





## Majors

Actuarial Science (B.S. or B.A.)  
Biology (B.S. or B.A. – 2 concentrations available)  
Chemistry (B.S. or B.A.)  
Computer Science (B.S.)  
Environmental Biology (B.S. or B.A.)  
Environmental Science (B.S. or B.A.)  
Environmental Studies (B.S. or B.A.)  
Exercise Science (B.S. – 3 different concentrations available)  
General Science (B.S. or B.A.)  
Health Science (B.S. or B.A. – 10 different concentrations available)  
Life Science Education (B.S.)  
Mathematics (B.S. or B.A.)  
Mathematics Education—Secondary (B.S. or B.A.)  
Medical Imaging (B.S. – 4 different concentrations available; a Grace College degree in partnership with John Patrick University) \*

## Minors

Applied Mathematics  
Biology  
Chemistry  
Environmental Science  
General Science  
Mathematics  
Mathematics and Computing  
Nutrition  
Public Health (in partnership with LCMC) \*

These programs are designed to be a part of a liberal arts education at Grace College. Information on general education courses, applied learning, and cross-cultural education requirements are described in the general Grace College catalog.

\*Additional information regarding our partnership programs is available below in the general descriptions.

## STRENGTHS WITHIN THE SCIENCE AND MATHEMATICS DEPARTMENT

### Pre-professional preparation

The Biology and Health Professions program offers students a contemporary understanding of life science topics and concepts gained through robust applied learning experiences in both the classroom and laboratory. This program includes traditional biology (with emphasis on research), pre-medicine, pre-dentistry, pre-pharmacy, pre-physical therapy, pre-physician assistant, pre-veterinary as well as other areas of healthcare.

### Environmental Science

The Environmental Science program at Grace is committed to equipping future professionals in environmental fields with the skills, competence, experience, and stewardship ethic to excel in caring for







**Concentrations- choose one(12 hours)**

Lifestyle Medicine Concentration:

- LM 501 Physical Activity and Weight Management
- LM 502 Health and Wellness Coaching
- LM 503 Sleep, Health and Wellness
- LM 504 Mindfulness and Emotional Wellness
- LM 505 Smoking and Tobacco Cessation Therapy
- LM 506 Alcohol and Addiction Therapy

Nutrition Concentration:

- NUT 502 Nutrition Assessment
- NUT 514 Eating Disorders
- GASTP 501 Gastronomy Science
- NUT 510 Nutritional Psychology

Sports ~~Concentration:~~ **Medicine Conc**

- LM 501 Physical Activity and Weight Management
- SCI 700 Exercise Physiology
- SCI 701 Integrative Kinesiology
- SCI 702 Fitness and Wellness
- SCI 703 ~~Sports and Exercise Nutrition~~
- SCI 704 Sports Medicine and Athletic Training

NOTE: All course codes listed here are JPU designations and are subject to change. Coursework is completed entirely online at the time of this catalog printing. Course descriptions for JPU courses can be found [here](#). Additional fees may apply to partnership programs. For more information, please contact the Director of the School of Arts and Sciences Partnership Programs [statoncg@grace.edu](mailto:statoncg@grace.edu) or the Biology Program Director.

\*This program results in a Master of Science degree from John Patrick University along with a Bachelor's degree from Grace College.

## MAJORS AND MINORS IN THE BIOLOGY

CHM 1610/1620 General Chemistry I and Lab  
CHM 1710/1720 General Chemistry II and Lab  
CHM 2610/2620 Organic Chemistry I and Lab  
CHM 2710/2720 Organic Chemistry II and Lab

**General Biology Concentration (22 hours)**

BIO 2110/2120 General Ecology I and Lab  
BIO 2210 Nutrition  
BIO 2410/2420 Plant Biology and Lab  
BIO 2510/2520 Animal Biology and Lab  
BIO XXX Development Biology  
BIO 4110/4120 Microbiology and Lab

**Neurobiology Concentration (25 hours)**

PSY 2170 Abnormal Psychology  
CHM 3610 Analytical & Environmental Chemistry  
BIO 3210/3220 Advanced Anatomy & Physiology I and Lab  
NSM I Neuroscience Foundations  
NSM II Biological Basis of Perception & Movement  
NSM III Cognitive Neuroscience  
NSM IV Clinical Neuropathology  
BIO Pathophysiology

**Electives- choose from the following(15-16 hours)**

BIO 2410/2420 Plant Biology and Lab  
BIO 2510/2520 Animal Biology and Lab  
BIO 3210/3220 Advanced Anatomy & Physiology I and Lab  
BIO 3310/3320 Advanced Anatomy & Physiology II and Lab  
BIO 4110/4120 Microbiology and Lab  
PHY 2140/2150 College Physics I and Lab  
PHY 2160/2170 College Physics II and Lab  
MAT 1230/1240 Calculus I and Lab



## HEALTH SCIENCE MAJOR

### Bachelor of Science and Bachelor of Arts

The requirement for a degree in health science varies, with the core major requiring 48-49 credit hours, and the concentrations adding 8-18 credit hours. Many concentrations include a minor in chemistry; if this minor is not required, then another minor must be completed.

A health science major must also declare a concentration, which defines course choices and lists additional courses required for professional health science schools in that concentration, or are covered on the entrance examination for that field. The listing of courses required for each concentration is available from the Pre-Health Professions advisor, if desired. Available concentrations include pre-medicine, pre-podiatry, pre-optometry, pre-dental, pre-veterinary, pre-chiropractic, pre-physician assistant, pre-physical therapy, pre-pharmacy, and pre-occupational therapy.

## LIFE SCIENCE EDUCATION MAJOR

### Bachelor of Science

The major in life science education is designed for students desiring to teach science, particularly biology, at the secondary level.

The requirement for a major in life science education is a minimum of 35 credit hours in the sciences, including a minimum of 17 credit hours of designated biology courses and four credit hours of general ecology. The major also requires a minimum of 36 credit hours of designated professional education courses. Students desiring this major must register their intent with the School of Education during their first year of study at Grace to ensure they receive the most recent communications from the School of Education in this ever-changing discipline.

#### Required Science Courses (5 hours):

- SCI 1140 Physical Science Survey
- SCI 1160 Theories of Origins
- BIO 1610/1620 General Biology I and Lab
- BIO 1710/1720 General Biology II and Lab
- CHM 1610/1620 General Chemistry I and Lab
- CHM 1710/1720 General Chemistry II and Lab
- ENV 2110/2120 General Ecology and Lab
- BIO 2310 Biochemistry
- BIO 3110 Cellular & Molecular Biology
- BIO 4210 Genetics

#### Professional Education Requirements (36 hours)

- SED 1000 Teaching School in America
- SED 2200 The School Age Child
- SED 2210 Responsive and Differentiated Instruction
- SED 2400 Teaching Exceptional Learners
- SED 2500 Teaching in a Pluralistic Society
- SED 2600 Teaching and Learning
- SED 3600 Teaching in the Middle and High School Setting
- SED 4660 Methods of Teaching Secondary Science
- SED 4700 The Moral Practitioner
- SED 4900 Student Teaching and Seminar



NM 408 Instrumentation, QC and QA  
NM 414 Radiopharmacy and Pharmacology  
NM 424 Radiation Safety in Nuclear Medicine  
NM 421 Clinical Practice II



3. Students will demonstrate field sampling skills.
4. Students will apply field sampling skills in a research context.
5. Students will demonstrate oral presentation skills.
6. Students will demonstrate written communication skills.

## **Majors and Minors in the Environmental Science Program**

### **ENVIRONMENTAL BIOLOGY MAJOR**

#### **Bachelor of Science and Bachelor of Arts**

The requirement to complete a major in environmental biology is 49 credit hours in ecology, biology, and supporting courses. A minor in chemistry is also required. The environmental biology major will prepare those students focused on a career in teaching or cutting-edge research with the academic



**Required Courses (6 hours):**

BIO 1010/1020 Biological Science Survey and Lab  
BUS 1010 Foundations of Business  
CHM 1010/1020 Introduction to Chemistry and Lab  
ENV 2110/2120 General Ecology and Lab  
ENV 3210/3220 Aquatic Ecology and Lab  
ENV 3410 Environmental Ethics  
ENV 4010 Senior Seminar  
ENV 4830 Field Education  
PSY 1100 Introduction to Psychology  
POS 2010 Introduction to Political Thought

**Electives choose from the following**

proficiencies launch students into practical and effective professional careers. The emphasis of this



BIO 2010/2020 Anatomy & Physiology I and Lab  
BIO 2040/2050 Anatomy & Physiology II and Lab

**Experiential Learning Requirements (7 hours):**

EXS 2150 Practicum in Exercise Science  
EXS 4840 Research in Exercise Science  
EXS 4930 Internship in Exercise Science

A minor is required with this major concentration.

**FITNESS AND NUTRITION CONCENTRATION (33 credit hours)**

**Exercise Science Foundation (30 hours):**

EXS 1000 Introduction to Exercise Science  
EXS 1050 Dynamics of Fitness  
EXS 2000 Kinesiology  
EXS 2130 Principles of Coaching  
EXS 2250 Care and Prevention of Injuries  
EXS 1500 Group Fitness Instruction  
EXS 3000 Strength and Conditioning  
EXS 3300 Special Topics in Fitness  
EXS 3600 Fitness Assessment  
EXS 4180 Exercise Physiology

**Nutrition Requirements (22 hours):**

CHM 1010 Introduction to Chemistry  
CHM 1020 Introduction to Chemistry Lab  
BIO 2210 Nutrition  
BIO 2240 Public Health  
EXS 2300 Nutrition for Life Cycles  
EXS 3200 Nutrition for Sport Performance  
EXS 3240 Diet, Planning, and Counseling  
EXS 3280 Nutrition for Health and Disease

**Experiential Learning Requirements (7 hours):**

EXS 2150 Practicum in Exercise Science  
EXS 4840 Research in Exercise Science  
EXS 4930 Internship in Exercise Science

**Science Requirements (8 hours):**

BIO 2010/2020 Anatomy & Physiology I and Lab  
BIO 2040/2050 Anatomy & Physiology II and Lab

**Psychology Requirements choose from the following (6 hours):**

PSY 3300 Sports Psychology  
PSY 3550 Health Psychology  
PSY 3600 Motivation and Emotion

No minor is required for this major concentration.

## **PREPHYSICAL THERAPY CONCENTRATION** (66 credit hours)

### **Exercise Science Foundation (24 hours):**

- EXS 1000 Introduction to Exercise Science
- EXS 1050 Dynamics of Fitness
- EXS 2000 Kinesiology
- EXS 2250 Care and Prevention of Injuries
- EXS 3000 Strength and Conditioning
- EXS 3600 Fitness Assessment
- EXS 4180 Exercise Physiology
- EXS 4240 Biomechanics

### **Science Requirements (35 hours):**

- BIO 1610/1620 General Biology I and Lab
- BIO 1710/1720 General Biology II and Lab
- BIO 2210 Nutrition
- BIO 3210/3220 Advanced Anatomy & Physiology I and Lab
- BIO 3310/3320 Advanced Anatomy & Physiology II and Lab
- CHM 1610/1620

**Required Courses (20 hours):**

- CHM 1010/1020 Introduction to Chemistry and Lab
- BIO 2240 Public Health
- EXS2050 Principles of Nutrition
- EXS 2300 Nutrition for Life Cycles
- EXS 3200 Nutrition for Sports Performance
- EXS 3240 Diet, Planning and Counseling
- EXS 3280 Nutrition for Health and Disease

## **MATHEMATICS PROGRAM**

**Business Requirements (21 hours):**

- ACC 2110 Financial Accounting
- ACC 2120 Managerial Accounting
- BUS 2230 Economics
- BUS 3050 Business Spreadsheet Applications
- FIN 3240 Corporate Finance
- FIN 4610 Advanced Financial Mathematics
- ISM 1150 Introduction to Computer Science

A minor is required for this major.

NOTE: Course descriptions for ACC, BUS, FIN, and ISM can be found in the Department of Business course listings.

## **COMPUTER SCIENCE MAJOR**

### **Bachelor of Science and Bachelor of Arts**

The requirement for a major in Computer Science includes 61 credit hours in a variety of computing and math disciplines. Specific Computing Science courses are offered online through a partnership with the Lower Cost Models for Independent Colleges Consortium (LCMC). A total of 3 concentrations are offered for students to pursue a more specific area of interest in Computer Science.

**Computing Core (21 hours)**

- CSI 1150 Introduction to Computer Science
- ISM 2700 HTML and Web Development
- ISM 2150 Object Oriented Programming
- ISM 3410 Database Programming
- ISM 4110 Client-Side Programming
- ISM 4120 Application Development Lab
- ISM 4930 Internship

**Math Core (13 hours):**

- MAT 1230 Calculus 1
- MAT 1240 Calculus 1 Lab
- MAT 1250 Calculus 2
- MAT 2200 Discrete Mathematics
- MAT 3130 Linear Algebra

**Computer Science (15 hours):**

- CSM I Introduction to C
- CSM II Inside of a Microprocessor
- CSM III Data Structures
- CSM IV Algorithms
- CSM V Product Development

**Concentrations select one of the following (12 hours):**

Concentration 1: Business

- BUS 1010 Foundations of Business
- ACC 2110 Financial Accounting

MGT 2430 Principles of Management  
ISM 4800 ISM Senior Seminar

Concentration 2: Pre-Data Science

MAT 4200 Probability Theory  
MAT 4320 Mathematics Statistics  
MAT 4830 Research in Mathematics  
MAT 4020 Math Senior Seminar

Concentration 3: Application Development

ISM 4800 ISM Senior Seminar

3 Electives from the following LCMC Courses:

CSC I Internet History, Technology and Security

CSC IV Web Development

CSC V Application Development I

CSC VI Application Development II 7922BT/F1 11.04 Tf1 0 0 1 108.02 515.35 Tm0 G(CSC)3( VI Ap)5(p)3(li)3(39-B

NOTE: Course descriptions for BUS, ACC, ISM and MGT can be found in the Department of Business course listings.

CSC and CSM courses are offered via partnership with LCMC and course descriptions can be found [here](#). Additional

fees may apply to partnership programs. For more information, please contact the Director of Partnership

Programs at [statoncg@grace.edu](mailto:statoncg@grace.edu). 41.85 569.14 Tm0 34TJ4500851ply BT/F1 9.96 Tf1a br-5(nfr)13ad Dep( ISi1 72(le)1ry,)9or2th45008

## MATHEMATICS MAJOR



SED 2210 Responsive and Differentiated Instruction  
SED 2400 Teaching Exceptional Learners  
SED 2500 Teaching in a Pluralistic Society  
SED 2600 Teaching and Learning  
SED 3600 Teaching in the Middle and High School Setting  
SED 4650 Methods of Teaching Secondary Mathematics  
SED 4700 The Moral Practitioner  
SED 4900 Student Teaching and Seminar

No minor is required for this major.

NOTE: Course descriptions for SED can be found in the Department of Education course listings. Course descriptions for ISM can be found in the Department of Business course listings.

## APPLIED MATHEMATICS MINOR

The requirement for an applied mathematics minor is 19 credit hours in mathematics.

### Required Courses (6 hours):

MAT 1230/1240 Calculus I and Lab  
MAT 1250 Calculus II  
MAT 2250 Calculus III  
MAT 2280 Differential Equations  
MAT 3130 Linear Algebra

### Electives choose one of the following (3 hours):

MAT 2100 Introduction to Proofs  
MAT 2200 Discrete Mathematics  
MAT 4200 Probability Theory  
MAT 4320 Mathematical Statistics

## MATHEMATICS MINOR

The requirement for a mathematics minor is 19 credit hours in mathematics.

### Required Courses (0 hours):

## MATHEMATICS AND COMPUTING MINOR

The requirement for a mathematics and computing minor is 24 credit hours in mathematics.

### Mathematics and Information System Courses (15 hours):

- MAT 3130 Linear Algebra (requires other math courses as prerequisites)
- CSI 1151 Introduction to Computer Science
- ISM 2150 Object Oriented Programming
- ISM 2700 HTML and Web Development
- ISM 3800 Database Programming

### Partnership Courses with LCMC (9 hours):

- CSC 3030/CSM 1 Introduction to C
- CSC 3150/CSM 1 Data Structures
- CSC 4100/CSM 1 Algorithms

## PHYSICAL SCIENCES PROGRAM

The purpose of the physical sciences program at Grace College is to present the facts and theories of the physical sciences and to provide laboratory experiences which emphasize scientific methods. The department seeks to help the student appreciate the truths of creation as revealed in the physical sciences. The courses are designed for students who desire broad cultural training, for prospective teachers, and for pre-professional students.

### Program Learning Outcomes

1. Students can understand the foundational principles of chemistry.
2. Students can use the principles to solve quantitative/conceptual chemistry-related problems.
3. Students can develop competence in the laboratory by doing experimen81 659.5 Tm0 g0 G(C)-3(o)5(u)4(r)-3(s)-2









**BIO 2020 Anatomy and Physiology I Lab**

The laboratory is designed to support BIO 2010 and must be taken concurrently with the course. This course has a fee for consumables used in its labs.

**BIO 2040 Anatomy and Physiology II**

This course is designed for students pursuing a career in an allied health field (nursing, health and wellness, etc.) This course includes a basic study of the gross and microscopic structure of several major organ systems – endocrine, circulatory, respiratory, digestive, urinary, and reproductive. The other body systems including – integumentary, skeletal, muscular, nervous, and endocrine to be covered in course BIO 2010. Students must enroll concurrently in BIO 2050. Four hours.



course; the intent is that the student completes all 3 courses to fulfill the required 3 credits of practical experience (the shadowed medical practitioners may be in the same profession). Prerequisite: BIO 1610/1620 and BIO 1710/1720, or consent of the instructor. The courses may be taken concurrently. One hour per course.

**BIO2910-2930 Biology Internship**

This course is designed to award college credit to students who participate in a life science internship.

Internship opportunities can range from workin5ITJETQm0BT3u0091 p1To7Qm0BT3u0091 p1To71 0 0 1 238.61 647.5 Tr

**BIO 3320 Advanced Anatomy and Physiology II Lab**

The laboratory is designed to support BIO 3310 and must be taken concurrently with the course. This course has a fee for consumables used in its labs.

**BIO 3710 Pathophysiology**

### **BIO 4810/4830 Research in Biological Science**

A course designed to give the student an opportunity to do individual research on special problems in biology. Prerequisite: BIO 1710 and BIO 2310 or consent of the biology program director. One to three hours. Maximum of six hours permitted.

## **CHEMISTRY**

### **CHM 1010 Introduction to Chemistry**

This course is designed to give the student a broad introduction to general, organic, and biological chemistry. The lecture emphasizes general chemical concepts while the laboratory concentrates on techniques and data handling. Students must enroll concurrently in CHM 1020. Four hours.

### **CHM 1020 Introduction to Chemistry Lab**

Designed to support CHM 1010 and must be taken concurrently with the course. This course has a fee for consumables used in its labs.

### **CHM 1610 General Chemistry I**

This course is designed to investigate all topics normally found within the American Chemistry Society recommended guidelines (i.e., atomic structure, physical measurements, chemical reactions and balancing equations, percent composition, solubility and precipitation, redox chemistry, gas laws, thermochemistry, quantum chemistry, VSEPR theory, molecular orbital theory, unit cells and unit cell calculation, and intermolecular forces) for a first-semester freshmen chemistry course. Students must enroll concurrently in CHM 1620. Four hours.

### **CHM 1620 General Chemistry I Lab**

General Chemistry I Lab investigates many of the concepts discussed in CHM 1610 and re-enforces the student's applied learning. Students must enroll concurrently in CHM 1610. This course has a fee for consumables used in its labs.

### **CHM 1710 General Chemistry II**

This is the second part of a two-semester sequence in general chemistry. This course studies and problem solves topics in solution chemistry, chemical kinetics, chemical equilibria, thermodynamics, acid-base equilibria, electrochemistry, and an introduction to organic chemistry. Prerequisite: CHM 1610/1620. Students must enroll concurrently in CHM 1720. Four hours.

### **CHM 1720 General Chemistry II Lab**

General Chemistry II Lab focuses on the van't Hoff factor and its effect on boiling point elevation, chemical kinetics of a combustion reaction, chemical equilibria and reaction rates, synthesis of biodiesel, electrochemical cells, oxidation-reduction, and testing functional groups of organic compounds. Students must enroll concurrently in CHM 1710. This course has a fee for consumables used in its labs.

### **CHM 2300 Forensic Chemistry**

This is a descriptive course covering the wide spectrum of current forensic chemistry and its application in criminal investigations. Drugs, drugs as physical evidence, seized drugs and their analysis, and selected drug classes are investigated. Drugs in the body, and the chemistry of combustion and arson, explosives, and firearms are also covered. Quantitative reasoning is utilized in the form of scientific units (e.g., dosage) and in oxygen balance calculations (i.e., explosives). Discussion boards and documented case studies re-enforce the material covered. Three hours.



**CHM 2610 Organic Chemistry I**

This is a first part of a two-semester sequence in organic chemistry. Fundamentals of organic chemistry will be studied which include atomic structure, functional groups, acid-base chemistry, chemical nomenclature, alkane conformations (Newman configurations, chair conformations),  $S_N2/S_N1/E2/E1$  reactions and their mechanisms, alkene reactions and mechanisms, radical reactions and their mechanism and general physical and chemical properties of all organic compounds presented herein. Additionally, FT-IR,  $^1H$  NMR and  $^{13}C$  NMR spectroscopy will be investigated along with mass spectrometry. Prerequisite: CHM 1710/1720. Students must enroll concurrently in CHM 2620. Four hours.

**CHM 2620 Organic Chemistry I Lab**

The lab component will cover essential organic chemistry skills that include (but are not limited to) melting point determination, acid-base extraction, aqueous extraction, thin-layer chromatography, FT-IR,  $^1H$  NMR and  $^{13}C$  NMR spectroscopic analysis and synthesis, isolation, purification, and characterization of a complex organic heterocycle. Must be taken concurrently with CHM 2610. This course has a fee for consumables used in its labs.

**CHM 2710 Organic Chemistry II**

This is the second part of a two-part sequence in organic chemistry. Reactions and mechanisms are covered for alcohols, ketones, aldehydes, carboxylic acids, carboxylic acid derivatives, aromatic EAS and NAS reactions, alpha-carbonyl chemistry, and amine chemistry.  $^1H$  and  $^{13}C$  NMR and IR spectroscopy and MS are heavily utilized. Special topics will include amino acid and nucleic acid chemistry. Students must enroll concurrently in CHM 2720. Four hours.

**CHM 2720 Organic Chemistry II Lab**

This lab course will heavily utilize modern synthetic organic chemistry research techniques and practices such as rotary evaporation, Schlenk glassware, vacuum manifold work, TLC and silica purification techniques, and recrystallization. Purified organic compounds will be analyzed by  $^1H$  and  $^{13}C$  NMR and IR spectroscopy using instrument within our department as well as out-sourcing to an external research laboratory. Must be taken concurrently with CHM 2710. This course has a fee.





### **ENV 322~~0~~Aquatic Ecology Lab**

This laboratory is designed to support ENV 3210 and must be taken concurrently with the course. This course has a fee for consumables used in its labs.

### **ENV 341~~0~~Environmental Ethics**

An exploratory study of secular and Christian views of the natural world and humanity's place in it. Special attention on practical application of a Biblical stewardship ethic. Prerequisite: 55 credit hours of coursework. Three hours.

### **ENV 401~~0~~Senior Seminar**

This course is designed as a capstone course for science majors and is meant to teach valuable skills and give experience with tools needed for science careers or post-graduate education. Prerequisites: BIO 1610/1620 and senior class standing, or consent of the instructor. Three hours. (Cross-listed; register as BIO 4010.)

### **ENV 421~~0~~Genetics**

A study of both in-depth, classical genetics and underlying molecular mechanisms, genetic mechanisms and processes, recombination, genetic interaction, and gene regulation. The course includes hands-on laboratory experiments involving current procedures in molecular genetics. Prerequisite: BIO 2310 or consent of the instructor. Three hours. (Cross-listed; register as BIO 4210.) This course has a fee for consumables used in its labs.

### **ENV 481~~0~~4860Field Education**

Research projects or internships to be chosen in the areas of environmental science and outreach in consultation with the instructor. Prerequisite: permission of the environmental science program director. One to six hours.

## **EXERCISE SCIENCE**

### **EXS 100~~0~~Introduction to Exercise Science**

Introduction to Exercise Science is an entry level course that is designed to introduce students to the field of exercise science. This course will prepare students with knowledge and information on related health topics including: the history of exercise science, fitness assessment, nutrition, biology, exercise physiology, biomechanics, physical fitness, career opportunities, and beginning diagnostic tools. Three hours.

### **EXS 105~~0~~Dynamics of Fitness**

This course will investigate major topics in the study of lifestyle management. Topics included are: wellness, physical fitness, nutrition, disease, prevention, stress management, and consumerism. Three hours.

### **EXS 200~~0~~Kinesiology**

This course is designed to guide students in the exploration of human anatomy, functional anatomy, fundamental movements and select movements. This will include an in-depth examination of the musculoskeletal framework through structure, function, and application in sport and exercise. Three hours.

### **EXS 2130 Principles of Coaching**

This course is focused on providing a practical guide to coaching. The fundamentals needed to build a successful sport, personal training or team/group experience begin with basic principles such as practice planning, team building and program development. This class provides instruction to assist the student in possessing the skills to lead and coach individuals in their specific field. Three hours. Offered every other year.

### **EXS 2150 Practicum in Exercise Science**

A practical experience rotation in real-world settings. Students observe exercise science professionals in their prospective fields, and work on interpersonal skills at rotation settings. Pre-requisite: EXS 1000. Two hours.

### **EXS 220 Care and Prevention**

Designed to provide information needed to manage the care of athletic injuries—from prevention, identification and assessment of injuries to interaction with players, parents and physicians. Geared toward those beginning careers in fitness or coaching, equipping them for management and implementation of injury and emergency situations. Prerequisites: EXS 2000 or BIO 1710/1720 or BIO 3210/3220. Three hours. This course has a fee for consumables used in its labs.

### **EXS 2300 Nutrition for Life Cycles**

Nutrient requirements and anthropometric aspects of nutrition for the following life stages: prenatal, pregnancy, lactation, infancy, childhood, adolescence, adult, and late adulthood. Exploration of the influences on the diet of each life cycle, including physiological, psychological, sociological, and cultural factors. Pre-requisite: CHM 1010/1020. Three hours.

### **EXS 2500 Group Fitness Instruction**

This course prepares students with skill and practice for group fitness instruction. The fundamentals needed to build a successful fitness class that engages the individual as well as the group. Students will begin building basic principles such as class planning, program development, and strategies for modifications or progression of clients. This class positions students for certification in group fitness instruction. Three hours. Offered every other year.

### **EXS 300 Strength and Conditioning**

Principles of strength and conditioning draws students into a creative design and implementation of exercise for various areas of the body. A large majority of students pursuing careers dealing with exercise will encounter prescription weight training and physical conditioning. This course specifically addresses form, function, and programming for the upcoming fitness professional. Prerequisite: EXS 2000. Three hours.

### **EXS 3200 Nutrition for Sports Performance**

Supporting and advancing athletic performance through nutritional strategies and therapies. Exploring specific nutritional needs among a variety of sports, as well as proper recovery methods and diet planning for optimizing body composition, speed, explosive and endurance-based performances. Examination of the risks and benefits of ergogenic supplements found in fitness and details concerning the effects of eating disorders. Students will frequently practice planning and strategizing diet and recovery methods for various sports and athlete profiles. Prerequisite: BIO 2210. Three hours.

### **EXS3280 Nutrition for Health and Disease**

This course examines the biochemical relationship between food and chronic illness and introduces the use of nutrition as an intervention for pathological conditions, encompassing the complex relationship between nutrients and human cells. Additional focus includes the human microbiome, as well as nutrigenetics – how personal genetics impact nutrient uptake and utilization – and nutrigenomics – how food components impact genetic expression. Prerequisites: BIO 2210 and CHM 1010/1020. Three hours.

### **EXS3240 Diet Planning and Counseling**

This course evaluates current methodologies and professional techniques used to assess an individual's nutritional status, lifestyle, and diet planning abilities. Students explore the utilization of nutritionally therapeutic interventions for disease prevention, counseling techniques for client support, building counselor-client rapport, and proper diet care documentation. Laboratory experience will provide numerous hands-on assessment opportunities and planning experiences. Prerequisite: EXS 3280. Three hours.

### **EXS3300 Special Topics in Fitness**

This course addresses the wide variety of fitness trends rapidly entering the fitness market space. In a hands-on learning approach, students will learn to engage, experiment, and practice these fitness topics with guidance, empowering students to incorporate different trends and topics into their repertoire as fitness professionals. Three hours. Offered every other year.

### **EXS 360 Fitness Assessment**

This course prepares students to understand the fundamentals of proper fitness assessment and development of prescriptive exercise. The focus of the course is placed on assessment methodology, developing skills with modern test equipment, and incorporating collected data into exercise programs. Prerequisite: BIO 1710/1720. Three hours.

**EXS 4840 Research in Exercise Science**

A course designed to give the student an opportunity to do individual research on a topic of interest in Exercise Science. Prerequisites: EXS 1000 and EXS 2150. Two hours.

**EXS 4930 Internship in Exercise Science**

The internship includes activity in a work environment, allowing the student to experience a hands-on opportunity to apply the skills and principles learned in class to a real-world, professional setting. Three hours of credit is given and is equivalent to approximately 120 hours in the work-place (or 40 work hours per credit hour). Prerequisites: EXS 1000 and EXS 2150. Three hours.

**MATHEMATICS**

**MAT 1110**Mathematics for Elementary School Teachers

**MAT 2100 Introduction to Proofs**

This course is an introductory course on proofs and emphasizes logic, set theory and proof techniques. Theorems will be taken from topics including set theory, number theory and real analysis. Three hours.

**MAT 2220 Discrete Mathematics**

This course is an introduction to discrete mathematics, including combinatorics and graph theory. Topics covered include graph coloring, trees and searching, network flows, network algorithms and complexity analysis, recurrence relations, functions and relations, generating functions, set theory, and probability. An emphasis will be on proof by induction. Prerequisite: MAT 2100. Three hours.

**MAT 2250 Calculus III**



mathematics is a non-repeatable class. Prerequisites: MAT 2250, availability of professor, and permission of the mathematics program director. Three hours.

**MAT 4020 Senior Seminar in Mathematics**

This is a capstone course for mathematics and mathematics education majors. This course will cover several topics that draw together the various mathematical disciplines, and will portray the global perspective of mainstream mathematics. This course may meet in conjunction with other capstone courses within the science division for a portion of the semester. Prerequisites: declared mathematics or mathematics education major; and MAT 2250. Three hours.

**MAT 4120 Interest Theory**

In this course we learn the concepts of financial mathematics, including simple, compound an



**PHY 2270 University Physics II Lab**

Designed to support PHY 2260 and must be taken concurrently with the course. This course has a fee for consumables used in its labs.

**PHY 48104830 Research in Physics**

Designed for research on a topic of interest. One to three hours.

**GENERAL SCIENCE**

**SCI 1140 Physical Science Survey**

Activities and lectures will cover motion, energy, gravity, light, radiation, earth materials, and space. Three hours.

**SCI 1160 Theories on Origins**

A survey of origin theories with emphasis on creation/evolution. Explores fossils, design, thermodynamics, chronology, flood geology, life in space, and current creation research. Three hours.

**SCI 2030 Faith, Science, and Reason**

Faith, Science, and Reason is designed to assist the student in demonstrating the scope and magnitude of science and mathematics: why we study these subjects; knowing the limitations of these subjects; where the Christian fits and operates within the scientific paradigm; how a Christian can incorporate their faith and reason within the scientific enterprise; and how to use it as a productive platform when communicating to those of different worldviews. Three hours.

**SCI 39103930 Independent Study in Physical Science**

Topics or projects to be chosen and investigated in the areas of physical science in consultation with the individual instructor. Prerequisite: permission of the physical science program director. One to three hours; non-repeatable.