BACHELOR OF SCIENCE IN EXERCISE SCIENCE

Graduates of this Bachelor of Science degree program are trained to assess, design and implement exercise plans for people who may be healthy or who have been compromised by disease or injury. Employment opportunities include work in medical, private, commercial and sports fitness facilities as well as clinical settings such as cardiac and pulmonary rehabilitation. Other graduates may move on to graduate school, medical school or research careers.

The Program

Graduates of Exercise Science programs are trained to assess, design, and implement exercise plans for groups and individuals who may be healthy or have diseases or injuries. Exercise scientists may evaluate risk factors, conduct assessments, develop appropriate fitness or treatment plans and motivate people toward healthy behaviors in a variety of settings.

SC Courses

SC 101. Introduction to Nutrition. 3 Hours.
This course serves as an introduction to nutritional concepts and to the interconnections of health, nutrition, weight, and physical activity. This course is particularly appropriate for students with no science background.

SC 104. Organismal Biology. 3 Hours.
Organismal Biology is an introductory biology course with an integrated lab, intended primarily for non-science majors. This course enables the student to become aware of their role in the complex biological system in which they live. Students will learn about plant biology, animal biology and microbiology in the context of how these organisms have shaped our current state of biodiversity. Since all organisms grow, develop and subsist within an environment, topics will include how organisms survive in, and interact with other organisms within their ecological community.

SC 105. Headline Science. 3 Hours.
This course explores various contemporary issues in science using an integrative and societal approach. Students will study the topics from a biological, chemical, physical, and environmental perspective, and relate the significance of the scientific matter to their major field of study. This course is intended for non-science majors.

SC 106. Introduction to Exercise Science. 3 Hours.
This is an introductory course to exercise science. Topics for the course include acute and chronic physiological responses to exercise, nutrition, biomechanics, and physical fitness. The course also covers concepts related to health and statistics.

SC 120. Functional Anatomy and Physiology. 3 Hours.
Functional Anatomy and Physiology is a one semester, 3 credit lecture with a separate laboratory course designed to give the non-science major knowledge of the human body and its relationship with the environment. Topics covered include: the chemical basis of life, the anatomy & physiology of all organ systems, growth, development, heredity and biotechnology issues.

SC 131. Human Genetics. 3 Hours.
This course is designed for nonscience majors to support the natural interest of most people in those human physical, behavioral, and social characteristics that have a hereditary basis. Lectures, discussions and the solving of simple genetic and statistical problems are used to form a basis for the consideration of current social issues with genetic implications.

SC 134. Introduction to Geology. 3 Hours.
The course, specifically designed for the Environmental Science majors, introduces fundamentals of geology in the environmental context. The issues of local and global environmental changes are placed into a broader perspective of the functioning of the Earth system. Students are introduced into the science of Earth’s materials: rocks, minerals, soils, and waters and the processes forming them. The internal processes (plate tectonics, earthquakes, volcanoes) and surface processes (streams, flooding, coastal zones, mass movements, glaciers, winds, desertification) are presented from the point of view of their influence on the geologic hazards, and on the distribution of natural resources. The interrelation of geology and human activities is examined in such contexts as waste disposal, air pollution, water contamination, climate change, land degradation, and resource and energy consumption. The format of this course includes one local field trip, lab activities on rocks and minerals identification, and introduction to topographic and geologic maps.

SC 135. Introduction to Meteorology. 3 Hours.
This course provides the student with a basic understanding of weather phenomenon and how weather is predicted. Students will master the terminology of weather prediction; explore the water cycle, and how the sun affects weather. The course will also treat atmospheric circulation, cloud formation and identification and students will learn how to make weather assumptions based on observations of temperature, pressure, humidity, wind direction, and sky cover. Students will also learn how weather data is collected and how forecasters make predictions based on previous and current weather observations.

SC 141. Environmental Science. 3 Hours.
This course is a survey of the important topics in environmental science. Concepts of energy flow and nutrient cycling are explored in the context of human impacts upon these processes. Sources of pollution and their total effect on ecosystem and biosphere function are also explored. Management of material wastes and energy efficiency is an integral theme of the class. This class satisfies the laboratory science requirement with a series on in-class lab experiences and field trips.

SC 142. Conservation Biology. 3 Hours.
This course emphasizes the basic principles of conservation that are applied to utilization and management of natural resources such as soil, water, range lands, forests, wildlife, minerals, and human populations. The study of the interrelationships between living organisms and their environment is known as ecology. This course applies ecological concepts to conservation problems and policies.
SC 145. Environmental Science Field Experience I. 1 Hour.
This course provides students with Environmental Science job experiences on and off campus. These experiences range in length from days to months, but are less rigorous and in-depth than traditional internships. The experience will be composed of time spent with a professional from an Environmental Science profession while working in their area of expertise. Areas of concentration include, but are not limited to: agriculture, compliance, energy systems, environmental monitoring, land use, natural resources management, policy, research, and sustainability. The student should have three experiences in different areas of concentration in order to expose them to a variety of employment experiences in their first two to three years of the Environmental Science program, and assisting the student in determining the focus of the coursework for the last year of their program. Each field experience must be coordinated through, and approved by, the director(s) of the Environmental Science program.

SC 146. Environmental Science Field Experience II. 1 Hour.
This course provides students with Environmental Science job experiences on and off campus. These experiences range in length from days to months, but are less rigorous and in-depth than traditional internships. The experience will be composed of time spent with a professional from an Environmental Science profession while working in their area of expertise. Areas of concentration include, but are not limited to: agriculture, compliance, energy systems, environmental monitoring, land use, natural resources management, policy, research, and sustainability. The student should have three experiences in different areas of concentration in order to expose them to a variety of employment experiences in their first two to three years of the Environmental Science program, and assisting the student in determining the focus of the coursework for the last year of their program. Each field experience must be coordinated through, and approved by, the director(s) of the Environmental Science program.

SC 147. Environmental Science Field Experience III. 1 Hour.
This course provides students with Environmental Science job experiences on and off campus. These experiences range in length from days to months, but are less rigorous and in-depth than traditional internships. The experience will be composed of time spent with a professional from an Environmental Science profession while working in their area of expertise. Areas of concentration include, but are not limited to: agriculture, compliance, energy systems, environmental monitoring, land use, natural resources management, policy, research, and sustainability. The student should have three experiences in different areas of concentration in order to expose them to a variety of employment experiences in their first two to three years of the Environmental Science program, and assisting the student in determining the focus of the coursework for the last year of their program. Each field experience must be coordinated through, and approved by, the director(s) of the Environmental Science program.

SC 150. Astronomy of the Solar System. 3 Hours.
This is an introductory astronomy course with a virtual observing component that is intended to give the students some basic knowledge about the world in which we live. The primary objective of this class is to help the students understand the solar system. The course will present an overview of the night sky, the constellations, light - telescope and the nature of stars and the galaxies but the emphasis will be on understanding our solar system. The Sun, Earth, Moon, planets and their satellites, asteroids and comets will be studied in some detail. No mathematics or physics background is assumed in this course.

SC 151. Conceptual Physics. 3 Hours.
Conceptual Physics is an introductory physics course with an integrated lab, intended primarily for non-science majors. In this course we will study motion, mechanics, gravity, heat, electricity, magnetism, optics, atomic, nuclear and molecular physics, and relativity. We will also learn about the process by which physicists attempt to understand the intriguing laws of nature. The course will be taught using a combination of lectures, classroom demonstrations and laboratory experiments. Understanding of the fundamental concepts rather than number crunching is emphasized in this course and the equations will serve to refine the concepts and facilitate student’s thinking process. Ultimately, it is hoped that by taking this course the student will develop a better appreciation for the natural world.

SC 167. Energy and Society. 3 Hours.
This course examines the basic physical principles underlying various energy technologies and develops the quantitative skills necessary to evaluate these technologies. Students present their work in both written and oral form. The end goal of this course is to help students become citizens that have the requisite background and communication skills to intelligently participate in energy policy discussions and decisions. Topics typically include basic scientific literacy and notation, introductory physics (such as force, work, energy, power), circuit analysis, thermodynamics, various energy technologies (fossil fuels, nuclear power, solar, hydroelectric, etc.), and placing these technologies in a broader environmental, social, and economic context. This course includes an integrated laboratory in order to introduce basic laboratory skills. Prerequisite(s): MS 141 or MS 180 or MS 181 or MS 182.

SC 180. Principles of Gen Chemistry. 3 Hours.
This course explores fundamental quantitative and qualitative principles of inorganic, organic and biological chemistry and provides a basic understanding of theoretical and applied aspects of general chemistry. Topics in inorganic chemistry include measurement, atomic theory and chemical bonding, chemical reactions and mass relationships, kinetic theory and gas laws, acids, bases, pH and buffers. Organic chemistry will provide an overview of the nomenclature, properties and reactivity of major groups of organic compounds, while biochemistry will focus on the chemistry of carbohydrates, lipids, proteins, and enzymes. An overview of biochemical energetics, nucleic acids and protein synthesis is also included.

SC 181. Chemistry I. 3 Hours.
This introduction to chemistry provides a basic understanding of theoretical and practical aspects of inorganic chemistry. The course includes the metric system, chemical elements and symbols, the structure of the atom, chemical bonds, molecules and compounds, and chemical reactions.

SC 182. Chemistry II. 3 Hours.
This course is a continuation of Chemistry I. It focuses on organic chemistry and biochemistry and provides a background for understanding the chemical mechanisms of health and disease. Organic chemistry will emphasize the study of carbon, its special properties, and its compounds. Biochemistry will focus on the chemicals of living organisms, carbohydrates, lipids, proteins, and nucleic acids. Selected physiological topics such as energy metabolism, the genetic code, and protein synthesis are included. Prerequisite(s): SC 181.
SC 190. The Science of Fingerprints. 3 Hours.
This course will allow students to examine every facet of the discipline, from the history of friction ridge identification and its earliest pioneers and researchers, skin growth in the embryo, structure of skin, scarring and histology, the chemistry of sweat and other secretions, to the scientific basis and the various steps of the identification process. The structure and growth of friction skin and how it can leave latent or visible prints are examined, as well as advanced identification methods in ridgeology, including Poroscopy, Edgeoscopy, Pressure Distortion and Complex or Problem Print Analysis. Students will learn how to process porous and non-porous items for friction ridge detail and how to preserve these impressions. Students will take known impressions and practice comparing developed impressions to these known exemplars.

SC 191. General Biology I. 3 Hours.
General Biology I focuses on biological principles that are fundamental to all of biology. This course covers the diversity of life and the commonalities of all living things including: molecular structure, cell structure and function, metabolism, cell division, heredity, and genetics. This course will also review the scientific process and the evaluation of scientific information. This course will prepare students for future courses in anatomy and physiology, cell biology, microbiology, biochemistry, genomic biology, and other biological specialties. This course is limited to students in programs requiring this course or are intending to take further biology courses.

SC 192. General Biology II. 3 Hours.
General Biology II is the continuation of a two-semester series in general biology for science majors. This course is designed to provide a thorough introduction to biology and prepare students for further study of evolution and ecology in SC 240. The goal of the course is to emphasize the diversity of species and for students to understand their relationship to, and their place in, the natural world. General Biology II is an introduction to the systematics, anatomy and physiology of the plant and animal kingdoms. This course will examine the structure and function of plant and animal organ systems in the framework of the evolution of adaptations. The course also concludes with an introduction to ecological systems.

SC 199. Topic/. 1-6 Hour.
This course is intended to provide the opportunity to offer introductory courses in science that would not normally be a part of the Husson curriculum. As such the topics will depend upon the interests of students and faculty.

SC 202. Science Immersion. 3 Hours.
This course emphasizes conservation by providing students an experiential setting that illuminates various aspects of the precarious balance between people’s effect on the environment and the natural order of things. Educational goals focus on the conservation and restoration of our natural heritage so that biodiversity is not depleted.

SC 210. Marine Biology. 3 Hours.
Oceans cover more than 70% of the earth’s surface and support all life on the planet. This course follows an ecological approach to consider the adaptations and interactions of plants and animals with their marine habitats, with particular emphasis on the ecosystems and organisms in the Gulf of Maine. Communities discussed include the open ocean, the deep-sea, subtidal and intertidal zones, and estuaries, as well as habitats found exclusively in tropical and polar regions. Prerequisite(s): SC 191 or SC 192.

SC 221. Anatomy and Physiology I. 3 Hours.
This course provides an in-depth understanding of the structures and functions of the human body and its parts. The course begins with the organization of the human body and descriptive terminology relating to various segments of the body. Cellular anatomy and physiology and study of tissues lead to the study of the organ systems. Topics included in the course are skin, the skeletal system, joints, the nervous system, and muscle.

SC 222. Anatomy and Physiology II. 3 Hours.
This course is a continuation of Anatomy and Physiology I. The course will provide a thorough understanding of structure-function relationships down to the molecular level. The semester will cover the special senses, blood, the cardiovascular system, lymphatics, the respiratory system, the digestive system, the urinary system, the endocrine system, and reproduction. Prerequisite(s): SC 221.  

SC 224. Research Design. 3 Hours.
This course introduces basic concepts and skills needed for understanding and conducting research in the social, educational and health sciences. Students will receive a basic introduction to the fundamentals of research—what it involves, what types exist, and how to design and conduct such research. Examined are the essential terms and concepts of research necessary for students to critically evaluate research literature, develop solid research questions, and plan simple research projects. Active engagement with the research process will occur through class participation, exercises, literature reviews, development of research questions, and creation of inquiry strategies for answering research questions. Prerequisite(s): MS 132.

SC 234. Nutrition. 3 Hours.
This course examines the basic nutritional principles (biological, chemical and regulatory mechanisms); the changing nutritional requirements throughout the life cycle; the relationship between nutrition and disease; the principles of therapeutic nutrition (diet therapy) and the assessment of nutritional status. Prerequisite(s): SC 180 or SC 181.

SC 240. Ecology. 3 Hours.
This course explores the interaction of biotic and abiotic components in functioning ecosystems. It will examine topics in population distribution and dynamics, major terrestrial and aquatic habitats, community interactions such as competition and predation, nutrient cycling, energy flow, and ecosystem succession. The concurrently run lab will train students in identifying local flora and fauna, as well as collection and analysis of field data. Prerequisite(s): SC 191 and SC 192.

SC 241. Microbiology. 3 Hours.
This course provides a broad understanding of both beneficial and harmful microorganisms and their roles in human welfare. Emphasis is placed on the structure, physiology, and control of human pathogens, particularly bacteria and viruses. The lab provides experience in important techniques of culturing, identifying, and controlling microorganisms. Prerequisite(s): SC 104 or SC 191 or SC 221.

SC 242. Biotechnology. 3 Hours.
The current explosion in wonder drugs, diagnostic tests and medical treatments has resulted, primarily, from advances in biotechnology. This course will explore the origins and current status of biotechnology and how it is applied in the world or research, product development, medical diagnosis, disease treatment and law enforcement. This course will primarily focus on those areas of biotechnology that pertain to molecular biology and biochemistry. The laboratory portion of this course will expose students to many of the techniques used in molecular biology/ biotechnology laboratories around the world. Prerequisite(s): SC 102 and SC 103.
SC 251. Astronomy. 3 Hours.
This is an introductory course that will describe, develop and create physical models for many of the observable astronomical events in the sky. The topics may include motion in the night sky, the solar system, light, stars, star groups, the origin of the universe, life in the universe, and UFO’s.

SC 261. Integrated Physical Science I. 3 Hours.
Integrated Physical Science I is the first course in the two semester sequence of Physical Science. The sequence is intended for, but not limited to, students planning career in elementary education. Using physical environment as a theme, principles of chemistry, physics, geology, atmospheric science, and space science are introduced, and reinforced through inquiry-based lab activities and field trips. This first course of the sequence, covers fundamental concepts of chemistry and physics, which include: motion, waves and particles, energy, structure and properties of inorganic and organic matter and their mixtures, interactions of energy and matter, order and equilibrium of physical systems. Prerequisite(s): EH 123 and (MS 111 or MS 141 or MS 180 or MS 181).

SC 262. Integrated Physical Science II. 3 Hours.
Integrated Physical Science II is the second course in the two semester sequence of Physical Science. The sequence is intended for, but not limited to, students planning careers in elementary education. Using environment as a theme, principles of physical sciences are introduced and reinforced through inquiry-based lab activities and field trips. The course covers fundamental concepts of geology, atmospheric science, and space science. Prerequisite(s): SC 261.

SC 271. Physics I. 3 Hours.
Physics I is the first course in a two semester general physics sequence. The goal of this course is to introduce the student to the concepts of force and motion, work and energy, fluids and gases, heat and thermodynamics, and periodic motion. The class meets for three hours each week in lecture and recitation, and two hours each week in the lab. This course assumes no prior background in physics. Prerequisite(s): MS 180 or MS 181.

SC 272. Physics II. 3 Hours.
This course continues the development of the basic physical concepts begun in SC 271. Topics include electricity and magnetism, optics, atomic theory, relativity. Quantum mechanics, nuclear physics, and elementary particles. The class meets for three hours each week in lecture and recitation, and two hours each week in the lab. Prerequisite(s): SC 271.

SC 283. Soil, Air, and Water Chemistry. 3 Hours.
An understanding of the fundamental chemistry implicit in the environment is important, but students must also be familiar with aspects of mineralogy, oceanography, soil science, sedimentology and microbiology. The course emphasizes natural geochemical processes and how they operate over a variety of scales. Topics range from global issues such as atmospheric pollution and its effect on global warming and ozone destruction to the link between microbiological populations and local and global scale nutrient and chemical cycling. The course is designed to introduce the student to that major systems and cycles in the environment and how materials and energy are cycled in these systems. Prerequisite(s): SC 181 and SC 182 and SL 181 and SL 182.

SC 285. University Physics I. 3 Hours.
University Physics I is the first course in a two semester, calculus based university physics sequence. The goal of this course is to introduce students to the concepts of force and motion, work and energy, simple harmonic motion, and waves. The class meets for three hours each week in lecture, two hours each week in recitation, and two hours each week in the lab. This course assumes no prior background in physics. Prerequisite(s): MS 181.

SC 286. University Physics II. 3 Hours.
This course continues the development of the basic physical concepts begun in SC 285. Topics include electricity, magnetism, and optics. The class meets for three hours each week in lecture, two hours each week in recitation, and two hours each week in the lab. Prerequisite(s): MS 181 and SC 285.

SC 291. Cell Biology. 3 Hours.
This course is a detailed exploration of cell structure and function with an emphasis on the cytoplasm and extracellular matrix. Topics in membrane structure, transmembrane transport, vesicle trafficking, cytoskeletal organization, and macromolecular assembly processes are considered. Cell to cell communications and the role of the extracellular matrix in tissue level processes are also explored. Superficial examination is given to the structure and organization of the nucleus, chromosomes and gene expression to prepare students for the companion course entitled Genomic Biology. Prerequisite(s): SC 191.

SC 292. Epidemiology. 3 Hours.
Basic concepts of epidemiology and methods for identification of factors influencing health and disease in human populations. Considerations are centered on physical, biological, psychosocial and cultural factors in relation to infectious and noninfectious diseases; interactions between agent, host, and environmental factors as determinants of health and disease; application of the epidemiologic approach to health services; and retrospective and prospective analysis of morbidity data. Instruction is by lecture, laboratory exercises and seminars.

SC 299. Topic/. 1-6 Hour.
This course is intended to provide the opportunity to offer introductory courses in science that would not normally be a part of the Husson curriculum. As such the topics will depend upon the interests of students and faculty.

SC 312. Adult, Infant, and Child CPR First Aid. 3 Hours.
This is a standard American Heart and American Red Cross course in adult, infant and child emergency care of injuries and CPR. Standard certificate awarded on successful completion of course.

SC 330. Exercise Physiology. 3 Hours.
This course examines changes within the human body due to the effects of acute and chronic exercise. The student is challenged to expand both their knowledge of and appreciation of human physiological reaction, regulation, and adaptation to exercise. Prerequisite(s): SC 111 or SC 120 or SC 222.

SC 332. Physiological Ecology of Animals and Plants. 3 Hours.
This course explores the structural and functional relationships within plants and animals that make them adapted to their environment. This course uses numerous examples to illustrate how plants and animals survive given the constraints of their environment. Examples will be taken from temperate, arctic, alpine, tropical, desert, and aquatic ecosystems. Prerequisite(s): SC 191 and SC 192.
SC 333. Pathophysiology. 3 Hours.
Pathophysiology is the study of abnormal, diseased physiological processes. The course begins with an examination of altered cell functioning, injury and death. The course continues with pathophysiology of the body systems and inability of diseased systems to maintain homeostasis. Also included are topics in inflammation, immunity, neoplasia, and adaptations of the body to stress. Although aging is not considered a disease, some aspects of aging will be discussed. Prerequisite(s): SC 221 and SC 222.

SC 334. Genomic Biology. 3 Hours.
This class will explore the structure of the nucleus, patterns of inheritance (traditional genetics), the molecular mechanisms of biological information management (molecular biology), and the technologies that are used to obtain and use the information contained within genomes (genomic science). The course will trace classical genetics, chromosome maps, the structure of DNA, gene expression and regulation, and the tools of molecular biology and genomic analysis. Prerequisite(s): SC 102 and (SC 180 or SC 181).

SC 340. Anatomical Basis of Kinesiology. 3 Hours.
This course involves studying the mechanics of human body movements and the interrelationships of bones, joints, and muscles. Prerequisite(s): SC 120 or SC 122.

SC 351. Oceanography. 3 Hours.
This course examines the physical and biological characteristics of the marine environment. Topics include the origin of earth and its oceans, life in the oceans, the history of oceanography, plate tectonics, the nature of water, ocean circulation, waves, tides, shorelines, and coastal regions. A large portion of the course examines the interrelationships between organisms and the marine environment, mariculture marine pollution, and pollution control.

SC 352. Biochemistry. 3 Hours.
In this offering, the student will be exposed to reductionism in the field of biology. Biochemistry overlaps and articulates with many fields of endeavor. The discipline embraces physiology, pharmacology, enzymatics, nutrition, immunology, structural biology, biotechnology, and molecular biology all at the same time. The course curriculum will focus upon the role of enzymes in guiding metabolic processes and pathways. The student will come to understand the details of biological functioning at these three levels of organization: Metabolism, metabolic pathways, enzymatic mechanisms and kinetics. Prerequisite(s): SC 182 and SC 191 and SL 191.

SC 353. Principles of Strength and Cardiovascular Conditioning. 3 Hours.
This course provides students with an opportunity to develop an in-depth understanding of the principles of strength training and conditioning. By critically analyzing current research, students utilize an evidence-based approach to develop and justify conditioning programs and techniques for a broad range of sports and activities. Prerequisite(s): SC 340.

SC 360. Biomechanics & Kinesiology in Human Performance. 3 Hours.
This course examines the application of anatomical and physiological principles of kinesiology and physical movement. Topics include the scientific study of human movement, analysis of motor skills, and programs of exercise and evaluation of human performance. Prerequisite(s): SC 222 or SC 120.

SC 362. Dynamics of the Earth. 3 Hours.
This course presents the basic concepts of earth science that include a broad and nonquantitative survey at the introductory level of topics in geology, oceanography, meteorology and astronomy. In geology, the topics emphasized are plate tectonics, volcanic activity, mountain building, minerals and rocks, earthquakes, geologic time and earth history. In meteorology, the specific areas include weather elements, weather patterns and storms. The astronomy unit reviews constellations, the moon, the solar system and beyond. Laboratory activities are included to demonstrate concepts. Within each unit human use and manipulation of physical resources is examined from both a scientific and economic perspective.

SC 367. Mathematics and Physics of Sustainable Energy. 3 Hours.
In this course you will examine the basic physical principles behind the generation and consumption of electrical energy. Mathematical skills necessary to quantitatively compare different sustainable energy technologies and associated issues are developed. This course assumes no prior background in physics. Prerequisite(s): MS 141 or MS 180 or MS 181 or MS 182.

SC 371. Horticulture. 3 Hours.
This course presents the fundamentals of horticulture including topics such as environmental factors affecting plants, methods of growing plants, pruning, grafting, harvesting and storing, pests and horticulture plants and their control, horticulture for home grounds, and the vegetable garden. Laboratory activities enable students to practice experimental design and planting techniques used in horticulture.

SC 373. Inorganic Chemistry. 3 Hours.
This course is designed to introduce the basic principles and concepts of inorganic chemistry. The course is intended for students who wish to pursue careers in chemistry, biochemistry, pharmacology, or the life sciences. Topics to be covered include: atomic and molecular structure, experimental techniques, bonding in polyatomics, acid/base chemistry, oxidation/reduction, descriptive chemistry of hydrogen and the s, p, d, and f block elements. Prerequisite(s): SC 181 and SC 182 and MS 181.

SC 381. Organic Chemistry I. 3 Hours.
This course comprises the first semester of a one-year introduction to the chemistry of carbon-containing compounds. It provides fundamentals of modern organic chemistry with an emphasis on chemical bonding, stereochemistry, and reaction mechanisms. Chemistry, as one of the exact sciences, requires quantification. Therefore, development of the critical thinking and problem solving strategies, as well as the experimental know-how and laboratory skills are major objectives of the course. Introduction to microscale lab techniques, modern analytical instrumentation, as well as computation technology additionally supports objectives of the course. Prerequisite(s): SC 182.

SC 382. Organic Chemistry II. 3 Hours.
This course comprises the second semester of a one-year introduction to the chemistry of carbon-containing compounds. It provides fundamentals of modern organic chemistry with an emphasis on stereochemistry, modern instrumental methods in identification of organic compounds, energetics, reaction mechanisms, and selected applications in biochemistry. Critical analysis of structure-properties’ relationships in organic chemistry, and their applications, as well as more advanced know-how (FT-NMR or FT-IR, and UV/Vis spectroscopies) and laboratory skills (applications of semi-empirical molecular computations, and multistep synthetic procedures) are major objectives of this course. Prerequisite(s): SC 381.
SC 383. Junior Science Seminar. 3 Hours.
This course introduces students to careers in science, the scientific research process, and research expectations within the biology, health science, chemistry and environmental science majors. The major focus is to develop a senior research proposal on the basis of what is attainable, interesting, and meaningful. Students learn, in detail, both the limits and expectations of undergraduate research in the sciences. Students are introduced to the important role of library resources and the professional literature as they investigate their chosen topic. Students are also expected to write a resume and career goals statement, give an oral presentation on a chosen career field in science, lead a class discussion of a scientific article, and submit a written research proposal that includes a scientific literature review, problem statement or hypothesis, a timeline for completion, and detailed budget for their proposed senior thesis research. Students present their proposed research and evaluate other student’s research proposals. Prerequisite(s): MS 132.

SC 393. Physical Chemistry. 3 Hours.
This course provides an introduction to the methods describing complex physiochemical systems and their responses to external chemical and/or physical stresses. Classical and modern theories of equilibrium and non-equilibrium thermodynamics, kinetic theory of transport phenomena, as well as quantum and statistical mechanics are introduced and applied to molecular systems and spectroscopy. Biological and biochemical problems are shown how to be formulated and solved by using principles of physical chemistry. Prerequisite(s): MS 132 and MS 181 and SC 182 and SC 272.

SC 394. Analytical Chemistry. 3 Hours.
This course is an introduction to the fundamentals of analytical chemistry. It covers sample treatment, statistical analysis of data, measurement errors, and applications of chemical equilibrium, kinetics, transport, light scattering, emission, and absorption to chemical analysis. The following analytical methods are studied: Volumetric, gravimetric, electrochemical, chromatography, and spectroscopy. The course includes lab. Prerequisite(s): MS 132 and (MS 180 or MS 181) and SC 382 and SL 382.

SC 399. Topic/. 1-6 Hour.
This course is intended to provide the opportunity to offer advanced courses in science that would not normally be a part of the Husson curriculum. As such the topics will depend upon the interests of students and faculty.

SC 410. Motor Learning in Human Performance. 3 Hours.
This course explores the application of learning and performance of motor skills. Topics include the scientific study of motor skills and abilities, motor control, attention and memory, motor skill learning, instruction and augmented feedback, and practice conditions. Prerequisite(s): SC 222 or SC 120.

SC 450. Physical Biochemistry. 5 Hours.
This course entails a study of the physical processes involved in living systems including thermodynamics and equilibria, kinetics and transport phenomena, and applications of quantum chemistry and spectroscopy. Prerequisite(s): SC 352 and SL 393 and MS 182 and SC 272.

SC 481. Senior Science Capstone Project I. 3 Hours.
This course serves as the capstone project for science majors in the School of Science & Humanities. The course provides experiential learning relevant to the student’s area of study. Acceptable projects include laboratory or field research, an internship with an approved mentor, research survey or some other project deemed appropriate by the faculty. During the course, students meet periodically with their faculty advisor to plan their progress through the project. At the end of the semester, students present the final results of their research or a summary of their experience in the form of an oral presentation and a written thesis. Prerequisite(s): SC 224 or SC 383.

SC 482. Biological Research & Laboratory Safety II. 3 Hours.
The course serves as the continuation of the capstone course in the Biology major and is necessarily preceded by SC 481. Students who wish to continue with their laboratory or field research may elect to take this course. The emphasis during this semester will be on increasing sample size or elaborating on the research that was started in SC 481. Students will be required to share their final results with the Husson University community and at a regional or national scientific meeting. Students will be encouraged to publish their work in the peer-reviewed literature. Prerequisite(s): SC 481.

SC 490. Environmental Science Research Seminar I. 3 Hours.
Environmental Science is a dynamic, responsive, and applied discipline. In this experiential course, students explore potential careers and research areas in Environmental Science. With individual guidance from course instructors as well as collaborative study, students will develop working résumés, apply for internship positions, and synthesize the primary scientific literature in their field of interest to develop a feasible scientific research proposal. An internship in environmental science with a local, state, or federal agency or a private organization is a required component of this course; students share their internship experience with classmates and the Husson community.

SC 491. Environmental Science Research Seminar II. 3 Hours.
This course serves as the capstone course in the Environmental Science Program. With guidance from course instructors, students conduct individual, self-directed research in their field of interest within the discipline of Environmental Science. During this course, students collect, analyze, and interpret data to complete a final written thesis. Students disseminate the results of their research with classmates and the Husson community in the form of a written and oral presentation. Exceptional students are encouraged to present their research at a local, state or national conference. Prerequisite(s): SC 490.

SC 492. Senior Chemistry Research Seminar. 3 Hours.
This capstone course provides an introduction to research in chemical sciences. In the seminar setting students critically review primary literature sources and design, with help of the instructor, a serious and original research proposal in theoretical or experimental chemistry. Students discuss their ideas and applied methodology with classmates during regular weekly meetings. The approved by instructor research hypotheses are subsequently validated by experiments, field studies, or theoretical calculations. Students report and share the research findings with classmates in the seminar format. The authors of projects of very high quality will be encouraged to present their work at regional chemical conferences. Prerequisite(s): SC 393 and SC 394.

SC 499. Topic/. 1-6 Hour.
This course is intended to provide the opportunity to offer advanced courses in science that would not normally be a part of the Husson curriculum. As such the topics will depend upon the interests of students and faculty.
SL Courses

SL 120. Functional Anatomy and Physiology Lab. 1 Hour.
Functional Anatomy and Physiology Lab is a 1 credit lab that students take at the same time as taking the lecture part of the course. SC 120. It is laboratory designed to give the non-science major knowledge of the human body and its relationship with the environment. Topics covered parallel the lecture topics in SC 120 and include: the chemical basis of life, the anatomy & physiology of all organ systems, growth, development, heredity and biotechnology issues.

SL 180. Prin of Gen Chemistry Lab I. 1 Hour.
This is a laboratory class.

SL 181. Chemistry Lab I. 1 Hour.
This is a laboratory class.

SL 182. Chemistry Lab II. 1 Hour.
This is a laboratory class.

SL 191. General Biology Lab I. 1 Hour.
This laboratory course is to be taken concurrently with SC 191. It is designed to reinforce the fundamental biology concepts discussed in lecture as well as introduce students to laboratory procedures and the basics of the scientific method.

SL 192. General Biology Lab II. 1 Hour.
This laboratory course is to be taken concurrently with SC 192. This course is designed to provide hands-on experience with plant and animal diversity, comparative anatomy and physiology, as well as the collection and analysis of lab and field data.

SL 210. Marine Biology Laboratory. 1 Hour.
Marine Biology Laboratory must be taken concurrently with Marine Biology. Laboratory activities focus on the organisms and ecosystems in the Gulf of Maine and include field trips to local marine habitats as well as laboratory investigations of local flora and fauna. Prerequisite(s): SC 191 or SC 192.

SL 221. Anat/Physiology Lab I. 1 Hour.
This is a laboratory class.

SL 222. Anatomy/Physiology Lab II. 1 Hour.
This is a laboratory course. Prerequisite(s): SL 221.

SL 240. Ecology Lab. 1 Hour.
This lab focuses on ecological research principles and is designed to complement and reinforce the topics discussed in SC 240. The labs will include reading primary literature, case-studies, identification of local flora and fauna, and field and laboratory data collection and analysis.

SL 241. Microbiology Lab. 1 Hour.
This is a laboratory class.

SL 242. Biotechnology Lab. 1 Hour.
This is a laboratory class.

SL 271. Physics Lab I. 1 Hour.
This is a laboratory class.

SL 272. Physics Lab II. 1 Hour.
This is a laboratory class.

SL 285. University Physics I (Laboratory). 1 Hour.
University Physics I is the first course in a two semester, calculus based university physics sequence. The goal of this course is to introduce students to the concepts of force and motion, work and energy, simple harmonic motion, and waves. The class meets for three hours each week in lecture, two hours each week in recitation, and two hours each week in the lab. This course assumes no prior background in physics. Prerequisite(s): MS 181.

SL 286. University Physics II Lab. 1 Hour.
This course continues the development of the basic physical concepts begun in SC285. Topics include electricity, magnetism, and optics. The class meets for three hours each week in lecture, two hours each week in recitation, and two hours each week in the lab. Prerequisite(s): MS 181 and (SC 285 or SC 271).

SL 291. Cell Biology Laboratory. 1 Hour.
This course is the hands-on laboratory component of SC 291 (Cell Biology). It is designed to introduce the techniques used to study cell structure and function. By the end of the semester you should be familiar with cell identification, cell culture, transfection, protein purification, SDS-PAGE, and Western blot procedures.

SL 299. Topic/. 0-3 Hours.
This course is intended to provide the opportunity to offer introductory courses in laboratory science that would not normally be a part of the Husson curriculum. As such the topics will depend upon the interests of students and faculty.

SL 381. Organic Chemistry I Lab. 1 Hour.
This is a laboratory class. Prerequisite(s): SL 182.

SL 382. Organic Chemistry II Lab. 1 Hour.
This is a laboratory class. Prerequisite(s): SL 381.

SL 393. Physical Chemistry Lab. 2 Hours.
This course is a hands-on laboratory component of the SC 393, covering topics in kinetics, thermodynamics, transport, and spectroscopy. The laboratory exercises apply physical methods to studies of complex physicochemical phenomena. Computer simulations of molecular properties complement the measurements. Three hours of laboratory per week. Prerequisite(s): SL 182 and SL 272.

SL 394. Analytical Chemistry Lab. 2 Hours.
This course is a hands-on introduction to the fundamental techniques of analytical chemistry. It covers sample treatment and volumetric, gravimetric, electrochemical, chromatographic, and spectroscopic analytical methods. Three hours of laboratory per week are designed to supplement and reinforce the knowledge gained in the SC 394. Prerequisite(s): SL 182.

SL 399. Topic/. 0-3 Hours.
This course is intended to provide the opportunity to offer advanced courses in laboratory science that would not normally be a part of the Husson curriculum. As such the topics will depend upon the interests of students and faculty.

SL 499. Topic/. 0-3 Hours.
This course is intended to provide the opportunity to offer advanced courses in laboratory science that would not normally be a part of the Husson curriculum. As such the topics will depend upon the interests of students and faculty.