Summary of Acadia University's Strategic Research Plan
January 2006

Introduction

This Plan reflects Acadia's institutional values, demonstrates respect for a diversity of research choices, and recognizes the value of basic, applied and community-oriented research. It demonstrates its dedication to excellence in knowledge transfer and research training at the undergraduate and graduate student level and, in particular, the role played in building Canada's research capacity by providing exceptional opportunities for undergraduate students to experience early and thorough engagement with research, under the close tutelage of faculty members. The Plan recognizes the value of collaborative and interdisciplinary research activity and identifies strengths on which to build the institutional research capacity that is required to pursue new opportunities and continue developing Acadia's national and international reputation.

Major Objectives of the Plan

The major objectives of this Plan are to enhance research activity, support knowledge transfer, and encourage innovation at Acadia. A key strategy is to develop and maintain major research facilities and initiatives that support multiple disciplines and which will build institutional research capacity.

Major Research Themes

Acadia University has established six research themes to enhance and develop its research capacity. They provide strategic direction for developing research infrastructure, and entry points for participation by individual faculty members. These themes construct inter-faculty and inter-organizational networks for research collaboration while enabling community integration in support of the social and economic agenda of the region.

The Environment

This theme integrates scholars from all disciplines while linking research areas on issues with environmental consequences. Acadia is well known for integrated research into ecological systems, the interaction of organisms with the environment, and the implications of human activities for the environment. Research spans the evolution of the earth over geological time to recent and often short-term dynamics of local populations, both essential to the understanding of anthropegenic-induced environmental change.

Through the creation of the Arthur Irving Academy for the Environment, research focusing on the environment in its broadest sense has integrated scholars across all disciplines and faculties to address local, national, and international environment-related issues. The goal is to build on this interdisciplinary and collaborative foundation by allocating three Canada Research Chairs under the theme and associating all Chairs with the Arthur Irving Academy for the Environment to establish Acadia as a nationally significant centre for holistic, pan-university, integrated research into ecological systems and into human interaction with the environment.

The Arthur Irving Academy for the Environment assesses the consequences of environmental change, the roles of humans, and the relationships between human health and wellness in changing environments. The Academy explores the creative, aesthetic, ethical and spiritual aspects and evolution of our relationship with the environment. It develops innovative community-based approaches to adaptation, environmental management, and governance and contributes to the development of regional, national, and international policies for sustainable management of the biosphere.

Established research centres, networks and facilities support research, including: The K.C. Irving Environmental Science Centre & the Harriet Irving Botanical Gardens; the Atlantic Co-operative Wildlife and Environmental Research Network; the Acadia Centre for Estuarine Research; the Centre for Wildlife and Conservation Biology; the Atlantic Centre for Global Change and Ecosystem Research and the CFI –funded Biomolecular Laboratory and Laboratory for Eukaryotic Microbiology and Parasitology.

Cultures, Civilizations, and Citizenship

This theme explores the multiple dimensions of our increasingly global, diverse coexistence, and is critical during this period of significant socio-political, organizational and economic transition and profound scientific, technological development. Scholars in the humanities are actively engaged in the analysis of culture and civilization using traditional, discipline-based methodologies and through interdisciplinary initiatives. Research examines the past and the present from different perspectives including identity, gender, ethnicity, textuality, ethics, religion, education, literacy (print and digital), race, ecology, justice, rights, language and cultural diversity. Members of this scholarly community not only seek to understand culture and civilization but also contribute to the development of culture as active and recognized creators.

Scholars examine the changing nature of citizenship and civic competence, and assess responses of the international community to violations of human rights. They study the homogenization of cultural expression in the global village, and the marginalization of youth, rural communities, aboriginal and remote regions in the service economy. In addition scholars are examining the effect of transformational and disruptive forces upon organizations, both domestically and abroad.

Expertise in Atlantic history, culture, and politics contributes not only to the literature but also to regional and national debates. Scholars recognize African-Canadian and Aboriginal contributions to the culture of the Maritimes and are studying ethno-cultural diversity, including long-term, historically rooted ethno-cultural communities and newer and emerging immigrant communities.

Acadia has access to Statistics Canada data sets as a collaborator with the Regional Data Centre. Research centres include Acadia's Centre for Planter Studies, The Northeast Asia Research Centre, and the Centre for the Study of Ethnocultural Diversity.

Health and Wellness

The Health and Wellness theme reflects an interdisciplinary faculty effort to design initiatives that examine the complexity of the independent and interdependent variables influencing that influence our health and well-being. The challenges confronting the twenty first century in Health and Wellness are reflected by Acadia's wide scope of health research

activities that are nationally and internationally recognized. Faculty members are actively involved in research that encompasses such areas as nutrition, kinesiology, medicinal chemistry, physical and biophysical science, behaviour, biochemistry, aging, immunology, recreation, health literacy, education, psychology, sociology, and the environment.

Health is described as a multi-dimensional condition that includes spiritual, physical, mental/psychological, occupational, and social well-being. Wellness is identified as a state of well-being involving good physical self-care, using the mind constructively, expressing emotions effectively, interacting creatively with others, and being concerned about the physical and psychological environment. The Centre for Organizational Research and Development and The Centre of Lifestyle Studies support research and a Canada Research Chair has been allocated to help build capacity in this theme.

Information Technology and Society

This theme provides opportunities for a broad interdisciplinary analysis of learning, literacy, culture and technology, changing values and practices in the use of computers and of initiatives concerned with computing in distributed and peer-to-peer systems. This theme is particularly relevant and strategic given the technology-rich, internationally recognized, mobile computing environment and specialized facilities that support Acadia's research community and that spans all disciplines.

Digital culture provides opportunities to observe and study how society is transforming and being transformed by technology, digital media and the associated cultural practices and values. Researchers are studying the interactions of people and communities with information and communication technologies, how they affect broad social issues, what they mean for the production of new knowledge, and how people interact with computer hardware, software and the world-wide web. Questions include the role of technology in learning and literacy, with some emphasis on children with special needs; the engagement of diverse individuals and groups, (such as First Nations people) in public policy and political debate; workplace literacy, health and productivity; the use of new technologies in the production, reproduction and diffusion of creative practices in everyday life, the arts, and the sciences; and the preservation of artistic and scientific works in digital form as part of cultural heritage.

Another area of research involves artificial intelligence, the results of which can be applied to complex problems from a variety of perspectives, including business, the environment and software design. Distributed systems research has applications in tackling problems arising from computing on multiple machines in many locations over great distances, including the collection of data from harsh environments, and the development of models for co-operative distributive systems for applications to areas such as teaching and e-commerce.

Researchers are studying the impact of information technology on organizations such as multinational corporations, co-operatives, small businesses, hospitals and not-for-profits, seeking to understand its impact on effectiveness and competitiveness and on the human condition within organizations.

Acadia developed the CFI-funded Acadia Digital Culture Observatory and allocated a Canada Research Chair to foster and support interdisciplinary research under this theme.

Materials Science

This theme focuses on research in the development and characterization of complex materials with wide-ranging applications in present and future technologies. It supports research to develop an understanding of the bulk and surface properties of materials from the macroscopic down to the molecular and atomic levels. Improved corrosion inhibitors, the development of advanced coatings, novel sensor technologies incorporating advanced metallic alloys, the analysis of proteins on surfaces, the characterization of fine-scale carbonate textures by cathodoluminescence, heavy metal uptake in plants, morphological changes in organisms resulting from a changing environment, systematics, pollutants and the effects of environmental contamination are subjects of study under this theme.

This field is inherently interdisciplinary, often involving collaborative research efforts with leading academic institutions, government agencies and industrial partners. ACMA members are participants and play key roles in the Materials Technology Network for Atlantic Canada (MATNET). Acadia has allocated a Canada Research Chair to build capacity in this theme while research is supported by the CFI-funded Acadia Centre for Microstructural Analysis, providing a cluster of modern microanalytical instruments and generating a forum for multi-disciplinary research and collaboration at the physical and life sciences interface, critical to progress in emerging fields such as nano and biotechnology.

Modelling

Quantitative modelling and analysis stand at the foundation of research in many of the natural science, biological science and social science disciplines. Quantitative models enable researchers to describe, predict, manipulate, and understand a rich variety of complex phenomena ranging from subatomic behaviour that occurs in microseconds to climate change that occurs over several millennia, from user interaction with adaptive software systems to the evolutionary forces that have shaped genomes, and from the behaviour of interacting decision makers in economic environments to the interaction of organisms across spatial and temporal scales. In many applied areas there has been a move to integrate the analysis of data with the analysis of complex quantitative models. By creating a model of real-world phenomena, researchers can explore in a virtual environment many “what if?” scenarios before committing time and resources to physical experimentation. Exploration of a model can involve predictions under new scenarios, visualization of results, or analysis of logical structure.

A Canada Research Chair has been allocated to continue developing research strength in this theme while the development of the CFI-funded Acadia Centre for Mathematical Modelling and Computation provides high performance computing hardware to researchers in a variety of disciplines. Quantitative modeling is further supported by the Intelligent Information Technology Research Laboratory, the Statistical Consulting Centre, and the Regional Data Centre.

Canada Research Chairs Program: Priorities and Sequence

The primary objective of the Canada Research Chairs strategy is to promote research excellence and to provide leadership within Acadia’s research themes. Canada Research Chairs also enable a cooperative interdisciplinary network that deals with all aspects of the environment including scientific understanding, ethical perspectives and socio-political and economic adaptation. The strategy for deployment of the Chairs is to make available technical and intellectual expertise that will enhance scholarship which contributes to the

attainment of sustainable ecosystems locally, nationally, and globally.

Distribution of Canada Research Chairs by Research Theme

TIER	THEME	COUNCIL	APPOINTED
Tier I	Environment	NSERC	2002
Tier II	Environment/ Cultures, Civilizations, and Citizenship	SSHRC	2002
Tier II	Materials Science	NSERC	2002
Tier II	Modelling	NSERC	2004
Tier I	Health and Wellness	SSHRC	2005
Tier II	Information Technology and Society	SSHRC	2005
Tier II	Environment	NSERC	2006

Gender Equity

Acadia University is committed to gender equity and provides a supportive environment to women researchers and CRC candidates. In recent years women students have earned approximately 60% of the university's undergraduate research awards and NSERC Postgraduate Scholarships. Likewise, over 60% of Acadia's graduate students are women. Currently the two largest NSERC Discovery Grants and the two largest SSHRC Standard Research Grants are held by women. As Canada Research Chair opportunities become available, the senior officers responsible for the program, the Vice-President (Academic) and the Dean of Research and Graduate Studies will work with Faculty Deans to consider the recommendations of the CRC Secretariat regarding gender equity and ensure that women candidates are actively recruited.

Assessment of the Plan

Enhanced research activity will be measured by the number of Honours and Masters theses completed, the number of students employed as research assistants, the number and quality of applications made to Acadia's graduate programs and the number and value of tri-council grants, other external research grants and research contracts from government, the non-profit and private sectors.

Enhanced knowledge transfer will be assessed by enumerating refereed articles; peer-reviewed books; creative work, performances, commissioned work and technical reports; public speaking engagement; papers and attendance at professional meetings and seminars; hosting and organization of conferences and workshops; patents, licenses or spin-off companies and research awards involving community collaboration. In addition, the number of undergraduates who pursue postgraduate training and the number of Masters students who pursue doctoral studies will be monitored.

Innovation will be assessed by measuring the number and value of interdisciplinary grants awarded; the number of invention disclosures and the number of awards from programs for technology development.

History and Approval Process of the Plan

This second iteration of Acadia's Strategic Research Plan resulted from a campus-wide consultative process. Developed by a committee of research representatives, it was approved by the Senate on 9 January 2006 and subsequently submitted to and accepted by the

President of Acadia University.