

CAREER PATHS FOR ASSOCIATE IN SCIENCE DEGREES

Biology

Nature of the Work

Biological scientists study living organisms and their relationship to the environment. Most specialize in some area of biology such as zoology (the study of animals) or microbiology (the study of microscopic organisms). Many biologists work in research and development. Others work in management or administration in which they plan and administer programs for testing food and drugs, for example, or direct activities at zoos or botanical gardens. Other related occupations include foresters, range managers, soil conservationists, animal breeders, horticulturists, soil scientists, agricultural and life scientists, as well as many health occupations.

Employment

For biological scientists, the Ph.D. degree is generally required for college teaching, independent research, and for administrative positions. A master's degree is sufficient for some jobs in applied research and management, inspection, sales, and service. The bachelor's degree is adequate for some non-research jobs. Some bachelor's degree graduates start as biological scientists in testing and inspection, or get jobs such as technical sales or service representatives. Others become high school biology teachers with additional education courses.

The Program

The Kirtland Community College biology curriculum is designed to provide the general education courses that are required to transfer to a university for bachelor's degree completion.

The following is a sample program. You will need to work with your advisor and transfer school to ensure a smooth transition.

First Year

Fall Semester

ENG-10000 Writing Lab	0-1
ENG-10303 English Composition I & Lab	3
BIO-10100 General Biology	4
CHE-10101/02 General Chemistry I w/lab	5
MTH-13000 College Algebra	4
	16-17

Winter Semester

ENG-10403 English Composition II	3
POL-10100 Intro to American Government	3
Humanities course	3
BIO-20100 General Zoology	4
CHE-10201/02 General Chemistry II	5
	18

Second Year

Fall Semester

Social Science Course	3
Humanities course	3
BIO-20200 General Botany	
Or BIO-11500 Anatomy & Physiology I	
Or GEL-10500 Geology	4
PHY-20101/02 Physics I w/Trig & lab	5
	15

Winter Semester

Social Science course	3
Humanities course	3
BIO-21000 Microbiology	
Or BIO-11600 Anatomy & Physiology II	
Or MTH-20600 Statistics	4
PHY-20201/02 Physics II w/Trib & lab	5
	15

Chemistry

Nature of the Work

Chemists search for and put to practical use new knowledge about chemicals. Many chemists work in research and development. Some also work in production and quality control in chemical manufacturing plants. Chemists often specialize in a sub-field such as analytical, organic, inorganic, or physical chemistry.

Employment

Employment of chemists and materials scientists is expected to grow 9 percent over the 2006-16 decade, about as fast as the average for all occupations. Job growth will occur in professional, scientific, and technical services firms as manufacturing companies continue to outsource their R&D and testing operations to these smaller, specialized firms. Chemists are employed in all parts of the country, but they are mainly concentrated in large industrial areas.

A bachelor's degree in chemistry or a related discipline is usually the minimum education necessary to work as a chemist. However, most research and college teaching jobs require a Ph.D. degree.

Many with bachelor's degrees in chemistry enter other occupations such as technical writing or sales representatives in chemical marketing. Some enter medical, dental, veterinary, or other health professions, and others become high school teachers.

The Program

The Kirtland Community College chemistry curriculum is designed to provide the general education courses that are required to transfer to a university for bachelor's degree completion.

The following is a sample program. You will need to work with your advisor and transfer school to ensure a smooth transition.

First Year

Fall Semester

ENG-10000 Writing Lab	0-1
ENG-10303 English Composition I	3
Humanities course	3
MTH-22002 Calculus I	4
CHE-10101/02 General Chemistry I w/lab	5
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	15-16

Winter Semester

ENG 10403 English Composition II	3
POL 10100 Intro to American Government	3
MTH-11201 Calculus II	4
CHE-10201/02 General Chemistry II w/lab	5
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	15

Second Year

Fall Semester

Social Science course	3
Humanities course	3
CHE-20101/02 Organic Chemistry I w/lab	5
PHY-20101/02 Physics I w/Trig & lab	5
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	16

Winter Semester

Social Science course	3
Humanities course	3
CHE-20201/02 Organic Chemistry II w/lab	5
PHY-20201/02 Physics II w/Trig & lab	5
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	16

Dentistry

Nature of the Work

Dentists diagnose, prevent, and treat problems of the teeth and tissues of the mouth. In order to treat their patients, dentists use a variety of equipment including X-ray machines, drills, and instruments such as mouth mirrors, probes, forceps, brushes, and scalpels. Those in private practice oversee a variety of administrative tasks as well. In addition, they may employ and supervise hygienists, assistants, lab technicians, and receptionists.

Employment

Employment of dentists is projected to grow nine percent through 2016. About nine out of ten dentists are in private practice. Dentists are required to be licensed in all 50 states. Demand for dental services tends to follow the business cycle, primarily because these services usually are paid for either by the patient or by private insurance companies. As a result, during slow times in the economy, demand for dental services can decrease; dentists may have difficulty finding employment, or if already in an established practice, they may work fewer hours because of reduced demand.

The Program

The program at Kirtland Community College is designed to provide the general education core courses that are required to transfer to a university. Most dental students have at least a bachelor's degree. All dental schools require applicants to take the Dental Admissions Test. Dental schools generally last 4 academic years. All 50 states require dentists to be licensed.

The following is a sample program. You will need to work with your advisor and transfer school to ensure a smooth transition.

First Year

Fall Semester

ENG-10000 Writing Lab	0-1
ENG-10303 English Composition I	3
BIO-10100 General Biology	4
CHE-10101/02 General Chemistry I w/lab	5
MTH-22002 Calculus I	4
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	19-20

Winter Semester

English Composition II	3
Humanities course	3
POL-10100 Intro to American Government	3
CHE-10201/02 General Chemistry II w/lab	5
BIO-20100 General Zoology	4
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	18

Second Year

Fall Semester

Social Science course	3
BIO-21000 Microbiology	
Or BIO-11600 Anatomy & Physiology I	4
CHE-20101/02 Organic Chemistry I w/lab	5
PHY-20101 Physics I w/Trig & lab	5
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Winter Semester

Humanities course	3
BIO-20200 General Botany	
Or BIO-11600 Anatomy & Physiology II	4
CHE-20201/02 Organic Chemistry II w/lab	5
PHY-20201/02 Physics II w/Trig & Lab	5
Social Science course	3
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Pre-Engineering

Nature of the Work

Engineers employ the theory and principles of science and mathematics to the economical solution of practical technical problems. They design machinery, products, systems, and processes for efficient and economical performance. Also, many engineers design, plan, and supervise the construction of buildings, highways, and transit systems. Most engineers specialize in one of more than 25 major specialties recognized by professional societies

Engineers in each specialization have knowledge and training that can be applied to many fields. They often use computers to simulate how a machine, structure, or system operates. Many engineers work in laboratories, industrial plants, or construction sites where they inspect, supervise, or solve onsite problems. Others work in an office almost all the time.

Employment

Overall job opportunities in engineering are expected to be good because the number of engineering graduates should be in rough balance with the number of job openings between 2006 and 2016. In addition to openings from job growth, many openings will be created by the need to replace current engineers who retire; transfer to management, sales, or other occupations; or leave engineering for other reasons.

The Program

The Kirtland Community College engineering curriculum is designed to provide the general education courses that are required to transfer to a university for bachelor's degree completion.

The following is a sample program. You will need to work with your advisor and transfer school to ensure a smooth transition.

First Year

Fall Semester

ENG-10000 Writing Lab	0-1
ENG-10303 English Composition I	3
MTH-22002 Calculus I	4
CHE-10101/02 General Chemistry I w/lab	5
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	15

Winter Semester

ENG-10403 English Composition II	3
Humanities course	3
POL-10100 Intro to American Government	3
EDT-10000 Engineering Graphics	3
MTH-22102 Calculus II	4
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	16

Second Year

Fall Semester

Social Science course	3
Humanities course	3
MTH-22202 Calculus III	4
PHY-22101/02 Physics I w/Calculus & lab	5
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Winter Semester

Social Science course	3
Humanities course	3
CIS-27001 Programming I	4
PHY-22201/02 Physics II w/Calculus & Lab	5
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Medical Technology

Nature of the Work

Clinical laboratory testing plays a critical role in the detection, diagnosis, and treatment of disease. Medical technologists perform most of these tests. They examine and analyze body fluids, tissues, and cells. Then they analyze the results and relay them to physicians.

Employment

More than half of jobs were in hospitals. Most of the remaining jobs were in offices of physicians and in medical and diagnostic laboratories. Other employment options are blood banks, research and testing laboratories, and the Federal Government.

Job Outlook

Job opportunities are expected to be excellent, because the number of job openings is expected to continue to exceed the number of job seekers. With the rapid growth in the older population, demand will remain constant. Employment of clinical laboratory workers is expected to grow 14 percent between 2006 and 2016, faster than the average for all occupations. The volume of laboratory tests continues to increase with both population growth and the development of new types of tests

The Program

The program at Kirtland Community College is designed to provide the general education and science courses that are required to transfer to a school of medical technology. Three years of college is a prerequisite for training at an AMA-approved school of medical technology. Students may enroll at KCC for two years and complete the third year at the transfer institution. At least 12 consecutive months must be spent at an approved school of medical technology.

The following is a sample program. You will need to work with your advisor and transfer school to ensure a smooth transition.

First Year

Fall Semester

ENG-10000 Writing Lab	0-1
ENG-10303 English Composition I	3
BIO-10100 General Biology	4
CHE-10101/02 General Chemistry I w/lab	5
MTH-13000 College Algebra	4
Humanities course	3
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	19-20

Winter Semester

ENG 10403 English Composition II	3
POL 10100 Intro to American Government	3
Humanities course	3
CHE-10201/02 General Chemistry II w/lab	5
BIO-20100 General Zoology	4
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Second Year

Fall Semester

Social Science course	3
BIO-21000 Microbiology	
Or BIO-11500 Anatomy & Physiology I	4
CHE-20101/02 Organic Chemistry I w/lab	5
PHY-20101/02 Physics I w/Trig & lab	5
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Winter Semester

Humanities course	3
Social Science course	3
BIO-20200 General Botany	4
CHE-20201/02 Organic Chemistry II w/lab	5
PHY-20201/02 Physics II w/Trig & lab	5
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Medicine

Nature of the Work

Physicians examine patients, obtain medical histories, and order, perform, and interpret diagnostic tests. They diagnose illnesses and prescribe and administer treatment for people suffering from injury or disease. Physicians counsel patients on diet, hygiene, and preventative health care. Those in private practices may handle or oversee the business aspects of running an office. Most MD's specialize in medical, surgical, or other specialties.

Job Outlook

Employment of physicians and surgeons is projected to grow 14 percent from 2006 to 2016, faster than the average for all occupations. Job growth will occur because of continued expansion of health care related industries. The growing and aging population will drive overall growth in the demand for physician services, as consumers continue to demand high levels of care using the latest technologies, diagnostic tests, and therapies.

The Program

The minimum requirement for entry to schools of medicine is three years of college, with most giving preference to those with bachelor's degrees. The program at Kirtland includes the math and science courses necessary for the study of medicine. This program is designed to transfer to universities for bachelor's degree completion.

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First Year

Fall Semester

ENG-10000 Writing Lab	0-1
ENG-10303 English Composition I	3
BIO-10100 General Biology	4
CHE-10101/02 General Chemistry I w/lab	5
MTH-22002 Calculus I	4
Humanities course	3
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	19-20

Winter Semester

ENG 10403 English Composition II	3
POL 10100 Intro to American Government	3
Humanities course	3
CHE-10201/02 General Chemistry II w/lab	5
BIO-20100 General Zoology	4
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Second Year

Fall Semester

Social Science course	3
BIO-21000 Microbiology	
Or BIO-11600 Anatomy & Physiology I	4
CHE-20101/02 Organic Chemistry I w/lab	5
PHY-20101 Physics I w/Trig & lab	5
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	17

Winter Semester

Humanities course	3
BIO-20200 General Botany	
Or BIO-11600 Anatomy & Physiology II	4
CHE-20201/02 Organic Chemistry II w/lab	5
PHY-20201/02 Physics II w/Trig & Lab	5
Social Science course	3
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