General Science

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Objectives

The general science program provides a broad background in the basic sciences, and allows flexibility for students interested in interdisciplinary fields involving science. The program can be customized for premedical, predental, and other allied health studies; a preprofessional specialization is offered to assist in preparation for health professions. Other curricula can be customized for a student in consultation with the advisor.

Degree Offered

Bachelor of Science in General Science

Major Offered

General Science

Specialization Offered

Preprofessional

Bachelor of Science in General Science

In order to earn the bachelor of science in general science degree with a major in general science, students must complete a minimum of 180 credits with a cumulative and major/department grade point average of 2.00, including the following:

I. Core Curriculum Requirements

ENGL 110 College Writing: Inquiry and Argument 5
PHIL 110 Introduction to Philosophy and Critical Thinking 5

Choose one of the following two courses 5
HIST 120 Origins of Western Civilization
HIST 121 Studies in Modern Civilization

ENGL 120 Introduction to Literature 5
Fine Arts (one approved 5 credit course; see course descriptions) 5
PHIL 220 Philosophy of the Human Person 5
Social Science I 5
Social Science II (different discipline from Social Science I) 5
Theology and Religious Studies Phase II (200-299) 5
Ethics (upper division) 5
Theology and Religious Studies Phase III (300-399) 5
Interdisciplinary satisfied within major
Senior Synthesis (Fulfilled by ISSC 489 and 490) 3

II. Major Requirements

95 credits in mathematics, science, engineering, and computer science including:

***Primary concentration 30**

***Secondary concentration..... 20**

(May not include introductory mathematics and science courses)

Science Electives (see department).....0 to 15

Courses used to satisfy the following requirements may, in some cases, be applied toward the primary or secondary concentrations.

Ten credits in chemistry, including:

CHEM 121	**General Chemistry I**	**4**
CHEM 131	**General Chemistry Lab I**	**1**
CHEM 122	**General Chemistry II**	**4**
CHEM 132	**General Chemistry Lab II**	**1**
CSSE	**Elective**	**5**

Interdisciplinary Science (300-400 level) .....3 to 5

Choose two of the following five options: 10

a. BIOL 161	**Biology I: Molecular and Cellular Biology**
BIOL 171	**Biology I Lab**
b. BIOL 162	**Biology II: Evolution and Ecology**
BIOL 172	**Biology II Lab**
c. BIOL 163	**Biology III: Physiology and Development**
BIOL 173	**Biology III Lab**
d. BIOL 200	**Anatomy and Physiology I**
e. BIOL 210	**Anatomy and Physiology II**

Choose option a, b, c, or d.....10

a. MATH 120	**Precalculus: Algebra**
MATH 131	**Calculus for Life Sciences (note: MATH 121 is co-requisite)**
b. MATH 118	**College Algebra for Business**
MATH 130	**Elements of Calculus for Business**
c. MATH 134	**Calculus I (note: MATH 121 is co-requisite)**
MATH 135	**Calculus II**
d. MATH 131	**Calculus for Life Sciences (note: MATH 121 is co-requisite)**
PSYC 201	**Statistics for Non-Majors**

Choose option a or b.....10

a. PHYS 105	**Mechanics**
PHYS 106	**Waves, Sound, Electricity and Magnetism**
b. PHYS 121	**Mechanics**
PHYS 122	**Electricity and Magnetism**

NOTE: 1. At least 20 credits of the 95 general science required credits must be from 300- or 400-level classes. An additional 10 credits must be from 300-level, 400-level, or approved 200-level courses. This may require prerequisites beyond the minimal degree requirements. The approved 200-level courses are BIOL 240, CEEGR 221/222, CHEM 231/241, CHEM 232/242, MATH 232, MATH 233, MATH 234, MEGR 210, MEGR 230, MEGR 281, PHYS 203, PHYS 204, PHYS 205, and PSYC 240. ISSC 489/490 does not count toward major or upper-division science credits. 2. No more than 15 credits from this major will be counted toward any minors. 3. Students must earn at least a C- in 100 and 200-level science and mathematics courses that apply to the major.

*Fields allowed: biology, chemistry, diagnostic ultrasound, engineering (all engineering courses are one field), mathematics, physics, computer science and interdisciplinary science. See department for approved science electives.

Bachelor of Science in General Science Preprofessional Specialization

This track is for students interested in preparing for post-baccalaureate programs in professions such as medicine, dentistry, pharmacy, osteopathic medicine, and veterinary medicine. In order to earn the bachelor of science in general science degree in the preprofessional track, students must complete a minimum of 180 credits with a cumulative and major/department grade point average of 2.00, including the following:

I. Core Curriculum Requirements

ENGL 110	**College Writing: Inquiry and Argument**	**5**
PHIL 110	**Introduction to Philosophy and Critical Thinking**	**5**
Choose one of the following two courses:		5
HIST 120	**Origins of Western Civilization**	
HIST 121	**Studies in Modern Civilization**	
ENGL 120	**Introduction to Literature**	**5**
Fine Arts (one approved 5 credit course; see course descriptions)		**5**
PHIL 220	**Philosophy of the Human Person**	**5**
Social Science I		**5**
Social Science II (different discipline from Social Science I)		**5**
Theology and Religious Studies Phase II (200-299)		**5**
Ethics (PHIL 352 recommended)		**5**
Theology and Religious Studies Phase III (300-399)		**5**
Interdisciplinary satisfied within major		
Senior Synthesis (fulfilled by ISSC 489 and 490)		**3**

II. Major Requirements

96 credits in mathematics, science, and computer science, including:

BIOL 161	**Biology I: Molecular and Cellular Biology**	**4**
BIOL 171	**Biology I Lab**	**1**
BIOL 162	**Biology II: Evolution and Ecology**	**4**
BIOL 172	**Biology II Lab**	**1**
BIOL 163	**Biology III: Physiology and Development**	**4**
BIOL 173	**Biology III Lab**	**1**
Choose any three among the following six biology courses:		15
BIOL 240	**Genetics**	
BIOL 300	**Microbiology**	
BIOL 310	**Developmental Biology**	
BIOL 325	**Comparative Anatomy of the Vertebrates**	
BIOL 388	**Animal Physiology**	
BIOL 485	**Cell Biology**	
CHEM 121	**General Chemistry I**	**4**
CHEM 131	**General Chemistry Lab I**	**1**
CHEM 122	**General Chemistry II**	**4**

CHEM 132	**General Chemistry Lab II**	**1**
CHEM 123	**General Chemistry III**	**4**
CHEM 133	**General Chemistry Lab III**	**1**
CHEM 335	**Organic Chemistry I**	**3**
CHEM 345	**Organic Chemistry Lab I**	**2**
CHEM 336	**Organic Chemistry II**	**3**
CHEM 346	**Organic Chemistry Lab II**	**2**
CHEM 337	**Organic Chemistry III**	**4**
CHEM 347	**Organic Chemistry Lab III**	**2**
CSSE	**Elective**	**5**
Interdisciplinary Science (300-400 level)		**3 to 5**

Choose series a or b 15

a. PHYS 105	**Mechanics**
PHYS 106	**Waves, Sound, Electricity and Magnetism**
PHYS 107	**Thermodynamics, Optics, and Modern Physics**
b. PHYS 121	**Mechanics**
PHYS 122	**Electricity and Magnetism**
PHYS 123	**Waves and Optics**

Choose option a, b, c, or d 10

a. MATH 118	**College Algebra for Business**
MATH 130	**Elements of Calculus for Business**
b. MATH 120	**Precalculus: Algebra**
MATH 131	**Calculus for Life Sciences (MATH 121 is co-requisite)**
c. MATH 131	**Calculus for Life Sciences (MATH 121 is co-requisite)**
PSYC 201	**Statistics for Non-Majors**
d. MATH 134	**Calculus I (MATH 121 is co-requisite)**
MATH 135	**Calculus II**

NOTE: 1. CHEM 454, CHEM 455, and CHEM 456 are strongly recommended as electives. 2. Students interested in preparing for professions such as chiropractic medicine, podiatry, and physical therapy should consult with an advisor to determine appropriate courses. 3. No more than 15 credits from this major will be counted toward any minors. 4. Students must earn at least a C- in 100 and 200-level science and mathematics courses that apply to the major.

Interdisciplinary Science Courses

ISSC 100 **Introduction to Environmental Science** **2**

Investigation of some significant topics in environmental science at an introductory level and research of current issues in the literature. Introduction to environmental science career opportunities through hands-on demonstrations, lectures, and site visits with professionals in the field. Open to all university students.

ISSC 120 **Introduction to Geology** **5**

Study of the principles of modern geology, with consideration of both the physical and historical aspects. Topics will include modern plate theory, tectonics, uniform processes, and the fossil record. Four hours of lecture and three hours of laboratory per week. Arranged field trips. (fall, winter, spring) Core lab science.

ISSC 191-193 **Special Topics** ..... **1 to 5**

ISSC 201 Digital Operations and Computation..... 5

Digital processing of information and data, number-systems, Boolean algebra; design of hardware for registers, counting, and arithmetic operations; organization of computers, storage, and input/output. Introduction to simple logic circuits. Elementary concepts of programming, assembly language, and computer simulation. Open to all university students. Core lab science. Cross-listed with ECEGR 201. (fall, winter)

ISSC 207 Air and Water..... 5

Dynamics of air and water systems. Consideration of the causes and control of air and water pollution. Monitoring and standards for clean air and water. The role of technology in the deterioration of air and water quality. Four hours of lecture and three hours of laboratory per week. Core lab science. Prerequisite: Core math. (winter or spring)

ISSC 291-293 Special Topics..... 1 to 5

ISSC 296 Directed Study..... 1 to 5

ISSC 480 The Human Response to Science and Technology..... 5

A comparative-historical approach to the scientization of culture and its contemporary and projected consequences; critical evaluation of competing claims about science and technology as enlightening allies of human progress; a personal search for appropriate intellectual and ethical perspectives on science as a way of knowing and on technology as a way of living. Seminar format; guest lectures; small-group paper conferences; student-led seminars. Interdisciplinary core option. Prerequisites: junior standing or higher, PHIL 220, HIST 120 or 121.

ISSC 481 To Feed the World..... 5

An interdisciplinary approach to the history, production, and distribution of food from the perspectives of paleontology, anthropology, biology, chemistry, and the social sciences; modes of scientific examination and interpretation are explored; interrelationships of science, technology, and human needs are emphasized. Active participation by students; lectures, movies, and small group discussions. Prerequisite: Phase II of core. Interdisciplinary core option.

ISSC 482 Global Climate Change..... 5

The science of global climate change and its effects on the environment, society and political decisions. Consideration of the main elements of the climate, measurement and consequences of change, evidence for past change and predictive tools for future change. Critical evaluation of current scientific literature, small group discussion and presentation. Prerequisites: Core lab science, junior standing. Interdisciplinary core option.

ISSC 483 Interdisciplinary Core Course..... 3 to 5

ISSC 489 Senior Synthesis..... 2

Initiation of an independent literature or laboratory research project. Searching, reading, and synthesizing scientific literature. Consideration of relationship between major, Core, and professional goals. Development of student portfolio. Oral presentation and written report. Along with ISSC 490, part of the senior synthesis requirement for general science and environmental science majors. Prerequisite: general science or environmental science major. (winter)

ISSC 490 Senior Synthesis Seminar..... 1

Continuation of the project developed in ISSC 489, including final oral and written presentations of the research. Along with ISSC 489, part of the senior synthesis requirement for general science and environmental science majors. Prerequisite: ISSC 489. (spring)

ISSC 491-493 Special Topics..... 1 to 5

ISSC 496 Independent Study..... 1 to 5

ISSC 497 Directed Reading..... 1 to 5

ISSC 498 Directed Research..... 1 to 5