

Premedical and Health Sciences

Preprofessional Studies

Clinical Laboratory Science
and Medical Technology
Cytotechnology
Health Information Management
Hospital and Health Administration
Nuclear Medicine Technology
Occupational Therapy
Optometry

Pharmacy
Physical Therapy
Physician Assistant
Podiatry
Pre dentistry
Pre medicine
Preveterinary Medicine

Majors and Minors

Athletic Training
Biochemistry
Biological Systems Engineering
Biology
Chemical Engineering
Chemistry
Diet and Exercise

Dietetics
Food Science
Genetics
Kinesiology and Health
Microbiology
Nutritional Science
Psychology

Iowa State University has more than 100 majors that provide virtually unlimited academic opportunities. In this brochure you'll find information about your specific area of interest and a family of related majors that you may want to explore during your adventure here at Iowa State. Please use the contact information listed inside and let us help you discover your passions, unlock your potential, and **enjoy the adventure.**

Sound academic preparation means healthy career options

Iowa State is nationally recognized as an academic center for biological, physical, and food sciences. Because of that reputation, many organizations maintain ongoing partnerships with Iowa State's programs, providing internships, cooperative learning, research, or employment opportunities.

Preparing for a career in health

Iowa State offers a curriculum that focuses on preprofessional studies and prepares you to pursue advanced education at most professional schools. The specific courses you take in your preprofessional program will depend upon the requirements of the professional schools to which you want to apply.

As part of your program, you will complete the prerequisite courses and laboratories that are required by professional schools. You will also be able to participate in research laboratory studies with Iowa State scientists, conduct independent study projects, and experience patient care by working with Ames health facilities. Students generally earn a bachelor's degree in the process of completing preprofessional health requirements and then continue their studies by transferring to a professional program.

Study with faculty who practice what they teach

There are opportunities for undergraduates to work in laboratories with biochemists, geneticists, microbiologists, neuroscientists, dietitians, therapists, athletic trainers, fitness and health specialists, and researchers.

Faculty assume many roles as they work to prepare students for advanced study. Faculty often work with students outside of the classroom, helping to facilitate research partnerships, learning communities, employment, lab assistantships, program contacts, and independent projects.

Selecting the best academic program

Many of the programs listed in this brochure require similar course work, which means that you can explore and prepare for many career options in the early stages of your studies. Your academic adviser will work with you to design your curriculum and make certain you can take advantage of the opportunities Iowa State offers you.

Premedical and Health Sciences

Preparation for medicine and other health programs

Iowa State's emphasis on science and technology has established our reputation for world-class programs and cutting-edge research, laboratories, and technologies that support your studies in science and math.

For more information about these programs, contact one of Iowa State's premedical and preprofessional health program coordinators:

Emily Olson or Jennifer Owens
102 Catt Hall, Ames, Iowa 50011
Email: prehealth@iastate.edu

The Health Care Track

College preparation for medical school or professional health studies programs

Medicine, physical therapy, clinical and medical technology, health services and administration—at Iowa State University, you can prepare for advanced study in any health care field.

Health programs are competitive. Though institutions may vary in their requirements for admission, most professional health programs require similar academic, testing, and attendance components:

• University study

2–4 years at an accredited college or university of arts and sciences or an institute of technology

• Core courses and laboratories commonly required

Biology
Biochemistry
General chemistry
Organic chemistry
Math, physics, and/or statistics
English
Psychology

• Other considerations for admission when you apply to medical school or advanced studies in health sciences

Test scores—you may be required to take an assessment test before you enroll in a professional program or graduate school. Possible tests include the Graduate Record Examination (GRE), Medical College Admissions Test (MCAT), or Dental Admissions Test (DAT)

Grade point average—usually a minimum of 2.5 or higher is required, though competitive programs will weigh your performance against other applicants

Other factors—internships, letters of recommendation, service activities, commitment, and character

Frequently asked questions about health care studies

So what major do I choose if I plan to enroll in medical, dental, or other professional health programs? Do I have to choose a major in the sciences?

You do not have to major in the sciences, even if you are choosing to pursue a career in a health-related field. In fact, you can choose any major, as long as you meet the requirements of the preprofessional program you've chosen.

Though the most common majors for premedical students are biological sciences, engineering, and psychology, many students choose majors that build on their own strengths, talents, and interests.

What is a preprofessional program? Is it a major? Do I get a degree in that program?

A preprofessional program is not a major. Typically, academic institutions do not offer a formal degree in pre-medicine or any preprofessional program. Rather, universities offer preprofessional programs of study that are geared to support the general admission requirements for the field you have chosen to pursue. In some cases, students who have completed their preprofessional program at Iowa State can earn a degree from Iowa State at the same time that they complete their professional studies elsewhere.

For health-related fields, your preprofessional program of study will include a background in science and math but will also accommodate a broad variety of courses, some of which may reflect your personal interests and enhance your science background—philosophy, music, art, creative writing, journalism.

Will Iowa State prepare me for medical school or advanced studies as a health professional?

Yes. Most professional programs or graduate schools require 2–4 years of course work at an accredited undergraduate college. To prepare for medical school or a health-related professional program, you will work with an adviser to make certain your preprofessional program meets the course requirements for future study. Admission requirements for professional programs vary, so it is always easier to plan if you have a sense of which graduate schools or health programs most interest you.

Preprofessional studies at Iowa State University Clinical Laboratory Science and Medical Technology

Prepare to perform tests to diagnose illness and blood profiles

Cytotechnology

Prepare to perform cell analysis—mounting, staining, and evaluating specimens of human body tissue

Health Information Management

Prepare to develop, coordinate, and implement information systems that impact organizations

Hospital and Health Administration

Prepare to work in health management, insurance, administration, or government program administration

Nuclear Medicine Technology

Prepare to use radioactive chemicals to diagnose and treat disease

Occupational Therapy

Prepare to help patients develop independence and to restore basic functions to those disabled by physical or emotional injury

Optometry

Prepare to diagnose, treat, and manage diseases of the visual system and the eye

Pharmacy

Prepare to dispense therapeutic drugs, educate various audiences about drugs, and conduct pharmaceutical research

Physical Therapy

Prepare to prevent physical disabilities and rehabilitate the disabled

Physician Assistant

Prepare to work with doctors to evaluate, examine, and treat patients

Podiatry

Prepare to diagnose, prevent, and treat injuries and deformities of the feet

Pre dentistry

Prepare to provide and promote oral health care

Premedicine

Prepare to study, diagnose, and treat human illness and injury

Preveterinary Medicine

Prepare to study, diagnose, and treat animal illness and injury

Some majors and minors to consider

If you are interested in a career as a health professional, you may major in any field as long as you meet the science and math requirements necessary for advanced study. Most of our premedical students major in biology,

biochemistry, or psychology. To complement your professional goals, you may consider a nonscience major, or a second major or minor, such as communications or business.

Athletic Training

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As an athletic training major students will study the prevention, assessment, treatment, and rehabilitation of injuries to athletes and others who are engaged in everyday physical activities.

Your coursework will include studies in anatomy, physiology, nutrition, chemistry, biomechanics, and evaluation, treatment, rehabilitation and use of therapeutic modalities in the care of athletic injuries. While enrolled in the accredited Athletic

Training Program at Iowa State, students will have the opportunity to gain hands-on experience through clinical rotations in areas such as the ISU athletic training rooms, local high schools, physical therapy clinics, physician clinics, emergency rooms, campus recreation services, surgical observations, and Drake University; these clinical rotations will be supervised by certified athletic trainers, physicians, and other allied health care professionals.

Biochemistry

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Biochemistry provides the basis for much of modern biotechnology. Biochemists seek to understand life processes in terms of chemical and physical principles. Individual members of the department form a highly interconnected and overlapping network and conduct research in areas such as the structure and function of enzymes, membranes, and hormones; cell metabolism; cell biology; structural biology and dynamics; signal transduction; reproduction; the chemical basis of heredity; nerve transmission; and the design and

evaluation of drugs for the treatment of disease.

The program of study emphasizes modern concepts and research methodologies and is designed to offer various opportunities to work with faculty in an active biomedical or plant science research laboratory. Such partnerships provide excellent training for future development in a wide variety of scientifically-based careers in universities, veterinary and medical schools, government laboratories, or the biotechnology sector.

Biological Systems Engineering

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As a biological systems engineering (BSE) student, you will learn to integrate life sciences with engineering to solve problems related to, or using, biological systems. These biological systems may include microbes, plants, animals, humans, and/or ecosystems. You will also learn about fundamental principles of engineering and life-science.

You will use your understanding of engineering to analyze organisms or ecosystems, and your knowledge of biological systems to inspire and inform their designs.

The BSE degree program is student-focused and derives strength from the broad, hands-on training provided to students in the program. You will learn to use engineering methods to address societal

needs related to biorenewables production and processing, water quality, environmental impacts of the bioeconomy, food processing, and biosensors. In so doing, you will be prepared for professional practice and post-graduate educational opportunities.

Four distinct options are available: biorenewable resources engineering, bioenvironmental engineering, food engineering, and pre-professions/pre-graduate. You will experience all the subjects in a hands-on team environment using modern engineering tools and equipment. Many opportunities also exist for studying and working abroad in countries such as Brazil, Germany, Poland, Taiwan, China, and Uganda.

Biology

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Iowa State University is a major center for research and education in the biological sciences. Students have the opportunity to learn from some of the nation's leaders in biological research and teaching and to participate in innovative programs.

You may develop your program of study to target your goals by choosing from a wide variety of courses in areas such as animal biology; plant biology; genetics, development and cell biology; biodiversity; ecology; and evolution. You will also have the opportunity to study abroad, take courses at field stations around North America, and participate in North American or international field

trips in biology. In addition, you may explore the frontiers of biology by doing research on campus or through summer field courses at Iowa Lakeside Laboratory or one of our affiliated institutes, including the Organization for Tropical Studies or the Gulf Coast Research Laboratory.

Iowa State's high-quality academic program will prepare you for further studies in graduate school in a diverse range of biological fields or to continue on to professional training in environmental biology, human medicine, veterinary medicine, dentistry, optometry, physical therapy, chiropractic or pharmacy.

Chemical Engineering

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As a chemical engineering major you will use science, experience, creativity, and ingenuity to deal with chemical and physical changes of matter and the conversion of energy.

The department provides a broad range of chemical engineering courses, as well as the opportunity to work with engineers at the Ames Laboratory of the U.S. Department of Energy,

which conducts physical and chemical science research related to energy technologies.

Your coursework will prepare you for employment in areas including product development, market research, economic feasibility studies, chemical process and design, supervision and operation, chemical plant construction, and pollution control and energy conservation.

Chemistry

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When you study chemistry you have the opportunity to study scientific processes and reactions that define every aspect of daily life.

As a chemistry major you will learn how to design, implement, record, and analyze the results of a chemical experiment. Your coursework will focus on the environmental and ethical dimensions of problems and issues that face professionals. You will use modern instruments and classical techniques to identify and solve chemical problems as you explore new areas of research.

Students also have the opportunity to join both the Chemistry Learning Community and the Society for Chemistry Undergraduate Majors as a way to network with other chemistry majors.

A degree in chemistry from Iowa State will prepare you to continue in graduate school or professional studies, or qualify you for a career as an environmental chemist, pharmaceutical chemist, forensic scientist, science writer, technical salesperson, product development chemist, or researcher.

Diet and Exercise

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Diet and exercise is an accredited program for students interested in earning concurrent bachelor's and master's degrees. To pursue this program you will start as a pre-diet and exercise major, and at the beginning of your junior year you will apply for admission to the accelerated program.

Your coursework will include studies in biology, anatomy, fitness, nutrition, and physiology. This program will prepare you for admission to

accredited dietetic internships. Upon completion of an internship you will be eligible to take the national exam to become a registered dietitian.

You will then be prepared for career positions in cardiac rehabilitation programs, school nutrition/wellness programs, corporate health programs, health clubs, public health programs and clinics, preventative health programs, and sport enhancement programs.

Dietetics

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The dietetics degree at Iowa State is an accredited science- and health-related program that emphasizes food and nutrition.

As a dietetics major you will take courses in nutrient metabolism, community nutrition, counseling and educational methods, medical nutrition therapy, and food service management. You will also have the opportunity to apply for an accredited dietetic internship, which provides

supervised practice for qualified students. After completion of the internship you will be eligible for the national registration exam, taken to become a registered dietitian.

Registered dietitians are prepared for employment in hospitals and health-care facilities, sports nutrition and wellness programs, business and industry, community and public health settings, education, research, and private practice.

Genetics

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As a genetics major you will explore the characteristics of living organisms to determine how they are passed from generation to generation. Understanding heredity is fundamental to all the biological sciences, particularly animal science as it relates to production and the study of disease.

The department offers a broad range of courses in every aspect of genetics, from molecular genetics

of microorganisms to population genetics. You may also consider minoring in genetics to complement a major in another field of science, mathematics, or computer science.

A degree in genetics will prepare you for a career in research and development, teaching, biotechnology, health, and graduate or professional study in science, medicine, or veterinary medicine.

Food Science

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Food science includes everything that happens to food, from the time it leaves the farm to the time the consumer purchases it.

As a food science major you will learn about the application of the basic principles of biology, chemistry, and physics in studying the quality, processing, preservation, preparation, safety, and development of foods.

You will focus on one of the following Institute of Food Technologists approved programs: Food Science and Technology or Food Science and Industry.

A degree in food science will prepare you for a wide variety of career areas such as product development, food quality & safety, food sales and technical services, and production and management.

Kinesiology and Health

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When you enroll in kinesiology and health at Iowa State you will study the physiological and behavioral aspects of physical activity and human movement through disciplines such as biomechanics, exercise physiology, motor control, and exercise psychology.

There are four areas of specialization to choose from: community and public health, exercise science, physical education teacher education (K–12), and pre-health professions. You can also pick up an endorsement to teach health or coach interscholastic athletics.

Your education will include exposure to well-equipped human movement labs as well as world-class faculty and staff assisting you with your academic preparation.

These programs prepare you to work as a

community health specialist or wellness coach, exercise leader or personal trainer, or a physical education teacher and coach.

The pre-health professions specialization will prepare you for entry into graduate school or professional schools such as physical therapy, medical school, or other health care professions.

In addition to your coursework, you will have the opportunity to complete a semester-long field experience within health or fitness facilities, student teach at the elementary and secondary level, gain real-world experience through practicums and volunteer activities, and maybe even study abroad.

Get ready for meaningful work improving the lives of others in a satisfying career in health, physical activity and preventive medicine.

Microbiology

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Microbiology is the study of living organisms and infectious agents. Microbiologists study the interaction of microorganisms with people, investigating how microbes exist and affect the ecosystem and our lives.

As a microbiology major you will study genetics, chemistry, biochemistry, physiology, physics, ecology, and pathology. With a degree in microbiology you may develop vaccines for

infectious diseases, test for infections, conduct research to determine how microorganisms cause disease, harness microbes to recycle waste, improve livestock production, or make food taste better and prevent spoilage.

Your degree will prepare you for professional study in human or veterinary medicine or for a career in clinical, food, industrial, or environmental technologies.

Nutritional Science

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When you major in nutritional science, you will look at the connection between diet and health; the effects of various nutrients in the cause, treatment, and prevention of many diseases; and the maintenance of normal health, growth, and development.

As a nutritional science major you will select either the pre-health professional and research option or the nutrition and wellness option. The pre-health professional and research option will provide a

strong science and nutrition education, preparing you for graduate school, research, or professional programs such as medical, pharmaceutical, or dental schools.

The nutrition and wellness option will provide education about the role of nutrition and healthy eating for disease prevention and wellness, preparing you for a career in community nutrition, public health, or related programs.

Psychology

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All psychologists have one thing in common: an interest in behavior. They work to understand how people and other animals develop, learn, think, feel, act, and relate to each other.

As a psychology major, you have the opportunity to apply your skills in analyzing behavior and its causes in supervised settings in the community or in research laboratories.

An undergraduate degree in psychology from Iowa State will prepare you for positions such as a paraprofessional in hospitals and clinics; counselor

in federal, state, and local health agencies; correctional, recreation, or rehabilitation counselor; human resource manager; writer; and researcher.

A bachelor of science in psychology is good preparation for law school and medical school, especially if you wish to specialize in psychiatry. If you want to become a professional psychologist, licensed to provide psychotherapy, or intend to seek an academic position in research (e.g., professor, research scientist), you should plan to pursue a doctoral degree in psychology.

Premedical and Health Sciences

Unique learning environment

Outstanding faculty and facilities in the biological sciences provide opportunities you won't find anywhere else. The biochemistry faculty received federal funding for research in such areas as nutrition, x-ray crystallography of proteins, nuclear magnetic resonance spectroscopy, and modern biotechnology procedures.

Iowa State University recently has been designated as a Collaborating Center for the World Health Organization in the area of food safety and research.

Established in 1997, the Laurence H. Baker Center for Bioinformatics and Biological Statistics develops computational, graphical, or algorithmic methods to interpret information from molecular, cellular, anatomical, physiological, population, and ecological studies.

Students in kinesiology and health are able to work with movement analysis in state-of-the-art biomechanics and motor behavior laboratories. Exercise physiology laboratories are equipped with treadmills, metabolic carts, and underwater weighing tanks. A muscle biochemistry lab utilizes muscle biopsy and blood/urine analysis techniques. Immune function improvement is being examined in relation to exercise adherence.

Iowa State's laboratories offer summer employment and part-time research development opportunities for students. For example, you may work in one of our genetics and cell biology labs, helping our researchers develop treatments for degenerative diseases of the brain using stem cells.

Unique learning opportunities

As an Iowa State undergraduate, you will have the option of participating in a wide variety of social, academic, and professional activities outside of the classroom. Often it's these activities that create lasting professional and personal support systems. Some of these activities may include:

- Learning communities—such as the BEST program (Biology Education Success Teams)—residence-based communities for new freshmen studying similar subjects
- Honors program—recognizing academic excellence by permitting students to customize their programs of study and complete independent research projects
- Undergraduate research opportunities—work with faculty participating in hundreds of ongoing research projects
- International field trips—scheduled trips to places such as Australia, Costa Rica, Honduras, Kenya, Central Europe, and the Galapagos Islands
- Study abroad opportunities—at affiliate universities in South America and Africa
- Internships—at partnering university research laboratories, cancer centers, medical schools and centers, and pharmaceutical companies
- High-tech computer laboratories—featuring microcomputers, high-quality printers, plotters, and video projectors

Student organizations

An important part of becoming a professional in your field is working and interacting with others in your field. Consider joining student clubs and organizations to support your academic pursuits. Here is a small sample of opportunities available to undergraduates.

- Beta Beta Beta
- Biochem & Biophys/Mol. Bio. Undergrad Club
- Biological/Premedical Illustration Club
- Biology/Genetics Club
- Biological Sciences Club
- Biological Systems Engineering Club
- Culinary Science Club
- Food Science Club
- Genetics Club
- Health Promotion Club
- Kinesiology & Health Club
- ISU Global Health & Aids Coalition
- Microbiology Club
- Nutrition Club
- Pre-med Club
- Pre-Physical Therapy Club
- Student Dietetic Association
- Student Health Advisory Committee

Iowa State University
Office of Admissions
100 Enrollment Services Center
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Phone: 515 294-5836
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Email: admissions@iastate.edu
Web: www.admissions.iastate.edu

Questions about admission

In addition to writing us at the address at left, we encourage you to visit our website, which features a course catalog, online application, and campus information.

Also, you can follow us on:



Preparing to do your best while in school

The best preparation continues to be a strong college preparatory program of study, which includes courses in English, mathematics, laboratory science, social studies, and foreign languages. If you intend to transfer credits from another institution, you may contact our Office of Admissions for assistance in selecting the best courses for your program of study.

Material in this brochure was accurate at the time of printing. For the most up-to-date information, visit our Web site at www.iastate.edu.

Iowa State University does not discriminate on the basis of race, color, age, ethnicity, religion, national origin, pregnancy, sexual orientation, gender identity, genetic information, sex, marital status, disability, or status as a U.S. veteran. Inquiries can be directed to the Office of Equal Opportunity and Compliance, 3280 Beardshear Hall, 515 294-7612.

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