SCIENCE
SHAPE THE WORLD
WELCOME TO THE FACULTY OF SCIENCE

WE ARE MAKING DISCOVERIES AND PUSHING BOUNDARIES. WE ARE FINDING WAYS TO BE MORE EFFECTIVE IN OUR PROCESSES AND MORE EFFICIENT IN OUR WORK MODELS. WE UNDERSTAND THAT SCIENCE RESPONDS TO GLOBAL AND SOCIETAL CHANGES AND IS BECOMING MORE INTERDISCIPLINARY IN NATURE.

SCIENCE IS NOT STATIC ... AND NEITHER ARE WE.
FACULTY OF SCIENCE

6,200
undergraduate students

47,000
alumni

PLANT WALK, 300-LEVEL
BOTANY CLASS USING THE
CAMPUS AS A CLASSROOM

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JOIN US IN THE FACULTY OF SCIENCE, AND SEE HOW OUR DEGREES ...
PROVIDE YOU WITH A STRONG EDUCATION
Gain in-depth knowledge of your science discipline, learn how to apply that knowledge, and understand how to use your newly acquired skillset and tools.

ALLOW FOR SCIENTIFIC GROWTH
Build the skills needed to adapt to new methods and a changing world.

TEACH YOU THE ART OF COLLABORATION
Work in teams and know how to apply your knowledge to various industries.

GIVE YOU THE SKILLS AND CONFIDENCE TO FORGE YOUR OWN PATH
From spin-off companies to unique careers, be open to all the paths a science degree can lead you down.

UNDERGRADUATE STUDENT ZAIN PATEL WORKING ON HIS CAPSTONE PROJECT WITH MATTHEW KINGSTON, INSCITE LAB COORDINATOR AND TECHNICIAN.
BIological SCIENCES

The biological sciences cover a range of topics, all relating in some way to the life sciences. Our programs cover the environment, climate change and its effects on life, biodiversity—including plants, animals, microorganisms and ecosystems—genetics, health studies, cellular structures, past life forms, and evolution.

CHEMISTRY

Considered the central science, chemistry is connected to all scientific disciplines in one way or another. Our degrees offer specialized training in the theoretical and practical components of chemistry. Students take a selection of courses in general, analytical, organic, and physical chemistry, as well as mathematics and related courses in environmental studies.

COMPUTING SCIENCE

The first program of its kind established in Canada, we have earned a reputation for being innovative, creative, and responsive. Combine a computing science background with another topic of your choice to create a flexible and applied program. Students build a strong theoretical and mathematical foundation through the program that includes hardware and software design and processes. Training in artificial intelligence, user interface design, and telecommunications is offered in later years.

EARTH AND ATMOSPHERIC SCIENCES

Our programs examine the Earth, its structure and evolution, and the atmosphere above us. Unique in Canada, we offer an interdisciplinary approach to the study of environmental earth science, geology, and geography.

MATHEMATICAL AND STATISTICAL SCIENCES

The mathematical and statistical sciences form the foundation which supports our science-based culture and addresses some of today’s most pressing issues, like climate change, epidemiology, and economic forecasting. Our undergraduate programs help to develop specialized skills in applied mathematics, mathematical economics, math and finance, and computational sciences.
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PHYSICS

Known as a fundamental science, physics provides a true understanding of how the world really works. Our students build a strong background in modern physics, mechanics, thermodynamics, electromagnetism, relativity, quantum mechanics, statistical physics, and laboratory work. Topics in areas such as laser spectroscopy, optics, electronics, nuclear physics, particle physics, stellar atmospheres, stellar interiors, field theory, condensed matter, and fluid dynamics are introduced in later years of the program.

PSYCHOLOGY

Shared between the Faculty of Science and the Faculty of Arts, our Department of Psychology offers students comprehensive opportunities to study two different aspects of the field. A science degree in psychology focuses on how the brain functions as well as how we perceive, learn, and forget things. Students learn about perception and motivation, behavior, and cognitive development with emphasis on the physical, biological, and mathematical sciences.

MEDICAL AND HEALTH SCIENCES

In collaboration with the Faculty of Medicine & Dentistry, we offer a number of outstanding undergraduate programs in health. Programs include Biochemistry, Cell Biology, Immunology and Infection, Neuroscience, Pharmacology and Physiology.

View department brochures at uab.ca/scibrochure
4 degree types

SCIENCE DEGREE
majors, minors, and areas of study
FOUR DEGREE TYPES

BSc GENERAL
For Science student Hannah Cooke, the Science Internship Program (SIP) has given her not only hands-on experience in a clinical setting but also the opportunity to develop her writing and interviewing skills.

Currently doing her internship at Lifemark, a large interdisciplinary rehabilitation clinic in Edmonton, Hannah considers it an integral part of her university journey. “I have learned skills such as accurate charting, reporting, and effective patient care. In order to learn these, I needed to put them into practice”.

HANNAH COOKE, 4TH YEAR GENERAL SCIENCE, DOUBLE MAJOR IN BIOLOGICAL SCIENCES AND PSYCHOLOGY

DEGREE FEATURES

+ 4 year Bachelor of Science degree.
+ Part-time study allowed (which will extend the degree).
+ Allows for more non-science electives than any of our other degrees.
+ Study areas are broader, allowing students to explore multiple topics.
+ Students can gain the skills to work in unique and variable industries.

OUR GENERAL SCIENCE DEGREE IS A HIGHLY CUSTOMIZABLE PROGRAM WITH A BREADTH OF TOPICS TO STUDY. IT INCLUDES A MAJOR AND MINOR (OR DOUBLE MAJOR), WHICH ALLOWS OUR STUDENTS TO DESIGN THEIR DEGREE AROUND TWO AREAS OF INTEREST. WHILE THE PROGRAM HAS A WELL-DEFINED CORE STRUCTURE, IT IS DESIGNED TO GIVE STUDENTS FLEXIBILITY AND CHOICE WITH THEIR COURSE SELECTIONS. STUDENTS CAN choose TO KEEP THEIR PROGRAM BROAD OR GO DEEPER INTO A DISCIPLINE OF THEIR CHOICE.

AVAILABLE MAJORS

These science majors can also be used as minors.

+ Biological Sciences
+ Chemistry
+ Computing Science
+ Earth & Atmospheric Sciences
+ Mathematics
+ Statistics
+ Physical Sciences
+ Physics
+ Psychology

* Students can opt for a double major using any two of the above science subjects.

AVAILABLE MINORS

Students with a double major will not have a minor.

+ Science areas listed on the left are also available as minors.
+ Agriculture
+ Arts (various topics from the humanities, social sciences, languages, fine arts, or interdisciplinary areas)
+ Bioinformatics
+ Business*
+ Human Ecology
+ Nutrition

* Indicates program is non-direct entry; prerequisites courses are required.
Through the Science Internship Program, I gained the opportunity to work as a Planning Intern with the Community Development group at Stantec over the summer. So far, my job has involved community plans, rezonings, redevelopment projects, and community engagement, both in established communities and greenfield areas. The office is a fast-paced environment where each day involves a variety of projects, different colleagues, and new opportunities to learn.

Working on projects and initiatives that have real-world implications is incredibly rewarding, especially when members of the community are involved.

Kaelin Koufogiannakis, 3rd Year Specialization in Planning
THE SPECIALIZATION DEGREES are designed for students who wish to focus on one specific discipline within science. Students follow a carefully planned curriculum that will train them in their desired field of study while allowing for a handful of electives. Some specialization programs will provide the necessary background for admission to graduate school.

DEGREE FEATURES

+ 4-year Bachelor of Science degree.
+ The curriculum provides focused and in-depth training in one subject.
+ Students follow a carefully designed curriculum, administered by the teaching department.
+ Students are expected to maintain a higher grade point average (GPA) than in the General Science program.

AVAILABLE SPECIALIZATION DEGREES

+ Astrophysics
+ Biochemistry
+ Cell Biology
+ Chemistry
+ Computing Science
+ Computing Science [Business minor]*
+ Computing Science – Software Practice
+ Ecology, Evolution and Environmental Biology
+ Environmental Earth Sciences*
+ Geology*
+ Geophysics
+ Immunology and Infection
+ Integrative Physiology
+ Mathematics
+ Mathematics – Computational Science
+ Mathematics and Economics
+ Mathematics and Finance*
+ Molecular, Cellular and Developmental Biology
+ Paleontology*
+ Pharmacology
+ Physics
+ Planning (City planning)
+ Psychology
+ Statistics

* indicates program is non-direct entry; prerequisites courses are required.
Robert completed his 12-month internship at the Public Health Agency of Canada’s National Microbiology Laboratory in Winnipeg, Manitoba. There he focused on sequencing the Hepatitis B virus and Hepatitis C virus found in patient samples with the goal of identifying transmission events occurring in Canada. He is currently doing research in the field of pediatric organ transplantation where he’s focusing on the interplay between a patient’s immune system and post-transplant therapy.

“My internship allowed me to develop new problem-solving strategies by observing how an expert approaches a problem.”

ROBERT PENNER, 4TH YEAR HONORS IMMUNOLOGY & INFECTION
THE HONORS DEGREES ARE FOR STUDENTS LOOKING FOR IN-DEPTH TRAINING IN A SPECIFIC FIELD OF SCIENCE, WHO ARE INTERESTED IN SCIENTIFIC RESEARCH AND ARE CONSIDERING GRADUATE LEVEL STUDY.

DEGREE FEATURES

+ 4 year Bachelor of Science degree
+ Provides department guided, in-depth training in one subject.
+ Students are expected to maintain a higher grade point average (GPA) than in the Specialization programs.
+ Grant and scholarship funds may be available in some departments.
+ Students are assigned to an advisor in the department.
+ Individual research project in the senior year:
  • Learn to pose your own research question, then collect, interpret, analyze and present the data.
  • Develop independent and critical thinking and the confidence to reach your own conclusions.
  • Fully understand the scientific process and methodology.
  • Hone your communication and writing skills.
  • Develop close ties with your department, making it easier to secure a supervisor for graduate study.

AVAILABLE HONORS DEGREES

+ Applied Mathematics
+ Applied Mathematics (Computing Science minor)
+ Applied Mathematics (Statistics minor)
+ Astrophysics
+ Biochemistry
+ Cell Biology
+ Chemistry
+ Computing Science
+ Ecology, Evolution and Environmental Biology
+ Environmental Earth Sciences*
+ Geology*
+ Geophysics
+ Immunology & Infection
+ Integrative Physiology
+ Mathematical Physics
+ Mathematics
+ Mathematics (Computing Science minor)
+ Mathematics (Statistics minor)
+ Mathematics and Economics
+ Mathematics and Finance*
+ Molecular, Cellular and Developmental Biology
+ Neuroscience
+ Paleontology*
+ Pharmacology
+ Physics
+ Physiology
+ Psychology*
+ Statistics
* indicates program is non-direct entry; prerequisites courses are required.
FOUR DEGREE TYPES

BSc/BEd COMBINED
THE BACHELOR OF SCIENCE AND EDUCATION COMBINED DEGREE IS A DUAL PROGRAM OFFERED JOINTLY WITH THE FACULTY OF EDUCATION. IT WAS DESIGNED FOR STUDENTS WHO WISH TO TEACH SCIENCE AT THE SECONDARY EDUCATION LEVEL. STUDENTS IN THIS PROGRAM SPEND THE FIRST 2 YEARS STUDYING IN THE FACULTY OF SCIENCE AND THE REMAINING 3 YEARS IN THE FACULTY OF EDUCATION. AT THE END, THEY RECEIVE BOTH A SCIENCE SPECIALIZATION DEGREE AND A SECONDARY EDUCATION DEGREE.

**DEGREE FEATURES**

+ 2 degrees in 5 years  
+ Secondary education only  
+ Structured course curriculum (The requirements for both degrees and for teacher certification requirements need to be completed within the 5 year time frame)  
+ The major and minor combinations to the right accommodate the variety in subject studies needed in secondary school teaching:  
  - Biological Sciences major/ Mathematical Sciences minor  
  - Biological Sciences major/ Physical Sciences minor  
  - Mathematical Sciences major/ Biological Sciences minor  
  - Mathematical Sciences major/ Physical Sciences minor  
  - Physical Sciences major/ Biological Sciences minor, Chemistry Concentration  
  - Physical Sciences major/ Biological Sciences minor, Physics Concentration  
  - Physical Sciences major/ Mathematical Sciences minor

**The following program combinations are available:**
LEARNING IN SCIENCE
$5.7M+ awarded in scholarships and awards for 2017

BIOL 333 FIELD TRIP TO THREE LOCAL WETLANDS.

BIOLOGICAL SCIENCES PROFESSOR KEVIN DEVITO LEADS GROUP DISCUSSION ASSESSING THE ECOLOGICAL SERVICES AND VALUES OF BIG LAKE MARSH DURING THE BIOL 333 FIELD TRIP TO THREE LOCAL WETLANDS.
TEACHING IS AT THE CORE OF WHAT WE DO, AND IT ISCelebrated.
IN THE FACULTY OF SCIENCE, WE ARE COMMITTED TO PROVIDING EDUCATION THAT IS CURRENT, DYNAMIC, AND DELIVERED IN A COMBINATION OF FORMATS. WE EMPLOY BOTH DISCOVERY-BASED AND ACTIVE LEARNING ACTIVITIES THAT TRAIN OUR STUDENTS TO CONSTRUCT THEIR OWN KNOWLEDGE, WORK COLLABORATIVELY, AND GAIN CONFIDENCE IN THEIR DECISIONS.

PROFESSORS BRING COURSE MATERIAL TO LIFE

Learning from instructors and professors who are involved with research means you will gain the most up-to-date knowledge from individuals who are excited about their discipline and are at the top of their field. Our students often have the opportunity to work in research labs over the summer or participate in special projects, thus giving them a chance to immerse in the scientific process, sharpen their skills, and be part of something new.

Our traditional classes appeal to students wanting a high level of instructor engagement and in-depth subject material during class, while our blended learning classes provide a healthy combination of online and face-to-face elements within the classroom for the student who prefers collaborative learning. 38% of our science classes employ technology-enhanced learning (flipped classrooms, new technologies and online learning), thus creating an environment for active learning and higher student engagement within the classroom setting.

INTERDISCIPLINARY SCIENCE THRESHOLD EXPERIENCE (INSCITE)

InSciTE is a first year experience where some courses are taught using scientific investigations, interdisciplinary projects, and discovery-based learning. These activities provide new ways for students to understand their course material and see the connections that exist between disciplines. Learn more at uab.ca/inscite.
WE OFFER A NUMBER OF LAB SPACES AND SPECIAL FACILITIES TO SUPPORT THE LEARNING PROCESS. HANDS-ON LEARNING IS IMPORTANT, AND WE HAVE UNIQUE FACILITIES THAT WILL PROVIDE PRACTICAL TRAINING IN A SAFE ENVIRONMENT.

SOME UNIQUE LEARNING SPACES FOR UNDERGRADUATES INCLUDE:

- The Science Hardware Hackerspace, AKA the Shack, is a student hackerspace equipped with tools like 3D printers, CNC milling machines, computers and electronics.

- The Department of Physics Astronomical Observatory houses three telescopes for solar observing on the roof of the Centennial Centre for Interdisciplinary Sciences.

- The Petrology Undergraduate Laboratory helps students refine their petrographic skills in igneous, metamorphic and sedimentary petrology using one of twenty Polarizing Microscopes.

- The Planning Studio and Teaching Space houses state-of-the-art equipment for teaching and is used for ongoing studio projects in the Urban Planning program.

- The Virtual Environments and Spatial Cognition Lab is used for investigating human spatial cognition using behavioral and neuroimaging methods including augmented reality (virtual reality), eye tracking, fMRI, and ERP.

- The Biotron consists of an aquatic facility, a greenhouse complex, and a large controlled environment facility. The facilities are designed to create tightly controlled environmental conditions for the study of animal and plant life.

- The Undergraduate Robotics Laboratory helps students learn to program robots in a project-based course. Students learn how to process data from a camera, and other sensors to enable robots to perceive its environment and make control decisions for navigation or manipulation.
THE CENTRE SUPPORTS STUDENTS AS THEY EXPLORE THEIR IDEAS, FROM CONCEPT TO BUILDING THEIR OWN PROTOTYPES.
The world is not divided into creative and non-creative people. Creativity can be learned and innovation can be harnessed by students and companies alike. Your passion is what you build, and we can help you build it.

The Student Innovation Centre is a collaborative workspace in the Faculty of Science for you to take your ideas beyond the classroom to create real-world impact. Our playful, creative, and welcoming community helps students from all programs connect to technology and expertise in exciting areas including the following examples:

+ Artificial intelligence.
+ Synthetic biology.
+ Space science.
+ 3D printing.

What will you build?

Find out how you can bring your ideas to life here: uab.com/innov8

SCIENCE INTERNSHIP PROGRAM (SIP)

Explore your career options with our Science Internship Program (SIP), and gain real-world work experience before you graduate. Students in all science degrees are eligible to participate in 4, 8, 12, or 16 month paid work terms. SIP placements will provide you the opportunity to do the following:

+ Apply classroom knowledge to hands-on, real life situations.
+ Graduate with a resume packed with relevant work experience.
+ Boost your chances of landing a great job after graduation.
+ Build your strengths, clarify your interests and goals.
+ Begin building a professional network.

uab.ca/scienceinternship

SCIENCE CAREER CENTRE

Our in-house science career centre hosts events and provides career resources and services to current students.

uab.ca/sciencecareers

319 employers actively recruited SIP students (2017–18)
The Faculty of Science attracted over $76M in research funding in 2017-18.
AT THE UNIVERSITY OF ALBERTA, RESEARCH ISN’T LIMITED TO GRADUATE STUDENTS AND FACULTY. WE ENCOURAGE OUR UNDERGRADUATE STUDENTS TO ASK THEIR OWN QUESTIONS AND GET INVOLVED WITH RESEARCH EARLY IN THEIR CAREERS. WE HAVE DEVELOPED TRAINING SERVICES, COURSES, AND CERTIFICATES THAT WILL TEACH YOU ABOUT SCIENTIFIC INQUIRY, DATA COLLECTION, ANALYSIS, AND REPORTING.

UNDERGRADUATE RESEARCH

Resources available to Science students include:

- Special topic and research courses that start in year 1
- Three research certificates
- The Undergraduate Research Initiative (URI)
- Working in a departmental research lab (during spring/summer)

CERTIFICATES

Certificates allow for further study in a special area of interest that is not easily identifiable on a student’s transcript.

Our certificates are embedded, meaning they are taken along-side regular courses and are completed over the course of your degree. By obtaining a certificate, you will enhance your degree and receive official recognition for the high level of skills you have developed.

We offer the following certificates:

- Research certificate in Biological Sciences
- Research certificate in Psychology
- Certificate in Biomedical Research (in conjunction with the Faculty of Medicine and Dentistry)
- Computer Game Development (in conjunction with the Faculty of Arts)
- Certificate in Engaged Leadership and Citizenship (in conjunction with the Faculty of Arts)

Science students can also earn a certificate offered through other faculties. Some examples include:

- Certificate in Sustainability
- Certificate in Peace and Post-Conflict Studies
- Certificate in Translation Studies

ONLINE LEARNING

The Faculty of Science is a leader in online-learning collaborating with multiple faculties and developing digital-courses ranging from paleobiology and software product management to the environment. Learn from the experts through interactive online modules, and even get credit for some courses. Popular courses include:

- Dinosaur Paleobiology
- Understanding Video Games
- Introduction to the Arctic: Climate Mountains 101
- Paleontology: Ancient marine reptiles; Early vertebrate evolution; Therapod dinosaurs and the origin of birds.
- Problem Solving, Programming and Video Games
- Astro 101: Black Holes

Have a look at the growing list of courses and sign up at uab.ca/mooc
A GLOBAL EDUCATION IS NOT JUST ABOUT VISITING ANOTHER COUNTRY; IT’S ABOUT UNDERSTANDING OTHER CULTURES AND SEEING YOUR FIELD OF STUDY THROUGH ANOTHER LENS. SHARING YOUR IDEAS WITH, AND LEARNING FROM COLLEAGUES AROUND THE WORLD IS AN ENRICHING EXPERIENCE THAT EXPANDS YOUR KNOWLEDGE, LEADS TO PERSONAL GROWTH, AND DEVELOPS CULTURAL SENSITIVITY.

MAKE THE WORLD YOUR CLASSROOM

Science students can attain a global education by participating in opportunities to study, volunteer or work abroad.

The Southern African Field School (SAFS) is a Faculty of Science-developed field education in Swaziland, South Africa and Mozambique. Connect with local communities, develop international networks, and learn to develop poignant research questions that will inspire future development in Africa. Earn up to 15 U of A credits during an experiential combination of field and in-class instruction in subjects such as ecology, marine science, and health.

Bamfield Marine Sciences Centre:
Your oceanside campus.

Attend Canada’s premier coastal research and training facility, located on the exposed west coast of Vancouver Island. Earn U of A credit while taking unique undergraduate field courses during the summer and fall semesters in coastal marine sciences, and other disciplines. Live on-site, and learn in a first-class, experiential environment using state-of-the-art research facilities. U of A students get exclusive access to courses and facilities.
ADMISSION TO SCIENCE

Admission to the Faculty of Science is competitive, and our program requirements vary. Visit uab.ca/apply to see what courses, minimum grades, and documents are required.

Whether you are applying directly after high school, took some time off and are now ready to start, changing careers or transferring from another post-secondary institution, we encourage you to visit our admission pages to see our requirements and application procedures.

JOIN US

Successful scientists are knowledgeable but also adaptable. They are responsive to global and societal changes and appreciate the importance of collaboration.

Join us in the Faculty of Science, and let us teach you, train you, and help you develop the specific skills needed to excel in your discipline. Study abroad, become an intern, engage in scientific discovery. Let us show you ways to be innovative and bold with your ideas.

INTERESTED IN APPLYING?

1. Start at uab.ca/programs to choose a program and view the admission requirements
2. Visit uab.ca/apply for the application form and deadline dates
3. Send us your questions to science.recruiting@ualberta.ca
4. Visit our campus by booking a tour at uab.ca/visit

HELP US SHAPE THE WORLD