

Graduate Certificate in Antarctic Studies

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The Graduate Certificate in Antarctic Studies (GCAS) is a fourteen week, in-depth study of the history, science, political discourse, environmental concerns and future challenges of the frozen continent and surrounding seas. The course is coordinated by Gateway Antarctica, the Centre for Antarctic Studies and Research at the University of Canterbury, in Christchurch, New Zealand. It was developed in 1998 jointly by the University of Canterbury and Antarctica New Zealand with significant input from government agencies and the wider national and international community. The multidisciplinary perspective along with the broad-based critique of the issues that Antarctica faces, and the 10 day Antarctic field course have resulted in a course that is unique in its focus.

Purpose and Goals of GCAS

The aim of GCAS is to provide a contextual programme of study for graduates and members of the professions who have an interest in Antarctica and the Southern Ocean. It provides an ideal course for members of national Antarctic programs who want to understand better the current issues and legal framework surrounding Antarctica, and experience first hand living and working in Antarctica. The course aims to:

1. Engage participants in a critical examination of the contemporary scientific, environmental, social and policy issues and debates related to the Antarctic region.
2. Strengthen participants' abilities to make professional and personal contributions to Antarctica.
3. Experience, and gain practical insights into the environments and operating conditions of Antarctica.

Applicant Qualifications

A Graduate Certificate qualification in New Zealand is offered to those who already have an undergraduate University degree (in any subject). It is not a Masters degree, but a qualification in its own right at a level between undergraduate and postgraduate teaching. Having the graduate certificate recognises that you have a high-level of understanding the critical issues concerning the Antarctic region.

The course is restricted to 20 participants who will be selected from applicants with a range of backgrounds including sciences, arts, humanities, law, policy, commerce,

engineering, social sciences, education and technology. Applicants must have qualified for the award of an approved degree or have equivalent professional training, and following selection, have satisfied the medical examination prescribed by Antarctica New Zealand. Selection will be based on the academic record of the applicant and prior relevant experience, recommendation by two referees and a statement that, on completion of the course the participant will contribute in a significant manner to the community or professions, or undertake postgraduate study in a field relevant to Antarctica and the Southern Ocean. The course is taught in English and participants must satisfy the entry requirements of the University of Canterbury. Successful applicants will complete a recognized First Aid certificate as part of the course and prior to the Antarctic field component.

Course overview

The course, which runs from mid November to the end of February each year, is set in the beautiful surrounds of the University of Canterbury in Christchurch, the garden city of New Zealand and gateway to the ice for the New Zealand, American and Italian Antarctic programs. The course content is focused on four central themes as follows:

- *Antarctica as an extreme environment.* Although Antarctica is the coldest, windiest, driest and highest continent on Earth, life has adapted to living in the hostile environment. Course participants are introduced to the physical environment and ecosystems of Antarctica including the geological evolution of the continent through time, the ice sheets, marine and terrestrial ecosystems, human endeavors and polar psychology, and the effect of climate on the inhospitable landscape.
- *Global linkages and influences.* Antarctica has long been synonymous with international cooperation and global linkages. New Zealand Antarctic activities are closely linked to the US program and the main US base, McMurdo station which is 3 km away from Scott Base on Ross Island. The course provides valuable links and insights into the history of exploration of the continent, and the current Australian, British, US, Italian and of course, New Zealand programmes. New Zealand is a conscientious steward in the Ross Sea region and plays a key role in developing environmental protection measures for Antarctica. Indeed it is often stated that New Zealand punches above its weight in Antarctica, a concept that is debated during the course.
- *Antarctic research issues.* Research in Antarctica has traditionally involved small groups of scientists operating in isolation. However over the past decade this has changed to multidisciplinary teams working together, often with extensive international linkages. The course provides participants with an introduction and overview of current research projects at both a national and international level in Antarctica for example, the multinational ANDRILL project, the US led ICECUBE project, and the New Zealand led Latitudinal Gradient and BioRoss projects. The course also provides an insight in to the role of Antarctica and the Southern Ocean, as a driver of global climate, and what effect global warming may have on Antarctica and the future of Antarctic ice.
- *Antarctic policy issues and futures.* New Zealand lies in close proximity to Antarctica and maintains a claim to territorial sovereignty over an area of

Antarctica known as the Ross Dependency. The course examines the international legal systems that govern Antarctica including the territorial claims to Antarctica and Antarctic policy in the international arena and considers some of the most pressing legal issues concerned with the environment, resource extraction, fisheries, tourism and sovereignty.

Course delivery

The themes are delivered through lectures, seminars, tutorials, group discussions, self directed studies, oral and written presentations, local field trips and a 10 day Antarctic study trip that is usually scheduled over the Christmas period.

Group discussions. Each year the 20 participants are divided into 4 syndicate groups each one of which is assigned a current and often controversial topic to discuss and debate during the course. Each syndicate group gives a formal one hour presentation towards the end of the course which is open to the University and local community and is required to produce a final group report for assessment. Recent topics have included:

- Historic Huts – Remove, Repair or Restore
- The South Pole Route, a necessity or scar on the landscape
- Bioprospecting in Antarctica; is it an legitimate commercial activity
- The Madrid Protocol on environmental Protection; is it an effective tool
- Exclusive Economic zones; should they be allowed in Antarctica
- Large ship tourism in Antarctica; the bigger the ship the bigger the mess
- Human impacts on the Antarctic environment; minimizing the risk to the unique environment of subglacial lakes
- The elimination of IUU fishing in the Southern Ocean.

Review. During the first part of the course participants undertake a synthesis and critical review of a topic that relates to an aspect of one of the major themes examined in the course. This is an individual self directed study that takes place outside of normal lectures and requires experience of using library and web based source material. Tuition in these skills is provided during the initial part of the course.

Recent review topics include:

- International conflict in Antarctica
- Cultural resource management in Antarctica
- Landscape evolution and history of the Dry Valleys
- The Mount Erebus tragedy
- Bioprospecting in Antarctica and the Southern Ocean
- The Ross Ice Streams
- Antarctic aviation; accidents and safety policy
- Ozone depletion and the effects of enhanced ultraviolet radiation on Antarctica
- Diving activities in Antarctica and associated risks
- Sustainable management of Toothfish in the Southern Ocean

Antarctic study trip. The course provides a unique opportunity for participants to experience living and working in Antarctica. The visit to the ice generally occurs over the Christmas period and is supported by Antarctica New Zealand. The duration

of the trip is approximately 10 days but is dependent on logistics and weather. The trip provides first hand experience of the geopolitical aspects of the US and New Zealand national programs operating side by side on Ross Island, and provides an opportunity for participants to undertake scientific, environmental and personal experience projects on the ice. Most of the time is spent camping on the McMurdo Ice Shelf in close proximity to the year round New Zealand station Scott Base, with a couple of familiarization days at Scott Base itself living alongside the support and scientific staff. There is generally an opportunity to visit the nearby US McMurdo Station and one or two of the historic huts which allows participants to gain a better understanding of the hardships of the heroic age, and the culture of both large and small modern Antarctic stations. The on ice projects vary from year to year but have included a study of:

- Dynamics and accumulation history of a part of the McMurdo Ice Shelf
- Sub-ice volcano and the history of the West Antarctic ice sheet
- Weather patterns in McMurdo Sound
- Population dynamics of a seal colony
- An environmental impact assessment
- Interpreting and communicating personal experiences
- Science and the media

Tutorials. Individual tutorials are held at regular intervals during the course where participants have an opportunity to discuss their learning objectives with staff tutors. They provide an opportunity to identify issues of individual concern and strategies by which they might be addressed. The tutorials are used to provide accelerated and targeted learning, as part of the interdisciplinary approach being used on the course.

Supervised research project. Each participant undertakes an individual research project on an approved topic towards the end of the course. The selected topic must reflect the individual academic and professional interests of the participant and involve at least 100 hours of research. The length and method of presentation depends on the nature of the approved topic. In most cases it is not appropriate to undertake the project work in Antarctica. Recent projects have included:

- Cultural heritage management and the role of Antarctica New Zealand
- Synthesis techniques and testing of frozen wood pulp in feasibility study for the enhancement of iceberg strength
- In the paw prints of Mrs. Chippy; An Antarctic short story
- Transmission of natural light through snow
- 'Punching above its weight' New Zealand role in promoting state of the environment reporting in the Antarctic
- Autonomous control of illegal, unreported and unregulated fishing in the Southern Ocean
- Valuing Antarctic gateways; an economic snapshot at Christchurch's Antarctic connections

Fees. The course fees are currently set at \$NZ5 000 for New Zealand citizens and permanent residents, and citizens of those countries (Germany, France and Australia) who have a bilateral educational agreement with New Zealand. All other participants will pay the international fee currently set at \$NZ12 000. This fee includes all tuition costs and the Antarctic field component. Participants from overseas countries who have approval by their national Antarctic programs to take the course will receive a

scholarship from Antarctica New Zealand and pay fees at the domestic rate (Lou to adjust as necessary). The relatively low cost of living in Christchurch and the availability of student accommodation make studying in New Zealand a superb experience.

Competency outcomes

On completion of the course Graduates are expected to have:

1. In-depth knowledge of contemporary research in Antarctica and the Southern Ocean
2. Understanding of the roles of the social sciences and humanities
3. Ability to engage in critical analysis of major issues
4. Practical experience and understanding of living and working in extreme environments
5. Advanced skills in group work, self directed studies, oral and written presentation, critical reflection and debate

The course has been running for six years and has been successful in stimulating and enabling the involvement of its graduates in Antarctic and Southern Ocean issues as policy analysts, environmentalists, diplomats and scientists. 52% of the graduates have at some stage since graduation had a direct or indirect involvement with Antarctica and Southern Ocean issues in their professional lives, with employers ranging from the Antarctic Heritage Trust, to NASA, to Antarctica New Zealand, to the Peruvian Diplomatic Service. Within this group, 24% regularly incorporate knowledge of Antarctica into their current professional work, and 7% are in professional positions with direct and regular involvement in Antarctic affairs. A significant proportion (23%) of graduates has gone on to Antarctic related post graduate research degrees.

The following are extracts from past graduates...

“GCAS has been beneficial for working in extreme remote environments, working with small isolated groups in the field, leadership and team building skills, conflict resolution, etc.

“The course component of access to the Antarctic environment cannot be underestimated in its value for direct empathy, education and understanding of this environment. Antarctic professionals will always recognise and take someone more seriously if they have Antarctic experience”. *Antarctic Artist*

“GCAS is always a discussion point with people... because the course itself is so diverse it caters to many work situations even if they are not Antarctic related. One example is the ability to conduct field work in trying conditions, which I now do in my current job”. *Environmental Scientist*

“My job includes the development of a visitor impact monitoring system for Stewart Island and for the Sub-Antarctic Islands and the monitoring of visitor assets there. This is my first full time job and I do not doubt the importance of the GCAS course in not only qualifying me for this job but also for providing me with a range of interdisciplinary skills relevant to this job.

“The course gave me a broad range of skills relevant to my career, including team skills, critical and lateral thinking skills and an appreciation of the broad range of issues pertinent to unique environments”. *NZ Department of Conservation Employee*

“I currently work in an environmental management role in NZ. My experience in GCAS has given me the skills to approach my work in a much more holistic or 'big picture' way, incorporating the policy, legal, historical and community aspects of working with environmental matters, not just the scientific view. This has been noticed and appreciated by colleagues and clients”. *Environmental Scientist*

“Thanks to GCAS I now think bigger, or think about things that I never really thought about before”. *Biological Scientist*

“GCAS taught me a lot about a place that I am very interested in personally, but it also taught me a lot about other disciplines, particularly international politics, international law, biology, geology, history, psychology, art. In this sense Antarctica was the case study to learn about a lot of other disciplines in an interesting way.

“I think it was a great course, I thoroughly enjoyed it, and I will take the things I learnt on that course and the memories with me throughout my life”.
Environmental Scientist

“The multi-disciplinary nature of the course provided a real background of information, and made me appreciate further the multi-faceted nature of any issue”.
NZ Ministry of Fisheries Employee

“Huge benefit in teaching geography.... Excellent links, contacts, resources”. *School Teacher*

“The qualification has helped me in my profession. It has made me a lot more open minded about all sorts of issues related to professions, cultures, organisations and in particular the environmental. I find I am a lot more careful / sensitive when designing things to consider the impact from all sides – not just from the financial or business sense which I think is often overlooked in engineering companies”. *Engineer*

This course is a unique opportunity to be engaged with experts in Antarctica and Southern Ocean issues. It will increase your understanding of the Antarctic system and will enhance your sphere of influence within the Antarctic Treaty System.

Find out more or apply TODAY (Closing date 1st August 2004) at www.anta.canterbury.ac.nz or contact Susannah Hawtin (Susannah.Hawtin@canterbury.ac.nz)