

University of New Brunswick

Overview

The University of New Brunswick (UNB), has origins dating back to 1785. Research at UNB is active over an array of subjects and encompasses approximately 75% of all university research in the province of New Brunswick. Helping develop the next generation of alternative energy technologies, helping lay the groundwork for smarter, safer computing, aiding in the protection of the environment and assisting in furthering humanity's understanding of outer space. UNB is keenly interested in forming research partnerships with other academic institutions, government, NGOs, and the private sector that will benefit UNB, our partners, our province, our region and our country.

Research Capabilities

Arts

- Archaeology/Anthropology
 - First Peoples Archaeology
 - Community-driven Anthropology and its Ramifications in Legal and Economic Spheres
 - Human Health Issues in the Modern World
 - Community-based Fisheries Management
- Classics
 - The Roman Mint
 - The Study of Hellenistic Jews
 - The Homes and Households of Roman Greece
- English
 - Early Modern Studies
 - Canadian and Post-Colonial Literature
 - Early Modern Studies
 - American Literature
- Economics
 - Immigration
 - Population and Social Policy
 - Environmental Economics
 - Canadian Economy
 - Healthcare
- History
 - Canadian Military History
 - Canadian Cultural History
 - Environmental History
 - European Culture and Colonial History

- Medical History
- Political Science
 - Aboriginal Government
 - Democratic Engagement
 - International Public Law
 - Women/Feminism in Politics
- Sociology
 - Social Structures
 - Social Relationships
 - Social Change

Business Administration

- Accounting/Management Information Systems
 - Sustainable Business Practices/Green Supply Chains
 - Direct Investment and Economic Development
 - Auditing
 - Business and Economic History (Military)
 - Accounting Practices of Public Utilities
- Administration
 - Business Ethics
 - New Product Design
 - Knowledge Management
 - Leadership
 - Motivation
- Entrepreneurship
 - Innovation
 - Venture Capital
- Finance
 - Crowdfunding
 - Financial Markets and Institutions
 - Fixed Income Securities
 - Behavioural Finance
 - Derivatives
 - International Finance
- Human Resources
 - Organizational Justice
 - Outcomes of Management Education
 - Not-for-Profit Organizations
 - Organizational Commitment
 - Business Negotiation
- Marketing
 - Consumer Choice
 - Customer Service and Satisfaction
 - Market Orientation
 - Non-Profit Marketing
 - Market and Economic Development
 - Market Opportunity Analysis

- Quantitative Analysis
 - Location Theory (hospitals, landfills, cell phone towers, etc.)
 - Counter terrorism
 - Total Quality Management
 - Statistics
 - Social Network Theories
 - Supply Chain Management/Inventory Theory

- Centres
 - International Business and Entrepreneurship Centre (IBEC)
 - Centre for Financial Studies

Computer Science

- Algorithm Design and Analysis
- Bioinformatics
- Artificial Intelligence
- Hardware/Software Co-Design
- Embedded Systems
- High Performance Computing
- Network and Information Security
- Big Data Analytics
- Software Engineering
- Computer and Data Communication
- Wireless and Mobile Computing
- Machine Learning and Data/Text Mining
- Web Services

- Special Equipment/Facilities
 - Information Technology Centre
 - Providing a means for UNB and researchers to interact with the information and communications technology industry.
 - IBM Centre for Advanced Studies
 - Promoting and cultivating collaborative research between IBM and UNB.
 - Advanced Computational Research Laboratory
 - Providing high performance computing resources for research and instruction to UNB and many other universities in Atlantic Canada.
 - Information Security Centre of Excellence
 - Promoting research on information and communication security.
 - Intelligent & Adaptive Systems Group
 - Promoting research on machine and statistical learning, data mining, intelligent agents and multi-agent systems.

Education

- Adult Education

- Administration and Leadership
- Counseling
- Curriculum Studies
- Exceptional Learners
- Critical Studies
- Instructional Design
- Early Childhood Education

- Special Equipment/Facilities
 - Second Language Research Institute of Canada (L2RIC):
 - Furthering second language education in Canada and abroad through research into teacher preparation, bilingual program evaluation and policy development.
 - Early Childhood Centre (EEC)
 - Facilitating research and development into early childhood education and care including early schooling, family and community education and early year intervention.
 - Health and Education Research Group (HERG)
 - Developing collaborative research alliances and applied research expertise to improve the physical, psychological and educational health of individuals and communities.
 - Atlantic Centre for Educational Administration and Leadership (ACEAL)
 - Seeking to bring high quality services such as capacity building services, international development projects and dissemination of leadership materials, to the places where teachers and administrators work and live.
 - Mi'kmaq-Maliseet Institute (MMI)
 - Promoting the professional growth and self-determination of the First Nations through its programs, services and research into culturally appropriate curriculum and pedagogy.
 - Canadian Research Institute for Social Policy (CRISP)
 - Conducting policy research aimed at improving the education and care of Canadian children and youth. Contributing to the training of social scientists in quantitative research methods and supporting low-income countries in their efforts to build research capacity in child development.

Engineering (Fredericton)

- Chemical
 - Nuclear Engineering: Corrosion
 - Catalysis: Biofuels, Nanoparticles
 - Recirculation Aquaculture Systems
 - Pulp & Paper: Bio-refinery, Mechanical Pulping
 - Nanotechnology
 - Surfaces: Polymers, Adsorption, Porous
- Civil
 - Concrete Materials
 - Environmental: Wastewater Management
 - Transportation

- Highway Construction and Pavement
 - Road Safety
 - Soil Structure
- Geodesy and Geomatics
 - Geodesy
 - Positioning and Navigation Systems
 - Ocean Mapping
 - Advanced Geomatics Image Processing
 - GIS and Spatial Data Infrastructure
 - Engineering and Mining Surveys
- Electrical and Computer
 - Controls, Instrumentation and Robotics
 - Myoelectric Controls/Biomechanics
 - Fibre Optic Systems
 - Communications
 - Sensor Networks
 - Embedded System Design
 - Biomedical Signal Processing; Neural Networks
 - Adaptive Signal Processing; Speech Recognition
 - Power and Sustainable/Renewable Energy
 - Software Engineering/Software Tools
- Mechanical
 - Acoustics and Vibration
 - Biomedical
 - Manufacturing and Materials Processing
 - Mechatronics and Design
 - Renewable Energy Systems
 - Robotics and Applied Mechanics
 - Thermofluids and Aerodynamics
- Biomedical
 - Electromyography
 - Prosthetics and Control Systems
 - Neural Engineering
 - Human Motion Analysis
 - Rehabilitation Engineering
 - Occupational Therapy
 - Ergonomics
 - Clinical Engineering
 - Medical Device Design and Development
- Special Equipment/Facilities
 - Canadian Centre for Geodetic Engineering

- Committing to the research, development, and implementation of innovative precision surveying and geomechanics solutions.
- Centre for Nuclear Energy Research
 - Focusing on corrosion process research, primarily in high-pressure/high-temperature water.
- Construction Technology Centre Atlantic
 - Providing a bridge between recent developments in construction research and industry partners.
- Institute of Biomedical Engineering
 - Furthering education, research and community service in biomedical engineering.
- Limerick Pulp and Paper Research Centre
 - Developing technologies for Canada's pulp and paper industries including: pulping, bleaching, papermaking and effluent treatment.

Forestry and Environmental Management

- Soils and Watershed Management
- Forest Biology and Genetics
- Forest Management
- Remote Sensing
- Wildlife Ecology
- Wood Science and Engineering
- Natural Resource Social Sciences

- Special Equipment/Facilities
 - Forest Watershed Research Centre
 - A partnership of industry, university and government dedicated to developing, applying and communicating watershed research to promote sustainable and integrated forest management policies and practices.
 - The Integrated Forest Management Lab
 - Finding solutions to modern challenges in forestry that combine the best ideas and expertise from all aspects of the forestry profession.
 - Wood Science and Technology Centre
 - Promoting conservation, sustainability and productivity through engineering, innovation and the efficient utilization of the forest resources.
 - Canadian Bio-Energy Centre
 - Promoting the sustainable and responsible use of forest and agricultural bio-resources within industry for a plurality of goods and services.

Kinesiology

- Movement Analysis
- Health and Rehabilitation Research
- Workplace Injuries
- Fitness and Performance Analysis
- Diabetes and Obesity

- Coaching Healthy Habits
- Sport and Leisure History
- School Nutrition
- Sport and Media
- Individual and Family Recreation, Sport Management and Marketing
- Natural Resource-based Recreation Sport Psychology
- Applied Ethics in Sport, Leisure and Health
- Physical Disabilities
- Ergonomics
- Occupational Therapy

- Special Equipment/Facilities
 - The Andrew and Marjorie McCain Human Performance Laboratory
 - Discovering, disseminating and applying knowledge in the biomechanics and neuromuscular physiology of human movement.
 - 12 Vicon Nexus T160 cameras, Zerowire EMG system, Delsys Trigno wireless 8ch EMG, Noraxon wireless system, Cybex isokinetic dynamometer, XSensor pressure imaging system, Kistler force plates, BalanceQuest (balance tracking, IScan 3D pupil tracking system)
 - Clinical Gait Analysis Service
 - Rehabilitation programs and services challenging individuals with and without disabilities to progress to their maximum functional independence, physical ability and quality of life. Provider for clinical gait analysis services to the Stan Cassidy Centre for Rehabilitation (SCCR).
 - Biochemistry and Exercise Physiology Laboratory
 - Understanding human cardiovascular, respiratory and neuromuscular responses to physical activity.
 - Occupational Performance Laboratory
 - Studying ergonomic, biomechanical and human factor concerns related to workplace injury development and strategies for injury reduction.
 - Motor Control, Learning and Sport Performance Analysis Laboratories
 - Exploring factors affecting information processing, issues of inhibitory control and motor learning (skill acquisition).

Science (Fredericton)

- Biology
 - Aquatic Ecosystem Science
 - Aquaculture Science and Biotechnology
 - Biodiversity
 - Conservation Science
 - Evolutionary Biology
 - Molecular, Cell and Developmental
 - Biochemistry
- Chemistry
 - Medicinal Chemistry

- Material Science
- Theoretical and Computational Chemistry
- Natural Products Isolation and Synthesis
- Molecular Spectroscopy
- Rechargeable Organic Batteries
- Molecular Switches
- Earth Sciences
 - Hydrogeology and Environmental Geochemistry
 - Sedimentology and Petroleum Geology
 - Geology and Geochemistry of Ore Deposits
 - Uranium-lead Geochronology
 - Volcanology
 - Planetary Geology
 - Rock Physics
- Mathematics and Statistics
 - Algebraic Combinatorics and Geometry
 - Applied Statistics
 - Dynamical Systems and Mathematical Biology
 - Mathematical Physics
 - Operator Theory and Non-Commutative Geometry
- Physics
 - Atomic and Molecular Laser Spectroscopy
 - Quantum Mechanics of Atoms and Molecules
 - Experimental Spectroscopy
 - Magnetic Resonance Imaging (MRI)
 - MRI Methods Development
 - Application of Magnetic Resonance to Problems in Materials Science
 - Atmospheric and Space Physics
 - Plasma Behaviour
 - Polar Network of GPS and Ionosondes
 - Observation and Modeling of the Middle Atmosphere
- Special Equipment/Facilities
 - MRI Research Centre
 - Inventing and successfully applying new magnetic resonance imaging methods.
 - Planetary and Space Science Centre
 - One of 17 worldwide NASA-designated facilities providing imagery, maps and data from NASA-led space missions. Studying impact cratering, planetary materials and landforms, frictional melting, shock metamorphism and sub/super/hyper-sonic impact damage and mitigation.
 - Canadian Rivers Institute
 - Developing the aquatic science required to understand, protect and sustain water sources for the region, nation and the planet.
 - Centre for Environmental and Molecular Algal Research (CEMAR)

- Investigating macroalgal and microalgal species.
 - Microscopy and Microanalysis Facility
 - Providing imaging and analytical services and training related to microscopy, microanalysis and x-ray analysis to universities, government and industry.
 - Centre for Laser, Atomic, and Molecular Sciences
 - Combining the expertise and facilities of all the theoretical and experimental spectroscopy groups in the Physics and Chemistry departments.
 - Applied Statistics Centre
 - Assisting with data analysis, experimental design and other uses of statistical methodology.

Science, Applied Science and Engineering (Saint John)

- Biology
 - Marine
 - Environmental
 - River Sciences
 - Terrestrial
 - Toxicology and Genetics
 - Aquaculture
- Computer Science and Applied Statistics
 - Software Engineering
 - Wireless and Mobile Computing
 - Computational Data Analysis
 - Semantic Technologies
 - Biostatistics
- Engineering
 - Transportation Modelling and Systems Analysis
 - Road and Motor Vehicle Safety
 - Transportation Logistics and Operations
 - Research Infrastructure Management Systems and Cost-Effectiveness Analysis
 - Marine and Intermodal Transportation
- Chemistry
 - Natural Products
 - Chemical Ecology
 - Laser-based Studies of Environmental and Atmospheric Molecules
 - Conformational Studies of Biomolecules
 - Benchmark Laboratory Astrophysics Database
 - Dynamics – Intramolecular Vibrational Energy Redistribution
- Nursing & Health Sciences
 - Healthcare Transitions, System Change and Patient Safety
 - Chronic Illness and Whole Person Care
 - Inter-professional Education and Interdisciplinary Practice
 - Homelessness
- Special Equipment/Facilities

- Canadian Rivers Institute
 - Developing aquatic science needed to understand, protect and sustain water resources for the region, nation, and the planet.
- Seaweed and Integrated Multi-Trophic Aquaculture (IMTA) Laboratory
 - Studying the eco-physiology and biochemistry of seaweeds of commercial value and development of IMTA systems for environmental sustainability, economic stability and societal acceptability.
- Bruce MacDonald Laboratory
 - Focusing on how marine suspension-feeding invertebrates are adapted to local habitats, with particular regard given to physiological or behavioural mechanisms that facilitate energy gain to support growth and reproduction.
- Long-term Experimental Wetlands Area (LEWA)
 - Examining the effects of widely used herbicides on amphibian, invertebrate and plant communities.
- Kate Frego Bryophyte Laboratory
 - Studying bryophyte responses to forest management and potential mechanisms of response.
- MADSAM Sturgeon Physiology Laboratory
 - Studying the influence of various environmental endogenous stresses on metabolism in fish.
- Heather Hunt Laboratory
 - Studying the physical and biological processes influencing the structure and organization of benthic marine invertebrate communities.
- Natural Products Research Group
 - Seeking to isolate and identify natural products with significant potential for application as therapeutic agents.
- Chris Baker Laboratory
 - Developing knowledge management and semantic technologies.
- Laser Instrumentation and Spectrometers Group
 - Developing practical applications for the use of lasers in industry.

Contact

Kelly Ashfield

Director

(506) 451-6822

kelly.ashfield@UNB.ca