WELCOME TO THE

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.
WELCOME TO THE FACULTY OF SCIENCE

CONTENTS
Science disciplines
Four degrees types
Learning in Science
Adding to your degree
Global education
Admission

7,000 undergraduate students

46,000 alumni

PLANT WALK, 300-LEVEL BOTANY CLASS USING THE CAMPUS AS A CLASSROOM
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, CHEMISTRY LAB COORDINATOR AND TECHNICIAN.
SCIENCE DISCIPLINES

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.
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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.

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
SCIENCE DEGREE
majors, minors, and areas of study

DEMONSTRATION OF A FOUCAULT PENDULUM DURING AN UNDERGRADUATE PHYSICS CLASS.
“During my internship term, I was able to gain and refine valuable skills that will definitely help me transition from university to a professional employment position. I was also given the chance to delve into a completely different field of study from my program which allowed me to explore a career path I otherwise would not have been able to experience.”

THEA JANESCA CASTILLO, IMMUNOLOGY AND INFECTION STUDENT, ON PLACEMENT AT THE NORTHERN FORESTRY CENTRE THROUGH THE SCIENCE INTERNSHIP PROGRAM (SIP)

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.

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.

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.
FOUR DEGREE TYPES

BSc
SPECIALIZATION
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.

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.
"Participating in SIP is a great way to apply the knowledge learnt from school and to explore future career opportunities."

JINNING LYU, STATISTICS STUDENT, ON PLACEMENT AT ALBERTA INVESTMENT MANAGEMENT CORPORATION THROUGH THE SCIENCE INTERNSHIP PROGRAM (SIP)
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.

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:

  The following program combinations are available:

  - 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
LEARNING IN SCIENCE
$5.7M+ awarded in scholarships and awards for 2018

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 IS CELEBRATED.

SCIENCE

PROFESSORS
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.

THE CLASSROOM

We continue to develop and re-design our curriculum using innovative educational models. By offering both traditional and blended learning formats, we can deliver varying levels of student engagement within our classrooms.

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.

Neuroscientist and Psychology Assistant Professor Kyle Mathewson (left) studies how the brain focuses on and filters out different information. His current study showed that our brains process stimuli, like sounds and sights, differently when we perform the same task outdoors compared to inside a lab.

“If we want to apply these findings to solve issues in our society, we need to ensure that we understand how the brain works out in the world where humans actually live, work, and play,” said Mathewson, who added that almost everything we know about the human brain is learned from studies in very tightly controlled environments.
LEARNING SPACES
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.
340+ employers have actively recruited SIP students

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

STUDENT INNOVATION CENTRE

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
The Faculty of Science attracts over $80M in annual research revenue.
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)

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
+ Bugs 101: Insect-Human Interactions

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

While the global pandemic has put a halt to physical travel, we can still embrace opportunities to enjoy a global education. As you interact with your classmates (whose origins can range from other Canadian provinces to other countries), attend a speaker series, or join engaging sessions during International week, you will emerge with an even broader mindset and appreciation for varying experiences and point of views.

The pandemic will end, borders will open and we will travel again. And when we do . . . the UofA will be ready to facilitate your next global experience.

Prepare by exploring the Certificate in International Learning, take a course on Intercultural Communication or form a team and join the World’s Challenge Challenge, where teams propose an innovative solution to a major global issue. Visit ualberta.ca/global-education for details.

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

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.
When the opportunity to combine her love of science and interest in food arose in the final year of her degree, Isha Datar leapt at the chance. She signed up for a post-graduate level meat science course that introduced the concept of cellular agriculture, the process of developing animal products—such as meat, milk, and eggs—from cell cultures in the lab, as an alternative to using animals and factory farming. She reached out to then-director and founder of New Harvest, a non-profit organization that supports research and development in this very field, for feedback on her final assignment, a research paper on the future of meat. His response: publish the paper. She went on to complete her master’s degree and is now the Executive Director of New Harvest.

“New Harvest is at the intersection of so many motives that will better our world. And we’re about creating the solution to many issues at once. So we start there, presenting the solution. All of these issues and problems are secondary.”

ISHA DATAR ('09 BSc)
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.

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.
ON THE COVER: 2019 SCIENCE GRADUATES CELEBRATE THEIR SUCCESS IN FRONT OF THE CENTENNIAL CENTRE FOR INTERDISCIPLINARY SCIENCE, HOME OF THE FACULTY OF SCIENCE.

FACULTY OF SCIENCE

1-001 CCIS, University of Alberta, Edmonton, AB, Canada T6G 2E1

T: 780.492.4758   F: 780.492.7033   Toll free: 1.800.358.8314

E: science.recruiting@ualberta.ca   W: ualberta.ca/science

facebook: ualbertascience    twitter: ualbertascience   instagram: ualbertascience