

Faculty of Science, Applied Science and Engineering

OVERVIEW

The University of New Brunswick's (UNB) Faculty of Science, Applied Science and Engineering's faculty members are internationally recognized experts in their fields. They provide research services to both public and private organizations from across the globe, with an emphasis on practical industry-driven solutions.

RESEARCH CAPABILITIES

Biology

- Marine
- Environmental
- River Sciences
- Terrestrial
- Toxicology and Genetics
- Aquaculture

Computer Science

- Software Engineering
- Wireless and Mobile Computing
- Computational Data Analysis
- Semantic Technologies

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

Mathematics and Statistics

- Combinatorics
- Finite Geometries and Coding Theory
- Fluid Dynamics
- Biostatistics
- Ecological Statistics
- Statistical Computing

Physics

- Laser-based Studies of Environmental and Atmospheric Molecules
- Conformational Studies of Biomolecules
- Benchmark Laboratory Astrophysics Database
- Dynamics – Intramolecular Vibrational Energy Redistribution

Nursing and Health Sciences

- Healthcare transitions
- Chronic illness
- Patient and family-centred care
- Patient safety
- Vulnerable Populations
- Pre-licensure nursing education
- Interprofessional education and practice
- Health information

MAJOR PROJECTS

Integrated Multi-Trophic Aquaculture (IMTA)

Researcher(s): *Dr. Thierry Chopin and Dr. Bruce MacDonald*

Pioneering a new approach wherein by-products from one species become nutritional inputs for other species co-cultivated based on their complementary functions in the ecosystem.

Identification of Hospital Acquired Infections (HAI)

Researcher(s): *Dr. Chris Baker*

Co-developing HAI ontology and deploying and documenting semantic automated discovery and integration (SADI) web services in the healthcare context for identifying HAI.

SADI Semantic Web Services Deployment

Researcher(s): Dr. Chris Baker

Developing, deploying and documenting SADI semantic web services in multiple bioinformatics use cases and organizing nationwide training workshops.

Interprofessional Patient-Centred Care

Researcher(s): Dr. Shelley Doucet

Developing innovative interprofessional community-based practice models and evaluating the impacts on patients, health professionals, and health service delivery.

FACILITIES

Canadian Rivers Institute

Developing the aquatic science required to understand, protect and sustain water sources 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.

Evidence Synthesis Group (ESG) - Joanna Briggs Institute (JBI), University of Adelaide, Australia

Advancing evidence-based nursing and building research collaborations locally, nationally and internationally.

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 (NPRG)

Seeking to isolate and identify natural products with significant potential for application as therapeutic agents.

Laser Instrumentation and Spectrometers Group

Developing practical applications for the use of lasers in industry.

For more information please visit: www.unb.ca/saintjohn/sase/