Department Brochure

Explore Our World with Earth and Ocean Sciences at UBC!

Are you considering majoring in EOS? This brochure outlines just a few of the areas of study possible in this department! Discover the complexity of the ocean system, the mechanisms behind the incredible power of storms and other weather, the structures and processes that give rise to earthquates and magnetism, the Earth as a sysem, and the many practical applications of this knowledge.
This brochure is also available at our main office. Also see the EOS contact page.

UBC`s Department of Earth and Ocean Sciences (EOS) is a dynamic, diverse group of scientists dedicated to understanding, and teaching about, how the Earth works. From the core to the atmosphere, and from the distant genesis of our planet, to current and future trends in global and environmental trends, faculty and students enjoy a unique opportunity to study, and become professionals in, all the major Earth Science disciplines. This is a Department where all the basic sciences are *applied*. Biology, Physics, Chemistry, Mathematics, Computing, Instrumentation . . . all are fundamental requirements for those trying to figure out how the Earth behaves, and how Humans continue to affect the planet they live on. This is a truly inter-disciplinary group of scientists and educators.

The research focus of the EOS Department extends from pure science studies of the earth`s deep interior, through near surface geological studies and environmental earth science, to a variety of studies of the oceans and atmosphere. Programs of study at the graduate and undergraduate level are equally diverse and are detailed elsewhere on this web site. See also the UBC Calendar under Earth and Ocean Sciences, Geological Sciences, Geophysics, Geological Engineering, Oceanography, Environmental Sciences and Atmospheric Sciences.

The Department administers majors, honours and applied science programs that attract some 190 undergraduate students. Our modern facilities, demanding curriculum and award winning faculty place us among the most prominent departments of this type in North America and enable our programs to offer challenges to students at all levels.

Although the remainder of this page outlines characteristics of five different disciplines within Earth and Ocean Sciences, EOS at UBC is an integrated department and there are no formal internal divisions. See our research page for outlines of current and on-going scientific investigations.

For more information see our contacts page , and the EOS home page on the World Wide Web.

Oceanography

Oceanographers study the biology, physics, chemistry and geology of the oceans. This makes Oceanography a truly multidisciplinary science. Members of the EOS Oceanography group (including our students) collect data at

sea, gather information about the ocean from satellites, conduct laboratory experiments, and simulate various ocean phenomena using computer models.

Students in oceanography learn how the oceans function, how interactions between the atmosphere and the oceans can affect global climate, and how various types of marine organisms interact with their environment.

Oceanographers work in a wide variety of settings that include university and government labs, and the private sector. At UBC, we offer a B.Sc. and combined honours degrees in Oceanography plus one of: Biology, Chemistry, Geology, Geophysics, Physics, or Fisheries. The honours programs are recommended for students who wish to go on to pursue graduate studies. Students may also take an EOSC Majors degree with a high concentration of oceanography courses.

Atmospheric Sciences

Meteorology is classical physics applied to the atmosphere. Meteorologists use the equations of fluid mechanics to describe atmospheric flow from the microscales of turbulence to global circulation. Some of the topics studied at UBC include cloud physics, air pollution dispersion, air-sea interactions, numerical prediction, climate dynamics and variability, and urban and forest meteorology.

Weather phenomena are inspiring in their beauty and power. The colours of a rainbow and the excitement of a storm chase are not soon forgotten. Being able to look at the sky, interpret the signs scientifically, and make your own forecasts are valuable skills.

Talented students like you can make a difference in advancing our understanding of the atmosphere, and making weather forecasts for the benefit of society. Jobs abound for meteorologists with B.Sc. degrees. As just one example, the Canadian Atmospheric Environment Service currently needs more meteorologists than are expected to graduate from all Canadian universities. There are also many research jobs with both national and international organizations, requiring advanced degrees, if that is your goal.

At UBC, we offer the following undergraduate degrees focussing on Atmospheric Sciences: B.Sc. - Major in Atmospheric Science, B.Sc. - Honours in atmospheric Science (higher math and physics than the major), Co-op program for B.Sc. in Atmospheric Science (5 yrs, including two 8-month work terms), Diploma in Meteorology. (Roughly one year of study, after a B.Sc. in another field). In addition, students in an EOSC Majors program can elect to take a high concentration of atmospheric science courses.

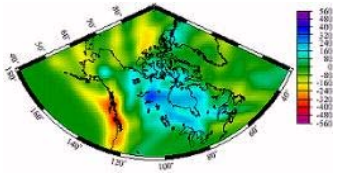
Environmental Sciences

Environmental scientists contribute in a wide range of societal and scientific contexts. UBC's Faculty of Science Environmental Sciences program, administered out of the Department of Earth and Ocean Sciences, is designed to give students a broadly based, rigorus understanding of the major environmental issues facing human societies. Students learn in

an integrative cross-deiciplinary context, while at the same time, choosing an area of to focus their develoment as scientists. Areas include *Chemical analysis of the environment*; *Physical analysis of the environment*; *The atmosphere and water*; *Life Sciences: (Systematics*, *Ecology*, or *Conservation Biology*); or *Computer Modelling*.

See details about this challenging and stimulating program at it's own website, http://www.ensc.ubc.ca/index.html.

Geophysics



What causes earthquakes? Why does Earth have a magnetic field? How hot is the Earth's centre? Where did Earth's atmosphere come from? When physicists and mathematicians started to ponder these great questions, the science of geophysics was born. Broadly speaking, geophysics involves the use of physics and mathematics to understand the history, structure and processes of Earth and other planets.

Today`s geophysicists contribute their expertise to solving a host of practical and fundamental problems that range from applying state-of-the-art approaches to locate buried contaminants to using high-performance computers to simulate the flow of Martian ice caps. Many of our undergraduates find employment with companies involved in environmental engineering, petroleum exploration or mineral exploration. Those who are interested in becoming research scientists continue their studies as postgraduate students.

Class work covers the rigorous theoretical and computational aspects of the subject. If you are interested in challenges and like integrating complex ideas, you will find geophysics a rewarding choice. Students in EOS can follow an honors program in geophysics or pursue an EOSC Major with a high concentration of geophysics courses.

Geology

Geology is the science of the solid earth. Professionals in geological fields tend to be good at chemistry and basic sciences, but they are also good at working with the "big picture". In other words, geologists can integrate of a wide variety of information in order to make decisions about where resources might be, how to extract them, what impact human activities will have on the Earth, and so on. Vancouver is the world capital for mineral exploration, and UBC has been supplying geologists to the mineral exploration industry for decades. Many of our graduates find work in the geo-environmental sector (especially within hydrogeology) or continue on to advanced studies at the graduate level and research careers in industry and academia.

EOS offers a B.Sc. Honours degree program in Geological Sciences. Graduates of this who have

choses the appropriate technical electives may apply for registration as a Professional Geoscientist in the Province of British Columbia. Students may also take a combined honours route in Geology/Geophysics, Geology/Geography, or Geology and another subject. A thorough grounding Geological Sciences can also bea ccessed through the EOSC Majors program.

Geology undergraduates enjoy the benefits of small class sizes, shared field experiences through field trips and field courses, and many extracurricular activities organized by the G.M. Dawson Club.

Geological Engineering

Geological Engineering is an interdisciplinary program that draws on the strengths of the Departments of Earth and Ocean Sciences, Civil Engineering, Mining and Mineral Process Engineering and Geography. This multi-disciplinary approach is designed to create multi-talented engineers with a strong background in geology.

Many of our graduates find work in the local engineering community and/or continue on to graduate school. Career prospects include geotechnical and groundwater engineering, natural hazards management, mineral and hydrocarbon exploration and production, energy development, exploration geophysics, mine reclamation, geotechnical aspects of land development, transport and forestry, and application of geology to environmental issues such as groundwater contamination.

The program is fully accredited by the Canadian Engineering Accreditation Board, which allows graduates to register as Professional Engineers in Canada and many other countries. Students also have the option to take technical electives which will allow them to apply for registration as a Professional Geoscientist in the Province of British Columbia. The geological engineering students play a lively role within the Department of Earth and Ocean Sciences. The Georox club is well known for its student activities. The students enjoy a communal atmosphere created through the geology field schools, classes and extracurricular activities.

This brochure, suitable for printing on a single two-sided page - PDF.