of "C" or better in one lab science course.  
**Corequisite(s):** BNS 250L.

### **BNS 250L Biostatistics Lab 0 Credits**

This lab is a co-requisite and must be taken with the corresponding course.  
**Prerequisite(s):** MTH 105 or higher or placement into MTH 210, grade of "C" or better in one lab science course.



**CHE 110 Survey of General Chemistry 4 Credits**

A one-semester survey of basic general chemical principles designed to be applied to questions in health-related fields. Students will explore the fundamental structures of atoms and simple compounds that comprise living beings; basic patterns in chemical reactivity, especially oxidation-reduction and acid-base reactions; quantitative analyses of biologically-relevant compounds and chemical reactions; properties of substances; and kinetic and thermodynamic principles underlying such chemicals and chemical processes. In the laboratory portion of this course, students will learn and apply principles of experimental safety and will apply knowledge gained in the class via application in basic experimental contexts. No prerequisites. Students who have completed CHE 120 and/or CHE 122 will not be permitted to enroll in CHE110/110L. Furthermore CHE 110 will not serve as a prerequisite for CHE 122.

**CHE 110L Survey of Gen Chemistry Lab 0 Credits**

In the laboratory portion of this course, students will learn and apply principles of experimental safety and will apply knowledge gained in the class via application in basic experimental contexts.

**CHE 120 Principles of Chemistry 3 Credits**

For students who have successfully completed one year of high school chemistry. This systematic study of the fundamental principles and concepts of chemistry covers atomic structure, bonding, stoichiometric relationships, including solution and oxidation-reduction reactions, and molecular structure. Three hours of lecture per week. Prerequisite(s): High school chemistry or CHE 100 is recommended before taking this course.

**Corequisite(s):** CHE 121.

**CHE 121 Principles of Chemistry Lab 1 Credits**

For students concurrently taking CHE 120. Experiments involve gravimetric, volumetric, and spectrophotometric quantitative analysis. One three-hour lab per week. Fall.

**CHE 122 Intro to Chemical Systems 3 Credits**

A continuation of CHE 120. For students majoring in the sciences but may be taken by others. Chemical systems in which the study of kinetics, thermodynamics, equilibrium, and radiochemistry are emphasized. Three hours of lecture per week. Prerequisite(s): CHE 120, MTH 105 or higher.

**Corequisite(s):** CHE 123.

**CHE 123 Quantitative Methods Lab 1 Credits**

Usually taken concurrently with CHE 122. Primarily for students majoring in the sciences. A number of quantitative classical and instrumental methods of analysis are used to determine thermodynamic properties and reaction mechanisms. One three-hour lab per week. Prerequisite(s): CHE 121.

**Corequisite(s):** CHE 122.

**ENV 200 Statistical and Computer Applications in the Natural Sciences 4 Credits**

This course introduces important statistical concepts, their application, and the usage of computer technology relevant to biological, environmental, geological, and marine problems. Students will learn various graphical and statistical techniques and how to execute them on personal computers. The curriculum emphasizes the integrated nature of these techniques and their importance to meaningful data evaluation and representation. Laboratory exercises are designed to emphasize useful solutions to problems found in many scientific disciplines using computer-based methodologies. Three hours of lecture and one three-hour lab per week.

**Corequisite(s):** ENV 200L.

**ENV 200L Statistical and Computer Applications in the Natural Sciences Lab 0 Credits**

This lab is a co-requisite and must be taken with the corresponding course.

**Corequisite(s):** ENV 200.

**EXS 121 Exercise Injury Control and Management 3 Credits**

This course is designed to provide the participant with entry level knowledge, competence, and skill in the care and prevention of injuries sustained during physical activity, sport, and exercise. This course includes units dealing with basic anatomy of common injuries, evaluation techniques, preventive measures to reduce the incidences of injuries and a knowledge of basic treatment procedures to be used after injuries occur. Legal and ethical issues will also be discussed.

**EXS 320 Exercise Physiology 3 Credits**

An entry level exploration of the physiological processes, metabolic requirements, and consequences of exercise in humans. Emphasis is placed on bioenergetics, as well as circulatory, respiratory, and neuromuscular responses to the physical stress of exercise performed for health and disease prevention.

**Prerequisite(s):** BIO 221, BIO 222.

**EXS 321 Exercise Physiology Laboratory 1 Credits**

EXS 321 is the laboratory course that accompanies EXS 320. Topics will include entry-level practical skills and competencies related to exercise capacity evaluation, interpretation of exercise data, and application of exercise interventions in a clinical setting. Prerequisite(s): BIO 221, 222 Co-requisite(s): EXS 320.

**EXS 340 Exercise Testing & Prescription 3 Credits**

An advanced, competency based course in the evidence based evaluation and prescription of exercise interventions in healthy and clinical populations. Prerequisite(s): EXS 320 Co-requisite(s): EXS 341.

**EXS 341 Exercise Testing & Prescription - Lab 1 Credits**

An advance, competency based laboratory course in the evidence based evaluation and prescription of exercise interventions in healthy and clinical populations Prerequisite(s): EXS 320 Co-requisite(s): EXS 340.

**EXS 360 Foundations of Strength and Conditioning 3 Credits**

This course examines the advanced methods and techniques associated with the design of strength and conditioning programs to enhance human performance in sport and fitness. This course is designed to develop, enhance, and apply knowledge and skills to prepare the student for the profession of strength and conditioning. Prerequisite(s): EXS 320, EXS 321, and HSC 302.

**Corequisite(s):** EXS 360L.

**EXS 361 Foundations of Strength and Conditioning Lab 1 Credits**

This course examines the advanced methods and techniques associated with the design of strength and conditioning programs to enhance human performance in sport and fitness. Prerequisite(s): EXS 320, EXS 321, and HSC 302.

**Corequisite(s):** EXS 360.

**EXS 401 Organization and Administration in Exercise Science 3 Credits**

This course examines the various issues, policies, and procedures involved with administrative aspects of exercise science in traditional and non-traditional settings. Emphasis is on administrative concepts, facility design, budgeting and equipment purchasing, personnel management, record keeping, and legal liability.

**Prerequisite(s):** EXS 360.

**EXS 405 Special Populations & Considerations 3 Credits**

This course is an advanced course in exercise programming for a variety of unique populations. Pathophysiology and considerations relative to diseases of the musculoskeletal, neuromuscular, and immunologic systems will be discussed. Recommended modifications and evidence based techniques that support fitness programming for individuals with specific exercise needs will be explored.

**Prerequisite(s):** EXS 320.

**HSC 110 Introduction to Human Nutrition 3 Credits**

This course is designed to offer the student an understanding of fundamental human nutrition concepts including, but not limited to, digestion, absorption, metabolism, functions, and sources of macronutrients and micronutrients. The theme of the course will align with human health and disease states and the important conceptions about the food industry and its relation to healthy dietetic choices.

**HSC 105 Introduction to Health Professions 1 Credits**

**Course Description:** This course will provide a basic overview of the health science professions including but not limited to: athletic training, clinical exercise physiology & cardiac rehabilitation, chiropractic, physician assistant, occupational therapy, nursing, community health education specialist, and physical therapy. The course will also cover the professional activities (i.e. professional organizations, certifications, professional issues, and professional liabilities) that are related to these professional applications.

**HSC 200 Environmental Health & Human Health 3 Credits**

The health of any individual is a function of both our genetics and environmental factors. Environmental factors most broadly defined include the air we breathe, the water we drink and the food we eat. This course will focus on numerous examples of how bacteria, viruses, and exposure to environmental chemicals result in human diseases. Examples range from failures in public health infrastructure (cholera, diphtheria, river blindness, etc), failures to vaccinate (polio, measles, hepatitis, etc) and chemical exposures (birth defects, cancer, etc). There is also much known about how diet and nutrition can prevent diseases.

**Prerequisite(s):** BIO 10X Life Science course or any biology laboratory course or BIO 115 or 116 or 117.

**HSC 210 Nutrition for Exercise and Physical Activity 3 Credits**

An introductory exploration of evidence based nutritional theory and applications in sport and exercise.

**Prerequisite(s):** HSC 100 with a minimum grade of D or BCH 225 with a minimum grade of D.

**HSC 302 Kinesiology 3 Credits**

The purpose of this course is to explore human movement during performance of activities. This course will explore the relationship between anatomical structures and function in the production of movement. The application and relationships between the fundamental principles of mechanics and musculoskeletal system function will be addressed within the framework of clinical and research perspectives. Both qualitative and quantitative approaches will be applied towards a better understanding of human movement, the analysis of physical activity. **Prerequisite(s):** BIO 221 & MTH 105 (or equivalent) or POI.

**Corequisite:** HSC 303.

**HSC 303 Kinesiology Lab 1 Credits**

This lab is a co-requisite and must be taken with HSC 302.

**Corequisites:** HSC 302.

**MTH 105 Algebra and Trigonometry 4 Credits**

The course is an in depth and rigorous study of functions and graphs, equations and inequalities, polynomial and rational functions, exponential, and logarithmic functions, basic trigonometric functions and their inverses, trigonometric identities.

**Prerequisite(s):** A mathematics SAT score of 570, departmental placement or MTH 100 with a grade of C or higher.

**MTH 120 Introduction to Applied Statistics 3 Credits**

Collection and presentation of data. Measures of location and variation, sampling theory, hypothesis testing, confidence intervals, t-tests, chi-square tests, regression, and correlation. Emphasizes practical applications. Not open to business administration, chemistry, environmental, geosciences, marine sciences, math or liberal studies: marine ecological or environmental emphasis majors.

**Prerequisite(s):** MTH 102 or MTH 105.

**PHY 101 Principles of Physics II 3 Credits**

Continuation of Physics 100. Electrostatics, electricity, and magnetism; DC and AC circuits, physical and geometrical optics, introduction to elementary particle and quantum physics. Three hours of lecture per week. **Prerequisite(s):** PHY 100.

**Corequisite(s):** PHY 101L.

**PHY 101L Principles of Physics II Lab 1 Credits**

For students concurrently taking Physics 101. One three-hour lab per week.

**Corequisite(s):** PHY 101.

**PHY 201 General Physics II 4 Credits**

A continuation of the concepts developed in Physics 200. Electricity, electrical circuits, magnetism, Maxwell's equations. Light and optics, including lenses, interference, and diffraction. Three hours of lecture and one three-hour lab per week. **Prerequisite(s):** PHY 200, MTH 211 or concurrent enrollment.

**Corequisite(s):** PHY 201L.

**PHY 201L General Physics II Lab 0 Credits**

This lab is a co-requisite and must be taken with the corresponding course.

**Corequisite(s):** PHY 201.

**PSY 100 Introduction to Psychology 3 Credits**

This course covers major facts, principles and concepts about human and animal behavior and experience, research findings, major problems, basic vocabulary, methodologies, and contributions in the field. Topics include psychology as a science; human development; individual differences; intelligence and its measurement; special aptitudes and interests; personality and social behavior; motivation and emotion; frustration and personality deviations; and learning, thinking, remembering and forgetting.

**PSY 105 Introduction to Research in Psychology 4 Credits**

Students will be introduced to the basic research methods used in psychology including surveys, experiments, and observation. Students will collect data and learn to describe this data using basic tools of analysis including graphic display and statistical analysis. Students will read original psychological research and learn to write using the conventions of the American Psychological Association.

**Prerequisite(s):** Grade of C or better in PSY 100 or PSY 102 or PSY 110 or PSY 131.

**PSY 201 Statistics and Research Design 3 Credits**

Introduces students to statistics and research methods in the behavioral sciences. Covers the fundamentals of descriptive and inferential statistics, a variety of issues in research design, selected research designs including the case study, correlational and experimental designs. In addition, students will explore the literature in psychology in order to examine the use of statistics and research design in real research problems.

**Prerequisite(s):** Grade of C or better in PSY 105/105L.

**PSY 283 Sport Psychology 3 Credits**

This survey course will focus on the social and psychological factors related to performance and participation in sport and exercise, health, and injury rehabilitation settings. Two general questions will be explored: (a) how do social and psychological variables influence performance and participation in physical activity pursuits? And (b) how does physical activity participation affect the psychological well-being of the individual? To better understand these questions, this course will overview theoretical and methodological approaches to a variety of sport and exercise psychology topics, including: socialization, motivation, group processes, competition, and performance enhancement. This course counts towards the fulfillment of the Disciplinary Perspectives element of the CLAS general education curriculum.

**Prerequisite(s):** Grade of C or better in PSY 100 or PSY 102 or PSY 110 or PSY 131.

**PSY 345 Health Psychology 3 Credits**

This course focuses on the biopsychosocial model of health in which biological, psychological and social factors contribute to health and wellbeing, as well as illness and disease. After a brief introduction to systems of the body, i.e. nervous, endocrine, respiratory, cardiovascular, digestive, immune, this course will examine health-enhancing behaviors such as exercise and nutrition, as well as health-compromising behaviors such as drug abuse and other reckless behaviors, along with models that explain behavior maintenance and change. Additionally, attention is devoted to a discussion of how health psychology can function in shaping health care policy.

**Prerequisite(s):** Grade of C or better in PSY 100 or PSY 102 or PSY 110 or PSY 131 and 45 credits.