Biology and Physical Education

Professors Barnard and Howard; Associate Professor Page (Chair), Hinkle and Wuorinen; Assistant Professor Doczi; Lecturers Kunkel and Roberge.

Curricula

Biology and Physical Education curricula offer students the opportunity to study the structure and function of living systems, from the complexity of cellular components to whole organism dynamics to ecosystem design.

Bachelor of Science in Biology

The Bachelor of Science in Biology prepares students for admission into graduate, medical, optometry, dentistry, and veterinary medical schools, as well as for immediate employment in the areas of environmental science, biotechnology, and teaching. Recent graduates are engaged in all of these areas. A core curriculum of science, mathematics and English courses ensures development of appropriate analytical and communication skills. Rounding out the major, seven free biology electives and 10 totally free electives allow students to mold their programs to meet specific career goals and develop one or more minors and/or double majors. A special Pre-medical Committee oversees our Pre-medical/Pre-dental track and assists in the placement of our graduates. Anyone interested in teaching biology can build in an education minor, including student teaching, to meet all criteria necessary for licensure.

Bachelor of Science in Physical Education

The Bachelor of Science in Physical Education prepares students for immediate employment or graduate work in the areas of physical education, coaching, and/or working in health centers and recreation facilities. Future physical educators will develop knowledge, skills, disciplinary concepts and instructional strategies through reflection and practice. Partnerships have been established with Barre Town Elementary School for grades K-8 and Union 32 Jr-Sr High School for grades 7-12, so that students can be exposed to hands-on learning. Students become reflective practitioners by critically analyzing the actions of role models and the reactions of learners. Physical Education majors are provided with the opportunity to fulfill all instructional, assessment and organizational competencies for licensure in Vermont with an endorsement for teaching Physical Education for grades K-12. An additional licensure endorsement is available for Health Education as well. PRAXIS I and PRAXIS II examinations are required for all teacher licensure candidates. Vermont licensure is reciprocal in most other states, especially in the eastern United States. The physical education program includes the opportunity to a minor in biology as part of its science core.

Biology

Biology is the scientific discipline that investigates life in all of its forms. An appreciation of the complexity of structure and function requires the use of a variety of teaching tools, including the use of living and preserved organisms. Consequently, both living and preserved organisms will be ethically and humanely employed whenever appropriate to further student understanding and appreciation for life.

B. S. in Biology – Curriculum Map

First Year

Fall	Credits	Spring	Credits
BI 101 Principles of Biology I	4	BI 102 Principles of Biology II	4
CH 103 General Chemistry I	4	CH 104 General Chemistry II	4
MA 107 Precalculus Mathematics	4	MA 108 Applied Calculus	4
EN 101 Composition and Literature I	3	EN 102 Composition and Literature II	3
	15		**15**

Second Year

Fall	Credits	Spring	Credits
BI 202 Genetics	4	BI Elective	4
CH 225 Organic Chemistry I	4	CH 226 Organic Chemistry II	4
EN 201 World Literature I	3	EN 202 World Literature II	3
BI 203 Introduction to Scientific Method & Bioscientific Terminology	1	Free Elective	3
Free Elective	3		
	15		**14**

Third Year

Fall	Credits	Spring	Credits
BI Elective	4	BI Elective	4
PS 201 General Physics I	4	PS 202 General Physics II	4
History Elective[1]	3	Humanities Elective[2]	3
Free Elective	3	Ethics (BI 303, BI 323, BI 350)	3
Free Elective	3	Free Elective	3
	17		**17**

Fourth Year

Fall	Credits	Spring	Credits
BI Elective	4	BI Elective	4
BI Elective	4	BI Elective	4
BI 401 Senior Seminar	3	Social Science Elective[3]	3
Free Elective	3	Free Elective	3
	14		**14**

Total Credits: 121

1 History Elective = any History Department course (HI) except HI 209.

2 Humanities Elective = EN (above EN 206, excluding EN 240-EN 242); FA, MU 101; CM 109, CM 261, CM 335, CM 436; Modern Language (above 112); or PH.

3 Social Science Elective = any PY, SO, EC or PO course.

- Biology electives must include at least one course from the following areas: anatomy (A), physiology (P), systematics (S), and field biology (F). [A single course can satisfy only one requirement.]
- Every biology major must take at least one botany (B) and one zoology (Z) course.
- All biology courses to be used toward major degree requirements must be passed with a "C" or better.

Pre-medical/Pre-dental Track

The following courses are recommended as biology electives or free electives within the B.S. program for students interested in the Pre-medical/Pre-dental Track:

BI 201	Comparative Vertebrate Anatomy	4
BI 220	Introductory Microbiology	4
BI 301	Histology	4
or BI 302	Embryology	
BI 304	Physiology	4
BI 306	Cell Biology	4
BI 330	Immunology	4
BI 405	Ecology	4
CH 324	Biochemistry I	4
PY 211	Introduction to Psychology	3
PY 212	Abnormal Psychology	3

A Premedical Advisor is available within the department to help you in your decision making and guide you through the application process. Similar help is available for students wishing to pursue graduate studies in other areas of biology.

B.S. in Physical Education

Physical Education Teacher Education – Curriculum Map

First Year

Fall	Credits	Spring	Credits
EN 101 Composition and Literature I	3	EN 102 Composition and Literature II	3
Math Elective[1]	3	PY 220 Developmental Psychology or 324 Adolescent Psychology	3
BI 101 Principles of Biology I	4	PE 265 Lifelong Motor Development	3
PE 161 Physical Fitness & Wellness Assessment	3	BI/CH/GL/PS Elective	4
PY 211 Introduction to Psychology	3	PE 107 Foundations of Physical Education	3
	16		**16**

Second Year

Fall	Credits	Spring	Credits
PE 260 Personal and Community Health	3	BI 253 Foods and Nutrition	4
PE 304 Motor Development Activities I	4	PE 305 Motor Development Activities II	4
PE 341 Instructional Strategies for Physical Education in Elementary School	4	PE 342 Instructional Strategies for Physical Education in Middle-Secondary School	4
BI 215 Human Anatomy and Physiology	4	BI 216 Human Anatomy and Physiology	4
MA 232 Elementary Statistics	3		
	18		**16**

Third Year

Fall	Credits	Spring	Credits
PE 355 Coaching:Leadership in Sports	3	PE 371 Physiology of Exercise	4
PE 365 Kinesiology	4	PE 373 Activities and Programs for the Disabled and Aging	3
Literature Elective[2]	3	PE 432 Organization and Administration in Physical Education	3
PE 306 Outdoor Physical Education I	3	PE 307 Outdoor Physical Education II	3
History Elective[3]	3	Humanities Elective[4]	3
	16		**16**

Fourth Year

Fall	Credits	Spring	Credits
SM 136 Emergency Care, Injury/ Illness	3	ED 425 Student Teaching or PE 426 Internship[5]	6-12
PE 406 Readings in Physical Education	3	Free Elective	3-4
Biology Elective (BI 200+)	4		
Humanities Elective[4]	3		
Free Elective	3-6		
	16-19		**9-16**

Total Credits: 123-133

1 MA 005 and MA 103 do not count as requirements (free electives only), must use one free elective for an IS course.

2 Literature Elective = must meet General Education literature requirement.

3 History Elective = any History Department course (HI) except HI 209.

4 Humanities Elective = EN (above EN 206, excluding EN 240-EN 242); FA; MU 101; CM 109, CM 261, CM 335, CM 436; CN; Modern Language (above 112); or Philosophy (SO 214).

5 To be eligible for ED 425 PETE students must have a 3.0 GPA and have passed Praxis II.

Students seeking PETE should have passed Praxis I or SAT equivalent and GPA > 2.75 by the end of the second year.

- **All Physical Education courses must be passed with a grade of "C" or better.**
- BI 102 must be completed for the Biology minor.
- All sciences must be taken as lab sciences (4 credit courses).
- Either PE 365 or PE 371 can count for Biology minor.
- **Certification in First Aid & CPR is required for graduation.**
- ROTC coursework requires additional content each semester, senior year being optional.

Minor in Biology

All courses must be passed with a "C" or better.

BI 101	Principles of Biology I	4
BI 102	Principles of Biology II	4

4 additional BI 200+ courses (of three or four credits), three of which must be 4-credit laboratory courses [1]	12-16
Total Credits	20-24

[1] PE 365, PE 371, or CH 324 may be used as a substitute for one BI 200+ course toward the minor.

Minor in Neuroscience

[A concentration for Biology and Psychology majors.]

All courses must be passed with a “C” or better.

The minor is designed to give students the opportunity to explore this emerging field and prepare them for graduate programs and potential careers in the Neurosciences.

Required Courses:		15
BI 215	Human Anatomy and Physiology	4
BI 370	Introduction to Neuroscience	4
PY 230	Biopsychology	3
PY 344	Cognition	4
One additional biology course: [1]		4
BI 302	Embryology	4
or BI 304	Physiology	
One additional psychology course: [1]		3-4
PY 212	Abnormal Psychology	3
PY 220	Developmental Psychology	3
PY 263	Perception	3
PY 352	Learning and Memory	4
Total Credits		22-23

[1] Students may also choose the following two chemistry courses: CH 324, CH 325, in lieu of the additional biology/psychology courses, however this option requires these additional prerequisites: CH 103-CH 104, and either CH 205, CH 226 or concurrent enrollment in CH 226.

Minor in Physical Education: Coaching

Physical Education majors can declare a Concentration in Coaching.

The concentration or minor is designed to meet proposed national standards preparation in coaching for elementary through high school level. The primary goals are to teach coaching fundamentals, injury prevention, health awareness, motor skill development, adolescent behavior, and youth leadership skills. The following courses are required:

All courses must be passed with a grade of "C" or better.

PE 161	Physical Fitness & Wellness Assessment	3
PE 305	Motor Development Activities II	4
PE 355	Coaching:Leadership in Sports	3
PE 432	Organization and Administration in Physical Education	3
Two courses from the following list:		7-8
PE 304	Motor Development Activities I	4
PE 341	Instructional Strategies for Physical Education in Elementary School	4
PE 342	Instructional Strategies for Physical Education in Middle-Secondary School	4
PE 371	Physiology of Exercise	4
SM 220	Care and Prevention of Athletic Injuries	4
PY 324	Adolescent Psychology	3-4
Total Credits		20-21

Minor in Physical Education: Health

Physical Education majors can declare a Concentration in Health.

This concentration or minor is designed to add depth and breadth to a student’s education in health and wellness, develop healthy lifelong patterns, and increase the marketability of graduates. Students must complete:

All courses must be passed with a grade of "C" or better.

PE 161	Physical Fitness & Wellness Assessment	3
PE 260	Personal and Community Health	3
BI 253	Foods and Nutrition	4
Select three of the following:		9-12
BI 220	Introductory Microbiology	4
BI 240	Environmental and Food Microbiology	4
BI 330	Immunology	4
BI 364	Pathophysiology in Sports Medicine	4
PE 261	Foundations in Health Education	4
PE 365	Kinesiology	4
PE 371	Physiology of Exercise	4
SM 220	Care and Prevention of Athletic Injuries	4
SO 320	Drugs and Society	3
PY 211	Introduction to Psychology	3
PY 220	Developmental Psychology	3
PY 324	Adolescent Psychology	3-4
Total Credits		19-22

Licensure in Health Education

Physical Education majors seeking **Licensure in Health Education** must take:

PE 161	Physical Fitness & Wellness Assessment	3
PE 260	Personal and Community Health	3
PE 261	Foundations in Health Education	4
BI 253	Foods and Nutrition	4
SO 320	Drugs and Society	3
Total Credits		17

All courses must be passed with a grade of "C" or better. At this time, health licensure can be achieved through the Vermont Department of

Education upon licensure in Physical Education, 60 hours of practicum experience, and transcript review.

Biology Courses

BI 101. Principles of Biology I. 4 Credits.
This course is the prerequisite for all biology courses and satisfies general education laboratory science requirements for both majors and non-majors. This course gives an introduction to biochemistry, cell structure, metabolism, and protein synthesis, as well as human anatomy and physiology. Dissection of living and preserved animals is required. Classroom 3 hours, laboratory 2 hours. Offered fall and spring semesters.

BI 102. Principles of Biology II. 4 Credits.
This course is a prerequisite for most biology courses and satisfies general education laboratory science requirements for both majors and non-majors. This course explores genetics, evolutionary theory, diversity of life on earth, history of life on earth, and ecology. Dissection of preserved animals is required. Classroom 3 hours, laboratory 2 hours. Prerequisite: BI 101 or permission of the instructor. Offered spring semesters.

BI 201. Comparative Vertebrate Anatomy. 4 Credits.
A study of the origins, structure and functions of the organ systems of representative vertebrates. An attempt is made to correlate form and function in the evolution of the vertebrates. Classroom 3 hours, laboratory 3 hours. Prerequisites: BI 101, BI 102. Offered fall semesters of odd numbered years.

BI 202. Genetics. 4 Credits.
The physical and chemical basis of inheritance, expression, and interaction of the hereditary units, linkage, and variation. The application of Mendelian principles to plants and animals. Consideration is also given to microbial and viral genetics and genetic engineering. Classroom 3 hours, laboratory 2 hours. Prerequisites: BI 101, BI 102. Offered fall semesters.

BI 203. Introduction to Scientific Method & Bioscientific Terminology. 1 Credit.
An introduction to the philosophy of science, the scientific method and bioscientific terminology. Analysis of data and interpretation of scientific and science-related popular press articles is stressed. Includes exposure to various forms of scientific communication and data collection and analysis. Prepares the student for the rigors of majoring in the biological sciences. Classroom 1 hour. Prerequisites: Sophomore standing, major in Biology.

BI 215. Human Anatomy and Physiology. 4 Credits.
This is the first half of a two semester course exploring human anatomy and physiology. It covers cellular metabolism, tissues, and the following body systems: skeletal, muscle, coetaneous, and nervous. Dissection of preserved animals is required. Classroom 3 hours, laboratory 2 hours. Prerequisite: BI 101 or permission of the instructor. Offered fall semesters.

BI 216. Human Anatomy and Physiology. 4 Credits.
This is the second half of a two semester course exploring human anatomy and physiology. It investigates the following body systems: endocrine, digestive, respiratory, circulatory, lymphatic (including the immune response), urinary, and reproductive. Dissection of preserved animals is required. Classroom 3 hours, laboratory 2 hours. Prerequisite: BI 215 or permission of the instructor. Offered spring semesters.

BI 220. Introductory Microbiology. 4 Credits.
A survey of the field of microbiology with emphasis on those microorganisms of medical significance. Fundamentals of microbial structure, physiology and control are considered along with the role of pathogenic organisms in the infectious and disease processes. Laboratory exercises are designed to provide facility in visualizing, staining, culturing, enumerating, isolating, maintaining, and identifying micro organisms. Classroom 3 hours, laboratory 2 hours. Prerequisite: BI 101 or permission of the instructor. Offered spring semesters.

BI 240. Environmental and Food Microbiology. 4 Credits.
A course designed to develop an awareness of the essential role of microbes in maintaining the biosphere and the quality of life of its human inhabitants. The role of microorganisms as degraders, bioremediators and recyclers of essential elements will be presented and reinforced through laboratory exercises. The dependence of humans on microorganisms for health, food transformation, pharmaceutical production and genetic engineering will be explored in lecture and lab. Controversies surrounding the use of biotechnology to produce genetically engineered foods and animals as well as agents for bioterrorism, will be discussed. Classroom 3 hours, laboratory 2 hours. Prerequisites: BI 101, BI 102 or permission of the instructor. Offered even-numbered fall semesters.

BI 253. Foods and Nutrition. 4 Credits.
A course designed to provide the student with a background in organizational structure and activities that emphasize the physiological basis of nutrition with an analysis of nutritional needs at various age levels. Consideration given to the relationship of nutrition to health and fitness, principles of food selection, metabolism of nutrients, vitamins and minerals, energy balance and obesity, food safety and technology. Classroom 3 hours, Field Experience/Laboratory 2 hours. Prerequisite: BI 101. Offered spring semesters.

BI 260. Orinthology. 4 Credits.
A survey of avian biology and ecology to include evolution, the anatomical and physiological adaptations for flight, migration, behavior, reproduction and identification of birds and their songs. Integrated classroom, laboratory, and field studies will emphasize Vermont birds. Dissection of the pigeon during the spring semester is an integral part of the spring course's laboratory component. The summer course features a nesting study in lieu of dissection. Classroom 3 hours, laroratory 2 hours. Offered spring semesters.

BI 275. Environmental Biology. 4 Credits.
An introduction to the interaction of man and the environment with emphasis on contemporary problems and their possible solutions. Local and global forms of pollution, detrimental environmental practices, and other relationships will be explored in the classroom and the laboratory. Classroom 3 hours, laboratory 2 hours. Prerequisities: BI 101, BI 102 or permission of the instructor. Offered even-numbered spring semesters.

BI 301. Histology. 4 Credits.
A study of the cellular anatomy of the fundamental tissues and organs. May require dissection of living and preserved animals. Classroom, 3 hours, laboratory 2 hours. Prerequisite: BI 101, BI 102 or permission of instructor. Offered even-numbered fall semesters.

BI 302. Embryology. 4 Credits.
A study of the fundamental principles of development through the establishment of the major organs and systems, exemplified in the laboratory by study of representative embryonic forms. May require dissection of living and preserved animals. Classroom 3 hours, laboratory 2 hours. Prerequisite: BI 101, BI 102 or permission of instructor. Offered even-numbered spring semesters.

BI 304. Physiology. 4 Credits.
A study of the comparative physiology of animals. Physical and chemical principles, cell physiology, with emphasis on homeostatic mechanisms and the study of functions of organ systems. May require dissection of living animals. Classroom 3 hours, laboratory 3 hours. Prerequisites: BI 101, BI 102, and 1 year of college chemistry. Offered even-numbered spring semesters.

BI 305. Modern Laboratory Procedures. 4 Credits.
Students are familiarized with the theories and applications of the new technologies that pervade the fields of biotechnology and molecular biology. Laboratory exercises illustrate key concepts and provide hands-on experience in the use of instrumentation essential to modern biologists. Classroom 2 hours, laboratory 4 hours. Prerequisites: BI 101, BI 102 or BI 215, BI 216, and CH 103, CH 104. Offered odd-numbered fall semesters.

BI 306. Cell Biology. 4 Credits.
A molecular level examination of the ultrastructure and function of the cytoplasm, intracellular components, cell membrane, extracellular structures and formation, and excretion of extracellular products. Recent developments in molecular biology will be stressed, including the implications for the biotechnology industry. The laboratory component will include state-of-the-art procedures and will emphasize hands-on experimental techniques. May require dissection of living animals. Classroom 3 hours, laboratory 3 hours. Prerequisites: BI 101, BI 102 and one year of college chemistry. Offered even-numbered fall semesters.

BI 316. Plant Taxonomy. 4 Credits.
A general survey of the taxonomy and evolution of vascular plants, emphasizing herbaceous plants. Recognition of plant families, identification of species, and principles of collecting and preserving are stressed. Classroom 3 hours, laboratory 3 hours. Prerequisite: BI 102 or permission of instructor. Offered even-numbered fall semesters.

BI 325. Invertebrate Zoology. 4 Credits.
A fundamental course designed to give the student a general knowledge of the structure, physiology, life histories, and ecology of the invertebrate animals. Requires dissection of living and preserved animals. Classroom 3 hours, laboratory 2 hours. Prerequisites: BI 101, BI 102. Offered even-numbered fall semesters.

BI 326. Natural History of the Vertebrates. 4 Credits.
A study of the classification, identification, and ecology of the vertebrates with special emphasis on the local fauna. Collection and preservation of organisms is an integral part of the course. Classroom 3 hours, laboratory 3 hours. Prerequisites: BI 101, BI 102. Offered odd-numbered fall semesters.

BI 330. Immunology. 4 Credits.
A course presenting the basic principles of immunology, including antigen-antibody characteristics, the role of the immune system in defense and disease, and the application of fundamental concepts in the development of new technologies and immunodiagnosis. Classroom 3 hours, laboratory 3 hours. Prerequisites: BI 101, BI 102 or BI 215, BI 216, and 1 year of college chemistry. Offered odd-numbered spring semesters.

BI 341. Plant Anatomy. 4 Credits.
[CAB1 (A), CAB2 (B), CAB5 (S)] The anatomy of vascular plants analyzed from an evolutionary viewpoint. Cell structure, tissues, their distribution in roots, stems, leaves and reproductive organs, and plant development are stressed. Classroom 3 hours, laboratory 3 hours. Prerequisite: BI 102 or permission of instructor. Offered odd-numbered spring semesters.

BI 351. Dendrology and Silvics. 4 Credits.
An introduction to major woody plant species in the Northeast, including taxonomic characteristics, life histories, habitat requirements, and economic importance. Classroom 3 hours, laboratory and/or field work 3 hours. Prerequisite: BI 102 or permission of instructor. Offered odd-numbered fall semesters.

BI 360. Pathophysiology. 3 Credits.
The study of human illness with primary emphasis on the pathogenesis of disease, its disruption of normal physiology, and the body's mechanism for restoring the steady state. The biology of the disease process is examined at the molecular, cellular, tissue, organ, and organ system level. Classroom 3 hours. Prerequisites: minimum "C" grade in BI 215, BI 216 or permission of instructor. Offered fall semesters.

BI 364. Pathophysiology in Sports Medicine. 4 Credits.
The study of human pathology with primary emphasis on the pathogenesis of those pathological states most commonly encountered in sports medicine, their disruption of normal physiology and the body's mechanism for restoring the steady state (homeostasis). The biology of the disease process is examined at the molecular, cellular, tissue, organ and organ system level. Classroom 3 hours, laboratory 2 hours. Prerequisites: BI 215 & BI 216 with "C" or higher, or permission of instructor. Offered even-numbered spring semesters.

BI 370. Introduction to Neuroscience. 4 Credits.
An interdisciplinary course designed to introduce the structure and function of the mammalian nervous system. Topics include, but are not limited to, neuronal development, sensory and motor systems, chemical control of the brain and behavior, and the underlying mechanisms of neurodegenerative disease. May require dissection of living animals. Classroom 3 hours, laboratory 2 hours. Prerequisites: BI 101 and either BI 215 or PY 230. Offered fall semesters.

BI 401. Senior Seminar. 3 Credits.
This is the capstone course that integrates reading, writing, speaking and critical thinking skills. It includes instruction in scientific writing, use of contemporary scientific biological literature, library research techniques, and requires a major paper considering ethics in science and research. Students will prepare research papers on current topics using primary sources and give oral presentations on their topics to the department faculty. Classroom 3 hours. Prerequisites: senior class standing or permission of the instructor. Offered fall semesters.

BI 402. Evolution. 4 Credits.
This course is designed to introduce the student to Darwinian and Non-Darwinian mechanisms of evolutionary change, a history of life in the context of contemporary biology, and scientific and cultural controversies surrounding this topic. Offered Fall semesters. Classroom: 4 hours. Prerequisites - BI 101, BI 102 and BI 202 or permission of the instructor. This class can fulfill the CAB1 (anatomy) or CAB5 (systematic) requirements.

BI 405. Ecology. 4 Credits.
The interrelationships between living organisms and their total environment are studied through a combination of lecture, laboratory and field studies. Major concepts include ecosystem structure and function, community development, species diversity, succession, interspecific and intraspecific relationships, competition, predation, behavior, population growth and regulation. Collection and preservation of plants and animals may be required. Classroom 3 hours. If taken for four credits also laboratory and/or field work 3 hours. Prerequisites: BI 101, BI 102. Offered fall and spring semesters.

BI 418. Medical Microbiology. 4 Credits.
A study of pathogenic microorganisms including their general characteristics, physiology, pathogenesis, pathology, diagnosis, treatment, immunity, prevention, and control. Laboratory exercises are designed to familiarize students with diagnostic procedures used in the clinical microbiology laboratory. Classroom 2 hours, laboratory 4 hours. Prerequisite: BI 220 or BI 240. Offered even-numbered spring semesters.

BI 424. Woodland Ecology and Management. 4 Credits.
A review of biotic and abiotic factors controlling the forest environment, methods for determining vegetation structure and succession, introduction to major forest associations in the Northeast, and consequences of various harvesting and management techniques. Classroom 3 hours, field studies 3 hours. Prerequisites: BI 351 or BI 316, or permission of instructor. Offered even-numbered spring semesters.

BI 440. Reading and Research. 3,4 Credits.
Independent study under the supervision of a department faculty member. Open to junior and senior majors with permission of instructor. BI 440 may be taken no more than twice, for a maximum of 7 credits. Students requesting this course must have a 3.0 GPA in biology courses or departmental approval. An approved topic, a brief outline of the research to be conducted, and a signature from a biology mentor must be submitted to the department chair before the end of the drop-add period of the enrolled semester.

BI 450. Intership in Biology. 3,4 Credits.
Intership in Biology.

BI 499. Evolution. 4 Credits.

Physical Education Courses

PE 107. Foundations of Physical Education. 3 Credits.
A course designed to provide students with an introduction to the professional aspects of the physical education profession. Includes historical and philosophical implications with emphasis on modern trends in program design. Acquaints students with professional organizations and reviews career possibilities in the field.

PE 161. Physical Fitness & Wellness Assessment. 3 Credits.
Introduces the student to the theory and practice of teaching physical fitness activities. A personalized assessment is conducted of health-related fitness and wellness components. Based on the evluation results and individual interests, an exercise program is designed by each participant, which she/he is expected to revise and update during her/his professional preparation at Norwich University. Individualized excercise program prescriptions may include aerobics, cycling, jogging, lap swimming, walking, yoga, or weight training. Professional ethics, client privacy, and liability issues are stressed throughout the program.

PE 199. Phys Ed Topics;. 4 Credits.

PE 260. Personal and Community Health. 3 Credits.
A course that emphasizes principles, problems, and procedures concerned with the improvement of individual and community health. Consideration is given to the nature of communicable diseases and the preventative measures used in schools and community. Health information protection and client privacy are stressed as an integral part of the community health care provider's professional ethics.

PE 261. Foundations in Health Education. 4 Credits.
This course will teach historical development, professional standards, philosophy and program planning, including current best practices in the development, implementation and evaluation of health education programs. It will focus on developing personal and social health skills, including decision making, interpersonal communication, goal setting and self managment skills. In addition, this course will integrate teaching students media literacy, personal advocacy, and how to access valid health information, products and services and how to teach this to prospective students. Lecture 3 hours: Field Experience 2 hours. Prerequisite: PE260. Offered even-numbered fall semesters.

PE 265. Lifelong Motor Development. 3 Credits.
This course studies the sequential, continuous age-related process whereby movement behavior changes. The class will cover information processing theories, theories of motor learning, effects of practice regimens and feedback and biological changes experienced over a lifetime, which affect motor skill acquisition. Understanding lifespan motor development is important for educators at all levels, special education teachers, physical educators, coaches, and adult fitness leaders.

PE 304. Motor Development Activities I. 4 Credits.
This course teaches students to apply principles of best practice to the development and delivery of appropriate instructional programs in individual and dual activities currently being taught in the public schools (e.g. dance, gymnastics, racket activities, orienteering). Consideration is given to the development of personal performance and skill acquisition in order to more effectively lead practical lessons in school. Students must demonstrate an understanding of, and competence in motor skill acquisition and physical education pedagogy in the context of public school instructional programs.

PE 305. Motor Development Activities II. 4 Credits.
This course teaches students to apply principles of best practice to the development and delivery of appropriate instructional programs in team sport and group activities currently being taught in the public schools (e.g. cooperative/challenge activities, basketball, volleyball, softball, soccer, lacrosse and floor hockey). Consideration is given to the development of personal performance and skill acquisition in order to more effectively lead practical lessons in school. Students must demonstrate an understanding of, and competence in motor skill acquisition and physical education pedagogy in the context of public school instruction programs.

PE 306. Outdoor Physical Education I. 3 Credits.
This course provides students with a comprehensive background in warm weather Outdoor Physical Education. Skills in trip planning, risk management, equipment selection concerning use and care, and group leadership techniques will be covered. This class will prepare students to recognize the assumption of risk, attractive nuisances, negligence, and the standard of care when facilitating an Outdoor Physical Education program. Students will study and practice principles and protocols for administering safe, high-quality outdoor education experiences in activities such as, canoeing, mountain biking, hiking & backpacking, and adventure. Also covered will be topics in animal and wilderness conservation, nutrition, compass use and navigation, and environmental ethics. 3 classroom/field experience hours. Prerequisites: PE 107, PE 161, or permission of instructor. Offered fall semester.

PE 307. Outdoor Physical Education II. 3 Credits.
This course provides students with a comprehensive background in cold weather Outdoor Physical Education. Students will be actively engaged in winter activities. This class will prepare students to conduct classes in outdoor education during the winter in activities such as, snowshoeing, cross-country skiing, and ice skating. Also presented will be, but not limited to, topics in animal and wilderness conservation, nutrition, mountain and cold weather illness and injuries, and snow science, such as avalanche assessment and ice assessment. An emphasis will be placed on preparing individuals to be active in cold weather under winter conditions. 3 classroom/field experience hours. Prerequisites: PE 107, PE 161, or permission by instructor. Offered spring semester.

PE 333. Management Sports Facilities. 3 Credits.

PE 341. Instructional Strategies for Physical Education in Elementary School. 4 Credits.
A course that provides classroom and laboratory experience designed to acquaint the student with basic materials, methods, and principles necessary to meet the educational needs of the elementary school child. Emphasis on curriculum development with consideration given to concepts of movement education and perceptual motor development. Application of movement theory to specific sports skills and activities. Health information protection and student privacy issues are included throughout the course of instruction. Classroom 2 hours, laboratory 3 hours on site at Barre Town Middle, Elementary School.

PE 342. Instructional Strategies for Physical Education in Middle-Secondary School. 4 Credits.
A course that places emphasis on ethics, principles, procedures, and techniques related to teaching health and physical education in the elementary and secondary schools. Methods of organization, types of programs, and content and materials of health and physical education courses. Laboratory experience provided in traditional and new media, self and peer evaluation, and micro teaching. Health information protection and student privacy issues are reinforced throughout this course. Classroom 2 hours, laboratory 3 hours on site at U-32 Jr. - Sr. High School.

PE 355. Coaching:Leadership in Sports. 3 Credits.
A course covering the philosophy, principles, and techniques of coaching individual and team sports. Emphasis on the organization and administration of interscholastic athletics in relation to the achievement of education objectives. Opportunity for youth sport certification.

PE 365. Kinesiology. 4 Credits.
A review of the structure and function of the skeletal and muscular systems with special emphasis on an analysis of human motion as related to human performance. Classroom 3 hours, laboratory 2 hours. Prerequisite: BI215, 216 or permission of the instructor.

PE 371. Physiology of Exercise. 4 Credits.
A review of physiological principles of muscular activity with emphasis on the integration of body systems in the performance of exercise and various athletic activities. Classroom 3 hours, laboratory 2 hours. Prerequisite: BI215, 216 or permission of the instructor.

PE 373. Activities and Programs for the Disabled and Aging. 3 Credits.
A study of activities and programs focused on meeting the needs of special population groups and the aging. Consideration given to teaching methodology and program planning for individuals and groups. Health information protection and client privacy is stressed as it relates to professional ethics and liability.

PE 399. Topics:. 3 Credits.

PE 406. Readings in Physical Education. 3 Credits.
This course examines the current literature on issues facing future professional educators of an ethical, legal or pedagogical nature. Students are expected to think, read, write and speak critically about these professional issues in the physical education discipline. The submission of a professional portfolio is required. Seminar 3 hours.

PE 426. Internship. 6,12 Credits.
A course designed to provide the Physical Education students with an intern-type experience in a professional setting appropriate to their career goals. Prerequisite: satisfactory completion of all courses in the major through the sixth semester. Cross listed as PE/SM. A student may not receive credit for both.

PE 432. Organization and Administration in Physical Education. 3 Credits.
A course that emphasizes the study of administrative principles, functional organization, and supervision in relation to the total physical education program in grades K-12 and to managing sports facilities and sports programs. Major topics include personnel, curriculum, legal liability, intramurals, evaluation, budgeting and risk management.

PE 441. Advanced Exercise Physiology and Prescription. 4 Credits.
This course prepares and qualifies students to work as personal trainers and fitness specialists in corporate fitness and health club facilities. The course bridges the gap between exercise physiology and the practical application skills of personal training. Advanced exercise physiology knowledge is presented to assure new knowledge and exercise techniques are acquired. Students will learn how to design and implement exercise prescriptions for multiple populations and as well as successful goal attainment. Students will be prepared to sit for certification examinations. Three lecture hours per week and two hour laboratory component. Prerequisites: PE 365, 371, or permission of instructor. Offered Fall semesters.

PE 450. Exercise Testing and Electrocardiography. 4 Credits.
This course focuses on the theory and methods of administering exercise stress tests using different modes of exercise and consideration of different populations. Further analysis of information gained from exercise testing, studying deviations from normal, and applications of exercise test information in adult fitness and cardiac rehabilitation programs will be highlighted. Emphasis will be placed on the recognition and interpretation of normal and abnormal resting and exercise ECG monitoring. Three lecture hours per week and two hour laboratory component. Prerequisites: BI 215, 216 and PE 371 or permission of instructor. Offered fall semester.

PE 499. TEST COURSE. 12 Credits.