DISCOVER

COMPUTING

SCIENCE

UNDERGRADUATE

STUDIES
THE SCIENCE OF INFORMATION

COMPUTING SCIENCE

Teri Drummond, COMPUTING SCIENCE GRADUATE AND BIOWARE PROGRAMMER
WITH A HALF-CENTURY HISTORY, the Department of Computing Science at the University of Alberta is the oldest and one of the largest computing science departments in Canada. We have an international reputation for contributions in the many fields of computing, both in foundations and applications.

OUR STUDENTS LEARN ABOUT THE FOLLOWING VARIOUS TOPICS:

Computing theory—whether, and how efficiently, a computer can solve a particular problem
Programming—a tool to solve problems by writing algorithms in a programming language
Algorithms—a set of defined instructions used for computation
Data structures and databases—the organization and storage of data
Artificial intelligence—uses games or robotics to study intelligent behaviour and learning in machines or systems
Bioinformatics (medical informatics)—uses computing science to solve biological problems such as genome sequencing

Computer graphics, vision, and multimedia—generates visual images synthetically and integrates visual information from the real world
Games—uses games to explore programming and artificial intelligence
Mobile computing—designing solutions for mobile devices
Networking—reliably communicates data across long distances
Robotics—controls the behavior of robots through algorithms
Software engineering—creates and maintains software programs

MEET TERI

“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.

My undergrad experience was well-rounded and allowed me to grow towards my dream career. 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.”

TERI DRUMMOND, ’14 BSC (COMPUTING SCIENCE)
ARE YOU INTERESTED in everything about the way computing is done, from hardware all the way to large programs? Or are you more interested in the application of computing in general?

Do you want to combine computing with another interest? Whatever the answer, we have a program for you.
OUR PROGRAMS

WE OFFER HONORS AND SPECIALIZATION DEGREES in the disciplines below. Students can also select a Computing Science major or minor in the Bachelor of Science General degree.

MAJOR OR MINOR IN COMPUTING SCIENCE
The General Science program is intended for students who want a broader undergraduate education. This program is suitable for students interested in taking a greater variety of courses, while maintaining a focus on computing science.

COMPUTING SCIENCE SPECIALIZATION
The Computing Science Specialization degree (also known as Computing and X) is for students who want to pursue a concentrated study of computing science, or combine the study of computing science with another discipline. With many options available, you can design and pursue a program of study that combines computing with almost any other field. Our advisors can help you design a program to fit your interests and goals, and ensure that your degree will benefit you and potential employers.

COMPUTING SCIENCE SPECIALIZATION–BUSINESS MINOR
This degree is ideal for students interested in a career that combines computing science and business. Computing is crucial for a business’ competitive advantage. A strong computing science background gives you a better idea of what computing can deliver to business and also lets you knowledgeably manage vendors and IT groups.

COMPUTING SCIENCE SPECIALIZATION IN SOFTWARE PRACTICE
Our specialization in Software Practice is for students who are interested in all aspects of building software. The program has a broad range of courses to develop depth in programming, algorithms, hardware, software design, user interfaces, project management, and business issues.

HONORS COMPUTING SCIENCE
The Honors program is for exceptional, highly motivated students. It is very flexible, and allows you to take responsibility for your studies. You must be comfortable with mathematics, be able to communicate well, and enjoy challenge and intellectual risk.

FOR ADMISSIONS REQUIREMENTS SEE ADMISSIONS.UALBERTA.CA
ENHANCE YOUR DEGREE

RETAIN (REsuscitation TrAIning for Neonatal residents) is a video game developed by undergraduate students to enhance neonatal training and help save lives.
GAMING CERTIFICATE

The Certificate in Computer Game Development is a joint certificate between the Faculty of Arts and the Faculty of Science. It is intended to complement discipline-specific studies with courses that give opportunities to work in multidisciplinary teams, build complete small and medium-scale games, and interact with industry.

uab.ca/game

RESEARCH

Our professors often accept students as part of their research teams, and spots in some groups are available to undergraduate students. Other opportunities for individual research exist through the Undergraduate Research Initiative (URI) where students can receive a stipend and access to numerous resources in support of their research.

INDIVIDUAL STUDY

Undergraduate students have the option of taking an individual study course, in which they work under a professor on a topic that is not covered in any currently offered classes.

THE SOCIAL IMPACT OF VIDEO GAMES

Associate Professor Vadim Bulitko was approached by neonatal physicians in the U of A’s Faculty of Medicine & Dentistry who identified a need for better neonatal resuscitation training to help prevent infant deaths.

He invited students from his CMPUT 250 (Computers and Games) class to submit proposals for the chance to work on the game and selected a team of six undergraduate students from the departments of Art and Design, Biological Sciences, Computing Science, and Psychology. The students filled the roles of three programmers, one writer, one musician, and one artist.

The simulation game provides a customized experience that adapts to the skills of the learner, drawing on our international leadership in artificial intelligence, machine learning, and gaming.
Advanced Man Machine Interface (AMMI) Laboratory. This research area focuses on the development of new man-machine interfaces that allow computer systems to enhance human abilities by adapting to their needs.
WORLD-CLASS LABS AND FACILITIES

In addition to specialized undergraduate labs open 24hrs a day, and studio-style introductory courses, our 18 research labs speak to the breadth of opportunities available in our department for students. Our research labs include:

- Advanced Man-Machine Interfaces
- Alberta Innovates Centre for Machine Learning
- Algorithmics
- Artificial Intelligence/Games
- Bioinformatics
- Centre for Intelligent Mining Systems
- Computational Intelligence
- Databases
- Graphics
- Internetworking
- Multimedia Research Centre
- Networks
- Reinforcement Learning and Artificial Intelligence
- Robotics
- Service Systems Research Group
- Software Engineering Research Lab
- Software Systems
- Vision

ADA’S TEAM

ADA’S TEAM IS A STUDENT GROUP SUPPORTING DIVERSITY in computing, games, and technology, and provides a safe space for students of all backgrounds, identities, and abilities. Through volunteer opportunities and educational events, members are able to grow their skills, confidence, and leadership abilities.

The team also acts as advocates to the department on issues of inclusion, student support, and diversity. Ada’s Team has an open office in the Computing Science Centre where members can meet to socialize and collaborate with their peers.
MACHINE LEARNING AND MEDICINE

Siamak Ravanbakshsh has developed a computer system called Bayesil that could dramatically improve diagnosis and treatment of a wide spectrum of diseases. Bayesil creates personalized metabolic profiles that could help doctors predict diseases like Alzheimer's, cancer, and diabetes before they develop.
IMPACT ON SOCIETY, INDUSTRY, AND LIFE

THE APPLICATIONS AND ADAPTABILITY OF COMPUTING have changed through the years. Computers are now used in almost every facet of the world’s operations and communication. Our department has an international reputation for excellence in both computing foundations and applications.

We can provide an education that will equip you with a wealth of skills, making you employable in countless industries.

SCIENCE INTERNSHIP PROGRAM

THE SCIENCE INTERNSHIP PROGRAM (SIP) is a paid work experience opportunity combining classroom study with a 4-16 month work term. Students are assigned robust projects and make valuable contributions to their employers.

VISIT UAB.CA/SCIENCEINTERNSHIP TO LEARN MORE

“One of my most valuable undergraduate experiences was facilitated by the U of A’s Industrial 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.”

-TERI DRUMMOND, ’14 BSC (COMPUTING SCIENCE)

OUTREACH AND COMMUNITY

Community outreach is valued in our department, and we offer numerous opportunities for the community to engage in computing at the University of Alberta.

OPPORTUNITIES INCLUDE:
- Ross & Verna Tate High School Internship Program
- The Iverson Computing Science Exam
- Summer Camps

VISIT UAB.CA/EXPLORECS TO LEARN MORE