To shape the world
We are Science

- Undergraduate Science students: 6,000
- Degree Choices: 67
- UAlberta Professors have been awarded 3M National Teaching Fellowships, more than any other university in Canada: 41
- Employers actively recruiting students through the Science Internship Program: 1st in Canada to offer an Undergraduate Research Certificate: 151
- Students participated in the Science Internship Program (2015-2016): 40
- Refereed publications by Science faculty members (2015-2016): 1,500
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We are Science
Which Science degree is right for you?

Each of our programs has strengths depending on your educational interests and goals.

To help you narrow down the best fit of program, apply for the program you find yourself answering “yes” to most often when reviewing the following questions:

**Bachelor of Science (BSc) General:**
Our most flexible and customizable program.
- Do you want to customize your U of A degree, allowing you to take a wide variety of courses from multiple faculties?
- Are you interested in two areas that may be completely opposite from one another? (ie. Major in Mathematics but minor in a Language)?
- Do you want the option of taking three or four classes a semester?
- Do you want to complete a double major in Science because you can’t decide on one area (ie. Chemistry and Physics)?
- Are you considering taking some Business courses while pursuing your Science degree (Business Minor option)?

**Bachelor of Science with a Business Minor:**
Compliment your Science focused program with a selection of Business courses.
- Do you have an entrepreneurial spirit with a goal to open your own business in the future?
- Do you want to take introductory Finance, Accounting and other business courses throughout your degree?

Application to a Business Minor can be made after completing a list of prerequisite courses, normally in the first year of studies. Available in the BSc General program, and BSc Specialization in Computing Science.

**Bachelor of Science (BSc) Specialization:**
Focuses your studies in one concentrated area while allowing you to take a few optional courses.
- Do you only have an interest in one specific area of Science (ie. Microbiology, Astrophysics, Biochemistry)?
- Do you want to become a specialist in your field of study?
- Are you driven to maintain a certain grade point average (GPA)?

**Bachelor of Science (BSc) Honors:**
Similar to BSc Specialization and focuses in one concentrated area but there is a strong emphasis on research in your final year.
- Have you always been interested in research?
- Do you see yourself pursuing graduate studies (Masters, PhD)?
- Are you interested in a career that may be focused on research?
- Are you driven to maintain a high grade point average (GPA)?

**Bachelor of Science/Bachelor of Education Combined:** A highly structured dual degree program in the Faculty of Science.
- Are you interested in becoming a secondary school teacher or educator?
- Do you want a comprehensive Science education to compliment your Education program?
- Do you want to earn two degrees in a five-year period?
Science programs at a glance

**Biological Sciences**

The Biological Science degree programs 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.

**General Degree**
- Major or minor in
  - Biological Sciences
  - Bioinformatics

**Specialization Degrees**
- Animal Biology
- Ecology
- Evolutionary Biology
- Microbiology
- Molecular Genetics
- Physiology and Developmental Biology (Animal Focus)
- Plant Biology

**Honors Degrees**
- Animal Biology
- Ecology
- Evolutionary Biology
- Microbiology
- Molecular Genetics
- Physiology and Developmental Biology (Animal Focus)
- Plant Biology

**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.

**General Degree**
- Major or minor in:
  - Chemistry
  - Physical Sciences

**Specialization Degrees**
- Chemistry

**Honors Degrees**
- Chemistry
“You can’t teach field work in a classroom. You have to be out there. That’s definitely where the U of A shines.”

– GREGORY FUNSTON, ’13 BSc

**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.

**General Degree**
- Major or minor in Computing Science

**Specialization Degrees**
- Computing Science
- Computing Science
- Computing Science
- Computing Science
- Computing Science
- Computing Science

**Honors Degrees**
- Computing Science

* indicates program is non-direct entry; prerequisites courses are required.

**Earth and Atmospheric Sciences**

Our programs examine the Earth, its structure and evolution, and the atmosphere above us. It is unique in Canada in that it offers an interdisciplinary approach to the study of environmental earth science, geology, atmospheric science, and geography.

**General Degree**
- Major or minor in Earth and Atmospheric Sciences

**Specialization Degrees**
- Atmospheric Sciences
- Environmental Earth Sciences*
- Geology*
- Paleontology
- Planning
  (Urban and Regional Planning)

**Honors Degrees**
- Atmospheric Sciences
- Environmental Earth Sciences*
- Geology*
- Paleontology

View department brochures at uab.ca/scibrochure
Science programs at a glance

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.

**General Degree**
- Major or minor in:
  - Mathematics
  - Statistics

**Specialization Degrees**
- Computational Science
- Mathematics
- Mathematics and Economics
- Mathematics and Finance*
- Statistics

**Honors Degrees**
- Applied Mathematics
- Mathematics
- Mathematics and Economics
- Mathematics and Finance*
- Statistics

* indicates program is non-direct entry; prerequisites courses are required.

Physics

Known as “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 like 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.

**General Degree**
- Major or minor in:
  - Physics
  - Physical Sciences

**Specialization Degrees**
- Astrophysics
- Geophysics
- Physics

**Honors Degrees**
- Astrophysics
- Geophysics
- Mathematical Physics
- Physics

* indicates program is non-direct entry; prerequisites courses are required.
“You may not realize or appreciate it at the time, but looking back, the faculty and students around you are truly among the world’s best.”

– PATRICK CHAGOURY, ’07 BSc

**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.

**General Degree**
- Major or minor in Psychology

**Specialization Degrees**
- Psychology

**Honors Degrees**
- Psychology*

* indicates program is non-direct entry; prerequisites courses are required.

**Medical Science Degrees**

In collaboration with the Faculty of Medicine & Dentistry, we offer a number of outstanding undergraduate programs in health.

**Specialization Degrees**
- Biochemistry
- Cell Biology
- Immunology and Infection
- Pharmacology

**Honors Degrees**
- Biochemistry
- Cell Biology
- Immunology and Infection
- Neuroscience
- Pharmacology
- Physiology

View department brochures at uab.ca/scibrochure
Why choose the Faculty of Science?

Make the world your classroom

Southern African Field School

The Southern African Field School (SAFS) is a Faculty of Science-developed study abroad opportunity that provides world-class 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. Highlights of this once-in-a-lifetime opportunity include:

• Living in a wildlife reserve in Swaziland
• Learning while on safari in Kruger National Park, South Africa
• Developing marine field techniques while snorkeling and scuba diving in Mozambique
• Trying a new language—how about Siswati, Zulu or Portugese.
Make the world your classroom

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.

Where will you go?
goabroad.ualberta.ca
Why choose the Faculty of Science?

20
Average size of our 1st year undergraduate biology labs

Specialized Laboratories and Facilities

- Small laboratory sections that are available to all science students.
- Lab training that provides the necessary steps for effective experimentation, specialized lab techniques and the ability to operate and understand complex apparatus.
- Access to Teaching Assistants and Lab Coordinators.
- Earth Science field classes encouraging hands on learning in various sub-disciplines.
- Unique learning sites like the Geoscience rock garden, Physics Observatory and Paleontology bone beds.
- Specialized labs like the Aquatics facility, Biology greenhouses and UofA Biotron.

Scientific Training

Education comes first and is at the core of all our activities. Learning in the Faculty of Science means you will receive specialized scientific training in various areas of modern science. You can expect:

- A solid scientific lab training. As a Science student you will enjoy the highest number of contact hours and the lowest fees in our first year science labs compared to any other university in Canada.
- Opportunities to learn from professors who are recognized internationally for their contributions to science.
- Hands-on learning experiences through field schools and specialized facilities.
- Interdisciplinary courses that encourage collaborations between different science disciplines.
- Training and support that teaches you how to engage in or direct research at the undergraduate level.
‘We are at such a cutting edge. It allows us to make a lot of new discoveries and I’m excited to be a part of that for the next four years’

– JAQUELINE KARATHRA, 2nd year BSc

Photo: Dark Matter Detector- Department of Physics
Why choose the Faculty of Science?

Our Size

Being a part of a large university means we can offer students access to numerous resources, internationally-recognized professors, millions of dollars in scholarships, and incredible global opportunities. With our size comes a dedication to quality that will not be compromised.

You will have access to:

• State-of-the-art facilities, specialized museums and collections, and student-focused resources and centres.
• Outreach opportunities that bring science education into the community.
• A dedicated team of advisors.
• Academic support services including the Decima Robinson Support Centre for Mathematical and Statistical Sciences.
• Our science-focused work experience program for Canadian and international students.

“The overall culture of the Faculty of Science is one that encouraged its students to be successful.”

– STEPHEN KRIZAN, ‘94 BSc
“Very few of my friends back home have been able to actually get involved with professors and doing research on campus. I think that this makes the U of A really unique.”

– ALEXANDRA ROCCA, 4th year BSc
Where will your Science degree take you?

Energy and Environment

“I’m not sure I’d be here today in this position without the U of A. Being a student there was a key stepping stone in my career.” Ken’s advice for students and new graduates who want to be successful in the energy industry is to make sure they learn to work effectively in teams and to think broadly. “There’s a lot of focus now on sustainable development and safety. That didn’t happen when I was starting out in my career. But today, the communities we operate in expect it,” he says. “We need to continue to grow these principles [because] we recognize we do have an impact in the communities where we live and work.”

– KEN LUEERS, ('85 BSc)
President ConocoPhillips Canada
For recent graduate Yasmin Barre, her fundamental research training at the U of A applies daily to her work as an Associate Laboratory Technologist with the product quality team at Shell Canada in Fort Saskatchewan. Barre developed an interest for understanding and examining host-pathogen interactions while working in the lab of UAbera microbiologist Christine Szymanski (biological sciences). “There was a vast array of techniques and skills I learned during my studies in the Szymanski lab. Working in a lab feels very natural for me.”

– YASMIN BARRE, (‘08 BSc, ‘12 MSc)
Health

“I wanted to pursue research in the field of infectious disease,” says Lindsay, “specifically with a focus on development of novel antimicrobials that can combat antibiotic resistant organisms.”

Kalan credits the education she received at the U of A as an undergrad. “The education is second to none,” comments Kalan. “My program had more lab-based courses than similar departments at other universities, giving students much needed hands-on experience.”

“At the time I applied [to the internship program], I never imagined I would end up where I am now. You can’t predict where your career will take you. It is important to keep an open mind,”

– LINDSAY KALAN (’06 BSc) Head of Research and Development, Exciton Technologies
Dr. Lorne Tyrrell co-developed the first antiviral agent for hepatitis B (HBV). For students today, he recommends they learn to be leaders within teams. “Leaders need to like working with people, you have to be ready to get to know the people, to work in teams and partnerships. I’ve solved what I thought were very difficult clinical problems when I’ve partnered with some excellent basic scientists.” Tyrrell encourages aspiring leaders to be flexible and to look beyond problems in order to find opportunities. “It’s important to be visionary.”

– LORNE TYRRELL (’64 BSc, ’68 MD) Founder of the Li Ka Shing Institute of Virology at the U of A, former Dean of the Faculty of Medicine and Dentistry, Officer of the Order of Canada, Canadian Medical Hall of Fame inductee among other major leadership positions in the medical community.
Justin Pahara has always seen himself as a biotechnology entrepreneur. With his new startup company Synbiota, he’s hoping to give everyday people the same entrepreneurial opportunities. Synbiota is all about making science and biotechnology accessible to the masses—even if he’s not sure yet what they’re going to do with it. When asked for his advice for current students, Pahara advocates, “Just keep going until you find something you’re passionate about, because it can come out of nowhere. For me, it came in my third year.”

With Synbiota, Pahara is running a company that he hopes can provide some of these same life-changing opportunities to the next generation of biotechnologists. “It’s the early days of biotechnology, and it already touches billions of people’s lives every day.”

– JUSTIN PAHARA (’06 BSc, ’08 MSc)
“I’ve loved playing video games ever since I could hold a game controller. Growing up, I knew that my dream career would be in game development, but I had no idea what that really meant.

The University of Alberta was the perfect solution for me. I was drawn to its versatile Specialization in Computing Science program, which offered a comprehensive education in computing science, while still being flexible enough to allow me to take art, design, and even film studies options. I participated in projects led by real business clients, in classes that had me solve complex and satisfying computing problems, and even in interdisciplinary game development courses!”

“One of my most valuable undergraduate experiences was facilitated by the U of A’s Internship Program; for sixteen months, I had the opportunity to work as a programmer at BioWare, a game development studio! Real industry experience was invaluable for my growth as a programmer: I became part of a team, contributed significantly to a video game, and experienced my passion for working on games. My internship even led to a job with BioWare after my graduation.”

– TERRI DRUMMOND (’14 BSc)
Software Developer, Bioware
Where will your Science degree take you?

Communications and Education

Dan Riskin is a renowned bat biologist as well as host of Discovery Channel’s Daily Planet.

Despite his successful academic and media career, Riskin admits that he struggled with math in high school and university. “Once I’d taken calculus in my undergrad, I thought it was done. But when I was in Cornell writing my PhD, I had to take several calculus classes. Once I really started trying, I realized that I not only could do math but that I loved it. When asked about the intersection of science and the real world, Riskin comments “It’s about getting people excited about the questions and the possibilities. We look for the conversation that everyone’s having and ask how science can add to that. Part of my role as a scientist-turned-science communicator has also been to act as a bridge between academia and the public.”

Riskin has published in prestigious journals, is the recipient of multiple teaching awards, and has appeared on various science television programs including Animal Planet, The Tonight Show with Jay Leno, and The Late Late Show with Craig Ferguson. In March 2014, he released his first book, Mother Nature is Trying to Kill You—a lighthearted venture into the lesser-known dark side of the natural kingdom.

– DAN RISKIN (’97 BSc)
During her undergraduate years, Tracy landed a Science Internship position with the Instructional Technology Lab in the Department of Psychology where she gained the skills and knowledge to propel her into a career as an educator. Now working with the Learning and Teaching Division of EDC (Educational Development Centre)—a company that designs, implements, and evaluates programs to improve education, health, and economic opportunity worldwide—Cordner collaborates on curriculum development, inquiry-based teaching, and online mathematics professional development. She has also helped develop online applications designed to help students deepen their learning in many subject areas, including math, psychology, and critical thinking. With funding from the National Science Foundation, she also helped develop eCMI (Electronic Communities for Mathematics Instruction) which engages groups of teachers in compelling mathematics through video conferencing and social media.

– TRACY CORDNER (‘05 BSc)

View alumni profiles at uab.ca/scialum
Science Internship Program (SIP)

Gain real-world work experience – before you graduate

Whether you hope to work in a pharmaceutical company, in a research lab or make Canada’s wilderness your work space, the Science Internship Program (SIP) will help you explore where your Science degree can take you. Students are eligible to participate in 4, 8, 12 or 16 month work terms and are paid industry standard wages.

**SIP will provide you the opportunity to:**

- 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.

Digital 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:

- DINO 101: Dinosaur Paleobiology
- STS 351: Understanding Video Games
- Introduction to the Arctic: Climate
- Mountains 101
- Paleontology: Ancient marine reptiles; Early vertebrate evolution; Therapod dinosaurs and the origin of birds.

Have a look at the growing list of courses and sign up for a course for free at uab.ca/mooc
Add a certificate to your degree

The Faculty of Science is a leader in offering undergraduate research certificates to enhance your degree program by officially recognizing high-level skill development. The following certificates are now available to Science students:

- Research Certificate in Biological Sciences; 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

Interdisciplinary Science Threshold Experience (InSciTE)

Explore fundamental and cutting edge topics from all of the major science disciplines including Earth and Atmospheric Science, Psychology, and Computing Science in addition to Chemistry, Mathematics, Physics and Biology. InSciTE offers a truly unique interdisciplinary experience by taking the lessons learned in regular classes and applying them in new ways to develop a deeper understanding of material and showing the connections that exist between disciplines.

Students in any Faculty of Science program can opt to be part of the in first-year InSciTE experience and then smoothly transition into second year and beyond.

Find out more at uab.ca/inscite
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