

Math & Science

College Transfer & Career Guide



Plan your Path

Career Path 3

Use the Career Path listings to learn what a major in science and math can do for you after you graduate.

SCC Math Course Descriptions..... 4

Math course descriptions are included so you have a better understanding of what SCC offers.

SCC Science Course Descriptions 5

Science course descriptions are included so you have a better understanding of what SCC offers.

SCC AA Degree Requirements..... 7

The Associate of Arts degree requirements are listed so you know what coursework you will need to transfer on to the Bachelor's Level.

Transfer Guides 8

The transfer guides will inform you of classes that will benefit you based on the college and major you are seeking.

SCC Math & Sciences Instructors:

■ Keokuk Campus

Glen Day, Mathematics Instructor

gday@sccciowa.edu 319-313-1947

Amber Ruskell-Lamer, Natural Sciences Instructor

aruskell@sccciowa.edu 319-313-1957

Mike Sallee, Biology Instructor

jmsallee@sccciowa.edu 319-313-1991

Elisabeth Snipes, Physical Sciences Instructor

esnipes@sccciowa.edu 319-313-1992

■ West Burlington Campus

Robert Dengler, Mathematics Instructor

rdengler@sccciowa.edu 319-208-5163

Don Krekel, Mathematics Instructor

dkrekel@sccciowa.edu 319-208-5187

Forest Morrisett, Biology Instructor

fmorrisett@sccciowa.edu 319-208-5237

Michael Polley, Mathematics Instructor

mpolley@sccciowa.edu 319-208-5189

Chris Sedlack, Physical Sciences Instructor

csedlack@sccciowa.edu 319-208-5259

Joan Sharp, Biology Instructor

jsharp@sccciowa.edu 319-208-5238

Carl Snipes, Chemistry Instructor

csnipes@sccciowa.edu 319--208-5192

Karen Stotlar, Mathematics Instructor

kstotlar@sccciowa.edu 319-208-5188

Ross Teal, Biology Instructor

rteal@sccciowa.edu 319-7208-5236

Cathy Ziglar, Biology Instructor

cziglar@sccciowa.edu 319-208-5224

Toll free: 866-SCC-IOWA

www.sccciowa.edu

Career Path

MATH Accountant. **Astronaut.** Astronomer. Banker. **Biologist.** Computer Systems Analyst. **Chemist.** Computer Consultant. Software Engineer. **Software Programmer.** Web Developer. Web Site Manager. Business & Corporate Cryptology. End-User Computer Security. Internet Security. **Economist.** Colleges & Universities – Research & Academic. Corporate Trainer. K-12 teacher. Chemical Engineer. Biomolecular Engineer. Materials Engineer. Molecular Engineer. Process Engineer. Civil Engineer. **Environmental Engineer.** Geotechnical Engineer. Structural Engineer. Transport Engineer. Water Resources Engineer. Electronics Engineer. Biomedical Engineer. **Computer Engineer.** Consumer Products Engineer. Controls & Instrumentation Engineer. Microelectronics Engineer. Power Generation Engineer. **Signal Processing Engineer.** Telecommunications Engineer. Mechanical Engineer. Acoustical Engineer. Manufacturing Engineer. Thermal Engineer. Vehicle Engineer. Aerospace Engineer. Agricultural Engineer. Robotics Engineer. Biological Engineer. Building Services Engineer. **Energy Engineer.** Industrial Engineer. Mechatronics. **Nanoengineer.** Nuclear Engineer. Petroleum Engineer. Systems Engineer. Financial Planner. Geologist. Insurance Underwriter. Market Research Analyst. Theoretical Researcher. Textbook Editor. Meteorologist. **Oceanographer.** Operations Research Analysts. Personal Financial Advisors. Physicist. Pharmacology. Marketing and Consumer Researcher. **Stockbroker.** Tax Examiner/Collector. **Zoologist.**

SCIENCE Audiologist. Biomedical Technician. **Cardiologist.** Chiropractor. Clinical Laboratory Scientist. Dental Hygienist. Dentist. Dietician. **Forensic Scientist.** Medical doctor. Mortician. **Neurologist.** Nurse Practitioner. Optometrist. Park Ranger. Pathologist. **Pharmacist.** Physical Therapist. Physician. Radiologist. Respiratory Therapist. Soil Conservationist. Surgical Technician. Urologist. Veterinarian. Veterinarian Assistant. **Infection Control.** Clinical microbiology. **Public Health.** Fuel Production. Biofuels. Food Production Quality Control. Medical Supplies Quality Control. Fossil Fuels Recovery Yield. **Food and Beverage Production.** Petroleum Alternatives Discovery. Waste and Waste Sites Reclamation and Detoxification. Teaching. Research. Science Writing. Pulp and Paper Industry. Food Industry. **Federal EPA.** State Department of Natural Resources. Local water and wastewater departments. Research Technician. Meteorologist. **Astrophysicist.** Renewable Energy Manager. **Structural Engineer.** Material Scientist. Scientific Consultant. Science Journalist. Clinical Scientist. Forensic Physicist. Particle Physicist. Physics Teacher. Patent Attorney. Radiation Therapist. **Oil Exploration.**

Math Course Descriptions

MAT-127 College Algebra and Trigonometry

Lec. 5 Lab. 0 Credit 5

The study of rational, exponential, logarithmic, and polynomial functions and relations, their graphs and related equalities. The study of the circular functions, graphs, and applications. Vectors, trigonometric properties, equations, identities and complex numbers are treated extensively. Prerequisite: MAT-102 with a grade of at least C- or equivalent or COMPASS Algebra score of 73-92 or ACT Math score of at least 25 or math faculty approval.

MAT-128 Precalculus

Lec. 4 Lab. 0 Credit 4

This course encompasses an in-depth review of mathematical concepts necessary in preparing students for the calculus. Problem solving is emphasized. Topics from algebra, trigonometry, and analytic geometry essential in the calculus are covered in this course. Topics include: properties of lines and quadratics, absolute value equations and inequalities, functions and their graphs, polynomial and rational functions, exponential and logarithmic functions, trigonometric functions, analytic trigonometry, vectors, conics in both the rectangular and polar coordinate systems, parametric equations, systems of equations and inequalities, matrices, three-dimensional coordinate geometry, partial fractions, sequences and mathematical induction. Prerequisite: MAT-127 or equivalent.

MAT-149 Linear Algebra

Lec. 3 Lab. 0 Credit 3

This course will include the study of systems of equations, matrices, determinants, vector spaces, inner product spaces, linear transformations, eigenvalues and eigenvectors. Applications relating to these topics will be investigated. Prerequisite: MAT- 216 or math faculty approval.

MAT-156 Statistics

Lec. 3 Lab. 0 Credit 3

This course is an applied course in statistics, designed to introduce students to some of the concepts, symbols, procedures, and vocabulary used in the field of statistics. Topics covered in this course include: organizing and graphing data, descriptive statistics, probability, various distributions, the sampling distribution of the mean, estimating a population mean, confidence intervals, inferential statistics (hypothesis testing), comparing two population parameters, analysis of variance, correlation, simple linear and multiple regression, contingency tables, and nonparametric statistics (time permitting). Prerequisite: MAT-102 or COMPASS Algebra score of 55 (or higher) or ACT score of 22 or above or math faculty approval.

MAT-210 Calculus I

Lec. 4 Lab. 0 Credit 4

This course includes the study of limits and continuity, derivatives and differentiation, differentials, maximum and minimum function values and techniques of graphing, applications, and an introduction to integration. Prerequisite: MAT-127 or MAT-128 with a grade of at least C- or COMPASS Algebra score of 93-99 (or higher) or ACT score of 29 or above or math faculty approval.

MAT-216 Calculus II

Lec. 4 Lab. 0 Credit 4

The study of integration, techniques of integration, applications and accompanying mathematical structure. Prerequisite: MAT-210 or math faculty approval.

MAT-219 Calculus III

Lec. 4 Lab. 0 Credit 4

Multivariable calculus is to cover topics from the functions of several variable and vector valued functions. The course includes directional derivative, gradients, the curl, the divergence, multiple integrals over regions and volumes. Line and surface integrals will be covered. Double integral in the polar coordinates will be done. Prerequisite: MAT-216 or math faculty approval.

MAT-227 Differential Equations with Laplace

Lec. 4 Lab. 0 Credit 4

The study of elementary theory and applications of ordinary differential equations. Course includes first and second order differential equations. Prerequisite: MAT-216 or math faculty approval.



Science Course Descriptions

Biology

BIO-112 General Biology I

Lec. 3 Lab. 2 Credit 4

First semester of biology for majors. An intensive cellular and molecular approach to the study of biological principles with emphases on biomolecules, cellular biology, genetics, and evolution. Prerequisite: CHM-165.

BIO-113 General Biology II

Lec. 3 Lab. 2 Credit 4

Second semester of biology for majors. Topics covered include: taxonomy and a survey of invertebrate and vertebrate organisms, fungi and plants. Prerequisite: BIO-112 with a minimum grade of C and CHM-165 with a minimum grade of C.

BIO-138 Field Ecology

Lec. 2 Lab. 2 Credit 3

A study of ecology and conservation using various resources but including "A Sand County Almanac" by Aldo Leopold in conjunction with both field and lab work.

BIO-163 Essentials of Anatomy and Physiology

Lec. 3 Lab. 2 Credit 4

This introductory course is designed for the student needing a one-semester combined anatomy and physiology course with laboratory. All systems will be covered with greater emphasis on the cardiovascular, respiratory, immune and urinary systems. This course also provides background for the more advanced course, BIO-177, Human Anatomy.

BIO-177 Human Anatomy

Lec. 3 Lab. 2 Credit 4

A systems approach to the study of the structure of the human body. The course covers cells, histology and the various organ systems of the body, e.g., nervous system, respiratory system, digestive system, reproductive system. Lab covers cells, tissues, bones, muscles, and other organ systems and includes dissection of selected organisms.

BIO-180 Human Physiology

Lec. 3 Lab. 2 Credit 4

Advanced structural and functional relationships of the human body with an emphasis on function. Prerequisites: BIO-177 with a minimum grade of C and BIO-252 with a minimum grade of C.

BIO-186 Microbiology

Lec. 3 Lab. 2 Credit 4

A study of microbial populations and their relationships to the human in health and disease. Prerequisite: BIO-252 with a minimum grade of C.

BIO-248 Introduction to Bioscience Technology

Lec. 3 Lab. 2 Credit 4

An exploration of the expanding field of biotechnology and its impact on science and society. Fundamental biological, chemical, and mathematical principles as they apply to biotechnology are examined. Laboratory emphasizes essential methodologies employed in scientific inquiry and experimentation.

Chemistry

CHM-165 General Chemistry I

Lec. 3 Lab. 2 Credit 4

The first semester of a traditional two semester sequence. General Chemistry I provides an in-depth and integrated study of chemical principles including terminology, measurements, unit conversions, atoms, elements, molecules, compounds, moles, stoichiometry, gases and gas laws, energy, electron configurations, periodicity and chemical bonding. Prerequisite: 1 year high school chemistry or CHM- 122 or BIO-252; high school algebra or equivalent.

CHM-175 General Chemistry II

Lec. 3 Lab. 2 Credit 4

The second semester of the traditional two semester sequence. College Chemistry II covers basic principles of intermolecular forces, colligative properties, reaction kinetics, chemical equilibrium, acids and bases, precipitation reactions, spontaneity and electrochemistry. Prerequisite: CHM- 165.

CHM-263 Organic Chemistry I

Lec. 4 Lab. 2 Credit 5

Fundamental principles of organic chemistry for pre-medical, pre-dental, pre-pharmacy, biochemistry, medical technology, forestry, and home economics students, as well as liberal arts students who have a special interest in the sciences. These general principles are illustrated by preparation and study of typical representatives of the aliphatic and aromatic series including all common functional groups. Prerequisite: CHM-175.

CHM-273 Organic Chemistry II

Lec. 4 Lab. 2 Credit 5

Continuation of Organic Chemistry I, with advanced synthesis, instrumental analysis, and emphasis on biochemistry. Prerequisite: CHM-263.

Environmental Science

ENV-111 Environmental Science

Lec. 3 Lab. 2 Credit 4

An interdisciplinary approach to the problems of the environment. An examination and evaluation will be made of man's impact on the environment. Specific topics that may be covered include, but are not limited to: population issues, atmospheric issues, water issues, energy issues, resource issues, wildlife issues, and food issues. This course contains a lab component.
Science

SCI-922 Field Studies

Lec. 0-3 Lab. 0-6 Credit 1-3

Field tours to various biomes, museums, and science research facilities to enhance the study of scientific concepts. Collections and displays of scientific importance, diverse ecological conditions, and/or laboratory facilities of interest will be examined. Specific written credit and participation requirements are established in advance of the field study and according to the number of credit hours enrolled.

SCI-928 Independent Study

Clinical 0 Credit 1-3

Individual study in a science area determined by consultation between the student and the department instructional staff. Study to be based on interest of student and capabilities of college facilities. Prerequisite: 12 hours of science work.

Physical Science

PHS-151 Introduction to Astronomy

Lec. 2 Lab. 2 Credit 3

A survey of astronomy including historical considerations, the solar system, the universe and several topics. Topics may include the laws, the methods, and current research. Each planet will be studied as well as major stars and galaxies. Special topics include: cosmology, cosmogony, nova, pulsars, quasars, relativity, space travel, black holes, and other space mysteries. Lab to include: experiments, observations, slides and movies.

PHS-185 Introduction to Earth Science

Lec. 3 Lab. 0 Credit 3

An introduction to geologic processes that have generated and continue to alter the surface of the earth. Covers: major types of rocks and the rock cycle; rock deformation, weathering, transport and deposition by fluid agents; plate tectonics, volcanoes, earthquakes, orogeny; absolute and relative time and the geologic column. Includes segment on the history of geology.

Physics

PHY-160 General Physics I

Lec. 4 Lab. 2 Credit 5

This course is designed to provide a working knowledge of physics for those who need physics but do not need the rigor of a calculus-based physics course. The topics covered will include motion, force, energy, work, power, torque, linear momentum, rotational motion, angular momentum and selected topics from thermodynamics. The conservation laws will be stressed. Topics in modern physics are covered as time permits. Solving practical problems will be a major emphasis. Prerequisite: Student must be familiar with algebra and simple trigonometry.

PHY-161 General Physics II

Lec. 4 Lab. 2 Credit 5

This course is a continuation of General Physics I. The major topics to be covered will include selected topics from thermodynamics, vibrations, wave motion, electricity, and magnetism. Topics in modern physics are covered as time permits. Solving practical problems will be a major emphasis. Prerequisite: PHY-160.

PHY-212 Classical Physics I

Lec. 4 Lab. 2 Credit 5

College Physics introduces the students to the classical topics of motion in one, two and three dimensions (kinematics and dynamics), gravitation, work and energy, relativistic dynamics, rotational and oscillatory motion and thermodynamics. This physics course depends very much on the calculus of reals and vector integral calculus. Pre or Corequisite: MAT-210.

PHY-222 Classical Physics II

Lec. 4 Lab. 2 Credit 5

College Physics continues in the second semester with emphasis on the theory of electricity and magnetism. The concept of a field is applied to the electrostatic charge. The laws of Coulomb and Gauss are to be developed and applied to various types of charge distribution. Electric current and magnetic force are to be discussed in connection with their application to electromagnetic induction. Prerequisite: PHY-212.

SCC AA Degree Requirements

The Associate of Arts Degree is primarily intended for those students who plan to transfer to a four-year college or university. Student should also consult with the four-year institution to confirm application of particular courses for their degree objectives.

In order to graduate, a student must have a 2.00 cumulative grade point average or above and have successfully completed sixty-two (62) semester hours of credit in courses designated for transfer. In addition to those requirements, every student must meet the following:

	Semester Hours
Communications	9
Composition: ENG 105; 106	6
Speech: SPC 112	3
Humanities (Select from at least 2 different departments)	8
Art: ART 101, 109, 120, 123, 133, 134, 138, 143, 144, 154, 157, 173, 174, 184, 203, 204, 208, 295, 922, 928	
Drama: DRA 101, 110, 130, 141, 142, 145	
French: FLF 141, 142, 241, 242	
German: FLG 141, 142, 231, 232, 922	
History & World Civ: HIS 131, 132, 151, 152, 211, 231, 251, 257, 266, 268, 271	
Humanities: HUM 114, 145, 287, 290; JOU - 120, 121	
Literature: LIT 101, 105, 120, 121, 122, 125, 131, 150, 151, 184, 204; ENG 221, 929; JOU 120,121	
Music: MUA 101, 104, 108, 109, 120 thru 127, 143, 146, 170, 173, 180, 183; MUS 100, 102, 120, 121, 135, 136, 140, 150, 162, 204, 220, 221, 235, 236	
Philosophy: PHI 101, 105, 110, 122	
Religion: REL 101	
Spanish: FLS 129, 141, 142, 231, 232, 922	
Social Science (Select from at least 2 different departments)	8
Economics: ECN 120, 130	
Geography: GEO 121, 141, 161, 922	
History & World Civ: HIS 131, 132, 151, 152, 211, 231, 251, 257, 266, 268, 271	
Political Science: POL 110, 111, 112	
Psychology: PSY 102, 111, 121, 211, 226, 227, 228, 241, 251	
Sociology: SOC 110, 115, 120, 136, 160, 161, 207, 230, 240, 851, 922	
Math & Science (must include one math and one laboratory science course)	8
Mathematics: MAT 110, 112, 113, 127, 128, 140, 149, 156, 165, 170, 210, 216, 219, 227	
Lab Science: BIO 105, 112, 113, 138, 163, 177, 180, 186, 248, 252; CHM 122, 165, 175, 263, 273; ENV 111; PHS - 120, 151; PHY 106, 160, 161, 212, 222; SCI 142	
Non-Lab Science: PHS 165, 185; SCI 922, 928	
Distributed Requirement (Select from the above three disciplines: (Humanities, Social Science, Math & Science))	8
Electives	21
All transfer courses may be used here including courses listed above (if additional credits are taken beyond the requirements). Students should plan their elective courses according to their college major if they are planning to transfer on for a four-year degree. Information on suggested coursework is available in the Enrollment Services office. 16 semester hours of career education courses with a grade of "C" (2.00 on a 4.00 scale) or better may be applied as part of the 21 semester hours of electives.	
Total	62

Transfer Equivalencies

How SCC Courses match up to other 4-year colleges

Southeastern Community College 	Western Illinois University 	University of Northern Iowa 	University of Iowa 	Iowa State University 
CHM 163 General Chemistry I	Chem 201	Chem 1110	004:011 Principles of Chemistry 1	Chem 177 and 177L
CHM 173 General Chemistry II	Chem 202	Chem 1120	004:012 Principles of Chemistry 2	Chem 178 and 178L
CHM 263 Organic Chemistry I	Chem 331	Chem 2220	004:141 and 004:121 Organic Chemistry 1 with Lab	Chem 331/331L
CHM 273 Organic Chemistry II	Chem 332	Chem 2220	004:141 and 004:122 Organic Chemistry 2 with Lab	Chem 332/332L
PHY 160 College Physics I	Phys 114	Phys 1511	029:011	Phys111
PHY 161 College Physics II	Phys 115	Phys 1512	029:012	Phys112
PHY 212 Classical Physics I	Phys 211	Phys 1701	029:081	Phys 221
PHY 222 Classical Physics II	Phys 213	Phys 1702	029:082	Phys 222
MAT 127 College Algebra and Trig	Mat 131	Math 1140	22M:005	Math 1T**
MAT 156 Statistics	Stat 171	Stat 1772	07P:025 or 22S:025	Stat 104
MAT 210 Calculus I	Mat 133	Math 1420	22M:025	Math 165
MAT 216 Calculus II	Mat 134	Math 1421	22M:026	Math 166
MAT 219 Calculus III	Mat 231	Math 2422	22M:028	Math 265
BIO 112 General Biology I	Zool 200	Bio 1000AL	002:002 or Gen Ed	Bio 112 and 113 transfer together as Biol 211/221L and Biol 212/212L
BIO 113 General Biology II	Bot 200	Bio 1000AL	Gen Ed	

Disclaimer: This is a recommended guideline and courses may vary. It is advisable for students to meet with a SCC enrollment specialist to confirm specific coursework.