



A Guide for Placing Students into University Core Curriculum Science and Mathematics Courses

C. The World: Enhancement of Cultural and Natural Awareness

C3. An understanding of Science and Scientific Thinking

Students should experience the unique methods of science by which we have acquired knowledge of the natural world. They should understand the roles and limitations of hypothesis, observation, and experimentation in distinguishing truth from misconception. Students should also acquire broad based knowledge about the natural world and of the laws and patterns that govern it; such knowledge should enable them to understand personal and public issues relating to science.

Astr 201(L): Astronomy

Biol 105(L): Biology of Human Concern

Biol 112(L): Ethnobotany

Biol 114(L): Understanding Evolution

Biol 121: Human Anatomy & Physiology I **AND**

Biol 122(L): Human Anatomy & Physiology II

Biol 133 (L): Biological Concepts

Biol 141: Principles of Biology

Biol 151(L): Botany & Cellular

Biol 152(L): Zoology

Biol 176: Nutrition

Biol 208(L): Wildlife Biology

Biol 251: Environmental Conservation

Biol 282: Heredity & Society

Biol 285: Animal Behavior

Chem 103: Molecules, Matter, and Me **OR**

Chem 107(L): Elements in Everyday Chemistry

Chem 141(L): Principles of Chemistry

Chem 175 (L): Survey of Chemical Concepts

Chem 261(L): General Chemistry I

Chem 262(L): General Chemistry II

Geog 112: Earth System Science

Geog 215: Climatology

Geol 101: Prehistoric Life

Geol 115: Landscapes and Geology of North America

Geol 131: Geology, Environment, & Society

Geol 132: Volcanoes and Eruptions

Geol 151 (L): Geology of America's National Parks

Geol 161(L): Physical Geology

Geol 162(L): Historical Geology

Geol 234: The Oceans: Past, Present, and Future

Phys 101: Introduction to Physical Science

Phys 175(L): General Physics I

Phys 176(L): General Physics II

Phys 205(L): Intermediate Physics I

Phys 206(L): Intermediate Physics II

Phys 207: Intermediate Physics I

Phys 208: Intermediate Physics II

Note:

Students taking the Science courses are expected to have passed MATH 100 with a C or better and college level reading is expected.

Geog 330 counts toward UCC under the C5: Global Communities Category, not C3: Science.

Available C3. Science Courses: 8-9 hours (including at least one lab) Required (L = lab course)

Astr 201(L): Astronomy (4 hours)

An introduction to the basic concepts in astronomy. Use of the telescope and exercises in uranography are stressed.

Pre-Requisites: Sophomore Standing

Information: Expected to have completed Math 100

Biol 105(L): Biology of Human Concern (3 hours)

General concepts in the life sciences, stressing those fundamental to life processes and of human concern.

Pre-Requisites: None

Information: This course is not for biology majors or minors. Locks students into taking three (3) science courses.

Biol 112(L): Ethnobotany (4 hours)

Examination of human uses of plants and the cultural/societal origins of usage. Plants for medicine and health, food, beverage, protection, aesthetics, and recreation will be discussed. Basic concepts in cell biology, genetics, plant taxonomy/identification, plant anatomy, and plant physiology typical of Introductory Biology for non-majors courses will be covered. Through the lab, students will gain experience that will reinforce concepts from lecture. Students will work through the scientific method and use some of the basic tools used in the study of science. There will be opportunities for students to work through open-ended laboratory experiences.

Pre-Requisites: None

Information: Does not apply toward a major or minor in biology.

Biol 114(L): Understanding Evolution (4 hours)

An introduction to the science of biological evolution, from the history of evolutionary thought to the concepts of modern evolutionary theory. Readings, videos, and discussions will examine the processes of organic evolution, the history of life on earth, and the impact that evolutionary thinking has had on the development of the modern Western worldview. The nature and process of science as a way of understanding will be stressed throughout. Students will gain experience with thinking and writing about scientific topics. In the lab exercises, students will apply scientific principles to formulate and answer questions and reinforce concepts introduced in lecture with hands-on experiences.

Pre-Requisites: None

Information: Does not apply towards a major or minor in biology.

Biol 121(L): Human Anatomy & Physiology I (3 hours)

An introduction to biological and chemical principles as they apply to the human body. Lectures and laboratory work will cover cellular anatomy and physiology, tissues, and the following systems: integumentary, skeletal, muscular, nervous, and endocrine.

Pre-Requisites: college chemistry strongly recommended or concurrent

Information: To count for UCC credit, both Biol 121 and Biol 122 must be taken.

AND

Biol 122(L): Human Anatomy & Physiology II (3 hours)

A continuation of Biology 121 consisting of lectures and laboratory work concerning the following systems: respiratory, cardiovascular, lymphatic, digestive, excretory, and reproductive.

Pre-Requisites: Biol 121

Information: To count for UCC credit, both Biol 121 and Biol 122 must be taken.

Biol 133(L): Biological Concepts (4 hours)

This lecture/laboratory course will cover biological concepts in the context of current issues in biology. Students will become more familiar with the scientific method as it applies to biology. Topics to be covered include: Science and Ethics; Evolution and Biodiversity; Ecology; Genetics; Cellular Biology. The lab will reinforce concepts from lecture.

Pre-Requisites: Completion of Gens 099 or Gens 151 unless exempt. Eng 100 (or placement into higher level English), Math 100 (or placement into Math 111 or higher)

Information: Does not apply towards a major or minor in biology. This course is a non-major's alternative to Biol 141. Students will be submitting some written assignments. Some math will be involved. This course would be similar to standard biology courses for non-majors at other institutions. This is an appropriate course for non-majors who have a strong background in high school science.

Biol 141: Principles of Biology (4 hours)

An introductory survey of the fundamental characteristics and process of living organisms, including cell structure and function, energetics, genetics, development, evolution, and ecology. Laboratories include both didactic and investigative explorations of these processes.

Pre-Requisites: Placement into Eng 100 or higher Eng writing course, C or better in Math 100 or placement into higher level college Math course, and science major or consent of instructor

Information: This course is designed for majors and minors in biology and other science areas. It is inappropriate for the typical non-science major.

Biol 151(L): Botany & Cellular (4 hours)

Fundamentals of plant structure and function are explored in the context of plant diversity and evolution. Consideration is given to variation in plant morphological and physiological strategies for life in a different environment.

Pre-Requisites: Biol 141

Information: A course for majors and minors in biology

Biol 152(L): Zoology (3 hours)

A survey of the adaptations and taxonomic relationships of the major animal phyla with emphasis on evolutionary trends.

Pre-Requisites: Biol 141

Information: Primarily a course for majors and minors in biology

Biol 176: Nutrition (3 Hours)

A study of the nutrients, their availability in foods, mechanisms of digestion, absorption and assimilation into body tissues. Also included will be a study of special conditions relating to nutrition.

Pre-Requisites: None

Information: Does not apply toward a major or minor in biology. One semester of college of chemistry recommended. This course also satisfies UCC B3.

Biol 208(L): Wildlife Biology (3 hours)

The course will address basic principles of wildlife ecology and their application in the management of wildlife ecology and their application in the management of wildlife populations. Topics include population growth, censusing, food habits, predation, harvesting, disease, exotic and endangered species, captive animal management, and conservation. Laboratories will include indoor and outdoor exercises in sampling, habitat evaluation, censusing, and wildlife observation.

Pre-Requisites: None

Information: Locks a student into taking three (3) science courses.

Biol 251: Environmental Conservation (3 hours)

This course is designed to introduce students to the basic scientific principles needed to understand the interdisciplinary and multinational (multicultural) nature of environmental issues and concerns. Through a series of lectures, discussions, and videotapes the students will be introduced to environmental issues from scientific viewpoints as well as political, economic, social, and philosophical realms.

Pre-Requisites: None

Information: This course also satisfies UCC C5.

Biol 282: Heredity & Society (3 hours)

An introduction to the principles of human heredity, nature, and expression of genetic material. The medical and social implications of genetics are explored.

Pre-Requisites: Biol 105; College chemistry is recommended

Information: Biology majors may not enroll.

Biol 285: Animal Behavior (3 hours)

Using biological studies augmented with video clips, the diversity of animal behavior will be explored in the contexts of genetics, environment, ecology, and evolution. Throughout the course, the process of science will be emphasized as a way to understand animal behavior.

Pre-Requisites: One college course in biology

Chem 103: Molecules, Matter, and Me (3 hours)

This introductory chemistry class is designed to give knowledge and understanding of selected important facts and principles of chemistry. Topics such as nuclear energy, radiation, global warming, and ozone depletion are investigated.

Pre-Requisites: None

Information: Both Chem 103 and Chem 107 cannot count for core credit.

OR

Chem 107(L): Elements in Everyday Chemistry (4 hours)

An introductory chemistry course that uses selected important facts and principles to explain interesting phenomena such as global warming, ozone depletion, nuclear energy, acid rain, etc. A laboratory experience enhances the understanding of chemistry.

Pre-Requisites: None

Information: Both Chem 103 and Chem 107 cannot count for core credit.

Chem 141(L): Principles of Chemistry (4 hours)

Selected principles and applications of inorganic, physical, organic, and biochemistry with laboratory experiments illustrating the principles covered.

Pre-Requisites: None

Information: A working knowledge of algebra is necessary. This course is intended for students majoring in the Health Sciences (i.e. nursing)

Chem 175 (L): Survey of Chemical Concepts (4 hours)

A broad introduction to chemical concepts selected to enhance the background of beginning science majors.

Pre-Requisites: high school chemistry or consent of instructor

Information: working knowledge of algebra

Chem 261(L): General Chemistry I (4 hours)

A systematic study of the essential nomenclature, hypothesis, theories, and laws of chemistry necessary for chemistry majors and minors. Some of the topics presented in the course include stoichiometry,

atomic structure, thermochemistry, solutions, crystal structure, and gas laws.

Pre-Requisites: MATH 111 or 118 or CHEM 175 or consent of instructor
Information:

Chem 262(L): General Chemistry II (4 hours)

A continuation of 161 with some laboratory work in qualitative analysis. Some of the topics presented include kinetics, equilibrium, ionic equilibrium, thermodynamics, electrochemistry, nuclear and organic chemistry.

Pre-Requisites: CHEM 261 or equivalent
Information:

Geog 112: Earth System Science (3 hours)

The study of the whole Earth as a system of many interacting parts. Including the solar system, the Earth's internal systems and landform, ocean, atmospheric and climatic systems, and global ecosystems. Applies the scientific method to the study of changes within and between these systems.

Pre-Requisites: None
Information: Class size is often large and class attendance is expected. Math is involved such as calculating percentages, general arithmetic, and the use of ratios and calculations of areas. Conversions from the US measurement system to the metric system may be required. College level reading is expected.

Geog 215: Climatology (3 hours)

Classification and distribution of the world's climates. Factors that control climate. Changing climates, and predictions for the future.

Pre-Requisites: Geog 112 or Geog 214
Information: This course is intended for geology majors.

Geol 101: Prehistoric Life (3 hours)

Scientific study of the history of life on earth. Emphasis on higher vertebrate groups such as reptiles and mammals. Discussion on current theories of dinosaur habits and mass extinction.

Pre-Requisites: None
Information: Class size is often large and class attendance is expected. Math is involved such as calculating percentages, general arithmetic, and the use of ratios and calculations of areas. Conversions from the US measurement system to the metric system may be required. College level reading is expected.

Geol 115: Landscapes and Geology of North America (3 hours)

A study of the geography and geology of North American landscapes with special reference to the United States. Factors in landscape development, including climate, vegetation, erosion, glaciation, tectonics, and human influences are explored in the context of specific landform.

Pre-Requisites: None
Information: Class size is often large and class attendance is expected. Math is involved such as calculating percentages, general arithmetic, and the use of ratios and calculations of areas. Conversions from the US measurement system to the metric system may be required. College level reading is expected.

Geol 131: Geology, the Environment, and Society (3 hours)

An examination of the controls on human activity by geology, and, the impact of humans on natural geologic processes. This course is a survey of fundamental geologic processes and associated hazards (energy, minerals, water), and topics such as pollution and land-use planning. The course provides an opportunity to discuss, from a geologic perspective, the ramification of and potential solutions

to problems associated with Earth's resources.

Pre-Requisites: None

Information: Class size is often large and class attendance is expected. Math is involved such as calculating percentages, general arithmetic, and the use of ratios and calculations of areas. Conversions from the US measurement system to the metric system may be required. College level reading is expected.

Geol 132: Volcanoes and Eruptions (3 hours)

An introduction to volcanoes, their occurrence, different styles of eruption, and the processes that control volcanic activity, emphasizing the impacts of volcanism, both beneficial and destructive, to human beings and the global environment.

Pre-Requisites: None

Information: Class size is often large and class attendance is expected. Math is involved such as calculating percentages, general arithmetic, and the use of ratios and calculations of areas. Conversions from the US measurement system to the metric system may be required. College level reading is expected.

Geol 151(L): Geology of America's National Parks (4 hours)

This course examines the principles of physical geology through the medium of America's national parks. Parks that were designated because of their unique geologic setting will be studied to understand the full range of geologic materials and internal and external Earth processes.

Pre-Requisites: Math 100 or placement in Math 111

Information: Students may not receive C3 credit from both GEOL 151 AND GEOL 161. . College level reading is expected.

Geol 161(L): Physical Geology (4 hours)

Lecture and laboratory studies of the materials, internal structure, and surface features of the earth, and the processes which have shaped them.

Pre-Requisites: None

Information: Class size is often large and class attendance is expected. Math is involved such as calculating percentages, general arithmetic, and the use of ratios and calculations of areas. Conversions from the US measurement system to the metric system may be required. College level reading is expected.

Geol 162(L): Historical Geology (3 hours)

Lecture and laboratory studies of the evolution of the earth and its life forms. Techniques used to interpret earth and life history. The concept of geologic time.

Pre-Requisites: None

Information: This course is intended for geology majors.

Geol 234: The Oceans: Past, Present, and Future (3 hours)

Origin and history of the oceans, including evolution of ocean basins and sea water. Causes and effects of oceanic circulation. Interaction of oceans and climate. The oceans as a habitat for life. Challenges of protecting oceanic environments. Problems in exploiting the oceans for mineral wealth and food. Effects of global warming and rising sea levels.

Pre-Requisites: Geog 112 or Geol 161

Information: A working knowledge of basic chemistry and biology is needed. This course is intended for geology majors.

Phys 101: Introduction to Physical Science (3 hours)

Lectures and demonstrations of physics at a primarily conceptual level. Basic problem solving

and the scientific method are introduced. Topics covered include Newton's Law, energy, momentum, light, electricity, magnetism, thermodynamics, fluids, and selected topics from modern physics. (3-0)

Pre-Requisites: None

Information: This course requires regular class attendance. A college reading level is necessary. Arithmetic, simple calculations, and the use of formulas is used in this course.

Phys 175(L): General Physics I (4 hours)

Review of metric system and vectors, the laws of motion and applications, work and energy, states of matter and molecular properties, heat and thermodynamics. Calculus is not employed in this course. An integrated laboratory serves to develop associated skills in measurement.

Pre-Requisites: Math 111 & 112; or Math 115 or Math 118 or placement test into Math 230

Information: This course is taken by biology majors, geology majors, exercise science majors.

Phys 176(L): General Physics II (4 hours)

Wave motion and acoustics, electrostatic fields and potentials, electric current and circuit theory, magnetic fields, optics and the wave properties of light, atomic and nuclear physics. A continuation of Physics 175.

Pre-Requisites: Phys 175

Information: This course is taken by biology majors, geology majors, exercise science majors.

Phys 205(L): Intermediate Physics I (5 hours)

An initial study of the phenomena and concepts of classical and modern physics in the areas of mechanics including energy and momentum principles, and heat and thermodynamics, with application involving elementary calculus. An integrated laboratory serves to develop associated skills in measurement.

Pre-Requisites: Math 230

Information: This course is required for chemistry majors, physics minors, and engineering students.

Phys 206(L): Intermediate Physics II (5 hours)

A continuation of Physics 205 in the areas of wave motion, acoustics, optics, electrostatics, circuit electricity, magnetism, and modern physics.

Pre-Requisites: Phys 205 and Math 230

Information: This course is required for chemistry majors, biophysics major, physics minors, and engineering students.

Phys 207: Intermediate Physics I excluding Laboratory (4 hours)

Physics 207 is identical to Physics 205 except the laboratory is excluded.

Pre-Requisites: Phys 205 and Math 230

Information: This is intended for students who have previously acquired credit for the general physics laboratory by having completed PHYS 175 or who have equivalent in laboratory experience.

Phys 208: Intermediate Physics II excluding Laboratory (4 hours)

Physics 208 is identical to Physics 206 except the laboratory is excluded.

Pre-Requisites: Phys 205 and Math 230

Information: This is intended for students who have previously acquired credit for the general physics laboratory by having completed course 175 or who have equivalent in laboratory experience.



A Guide for Placing Students into University Core Curriculum Mathematics Courses

A. The Mind: Enhancement of Cognitive Abilities

A2. The Ability to Think in Mathematical Terms

Students should achieve proficiency in algebraic skills and learn to apply mathematical techniques to solve problems. They should be able to interpret information and data presented in numerical, graphical, or statistical form, and convey this knowledge to others.

Math 108: Survey of Mathematics

Math 111: College Algebra

Math 115: Pre-Calculus Mathematics

Math 118: College Algebra and Trigonometry

Math 122: Analytical Geometry

Math 202: Mathematical Concepts for Early Elementary Teachers

Math 206: Mathematical Concepts for Elementary, Junior High, and Middle School Teachers

Math 215: Survey of Calculus

Math 230: Calculus I

Note: The A2 component may be satisfied by successful completion of one of the courses listed above or by successful completion of the mathematics proficiency exam. For additional information on this exam, see <http://www.usi.edu/science/math/Mathprofexam.asp> or contact the Department of Mathematics.

Transfer Students and Mathematics Courses: All students entering USI for the first time without transfer credit to satisfy the mathematics component of the University Core Curriculum must take the math placement test prior to enrolling in a math course. The placement test recommendation will give students the best opportunity for success.

Authorizations into mathematics courses are **only** to be given by personnel from the Department of Mathematics. Call 465-7093 or 461-5336.

Available A2. Mathematics Courses: 3-4 hours

MATH 100/101

Notes: When do students take MATH 100/101?

- Students who were placed into GENS 097 and were not successful (W or NP) on their first attempt must enroll in the expanded offering of Math100/101 once they have successfully completed GENS 097.
- Students who have not earned a grade of C or better in Math 100 after two attempts must enroll in the expanded offering of Math100/101.

MATH 108: Survey of Mathematics (4) A survey of contemporary topics in mathematics designed to introduce students to thinking processes developed in mathematics. Scientific calculators will be used.

Pre-requisites: MATH 100 (grade of C or better) or satisfactory placement score.

Information: This is a survey course that satisfies the A2 component of the UCC. This course does not apply toward a major or minor in mathematics, nor does it fulfill the prerequisite of any other math course.

MATH 111: College Algebra (4) Topics to be emphasized include: Polynomials, rational algebraic expressions, graphs, inequalities, theory of equations and matrices. Special attention is focused on functions and the utilization of appropriate technology.

Pre-requisites: MATH 100 (grade of C or better) or satisfactory placement score.

Information: A TI-83, TI-83 Plus, or TI-84 Plus graphing calculator is required for the course. This course does not apply toward a major or minor in mathematics.

NOTE: Students preparing to take MATH 230, Calculus I may do so by taking either of the following 2 courses. Students with a working knowledge of trigonometry may enroll in MATH 115, Pre-Calculus. Students with a minimal background in trigonometry should enroll in MATH 118, College Algebra & Trigonometry.

MATH 115: Pre-Calculus Mathematics (3) Advanced topics in algebra plus selected topics in trigonometry, elementary functions (polynomials, rational, algebraic, exponential, logarithmic and trigonometric) are studied with emphasis upon notation, properties, operations, and graphs of functions and their inverse.

Pre-requisites: MATH 111 (grade of C or better) or satisfactory placement score.

Information: A TI-83, TI-83 Plus, or TI-84 Plus graphing calculator is required for the course.

MATH 118: College Algebra & Trigonometry (3) This course is designed for students planning to enroll in MATH 230, Calculus I. The study of functions, polynomial, rational, exponential, logarithmic, algebraic, and trigonometric forms the foundation for this course. This course will promote the development of algebraic and analytic skills as well as conceptual understanding.

Pre-requisites: MATH 100 (grade of C or better) or satisfactory placement score.

Information: A TI-83, TI-83 Plus or TI-84 Plus graphing calculator is required for the course.

MATH 122: Analytic Geometry (4) Emphasis is placed on two and three dimensional coordinate geometry, lines, circles, conic sections, planes, Spheres, surfaces and basic properties of vectors.

Pre-requisites: MATH 111 and MATH 112 (grade of C or better) or satisfactory placement score.

Information: This course is offered infrequently.

MATH 202: Mathematical Concepts for Early Elementary Education Teachers (4) This course extends the fundamental concepts studied in Math 106 and focuses on the topics for early elementary students. These include concepts and processes in advanced counting, the four basic operations, angles, and other geometrical concepts beyond shapes, elementary fractions, decimals, probability, and statistics. The use of manipulatives and technology will support learning and teaching in these and other topics studied.

Pre-requisites: MATH 106 (grade of C or better)

Information: This course is only open to students in early childhood education programs and is only taught in the spring semester. No grade below a "C" is permitted in any course to be applied to an education program.

MATH 206: Mathematical Concepts for Elementary, Junior High and Middle School Teachers (3) This course contains fundamental concepts in mathematics selected for the elementary and/or junior high/middle school programs. Included will be the examination of problem-solving processes and strategies, decimals, integers, real numbers, and selected topics in algebra, statistics and probability. The use of manipulatives and technology will support learning and teaching in these and other topics.

Pre-requisites: MATH 106 (grade of C or better)

Information: This course is only open to students in elementary, special education, junior high and middle school programs. No grade below a "C" is permitted in any course to be applied to an education program.

MATH 215: Survey of Calculus (3) An introduction to calculus and its application in business, economics, and the social sciences.

Pre-requisites: MATH 111, MATH 115, or satisfactory placement score

Information: A TI-83, TI-83 Plus, or TI-84 Plus graphing calculator is required for the course. Not applicable to the major or minor in mathematics

MATH 230: Calculus I (4) The theory of limits, differentiation, successive differentiation, the definite integral, indefinite integral, and applications of both the derivative and integral.

Pre-requisites: MATH 115 (grade of C or better), MATH 118 (grade of C or better), satisfactory placement score, or consent of instructor.

Information: A TI-83, TI-83 Plus, or TI-84 Plus graphing calculator is recommended for the course.

Science and Mathematics Courses Required by Major

College of Business

Business:

MATH 215

Applied Computer Science – Business Option

MATH215
MATH 253

Applied Computer Science – Technical Option

MATH 230
MATH 253

College of Education and Human Services:

Education:

Early Childhood Education

MATH 106
MATH 202

Elementary Education:

MATH 106
MATH 206
MATH 226
MATH 392

Secondary Education:

MATH 108, 111 or as required by specific programs

Exercise Science:

BIOL 121
BIOL 122
BIOL 176 or NUTR 376 or NUTR 378
CHEM 107
MATH 111
MATH 112
PHYS 175

Social Work:

MATH 100 or higher with a minimum grade of C is required for admission to the Social Work program; MATH 108, MATH 111, or higher is required for degree completion.

NOTE: A grade of C or better is required for all coursework to be applied to a degree in education.

College of Liberal Arts

International Studies:

GEOG 330
BIOL 251 could be chosen as an elective

Sociology:

BIOL 105 recommended for Gerontology concentration

Social Science (Secondary Education Major):

MATH 111
GEOG 112 + 2 other courses

Social Science (Associate Degree):

MATH 108 or MATH 111

College of Nursing and Health Professions

Dental Hygiene:

BIOL 121
BIOL 122
CHEM 107

Food and Nutrition (Dietetics):

BIOL 121
BIOL 122
BIOL 272
CHEM 261
CHEM 262
CHEM 241
MATH 111

Food Service Management:

BIOL 141
CHEM 141

Health Services:

BIOL 121
BIOL 122
MATH 111
BIOL or CHEM course

Nursing (Baccalaureate Degree)

BIOL 121
BIOL 122
BIOL 272
CHEM 141
MATH 111

Nutrition and Wellness:

BIOL 121
BIOL 122
CHEM 141

Occupational Therapy:

BIOL 121
BIOL 122
MATH 108 or MATH 111

Occupational Therapy Assistant:

BIOL 121
BIOL 122