Faculty of
SCIENCE

UNIVERSITY OF ALBERTA

# SCIENCE INTERNSHIP PROGRAM

## EMPLOYER HANDBOOK





# TABLE OF CONTENTS



## SCIENCE INTERNSHIP PROGRAM

The Science Internship Program integrates university studies with relevant, paid work experience while providing employers with knowledgeable and highly-motivated undergraduate students who are prepared to contribute to their organizations.

These students possess a solid knowledge base and technical skill set from their academic courses and labs, with many students having additional research and volunteer experience in scientific fields.

## PROGRAM FEATURES:

- Year–round employment access to a wide range of talented students from 7 departments that include over 356 different fields of study.
- Most students will have completed 3 years of study before placement.
- Student entrance to program is competitive.
- Work terms are 4, 8, 12 or 16 months and start in January, May or September.
- We offer flexible, year-round employer recruitment.

# HOW IT WORKS

## STEPS TO HIRING A SCIENCE INTERN

### POST

Submit your job posting on our online career portal, **SciWorks.**

### INTERVIEW

Screen applicant resume packages and select the candidates you wish to interview. **SciWorks** can assist in arranging interviews.

### HIRE

Select the candidate that best suits your needs and present an offer of employment directly to the student.

## POST A JOB AT: **UAB.CA/SCIENCEINTERNSHIP**

**We are here to assist with any stage of the hiring process**



### WHAT WE ASK FROM INTERNSHIP EMPLOYERS:

- **Offer** a competitive wage.
- **Assign** a supervisor to provide regular, constructive feedback.
- **Meet** with an internship coordinator at a midpoint site visit.
- **Provide** a midpoint and final evaluation of your intern.

### RECRUITMENT TIMELINES:

For your convenience, **SIP** follows a continuous recruitment cycle to allow employers the flexibility of posting, interviewing and hiring on your own schedule. We recommend peak recruitment periods as the ideal time frame to post jobs and interview applicants to increase chances of accessing a wider pool of candidates.

To ensure a large volume of quality candidates we suggest a minimum **2 month lead time** to allow for posting, applicant screening, and interviews before you would like the position to be filled.

| POSITION START DATE | PEAK RECRUITMENT PERIOD | CONTINUOUS RECRUITMENT |
|---|---|---|
| January | September–October | November–December |
| May | January–February | March–April |
| September | March–April | May–August |

As the most diverse department in the **Faculty of Science, Biological Sciences** offers degree programs that cover a range of topics relating to the life and environmental sciences.

Students have options to study in the focus areas of animal biology, ecology, evolutionary biology, entomology, immunology and infection, microbiology, molecular genetics, physiology and developmental biology, and plant biology.





# BIOLOGICAL SCIENCES

## OUR STUDENTS CAN ASSIST WITH:

- Preparation of reagents and media
- Molecular biology techniques and assays
- Genetic analysis
- Growth and maintenance of experimental organisms
- Culturing and identification of microorganisms
- Preparing biological samples for microscopic analysis
- Separation and analysis of cellular components
- Identification of vertebrate and invertebrate species
- Identification of plant species
- Collecting and processing field data from terrestrial and aquatic ecosystems for plants and animals
- Collection and analysis of visual, auditory, and spatial (GIS) data
- Bioinformatic analysis
- Data entry and management
- Preparing reports

## OUR STUDENTS KNOW ABOUT:

- Techniques in molecular biology and biotechnology
- Bioinformatics
- Molecular genetics, heredity and evolution
- Cell biology and metabolism
- Microbial physiology and taxonomy
- Plant and animal anatomy, taxonomy, and physiology
- Biology and diversity of invertebrates
- Parasitism
- Behavioural ecology
- Developmental biology
- Ecosystems, community and population ecology
- Biogeochemistry

# CHEMISTRY

**The Department of Chemistry** provides an outstanding environment for studies in chemistry and is renowned internationally for its excellence in teaching and research.

Our students receive specialized training in the theoretical and practical components of chemistry and take a selection of courses in general, analytical, organic, inorganic biochemistry, and physical chemistry, as well as in mathematics and physics. Options can be done in a variety of areas including environmental, materials, bioanalytical, organic synthesis, and computational chemistry.

## OUR STUDENTS CAN ASSIST WITH:

- Basic laboratory techniques
- Quality control, qualitative and quantitative analysis of unknown samples
- Spectroscopic identification and method development
- Organic synthesis
- Sampling and data analysis
- Analysis of environmental samples
- Materials research and development of applications
- Bioanalytical analysis and research
- Hazard assessments
- Computational modeling and analysis
- Chemical problem solving
- Independent projects

## OUR STUDENTS KNOW ABOUT:

- Analytical Instrumentation (separations, electroanalytical, spectroscopy)
- Spectroscopic analyses for organic and analytical applications; instrumentation and interpretation of spectra; UV-Vis, IR, NMR, Mass Spec., Fluorimetry
- Chemical synthesis—development of new synthesis, modification of current synthetic routes
- Sampling; statistical analysis of data; data interpretation
- Environmental analytical instrumentation techniques: GC, HPLC, UV-Vis, electrophoresis, potentiometry
- Solid-state: metals, semi-conductors, polymers and nanomaterials
- Biomolecule detection and quantitation
- Chemical safety, MSDS
- Titrations, dilutions, gravimetry, instrumental calibration, and preparation of standard reagents





# COMPUTING SCIENCE

**The Department of Computing Science** is the oldest and one of the largest computing science departments in Canada.

Our international reputation for contributions in the many fields of computing, both in foundations and applications, has earned worldwide recognition for departmental accomplishments in the areas of artificial intelligence and games. Our many research partners come from a wide variety of industries and other academic disciplines.

## OUR STUDENTS CAN ASSIST WITH:

- Software/application development
- Testing and debugging
- Internet application development
- Database software development
- E-commerce software development
- Multimedia and game development
- Mobile/cloud development
- On-site support
- Technical writing and documentation

## OUR STUDENTS KNOW ABOUT:

- Software engineering
- Human computer interaction
- Algorithms
- 3D graphics and animation
- Computer networks
- Non-procedural programming languages
- Computer organization and architecture
- Network security
- Numerical methods
- Game programming (C++, ORTS, Open GL)
- Game design principles and practice
- Intelligent systems and artificial intelligence
- Operating system concepts
- Database management systems

**The Department of Earth and Atmospheric Sciences (EAS)** is distinguished nationally and internationally for its research in geology, environmental geoscience and climate studies, Arctic studies, geomorphology, atmospheric sciences and meteorology. EAS also includes an internationally recognized human geography and planning group that rationalizes the relationship between humans, cities and landscapes.

Due to this breadth, EAS has the ability offer to our students a remarkably interdisciplinary experience in their pursuit of degrees in human geography and planning as well as atmospheric science, environmental earth science, and geology.





# EARTH AND ATMOSPHERIC SCIENCES

## OUR STUDENTS CAN ASSIST WITH:

- Geologic mapping, including making cross sections and stratigraphic sections
- Field safety training and preparation
- Petrographic analysis (thin-section analyses of rock samples)
- Wellsite geology and drill planning
- Resource inventories: reserves and resources
- Core logging: sedimentary core and mineral-resource core
- Computer software for mapping, cross-section construction, geological prediction and flow modelling
- Recording and measuring river and stream stage and flows
- Mapping groundwater properties, head distributions, and determining flow systems
- Collecting and analyzing water samples
- Well testing and analysis
- Geochemistry techniques and analyses
- Qualitative and quantitative research skills
- Geospatial computer techniques (i.e., GIS)
- Community consultation skills
- Land use planning and policy
- Environmental impact assessments
- Parks planning
- Subdivision development

## OUR STUDENTS KNOW ABOUT:

### ENVIRONMENTAL EARTH SCIENCES

- Sedimentary geology
- Mineralogy
- Earth surface processes and landforms
- Climate change
- Ecology
- Biogeography
- Geochemistry
- Hydrogeology
- Environmental instrumentation
- Geophysical techniques

### ATMOSPHERIC SCIENCES

- Environmental instrumentation
- Applied atmospheric physics
- Atmosphere and ocean science
- Weather analysis and forecasting
- The climate system
- Computational physics
- Environmental applications of GIS

### PLANNING

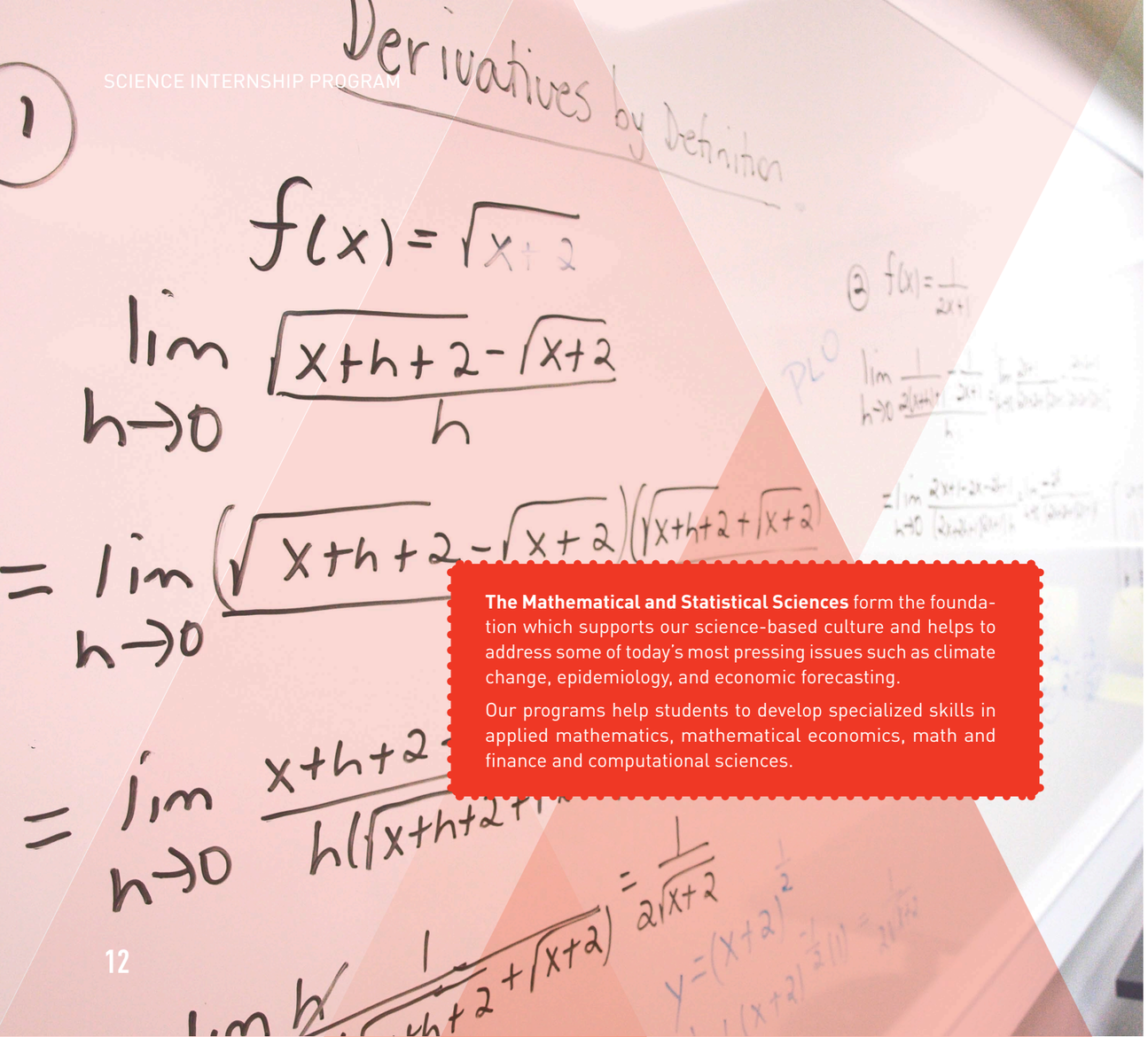
- Principles of ecology
- Geographical information systems
- Earth surface processes and landforms
- Biogeography
- Natural resources
- Environmental management
- Community planning and policy
- Planning law
- Environmental planning

### PALEONTOLOGY

- Molecular genetics and heredity
- Ecology
- Stratigraphy and sedimentation
- Invertebrate paleontology
- Geologic structures
- Mechanisms of evolution
- Principles of systematics
- Sedimentary systems
- Vertebrate paleontology

### GEOLOGY

- Hydrogeology
- Igneous and metamorphic petrology
- Sedimentary geology
- Petroleum geology and subsurface methods
- Ore deposits geology
- Physics of the earth
- Environmental geophysics
- Geophysical exploration techniques
- Stratigraphy
- Paleontology




**The Mathematical and Statistical Sciences** form the foundation which supports our science-based culture and helps to address some of today's most pressing issues such as climate change, epidemiology, and economic forecasting.

Our programs help students to develop specialized skills in applied mathematics, mathematical economics, math and finance and computational sciences.





# MATHEMATICS AND STATISTICAL SCIENCES

## OUR MATHEMATICS AND ECONOMICS/FINANCE STUDENTS KNOW ABOUT:

- Mathematical finance
- Financial economics
- Finance and investment principles
- Risk theory and risk management
- Probability
- Stochastic processes
- Correlation analysis and regression
- Operations management
- Optimization
- Microeconomics
- Macroeconomics
- Econometrics
- Economics
- Statistics
- Computing

## OUR MATHEMATICS AND STATISTICS STUDENTS KNOW ABOUT:

- Generalized linear modelling
- Design of experiments (ANOVA/ANCOVA)
- Sampling techniques
- Probability
- Stochastic processes
- Computing / Algorithms
- Survival analysis
- Data mining
- Time series analysis
- Correlation analysis
- Analysis of variance and covariance
- Multiple regression
- Nonlinear regression
- Power analysis
- Mathematical statistics

## OUR MATHEMATICS AND ECONOMICS/FINANCE STUDENTS CAN ASSIST WITH:

- Risk assessment and management in finance and insurance
- Financial modeling and analysis
- Investment and asset management
- Financial reporting
- Data entry and management using software such as Excel
- Analysis and reporting of project and company performance metrics
- Economic analysis and business consulting
- Financial Planning (Corporate or Personal)
- Performance Metrics
- Data Management

## OUR MATHEMATICS AND STATISTICS STUDENTS CAN ASSIST WITH:

- Optimally designing experiments for research
- Sample-size calculation for a research objective
- Statistical model building
- Run statistical software (R, SAS, SPSS)
- Interpret statistical computer outputs
- Writing the methods section of research papers
- Writing grant proposals (power and sample size)
- Actuarial reporting
- Data entry and data transformations
- Data presentation (informative graphs, charts, tables)
- Survey creation and evaluation
- Data collection and analysis
- Conduct literature reviews

**The Department of Physics** emphasizes the development of a strong base in modern physics, mechanics, thermodynamics, electromagnetism, relativity, quantum mechanics, statistical physics and laboratory work.

Our students focus on 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.





# PHYSICS

## OUR STUDENTS CAN ASSIST WITH:

- Design and construction
- Data collection and analysis
- Software development
- Electronics–design, construction and debugging
- Material testing
- Component testing - quality control
- Optics
- Medical imaging and isotope production
- Literature reviews
- Geophysical data processing
- Theoretical and applied seismology
- Environmental geophysics
- Mathematical models

## OUR STUDENTS KNOW ABOUT:

- Advanced newtonian mechanics, elastic deformation and fluid dynamics
- Error analysis, least squares fitting
- Basic algorithms, hardware interfacing, numerical techniques and their application to physical problems
- Circuit components
- Crystallography, hardness and fatigue
- Lenses, fiber optic and optical testing
- Electrostatics and dynamics, quantum mechanics, nuclear physics and particle physics
- Neutron stars, black holes, and quasars
- Physics of magnetic storms and substorms
- Astronomy and astrophysics

# PSYCHOLOGY

**The Department of Psychology** provides students with a comprehensive range of experiences and skills that are important for understanding mind and behaviour. A science degree in psychology focuses on how the brain functions as well as how we perceive, learn and forget.

Our students learn about perception and motivation, behavior and cognitive development with emphasis on the physical, biological and mathematical sciences.

## OUR STUDENTS CAN ASSIST WITH:

- Psychological assessment and scoring
- Assistance in the preparation of psychological summaries/ progress reports
- Clinical interviewing
- Patient/client chart/file review
- Patient/client behavioural tracking
- Co-facilitation of group therapy
- Provision of recreational activities/therapies
- Provision of organization-specific services such as biofeedback
- Preparation for Interdisciplinary clinical team meetings
- Literature reviews
- Ethics applications
- Instrument/tool development
- Data collection including paper-and pencil administration and focus group interviews
- Data entry and use of Excel and SPSS
- Quantitative and Qualitative data analysis
- Dissemination of findings, including poster and paper presentation
- Report writing including grant proposals, manuscripts, and court materials
- Development of organization-specific documents such as handbooks, manuals, and workshops

## OUR STUDENTS KNOW ABOUT:

- Basic psychological processes
- Normal and abnormal human development
- Psychological assessment
- Principles and development of psychological concepts such as perception, motivation, and learning
- Personality Theory
- Characteristics of psychiatric disorders and populations
- Basic brain mechanisms involved in sensation, movement, learning and cognition
- Ethical principles associated with experimental design
- Experimental and non experimental methods in psychology
- Theories and research on the individual in a social and cultural context





# SCIENCE AND MEDICINE

In collaboration with the **Faculty of Medicine and Dentistry,** we offer a number of outstanding specialization and honors undergraduate programs in health including biochemistry, cell biology, neuroscience, pharmacology and physiology.

## These disciplines provide students with a solid research foundation and advanced skill sets in the following areas:

- Principles of bioenergetics
- Oxidative phosphorylation
- Experimental techniques used to study proteins, selected illustrations of protein function, the structure of lipids, biological membranes and mechanisms of transport
- Protein function
- Gene expression and developmental biology
- Brain function at the cellular and molecular level
- Pharmacodynamics
- Pharmacokinetics
- Toxicology
- Endocrinology
- Cardiovascular physiology
- Neurobiology and perinatal research.

# BENEFITS OF AN INTERNSHIP:

- Risk-free method for companies to evaluate prospective hires
- Students can act as a secondary recruiting role, since students return back to university and spread the word if they had a great experience
- Access to a vast and diverse pool of talented students
- Interns are a great source of employees for peak load periods
- Former interns usually remain longer with a company and progress up the ranks than regular employees hired

## UAB.CA/SCIENCEINTERNSHIP

Contact the **FACULTY OF SCIENCE** to learn more about how a science intern can benefit your organization.



"IF YOU ARE THINKING ABOUT HIRING A SCIENCE INTERN, JUST DO IT. WE HAVEN'T BEEN DISAPPOINTED"

**–Zhongxin Zhou,** Senior Director at Gilead Alberta ULC.

Faculty of
SCIENCE

## FOR MORE INFORMATION: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University of Alberta

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