UNIVERSITY OF NEW BRUNSWICK
INTERNATIONAL RELATIONS OFFICE
PO Box 4400
Fredericton, NB
CANADA E3B 5A3
TEL 506-453-4816
FAX 506-453-4908
iro@unb.ca
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Unit & Sub-unit	Areas of Strength	Description of the unit and collaboration
UNBF Faculties and Departments		
Arts, faculty of		
Anthropology	Anthropology of Fisheries; Property Studies; Anthropology of Education; Medical Anthropology/HIV-AIDS Research; Maritimes Prehistory	The only stand-alone three-fields Anthropology Department in the Maritimes offering both undergraduate and graduate programs.
	Centre for Conflict Studies	Focuses exclusively on revolutionary and civil wars, political terrorism, covert operations, unconventional warfare, intelligence services, propaganda, and the role of the media in modern warfare.
Classics and Ancient History	Study abroad/archaeology	Tours to Greece and Turkey. Archaeology programme planned for Greece.
Culture and Language Studies	18th and 20th-Century German Literature and Culture, German Language Acquisition, Music-Theatre, Opera, Performing Arts; 19th and 20th c Spanish, Latin American, Polish and Russian narrative; Contemporary culture of Latin America and Spain; 18th - 20th Century German Literature and Culture, Lessing, Goethe, Holocaust Literature, Popular Culture, Queer Theory, Gay and Lesbian Literature; Literary Theory (Bakhtin, Lotman), World Literature, Russian Literature (Babel, Aksyonov, Bulgakov, Gorbanevskaia)	
Economics	Public policy, regional economics, health economics, industrial organization	The Department of Economics is the premier economics department in New Brunswick, we are an applied research department with research and policy expertise in a broad range of areas in both microeconomics and macroeconomics, including a focus on public policy in Atlantic Canada through our Policy Studies Center.
English	Strong undergraduate programme in all areas of english with options in drama, creative writing and film studies. At the graduate level, known especially for early Modern, Post-Colonial, and Creative Writing, the latter considered among the top programmes in the country. Applying for an interdisciplinary Fine Arts Minor in Film. Developing an MA option in Scholarly	

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Unit & Sub-unit	Areas of Strength	Description of the unit and collaboration
	Editing and Humanities.	
French	Francophone Studies	Offers students a window onto cultural diversity.
Fine Arts	The Department offers in its general programme a wide range of courses in British, Canadian, American, and Postcolonial literature. It also offers courses in creative and expository writing, film, drama production, and language and linguistics, some of which are basic parts of special programmes in Drama, in Creative Writing, and in English Language and the Linguistics of English.	
Interdisciplinary Studies Interdisciplinary programmes: - Comparative and General Literature - International Development Studies - Law in Society - Linguistics - Russian Studies - Women's Studies	Offer the opportunity to cross departmental boundaries and explore issues from multiple perspectives.	
History	Canadian and Atlantic Canadian History, Military/International History, Women's History, and North American, American, and European History	A nationally top ranked department for both its research accomplishments and teaching excellence
Military and Strategic Studies	The Military and Strategic Studies Program at UNB fosters and develops informed public debate and awareness of Canada's security and defence affairs, and builds bonds between Canada's armed forces and its citizens. Students interested in Military and Strategic Studies enrol through the Department of History in an undergraduate or graduate (Masters and PhD) Arts degree program, with a concentration in MSS courses.	
	The Centre for Conflict Studies	Leading academic centre for the study of modern warfare, specializing in Peacekeeping, Intelligence, Low Intensity Conflict and its resolution
Multimedia Studies		
Muriel McQueen Fergusson Centre for Family Violence Research	Current Research Teams:	
	Child Abuse and Neglect	

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Unit & Sub-unit	Areas of Strength	Description of the unit and collaboration
	Conditional Sentencing	
	Creating Peaceful Learning Environments Research	
	Family Violence on the Farm and Rural	
	Provincial Strategy for Dating Violence	
	Religion and Violence	
	Tantramar Family Violence Research	
	The Co-existence of Domestic Violence and Child Maltreatment	
	Workplace bullying	
Philosophy		
Political Science		
Psychology	Cultural studies of communications, deception, stress reactivity, and resilience; Adolescent Development; Clinical Neurophysiology, Physiological Basis of Learning and Memory; Clinical-Social Psychology; Cognitive Science, Cognitive Psychology Neural Networks, Lexical Access; Depression/Anxiety Disorders; Developmental Handicaps (Early Individual Differences), REM Sleep; Feminist psychology; Gambling and Internet Addictions; Health and Rehabilitation Psychology; Human Neuropsychology, Behavioural and Brain Mechanisms of Laterality; Human Sexual Behaviour (communication, satisfaction, dysfunction), Sexual Violence; Individual differences and cognitive neuropsychology; Infant Development (Behaviour Problems in Children); Personnel selection, training and retention	
Sociology	Multimedia and communication; criminology, the law and society; family and domestic violenc; health, healthcare, and wellness.	
Business Administration, faculty of		
	International BBA and MBA degree programs, Curriculum development	University of Warmia and Mazury (UWM) in Olszten, MBA program to students in Poland
		International Institute of Business, MBA program in Kiev

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Unit & Sub-unit	Areas of Strength	Description of the unit and collaboration
		Royal Bank of Trinidad and Tobago, BBA program in Trinidad and Tobago
		Sadat Academy of Management Science (SAMS) in Cairo, Egypt.
Business Administration (Undergrad)	Domestic BBA degree programs	
BBA Concentrations:		
- BBA in Aviation and Operations Management Option		
- Joint Concentration in Finance & Economics		
- BBA and Law		
- Concurrent BBA/BEd Degree Program		
- BBA for Students with another Bachelor Degree		
Business Administration (Graduate):	Domestic MBA degree programs	
- Traditional full-time MBA:		
- Traditional part-time MBA		
- MBA with research components		
- MBA with domestic or international internship		
- Joint MBA/LLB		
- MBA in Sport and Recreation Management		
Computer Science, faculty of		
	Automated Reasoning Group	Automated Argumentation, which corresponds to deductive reasoning, whereas *automated reasoning* implies induction as well as deduction.
	Intelligent and Adaptive Systems	R&D in Web intelligence, network security and application of multiagent systems to eHealth. Currently, the group's work focused on extending the flexibility and responsiveness of websites through automated learning to user usage patterns, interests, goals, knowledge and preferences.
	Grid Computing Research Group	Mesh-based high performance computing applications distributed over multiple parallel computers, and coupling of high-performance Computer Aided Engineering software with Model Predictive Control software.
	Molecular Modeling Software Development Team	Information Systems, Software Engineering, Visual Programming, Molecular Modelling and Computational Chemistry.

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Unit & Sub-unit	Areas of Strength	Description of the unit and collaboration
	Network Security	Research projects in the group focus on various aspects of information and network security. Currently, the group is mainly focused on network survivability and intrusion detection & response systems.
	Reconfigurable Computing Research Group	Hardware-Software co-design, Virtual Machines.
Bachelor of Computer Science - BCS		
Concurrent Degree Programs:	Concurrent Degree Programs - pursue two undergraduate degrees at the same time	
- Computer Science and Arts - BA/BCS		
- Computer Science and Education - BCS/BEd		
- Computer Science and Science - BCS/BSc		
- Computer Science and Geomatics Engineering - BCS/BScE(GGE)		
BCS/MCS Accelerated Program		
Bachelor of Science in Software Engineering - BScSwE		
Undergraduate Certificate in Software Development, including optional work term		
Certificate in Computer-Telephony Integration		
Graduate Degrees (Masters & PhD)		
Education, faculty of		
	Teacher education and curriculum development	B.Ed. Program-we deliver a degree program for practicing teachers, Trinidad and Tobago (Roytec). Research, collaborative degree program(s), students exchange
	Teacher education and curriculum development	Bhutan (CIDA). Research, collaborative degree program(s), students exchange
	Teacher education and curriculum development	Russia (CIDA) Project now completed. Research, collaborative degree program(s), students exchange.
	Professional Development	England (Walsall)- on-going, over 20 years, student teachers' and practicing New Brunswick teachers' exchange program. Promotes collaborative research and in-class experience.
BEd Concurrent Degrees:	The five-year Concurrent Bachelor of Education (BEd) degree in conjunction with another Bachelor's degree.	

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Unit & Sub-unit	Areas of Strength	Description of the unit and collaboration
- Educations and Arts		
- Educations and Administrations		
- Educations and Science		
- Educations and Kinesiology		
- Educations and Computer Science		
BEd Consecutive Degrees: - Adult Education - Art Education - Early Childhood Education - Literacy Education - Mathematics Education - Physical Education - Science Education - Second Language Education - Social Studies Education - Technology Education	The Consecutive Education degree requires that students complete a Bachelor's degree before applying for the BEd degree.	
BEd – 4-year Elementary Degree for First Nations Students	Mostly delivered on site to various New Brunswick First Nations Communities. Curriculum Development and delivery.	Degree program for practicing teacher assistants and early childhood educations.
Graduate Degrees (Masters & PhD): - Adult Education - Counselling Psychology - Critical Studies in Education - Curriculum Studies - Educational Administration - Education Studies - Exceptional Learners - Instructional Design		
	Canadian Research Institute for Social Policy	A multi-disciplinary research organization dedicated to: 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.
	Early Childhood Centre	Research and development in multiple aspects of early year's education and care including early years schooling, family and community education and early intervention.

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Unit & Sub-unit	Areas of Strength	Description of the unit and collaboration
	Mi'kmaq-Maliseet Institute	Assists First Nations students from the Atlantic region and beyond with admissions, academic advising, and access to the many services available to UNB students. Coordinates and administers the Bridging Year for First Nations students, the 4-year Elementary BEd, and summer science camps at various First Nations communities in New Brunswick. Consultants on First National Education to New Brunswick Department of Education. Maintains an on-line dictionary of Maliseet/Passamaquody words, with regular updates. Currently contains over 16,000 words. Compiles and maintains an annotated bibliography and collection of children's books written and/or illustrated by First Nations authors and /or illustrators living in Canada.
	Bhutan Project	Aims are to strengthen the capacity of teacher training institutes in Bhutan, upgrade the academic background of secondary-school teachers and post-secondary lecturers, and enhance the capacity of the Curriculum and Professional Support Services and the Bhutan Board of Examinations. It also assists Bhutan in strengthening its capacity in Education (English and Mathematics), computer science, and Engineering.
	Second Language Education Centre	Teacher education, professional development, curriculum development, research, and evaluation in the field of second language (SL) education, provides SL educators with current information related to SL learning and teaching. The SLEC has been involved in numerous international projects including the Estonian Language Training Project (funded by CIDA), the Canada-EU student/teacher exchange, the hosting of visiting scholars, and most recently a partnership with the Department of French to offer summer school credit courses in France. In addition, SLEC is in the process of a collaborative project with the European Centre for Modern Languages to determine the applicability of the European Language Portfolio project for Canada.

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Engineering, faculty of		
Chemical Engineering	Hydrogen UNB	Production of Hydrogen from Natural Gas The impact of the "green house effect" on the atmosphere has promoted alternative fuels. Hydrogen has been developed as a source of "green energy". Fuel cells and electrical generators can now be powered with hydrogen to run automobiles and produce electricity. UNB is taking another initiative to address a problem that concerns the whole world. UNB Hydrogen as a group has been working on the production of hydrogen from methane. Hydrogen is being produced by cracking methane in plasma reactors. The reaction produces hydrogen and solid carbon with other by-products like acetylene, propylene and unconverted methane. The project scope covers the production, purification and application of hydrogen.
	Nuclear	Water Chemistry & Corrosion in Nuclear Power Plant The nuclear research team is exploring the possibility of using supercritical water in the next generation of nuclear plants to be built. Existing plants are using pressurized water at conventional sub-critical conditions. The research is extended to the investigation of the behavior of different materials in supercritical water at different operation conditions like pressure, temperature and pH. The team is also developing electrochemical reference electrodes for applications in a high temperature and high pressure environment. The electrodes will be applicable in the making of industry standard sensors, pH meters and conductivity measuring gadgets, and will be able to withstand the harsh conditions that affect electrode activity. Chemistry of Corrosion and Fouling This research work is focused on the chemistry and mechanism of corrosion encountered in nuclear plants. Hydrodynamic behaviours - like corrosion rates of different materials are being studied under simulated nuclear reactor conditions. Experiments are performed with the conditions of the nuclear reactors simulated with different chemicals - similar to the ones encountered in the nuclear plants e.g boric acid,

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		dissolved in coolant water and maintained at high temperature and pressure. Pressure and temperature are as high as 2000 psig and 300 ^{o}C. Hypothesis on how to prevent the corrosion are formulated from the results of the experiments. The other aspect of this research work involves the study of mechanisms of fouling as seen in nuclear plant equipment. Fouling conditions are simulated and the fouling rates are monitored for different materials as different operating parameters are varied. The research work finds major application in nuclear plants and some of the results of this work have already been applied in some plants.
	Pulp and Paper	Innovative Processing and Modification of Pulp Fibre The Pulp & Paper Centre has extensively been studying pulp fibre properties. They are investigating the impact of these properties on the quality of the products the pulp is used for. They are developing polymers that can be incorporated into fibre networks so as to improve the properties of the pulp and, ultimately, improve the quality of the products. The modified fibres will have improved properties that natural fibres ordinarily will not have. This fibre engineering finds application in the making of tissue paper and women's hygiene products where the water absorbent property of the products can be improved for better performance. The work has also been extended to impartation of electrical conductive properties into pulp used to make packages for sensitive electronics. The team is also developing bleaching processes that are more economical and more environmentally friendly compared to the conventional bleaching processes. They are using oxygen-based bleaching agents like ozone, hydrogen peroxide and peracetic acid in place of chlorine based agents. Surfactant Properties of Wood Pulp Fibres in Relation to Paper Properties In the papermaking process, fibres interact and form bonding with each other at their surfaces. Fillers and other papermaking additives also interact with fibres at their surfaces. Therefore, it is the fibre surface which plays the more important role in the papermaking process and

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		determines paper properties. Different pulp fibres have different surface properties with regard to both the surface morphology and surface chemistry. This research program uses advanced surface analysis techniques, such as XPS, SIMS, CLSM, SEM and AFM, for surface characterisation of pulp fibres, including the nano-surface structure, lignin distribution of the fibre surface, and the surface adhesion force in a ligno-cellulose material system. The ultimate goal of the research program is to develop novel technologies for surface modification and technologies for producing fibres with desirable surface properties, with a focus on mechanical pulp fibres (TMP, CTMP and APMP). Mechanical pulp fibres have more heterogeneous surface chemistry, and more lignin-rich surface material. By a mechanical peeling technique developed in this research, some lignin-rich surface material can be selectively removed, thus improving the inter-fibre bonding ability of fibres. Bio-surface treatment is also underway for improving CTMP and APMP fibre properties. The improved fibre surface properties will allow an extended use of mechanical pulp fibres in value-added paper grades.
	Aquaculture	Innovative Recirculation System for Aquaculture Wastewater management is a major issue to the aquaculture industry. Fish produce ammonia and phosphorus as waste. The ammonia is toxic and the phosphorus acts as fertilizer to the growth of algae which is another concern. The ammonia and phosphorus makes it inappropriate to release the waste water into seas and lakes. The aquaculture team is working on the design of a system that treats waste water from a land aquaculture tank. The system will collect waste water, filter it and send the filtrate to a biofilter. The filtrate consists of dissolved ammonia which will be converted to nitrate by bacteria in the biofilter. This treated water can then be oxygenated and recycled back into the tank. The nitrate is not toxic to the fish. A branch of the research is also exploring the possibility of converting phosphorus to food for the bacteria in the biofilter.

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	Oil & Gas	Improved Technology for Cleaner Fuels Catalytic cracking of crude oil produces gasoline, jet fuel and diesel fuel among other products. Refinery operation units need to be optimized to improve the quality of these fuels for better performance and to meet environmental regulations. This research team is working on how to reduce the sulfur, nitrogen and aromatic contents of gasoline, jet fuel and diesel fuel produced in the hydrotreater unit of the refinery, as well as finding the optimum operating conditions in the unit. The hydrotreater is used to process the straight-run products (from the atmospheric distillation unit) into gasoline, jet fuel and diesel fuel. The team is also synthesizing zeollite catalysts that can convert aromatic hydrocarbons into straight chain paraffin. Surfactant Selection and Gel Characterization - for Enhanced Oil Recovery (EOR) Processes EOR processes are used for wells where primary and secondary production methods are not effective. This research work focuses on surfactant selection and gel characterization to provide significant oil production increase for these wells. Surfactants are used to achieve low interfacial tension between the trapped oil and the injection fluid. Surfactants are mixed with high pressure gas like CO_2 and polymer to produce foam which can be injected into wells. The foam penetrates deeply into the formation and contacts the trapped oil globules. The polymer in the foam increases the viscosity of the injection fluid, minimizes channeling and provides mobility control. The foam can reduce the permeability of swept zones, forcing carbon dioxide or other gas phase into un-swept areas of the formation. Foams are also used in well clean-up operations to suspend and remove solids. Water in wells hinders oil recovery. Polymer gel can be used as a water-shutoff treatment. The use of appropriate gel can successfully reduce unnecessary water production in wells. Gels can function as blocking agents by invading naturally-occurring fractures and diverting flow into other parts of the reservoir, improving the conformance of the flood water. The second aspect of this research work focuses on the characterization of gels and gelatin

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		processes using nuclear magnetic resonance.
	Adsorption & Adsorption Processes	Technique to Control Automobile Emission The automobile engine emits hydrocarbons (HCs), oxides of Nitrogen (NOx) and oxides of carbon. These compounds contribute to the formation of smog, acid rain and have other adverse effect on the environment. Smog is a photochemical haze (fog) caused by the action of solar ultraviolet radiation on atmosphere polluted with hydrocarbons and oxides of nitrogen from automobile exhausts. Catalytic converters are installed in automobile exhaust systems to trap and reduce NOx to harmless nitrogen and oxygen molecules. The converter also traps poisonous carbon monoxide and HCs and oxidize them to less harmful carbon dioxide and water vapor. The performance of the converter depends on the type of adsorbent used for trapping the NOx and HCs. Catalytic converters are not efficient during a cold startup. The reduction of the NOx and the combustion of the HCs and CO take place at high temperature. During a cold start up, these compounds need to be trapped until the converter reaches a high temperature, and then released to be converted. The focus of this research is to find suitable adsorbents that can hold these compounds during cold start up until the converter reaches the required temperature to treat them.
	Polymer Technology	Preparation and Applications of Novel Functional Polymers Polymer research group aims at developing a variety of polymers for various applications. The main focuses of the current research are to develop antimicrobial polymers for value-added forest or paper products (e.g., bioactive paper) and to synthesize novel star or branched polymers as non-viral vectors for gene or DNA delivery or as drug carriers. To render cellulose fibres antimicrobial, several innovative approaches have been developed in an attempt to incorporate antimicrobial polymers or functional additives into fibre networks or on the surfaces of cellulose fibres for a long-term effectiveness. The research will also lead to the better understanding of the mechanisms of antibacterial processes via advanced characterizations including that by an atomic

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		force microscope (AFM). Apart from antimicrobial polymers, the work on functional polymers for papermaking includes the temperature/pH responsive polyelectrolytes for layer-by-layer (L-b-L) assembly and in-situ polymerization of cationic copolymers for fibre strength improvement and better filler distribution. Cationic-modified microparticles or nano-spheres have been developed and employed in conjunction with anionic polymers for simultaneous removal of dissolved and soluble substances via effective flocculation and sorption. To enhance the transfection efficiency of DNA, cationic star polymers have been synthesized through atom transfer radical polymerization (ATRP) by a core-first method using a β-cyclodextrin initiator with 21 initiation-sites. The resulting polymers are capable of forming a nano-complex with plasmid DNA, thus increasing the cell transfection efficiency (e.g., improved drug delivery across the blood brain barrier). Catioinc branched polymers based on β-cyclodextrin also enhance the water solubility of drugs including the one used for anti-HIV. The work above has been conducted via strong international collaboration. The modification and application of polymers have also been extended to other areas including bio- or synthetic polymers for enhanced oil recovery; polymer-modified cellulose fibres for bio-composites; polymer templates for preparing mesoporous materials; and the investigation of penetration behaviours of polymer resins in wood substrates for engineered wood products.
Civil Engineering	Construction Engineering and Management Group	Improvements to the performance of the industry through innovation, focused on management processes through the application of information and communication technologies.
	Transportation Group	A multi-disciplinary group composed of faculty from both the engineering and economic departments.
	Materials Group	Treat's Island Natural Marine Exposure, Epoxy Coated Rebar/Corrosion Studies, Lightweight Aggregate/Alkali Aggregate Reaction, Use of High Purity Lignin as a Superplastizer for Concrete, Rpller Compacted Concrete, Ferrocement.

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	Groundwater Studies Group	Consists of a multidisciplinary core of individuals who actively work on technical and managerial problems related to groundwater. Research in area of groundwater quality and contamination issues.
Electrical and Computer Engineering	Sustainable Power Research Group	The group conducts research and training in the areas of distributed power generation, renewable energy conversion, power electronics, electrical machines, communications, and advanced control systems. The current research activities include development and demonstration projects of distributed power generation based on wind, photovoltaic, small hydro, micro gas turbine and fuel cell systems, funded by NSERC, SDTC, AIF, NRCan, NBIF, and industry partners.
	Signal Processing, Communications	Digital communications, electromagnetics, signal processing, fibre optics, antenna arrays, cellular location techniques, radio propagation, wireless, spread spectrum, computer networking, space-time techniques, equalization, cyclostationarity, interference. Wireless communications, Distributed Power Generation and Renewable Energy, Adaptive filtering, spectral and signal estimation, Image processing: optical, synthetic aperture radar, hyperspectral analysis, etc.
	Power Systems, Power Electronics, Power Delivery	Electric Power Utility, Power Electronics, Motor Drives, Electro technical Energy Systems, Power Quality, Facts Technology, Renewable Energy Systems
		Bhutan, Development of Transmission Systems in Bhutan.
	Electrical Engineering degree programs	East China M.Eng. program in Environmental studies joint delivery (30ch)
		Egypt, Helwan University. Research collaboration, students and facuty exchage
		Sweden, University of Orebro. Research collaboration, students and facuty exchage
		Jordan, Princess Sumaya University for Tehnology. Research collaboration, students and facuty exchage
	Joint BScE degree with Akbar El Yom Academy, Egypt	Delivery of 2 years of program meeting accreditation requirements.
	Software Engineering	Artificial Intelligence, Knowledge Engineering, e-Activities (i.e. e-Learning). Collaboration with Kharkiv National University of Radio-Electronics, Ukraine.
Institute of Biomedical Engineering	Biomedical Engineering	Basic research in signal processing with applications in control systems for prosthetic limbs, and surgical monitoring; ergonomics; exercise physiology; experimental design; analysis of human gait; medical imaging; and psychology.

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Forest Engineering	Same as Faculty of Forestry and Environment Management	
Geodesy and Geomatics Engineering	Canadian Centre for Geodetic Engineering	Research, development and implementation of innovative precision surveying and geomechanics solutions.
	Geodetic Research Laboratory	Research and development in the areas of static and kinematic positioning with the Global Positioning System and other global navigation satellite systems (GALILEO and GLONASS), satellite altimetry, geoid determination, crustal deformation, the earth's rotation, and tropospheric and ionospheric studies.
	Geographical Engineering Group	Specializing in geographic information systems (GIS), remote sensing, ocean mapping, land administration, land information management research, and geographic information standards.
	Ocean Mapping Group	The research is focused on developing new and innovative techniques and tools for the management, processing, visualization, and interpretation of ocean mapping data.
Geological Engineering	Cooperative program between departments of Geology and Civil Engineering	
Mechanical Engineering	Design Optimization, Robotics, Vibration, Flow Induced Vibration, Sensor Systems and Control, Material Properties, Advanced Machining, Advanced Plastics Manufacturing, Computational and Experimental Heat Transfer, Computational and Experimental Fluid Mechanics, High-Resolution X-ray Microtomography (Micro-CT), Threat Material Detection, Nuclear Radiation.	
Software Engineering	Cooperative program between the departments of Electrical and Computer Engineering and Faculty of Computer Science	
Engineering Library	The Engineering Library provides the resources and services required for the teaching and research programs offered in the Faculties of Engineering and Computer Science.	

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Technology Management and Entrepreneurship	The Technology Management and Entrepreneurship Program emphasizes learning outcomes in the following key areas for all TME graduates: • Entrepreneurial Finance • Business Planning and Strategy in an Entrepreneurial Environment • Quality Management • Project Management • Marketing of Technological Goods and Services • Technological Creativity and Innovation Technological Risk and Opportunity	The Dr. J. Herbert Smith Centre offers a unique program that assists in growing careers. We welcome engineering students, and those with a passion for technology management and entrepreneurship, to seize the opportunity to develop business venturing and management skills. Our student-centered approach delivers practical and relevant business concepts that can diversify your skills as your future unfolds. We collaborate with Faculty of Engineering and Faculty of Business Administration to co-develop courses, as well as integrate local business leaders into the classroom environment.
College of Extended Learning		
Part-time Degree Studies & Adult Learner		
Distance Education & E-Learning		
Career Development		
English Language Programme	English as a Second / Other Language	Since 1952, ELP has offered English second / other language (ESL / ESOL) training. At the present time, ELP offers courses year-round, credit /non-credit, graduate / undergraduate, academic /professional to local / provincial /national / international clientele. ELP has several formats and services designed to enable individuals of all proficiency levels to acquire confidence and competence in the language. Offerings include: three and five-week total intense SubmarineC immersion sessions, Intensive English Format for Academic Purposes, English Language Classes (10 - 35 hours per week), tutorial sessions, customized weekend workshops and proficiency assessment services.
Information Technology Programs		
Personal Development & Special Interest		
Forestry & Environmental Management, faculty of		
	Atlantic Cooperative Wildlife Ecology Research Network with the Senior Research Chair in Wildlife Ecology	Improving understanding of ecosystem dynamics, and to complement and enhance abilities of government to conserve wildlife populations and habitats.

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	Cooperative Fish and Wildlife Research Unit	Conducting research related to the management and conservation of wildlife and fisheries resources and their habitats within New Brunswick and Atlantic Canada
	Environment and Sustainable Development Research Centre	ESDRC works to enhance the understanding and adoption of sustainable development principles through education, outreach, research and community involvement.
	Laboratory for Soils and Environmental Quality	Has provided operational support directly to centres of planting stock production; seed orchards and Christmas tree growers through its analytical services programs and indirectly through research and development. The laboratory's second focus is on the impacts of forestry practices and industrial activities on soil, watersheds and water quality.
	Nexfor/Bowater Forest Watershed Management & Conservation Research Centre	Developing a research program which will help resolve key issues regarding landscape dynamics and sustainable forest management, with watersheds as the primary management design units.
	Sustainable Forest Management.	This project examines how public involvement in forest management is undertaken in Newfoundland.
	Population Ecology Group	Investigating the roles of biotic and abiotic factors and individual behaviour on the abundance and distribution of animals in forested and agricultural systems, and subsequent influences on host plants.
	The Entomology Lab	Investigating the roles of biotic and abiotic factors and individual behaviour on the abundance and distribution of insects in forested and agricultural systems, and subsequent influences on host plants.
	The Forest Engineering/Geotechnical (Gillin) Lab	Handles geotechnical testing relevant to unbound roads
	The Greater Fundy Ecosystem Project	Research and monitoring effort to provide the science support necessary to manage an ecologically sustainable landscape.
	Wood Science and Technology Centre	WSTC has assisted companies in investigating the feasibility of new technologies and their implementation. Machine stress rated lumber, finger joined studs and structural I-joists are a few examples
Forest ecosystem management		
Forest engineering		
Graduate Degrees (Masters & PhD)		
Kinesiology, faculty of		

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PO Box 4400
Fredericton, NB
CANADA E3B 5A3
TEL 506-453-4816
FAX 506-453-4908
iro@unb.ca
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Unit & Sub-unit	Areas of Strength	Description of the unit and collaboration
	Special Populations - Physical Activity, Biomechanics, Locomotion & Balance Disorders, Exercise Physiology/Biochemistry, Exercise Physiology/Biochemistry, Exercise Physiology/Biochemistry, Motor Control and Learning, Philosophy & Ethics, Resource Based Recreation, Volunteerism and Leadership, Gender Issues, History of Leisure and Sport, Sponsorshop and Partnership Arrangements, Sociology of Sport and Leisure, Marketing of Sport and Recreation Services, Information Technology in Sport/Sport and Recreation/Management, Pediatric Exercise Science, Sport and Exercise Psychology, Human Factors Engineering, Exercise and Sport Nutrition, Medical Imaging, Ergonomics, Pediatric Obesity.	
Recreation & Sport Studies program		
Kinesiology Science Program		
	Fitness Assessment Center	The Fitness Assessment Center is a facility that is dedicated to promoting the health and wellness of all individuals. We offer a variety of services that will be suitable to individual needs.
Law, faculty of		
	A good selection of Law courses useful for international students. Students exchange: Australia, U.K, Denmark, Sweden.	
Nursing, faculty of		
	Currently have a partnership with UMEA University in Sweden for undergraduate students to do exchanges.	Discussions are very preliminary. They are requesting collaboration at the Masters level. UMEA University in Sweden for undergraduate students to do exchanges
		Assumption University, Thailand. Research, collaborative degree program(s), students exchange
BN Basic Program **BN Advanced Standing Program** **BN/RN Program**		

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Unit & Sub-unit	Areas of Strength	Description of the unit and collaboration
UNB - Humber Collaborative Program		
Renaissance College		
B.Phil in Interdisiplinary Leadrerhip Studies International Baccalaureate	Renaissance College is an intensive program designed for highly capable learners.	This unique undergraduate experience is a four year degree program completed in three years and two summers. Renaissance College graduates earn a Bachelor of Philosophy in Interdisciplinary Leadership Studies (BPhil.) with a minor in another discipline of their choice. In our case, the term “philosophy” is particularly apt for an interdisciplinary program that values all knowledge and wisdom. Students are carefully selected based on academic performance, demonstrated leadership potential, their record of volunteer and community service, and the diversity of their backgrounds and skills in artistic, musical, athletic or cultural endeavors.
Science, faculty of		
Biology	Macroalgal systematics, combines field trips, scuba, etc., to bring samples back here to UNB for molecular work.	Collaborator: Dr Gerry Kraft, Department: Botany, Institution: University of Melbourne, Australia
		Collaborator: Dr John Huisman, Department: Biological Sciences, Institution: Murdoch University, Australia
		Collaborator: Dr David Ballantine, Department: Marine Sciences, Institution: University of Puerto Rico, Puerto Rico
		Collaborator: Dr Craig Schneider, Department: Biology, Institution: Trinity College, Country: CN, USA
		Investigation of LI818's role in photoprotection and the basis of very high-light resistance in Chlamydomonas.
Chemistry	Analytical, bioorganic, inorganic, organic, physical, pulp and paper, and theoretical chemistry	
	The international stature of the research in this department is reflected in the recent appointment of one of its members, Ajit Thakkar, as University Research Professor	Dr. Ajit Thakkar's research concerns predictions of the properties of molecules and interactions between pairs of molecules. Such predictions are made using numerically-intensive computational methods based on quantum mechanics.

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	Development of novel approaches to the semi-synthesis of pharmaceutically important taxanes.	Paclitaxel (Taxol®) and docetaxel (Taxotere®), two taxane-based compounds, have been praised as the most important anticancer drugs to emerge from the pharmaceutical industry in the last 30 years. They are now widely used to treat breast, ovarian, non-small cell lung cancers, as well as Kaposi's sarcoma, and constitute a multi-billion dollar industry. A key strategy for producing paclitaxel is that of semi-synthesis where one of its common metabolites is transformed by a chemical route.
	Development of "*Organic Chemistry Flashware*", a collection of interactive web-based multimedia courseware for teaching and learning college-level chemistry.	The courseware package, covers many aspects of introductory and intermediate-level organic chemistry, with an emphasis on reaction mechanisms, arrow-pushing notation and frontier molecular orbital interactions.
	Development of new and/or simpler ways to make biologically interesting and structurally challenging natural products.	Completed the total synthesis of (-)-cryptosporiopsin (anti-fungal and anti-biotic), epi-reisiwigin A (anti-viral), calicogorgin A and C, and manzamine C (anti-cancer and anti-malarial).
	Exploration of a range of metal hydrides with potential as hydrogen storage media (HSMs)	This research has been given much impetus recently with the declining reserves of hydrocarbons, with the environmental and geopolitical issues associated with fossil fuels, and with the development of hybrid and electric cars. Light metal hydrides like $NaAlH_4$, which contains a high percentage of hydrogen by weight, are attractive as on-board sources of H_2 in vehicular applications.
	Laser spectroscopy of gas-phase, metal-containing cluster compounds.	The study of these metal compounds, mostly small diatomic and triatomic species, have important implications in the understanding of what is happening at the surface of a metal during vapour deposition to produce silicon chips.
	Built *the only Canadian pulsed EPR spectrometer*, to purchase this spectrometer commercially would cost approximately 1.5 million dollars. The only research group that computes the hyperfine interactions of diatomics and triatomics that contain first row transition metals.	
	Study of the inner-shell spectroscopy and subsequent relaxation processes of core-excited molecules using time-of-flight mass spectrometry, Auger electron spectroscopy and excitation by both photoabsorption and electron impact.	Core excitation occurs in the VUV and X-ray regions of the electromagnetic spectrum and typically results in considerable ionisation and fragmentation of the absorbing molecule. A quantitative understanding of the inner-shell spectroscopy of molecules has applications as diverse as the accurate modeling of damage to tissue as a result of radiation exposure and an understanding of the chemistry of the upper

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		atmosphere.
	Preparation of compounds that are counter intuitive, that is they appear to be impossible according to what was learned in the first year chemistry course.	The aim of this research is to synthesize compounds which fall into the following categories: 1. as simple as possible, 2. have novel bonding, 3. possess novel properties, and 4. simple and quantitative synthesis.
	Chemical modification of electrode surfaces with thin films of porous inorganic solids.	The objective is to use the adsorptive and catalytic properties of the solids to improve the selectivity and sensitivity of the electrodes towards solution species.
	Control of the chemical and structural properties of surfaces; this is important for advances in a wide variety of academic and applied endeavors.	research program has evolved into two distinct areas that coincide with three- and two-dimensional surfaces. Design and Synthesis of Modified 3-D Surfaces: • Nanoparticles for Supported Chemistries. Design and Synthesis of Modified 2-D Surfaces: • Construction of TiO_2 Thin Films by Solution Phase Atomic Layer Epitaxy. • A New Strategy for Dye-Sensitized Solar Cells and the Production of Hydrogen via Photoelectrolysis of Water.
Geology	Economic geology, engineering geology, environmental geochemistry, glacial sedimentology, ichnology, impact geology, mineral exploration, rock physics, sedimentology, and structural geology	
	Economic Geology	The Ore Research and Exploration Group includes Drs. Bruce Broster (exploration in glaciated terrains), Karl Butler (geophysical techniques in exploration) and David Lentz (origin of precious minerals) who also holds the position of 'Chair in Economic Geology'.
	Environmental Geochemistry	Drs. Tom Al and N. Susak form the environmental geochemistry team with collaborations with Dr. K. MacQuarrie, Civil Engineering, and several researchers in government and universities across Canada.
	Experimental Mineralogy and Petrology.	Dr. Cliff Shaw directs the investigation of mineral and magma reactions at high pressures and high temperatures with applications to modeling volcanic hazards. The experimental petrology laboratory houses the only high pressure material synthesis equipment in Atlantic Canada.

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Unit & Sub-unit	Areas of Strength	Description of the unit and collaboration
	Geoarchaeology	Geoarchaeology is offered as a joint program in conjunction with the Department of Anthropology. Collaborator: Dr David Black, Department of Anthropology and Bruce Broster, UNBF and Lucy Wilson, UNBSJ.
	Geological Engineering	An undergraduate program, unique in Atlantic Canada, delivered in collaboration between the Departments of Geology and Civil Engineering. Under the Direction of Dr. Karl Butler, the options include; Geotechnical, Environmental and Mineral Resources.
	Glacial Geology	Dr. Bruce Broster is the director of the QUEST (Quaternary and Environmental Studies Group) that collaborates with Lucy Wilson (UNBSJ) and members of the NB Geological Surveys Group in studies of climate change, glacial sedimentation and stratigraphy, and exploration technology.
	Ichnology, Sedimentology and Stratigraphy	Drs. Keighley & Pickerill are internationally recognized experts in ichnology and stratigraphy. Collaborations exist with Dr. Jackson, Jamaica: Dr. Harper, Denmark: and Dr. Donovan, Holland as well as several other researchers around the world.
	Impact and Space Science	The department houses the Planetary and Space Science Centre (see below) under Dr. Spray who also holds a CRC Chair in Planetary Sciences. Collaborations exist with NASA.
	Structural Geology	Structural geology has continued to be one of our main strengths and includes the study of micro- and mega-structures (Dr. White), impact structures (John Spray) and sediment deformation (Bruce Broster, David Keighley)
Mathematics and Statistics		Quantum theory, differential equations, applied probability, numerical analysis, noncommutative algebra, operator theory, mathematical modelling theory, differential geometry and geometric functional analysis, statistical decision theory, multivariate analysis, ring theory, sampling theory, operations research, scientific computation general relativity and cosmology, time series and mathematical biology
	Algebra	Research Interests: Noncommutative Algebra, Algebraic Geometry, C*-algebras and Noncommutative Topology, Groups, Rings, Nearrings, Discrete and Classical Geometry, Lie algebras, Lie rings, Geometry

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Unit & Sub-unit	Areas of Strength	Description of the unit and collaboration
	Applied Mathematics and Scientific Computation Group	Research ties with faculty in biology, computer science, engineering, forestry and physics. Research Interests: General Relativity; Quantum Gravity; Quantum Field Theory; Mathematical Finance and Scientific Computation, Generalized Linear Models; Survival Analysis; Random Effects Modelling; Environmental and Social Statistics, Mathematical Biology; Biological Invasions; Dispersal; Epidemiology.
	Relativity Group	Classical and Gauge Field Theories, Conservation Laws, Cosmology, Exact Solutions, Quantum Gravity, String and Related Theories, Scientific Computation, Spacetime Geometry, Spacetime Symmetries.
	Statistics Group	Research Interests: Generalized linear models; survival analysis; random effects modelling; environmental and social statistics, Order-restricted inference: estimation and testing when order restrictions are present on the parameters of a population. Spline-regression problems, in particular estimation of change-points and the use of transforms in estimating regression parameters, Spatial statistics, random sphere packings, properties of composite materials, Inference for small samples --- including bootstrap techniques. Information and power, Time series, especially frequency domain methods. Stochastic processes, especially hidden Markov models. Generalized linear models.
	Applied Statistics Centre	Assists with data analysis, experimental design and other uses of statistical methodology. Statisticians are of most help at the planning stages of a data-gathering exercise: we have seen what can go wrong.
Physics	Atomic and Molecular Laser Spectroscopy	Laser Spectroscopy; Infrared and Microwave Spectroscopy; Nuclear Magnetic and Magnetic Resonance Imaging; Theoretical Studies; Theoretical Space Plasma Physics; Space & Atmospheric Physics; and High-Precision Theory for Few-Body Systems
	Atmospheric and Space Physics	Investigation of phenomena occurring in the atmospheres and plasmas associated with the Earth, Sun and solar system.

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Unit & Sub-unit	Areas of Strength	Description of the unit and collaboration
	Magnetic Resonance Imaging Centre	The UNB MRI Centre has invented a family of new MRI methods which permit the ready visualization of mobile and immobile ^{1}H containing structures not only in vivo, but in a large range of materials including concrete, polymers, composites, food materials and microporous solids. one of the largest and best known material science MRI laboratories world-wide and the leading university based laboratory of its type in North America. As the birthplace of the SPRITE MRI technique we are, by definition, one of the leading laboratories world-wide in many aspects of material science MRI.
Graduate Degrees (Masters & PhD)		
Research Centers and Institutes		
Atlantic Cooperative Wildlife Ecology Research Network	Forestry Biology	The Atlantic Cooperative Wildlife Ecology Research Network (ACWERN) is a collaborative initiative from Acadia University, Memorial University of Newfoundland, and the University of New Brunswick in partnership with the Canadian Wildlife Service of Environment Canada (CWS), and with commitments of support from the Canadian Parks Service of Heritage Canada, the New Brunswick Department of Natural Resources and Energy, and the governments of Nova Scotia and Newfoundland.
BMO **International Business & Entrepreneurship Centre**	Development and support of international business and entrepreneurial leadership among students, faculty and growth-oriented businesses in New Brunswick.	IBEC's teaching, research and outreach activities support several objectives, which include developing expertise in the fields of international business and entrepreneurial leadership among UNB faculty and providing students with experiential learning opportunities. It continues to be a logical fit with the Faculty's goal of being "...a major contributor to the state of knowledge and practice of management; an effective facilitator of economic growth in the region; and a major contributor to the overall mission of the University of New Brunswick."
CADMI Microelectronics, Inc.	Electrical and Computer Engineering	CADMI represents a true partnership among the university (UNB), government, and industry to provide state-of-the-art microelectronics technology transfer to New Brunswick businesses.

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Canadian Centre for Geodetic Engineering (CCGE)	Geodesy and Geomatic Engineering	CCGE is committed to the research, development, and implementation of innovative precision surveying, deformation monitoring and analysis, and geomechanics solutions. The Centre's developments, methodologies, and software are in use world-wide, by government agencies, universities, and industry. Research goals are always driven by the emerging needs of industry.
Canadian Research Institute for Social Policy (CRISP)	Business Administration, Education, Kinesiology, Nursing, and Statistics	The aims of the Institute are to conduct policy research that will help Canadian communities provide better education and care for their children, to contribute to the training of social scientists in the areas of statistics and research methods, and to contribute to capacity-building efforts in developing countries.
Canadian Rivers Institute	Forestry, Biology	The mandate of the CRI is to teach and carry out multi-disciplinary basic and applied research focusing on river ecosystems, including their land-water linkages, for the purpose of conservation and habitat restoration. The objective of the CRI is to build a network of researchers with common interests in river science across universities, government, and industry. The CRI at Saint John focuses on the environmental impacts of industrial and agricultural operations with an Ecosystem Health Assessment Laboratory (K. Munkittrick), and a Fish Reproductive Physiology and Ecotoxicology Laboratory (D. MacLatchy). Developing undergraduate and graduate training in river sciences, and also seek to develop field-based, training opportunities for students and professionals in areas of river restoration, ecosystem sciences, and ecotoxicology.
Center for Entrepreneurial Leadership	Business Administration	The Center for Entrepreneurial Leadership has a mission to develop and support entrepreneurial leadership among students, faculty, and growth-oriented businesses in New Brunswick.
Center for Financial Studies Coming soon…		
Center for International Business Studies	Business Administration	The Center for International Business Studies (CIBS) was established to develop and support the international competitiveness, knowledge and skills of students, faculty, and growth-oriented businesses in New Brunswick.

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Unit & Sub-unit	Areas of Strength	Description of the unit and collaboration
Centre for Conflict Studies	Social Studies, Arts	A leader in the field of low-intensity conflict since 1980, the Centre is the only organization in Canada that focuses exclusively on revolutionary and civil wars, political terrorism, covert operations, unconventional warfare, intelligence services, propaganda, and the role of the media in modern warfare.
Centre for Nuclear Energy Research, Inc.	Chemistry, Control Systems, Nuclear Engineering	The Centre for Nuclear Energy Research is devoted to conducting research and development work in the areas of nuclear energy associated with the operation and maintenance of nuclear power stations. The Centre, affiliated with the department of Chemical Engineering, collaborates with Atomic Energy of Canada Ltd. and the NB Research and Productivity Council.
Centre for Property Studies	Economics, Law, Geodesy and Geomatics Engineering	The Centre for Property Studies is a globally accessible resource for research, training, information-sharing, networking, and advice in the field of property studies. The Centre has adopted a multi-disciplinary approach, emphasizing the role of property in economic and social development, in poverty reduction, and in sustainable resource and environmental management.
Centre for Enhanced Teaching and Learning		CETL offers services to support your teaching and learning in the following areas: Professional Development; Classroom Support; Smart Classrooms and Videoconferencing; Media Production; Multimedia Labs; Training Opportunities; Instructional Design; Consultation, Coordination, Assistance
Construction Technology Centre Atlantic, Inc. (CTCA)	Civil Engineering	Since its inception in 1988 as a non-profit organization, the Construction Technology Centre Atlantic (CTCA) has served construction industry members by providing a personalized bridge to the implementation of the most recent developments in construction technology. Transferring technology and brokering innovation for the region's Architectural, Engineering, Construction industry.
Electronic Text Centre		The Electronic Text Centre works collaboratively with various University departments and external organizations on research initiatives dealing principally with archival and publishing issues for electronic resources. As part of its mandate, the Centre applies its research to support the technical and educational needs of University of New Brunswick faculty, students, and other organizations for the development of Web-based publishing projects.

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Unit & Sub-unit	Areas of Strength	Description of the unit and collaboration
Environment and Sustainable Development Research Centre		The Centre was established in 1994 with initial funding from the Environmental Trust Fund and UNB. The Centre provides a focal point between the university, the private sector, government and the public.
Institute for Materials Visualization and Analysis		The Institute for Materials Visualiztaion and Analysisi is a nucleus for research expertise in the visualization and analysis of materials at nanometer to cm scales. This expertise exists within three participating groups, The Laboratory for Threat Materials Detection, the Magnetic Resonance Imaging Centre, and The Microscopy and Microanalysis Facility. The research facilities within the Institute are accessible either through collaboration with Institute members, or through direct pay-for-service arrangements.
Institute of Biomedical Engineering	Electrical and Computer Engineering, Mechanical Engineering, Biology, Physics	The Institute brings together an interdiciplinary research team to investigate a broad range of topics, all related to designing systems and equipment that meet human physical requirements or medical needs.
Information Technology Centre (ITC)		The ITC assists and supports the growth of the Information Technology industry in New Brunswick. It was established through support from the Canada-New Brunswick Cooperation Agreement and the University of New Brunswick. The Centre focuses on conducting research, providing courses, and peforming usability evaluations.
Dr. Jack McKenzie Limerick Pulp & Paper Research & Education Centre		The objectives of the Centre are to perform world-class R&D work in selected pulp and paper areas, to provide relevant education to university and industry students, to collaborate with industry and government on R&D projects, and to provide testing, technical, and library services to organizations in the Atlantic Provinces.
Magnetic Resonance Imaging Centre		The UNB MRI Centre has invented a family of new MRI methods which permit the ready visualization of mobile and immobile ^{1}H containing structures not only in vivo, but in a large range of materials including concrete, polymers, composites, food materials and microporous solids. one of the largest and best known material science MRI laboratories world-wide and the leading university based laboratory of its type in North America. As the birthplace of the SPRITE MRI technique we are, by definition, one of the leading laboratories world-wide in many aspects of material science MRI.

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Unit & Sub-unit	Areas of Strength	Description of the unit and collaboration
Microscopy and Microanalysis	The Microscopy and Microanalysis Facility is a regional facility providing imaging and analytical services to universities, government and industry.	This facility offers services and training in scanning electron microscopy (SEM), transmission electron microscopy (TEM), electron probe microanalysis, energy dispersive X-ray analysis, wavelength dispersive X-ray analysis, electron energy loss spectroscopy, energy-filtered TEM, electron diffraction, low-temperature electron microscopy, confocal laser scanning microscopy, digital imaging and numerous specialized sample preparation techniques.
Muriel McQueen Fergusson Centre for Family Violence Research	Arts, Public Education The Muriel McQueen Fergusson Centre for Family Violence Research at UNB has the mandate to promote interdisciplinary research aimed at understanding, treating and preventing family violence and violence against women. The strength of the Centre lies on the collaboration between academic and community members.	The Centre works in close collaboration with the Alliance of Canadian research centres on violence that are located in Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia. Please visit our webpage for all on-going research and education programs at the Centre: http://www.unbf.ca/arts/CFVR/
Planetary and Space Science Centre	Physics	The Planetary and Space Science Centre (PASSC) at UNB facilitates education, research, and resource evaluation pertaining to our Solar System. PASSC houses the national Canadian Planetary Image Facility, a NASA-supported outlet for space and planetary data. Current expertise concerns impact cratering and shock processes on the terrestrial planets.
Second Language Education Centre		The Second Language Education Centre (SLEC) was established in 1987 to address needs related to teacher education, professional development, curriculum development, research, and evaluation in the field of second language (SL) education. It provides SL educators with current information related to SL learning and teaching. The Centre also conducts research and programs with an international focus in the area of SL learning. The SLEC has been involved in numerous international projects including the Estonian Language Training Project (funded by CIDA), the Canada-EU student/teacher exchange, the hosting of visiting scholars, and most recently a partnership with the Department of French to offer summer school credit courses in France. In addition, SLEC is in the process of a collaborative project with the European Centre for Modern Languages to determine the applicability of the European Language Portfolio project for Canada.

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Unit & Sub-unit	Areas of Strength	Description of the unit and collaboration
Wood Science and Technology Centre	Forestry, Biology, Physics	The Wood Science and Technology Centre at UNB is committed to helping wood products manufacturers remain competitive. Numerous Canadian firms have been assisted in meeting global market demands with innovative technologies and quality products.
Canada Research Chairs		
Bruce J. Balcom	Application of new methods of Magnetic Resonance Imaging (MRI) to a broad array of problems in materials science. Improve and develop a new materials research capability in Canada, and facilitate the introduction and development of new processes and products.	Dr. Bruce J. Balcom has invented a series of MRI techniques that permit unrivalled and unprecedented visualization of a very large range of materials systems. Dr. Balcom's Canada Research Chair in Materials Science MRI aims to accomplish three principal goals: to permit rapid and continued development of the material science imaging techniques pioneered at UNB; to permit the earliest and most advantageous application of these techniques by their collaborators, and to provide national leadership in the technology and applications of materials science MRI. His fundamental goal in technique and instrumentation development is to improve the sensitivity and generality of the techniques. Dr. Balcom's work, in the only university-based MRI of Materials research centre in North America, has been recognized through extensive grant and contract support by a wide variety of international companies and research organizations.
Margaret R. Conrad	Research on Atlantic Canada's history and culture to further debate regarding issues of public policy. Development of more effective policies to improve the social and economic well-being of the Atlantic provinces.	The main focus of the research is to uncover innovative ways to improve Atlantic Canada's global competitiveness and social well-being. Exploration the history of cooperation and conflict in the region, and creating an Atlantic Canada Portal to support scholarly research. Dr. Conrad is also exploring the connection between a person's understanding of their history, and their behaviour and sense of identity.
Richard A. Cunjak	A detailed assessment of the aquatic habitats of the Atlantic Salmon population in New Brunswick's rivers and bays. Establishment of the Canadian Rivers Institute, a multidisciplinary research centre focused on conservation and restoration of river ecosystems.	Dr. Cunjak is one of Canada's and the world's leading authorities on watershed research and the lifecycle of the Atlantic Salmon. He has spent many frigid months outside in the Canadian winter studying the behaviour of stream fishes. His contribution to understanding the winter biology of fish is considered required reading for others in the field. Now he is taking that experience forward in establishing the Canadian Rivers Institute. The Atlantic Salmon will be the focus of one

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		branch of the study. The Rivers Institute will be unique in Canada and one of only a handful of such centres in the world. It is expected to attract a multidisciplinary group of scientists from within Canada and other countries. The Canada Research Chair has given the impetus for a far more global approach to the study of aquatic ecosystems in this country and beyond.
David L. Gants	Groundbreaking scholarly research on early modern English author, Ben Jonson, and the first two centuries of England's publishing and printing industry; publication of a six-volume edition on Jonson; and development of two unique databases for humanities research and training. Will create innovative approaches to electronic editing and publishing that can be employed in humanities research and by publishing industry.	Dr. David L. Gants is considered a pioneer in this emerging field. As a humanities computing specialist, he has been combining his highly developed computer skills with fundamental textual and literary scholarship for over a decade. As a leading scholar in electronic editing and humanities computing, he actively investigates how to use emerging technologies to explore key questions challenging the arts and humanities, and to uncover innovative ways to ask new questions. His present research promises to transform the content and delivery capabilities of the printed book. It centres on developing a new generation of digital publications that incorporate the power of hypertext and computer networks to investigate textual culture. The program involves two major components. First, Dr. Gants is creating the electronic component of the forthcoming edition of Ben Jonson, a project that will publish (simultaneously in print and digital formats) the works of one of early modern England's most important authors. His second focus is to develop a revolutionary electronic resource for the quantitative analysis of the first two centuries (1475-1640) of England's printing and publishing industry.
Karen Kidd	Studying the factors that affect the accumulation of persistent pollutants (pesticides and mercury) in food webs, as well as the impact of a potent endocrine-disrupting chemical on the food web, and the effects of exotic species on the energetics of freshwater food webs. The research aims to contribute to the elimination of the production and use of toxic chemicals capable of magnifying in food webs and to understand the impact wielded by pharmaceuticals on aquatic food webs.	Dr. Karen Kidd, a research scientist with the Department of Fisheries and Oceans at the Freshwater Institute in Winnipeg, is concerned about the health of our freshwater food webs, and with good reason. As the Canada Research Chair in Chemical Contamination of Food Webs, Dr. Kidd is studying the fate and effects of pollutants such as pesticides on freshwater food webs. Her research program will include an examination of the risks these pollutants pose to human health and the health of fish-eating wildlife.

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Peter J. Kyberd	Developing state-of-the-art cybernetic solutions to advance the capabilities of prosthetic systems designed to replace a complete human arm. Ultimately, these discoveries will vastly improve the quality of life for individuals with missing or deficient limbs.	The main focus of the research is designing and testing intelligent hand systems gave birth to what is now widely regarded as the world's most sophisticated artificial hand. The Southampton Hand contains the artificial intelligence to relieve the mental burden of control from its user. As Canada Research Chair, Dr. Kyberd plans to advance prosthetic and assistive systems to even greater heights. One of Dr. Kyberd's key short-term goals is to combine his expertise with other leading researchers at the university's Institute of Biomedical Engineering. The team will develop a complete prosthetic solution combining commercial components for elbow and wrist devices, the Southampton Hand and the university's advanced myoelectric control system, which uses the electricity generated by muscles. This will be the first prosthesis to offer users the chance to control their devices with truly low mental effort, by allowing as much of the control to be taken by the on-board computer system. The prosthesis will also imitate the smooth, multi-jointed movements of the human arm. In the longer term, he will turn his efforts to furthering research in two promising areas, directly attaching a prosthesis to the residual bone (the application of osseo-integration techniques to exo-prosthetics), and the direct connection of electronics systems to neural pathways.
Nicole Letourneau	Designing and testing interventions that promote the healthy development of children vulnerable to less than optimal outcomes. The research contributes to a basic understanding of the link between early care giving experiences and children's development.	Letourneau develops and supports interventions that help vulnerable children, mothers with postpartum depression and mothers and infants who are exposed to domestic violence. She also studies the impact of these interventions on parent-child relationships. Letourneau's research is providing a strong incentive for policy-makers and those who have influence on the development of social programs to implement the appropriate support interventions for these children and their families.
Kerry MacQuarrie	Studying groundwater-surface water interaction, an area of importance often ignored in research and water-management policies. Findings may improve the quality of Canada's freshwater resources.	MacQuarrie's research has three critical components: First, the research is helping to quantify spatial and temporal thermal interactions between groundwater, hyporheic water and stream water in cold-water fish habitats. (Hyporheic water comes from the hyporheic zone, the saturated interstices beneath the stream bed, a transition zone between stream water and groundwater.) Second, MacQuarrie is developing methods to assess how long water takes to travel between

UNIVERSITY OF NEW BRUNSWICK
INTERNATIONAL RELATIONS OFFICE
PO Box 4400
Fredericton, NB
CANADA E3B 5A3
TEL 506-453-4816
FAX 506-453-4908
iro@unb.ca
www.unbf.ca/international

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		surface water bodies and drinking wells in adjacent aquifers. And third, the research is helping to determine how much groundwater-derived nitrogen has invaded sensitive coastal estuaries. The excessive loading of nutrients (containing nitrogen) in waterways accelerates the aging of waterways in a process known as eutrophication. Meeting these three objectives will represent a significant contribution to the study of groundwater-surface water interaction by developing new collaborations and enhancing existing ones here and abroad.
Kelly R. Munkittrick	Studying the fish populations of the Saint John River and the effects of industrial and urban effluents. Developing a reliable method for analyzing and monitoring water conditions and environmental change.	The approach is especially suited to rivers where fish populations are exposed to multiple forms of stress. Early studies conducted by Munkittrick were so convincing, the assessment method formed the basis of Federal Environmental Effects Monitoring regulations for pulp and paper mills. Discharges from some mills were shown to interfere with the reproductive systems of fish in a manner unpredicted and at concentrations of effluent below those thought to pose a threat to receiving waters.
Yonghao Ni	Development and refinement of chemical processes to improve the efficiency of pulp and paper production. Decrease production costs, improve production efficiencies and reduce the environmental impact of the pulp and paper industry.	Dr. Yonghao Ni has played a key role in developing the University of New Brunswick's Pulp and Paper Program, introducing important new techniques in processing pulp and bleaching mechanical pulps for paper production. Dr. Ni will work to develop ways of increasing the amount of oxygen delignification that can be accomplished in mills without a resultant loss in pulp viscosity. The key is to remove transition metal ions, such as iron and manganese, which play a crucial role in reactions that lead to carbohydrate degradation and a reduction in the strength of the pulp produced. The second aspect of Dr. Ni's research relates to improving peroxide bleaching processes that will decrease the bleaching cost, increase production efficiency and improve product quality while decreasing production cost.
John Spray	Studying the exploration, evolution, and resource evaluation of planetary bodies. The research is leading to a science-driven, technology enabled exploration of Earth and other planets via the creation of a unique, world-class centre for research, training, and enterprise.	Dr. John Spray investigates planetary bodies in our solar system in order to understand the role played by hypervelocity impact in the formation and evolution of planets and asteroids. He also explores the effects of impact-induced shock and frictional processes on natural and synthetic materials. The study of planetary surfaces and their evolution through time, and the geological context of Earth in relation to our neighbouring planets (Moon, Mars) also form critical parts of

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		Spray's research. Research involves the application of new technologies in orbital and ground-based remote sensing and in high resolution micro-analytical techniques, in order to generate scientific data needed for terrain and resource evaluation, mapping, and materials characterization.
Lucia O'Sullivan	Studying a complex array of risk and protective factors associated with adolescents' sexual health. The research is exploring the present-day risks threaten the physical and social well being of Canadian youth.	The main focus of the research is providing both graduate and undergraduate students at UNB with exceptional experience and training as adolescent sexual health specialists. In addition, it is offering training in longitudinal research and specialization in adolescent issues — two rapidly growing fields of importance.
Barbara Paterson	Developing health-care strategies that are tailored to the needs and culture of Canadians with chronic illness who have limited access to health services. The research will contribute to knowledge of how people with chronic illness in all countries are taught to be more effective in managing their disease.	Dr. Paterson's research is built on her previous research and theory development in the field of chronic illness. Her program uses an innovative approach that recognizes the complexity of social determinants of health in influencing how people with chronic illness manage their disease and access information and support for themselves. She examines determinants such as culture, the nature of the health-care system, and geographical location.
Om P. Rajora	Gaining scientific knowledge of genome organization and the function of genes, as well as genetic control of traits related to trees' productivity, health, and ability to adapt to climate change. The research will enable the Canadian forestry industry to remain competitive on the global stage while ensuring the economic and ecological sustainability of forests as well as the conservation and sustainable management of their genetic resources.	The field of research is in genetics and biotechnology, the work involves exploring the genetic basis of productivity, health, and the ability to adapt climate change in trees. The research is aimed at finding workable ways to support the conservation and sustainable management of the trees' genetic resources. Dr. Rajora hopes to gain a better understanding of genome organization, the function of genes, genetic biodiversity, population viability and fitness, gene dispersal, minimum viable population size, and the genetic effects of forest management practices and forest fires. His research offers an important response to the need for increasing our wood supply and for forest sustainability and will provide outstanding training and technology transfer opportunities.
Gary Saunders	The importance of algae to the health of the Bay of Fundy ecosystem. Examining the biodiversity of algae and systematic studies important for sustainable development of marine resources.	Gary Saunders and his colleagues have established unrivalled expertise in classifying different types of algae. They have introduced new techniques based on molecular biology, technology similar to that used to map the human genome. And in a similar way, their work has shed new light on the evolution and diversity of these simple algae. Gary Saunders is interested in gauging the impact of human influences—pollution, overfishing, accidental introduction of new species, and even global warming.

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Mihaela Ulieru	Exploring the latest advances in information technologies that enable human-machine and hardware-software integration. The research aims to lead to the creation of a systematic framework for the design of Adaptive Information Infrastructures (AIIs), which will advance the field of intelligent, multi-agent systems.	Dr. Ulieru explores the latest advances in the development of information technologies that enable human-machine and hardware-software integration. In particular, she is conducting research on the design and implementation of what are called “adaptive information infrastructures or AIIs.” AIIs is a new technology that is designed to “understand” how to adapt to system and data process changes; it makes the necessary adjustments automatically and is quicker to respond than infrastructures that rely heavily on human intervention. Dr. Ulieru’s work involves the development of computational intelligence techniques that can endow AIIs with learning and discovery capabilities, thus emulating social and biological behaviour. She is looking for solutions to a wide range of logistical problems in areas such as disaster response, national defense and security, and efficient health-care delivery.
Jon Douglas Willms	Social policy research, training and program development to aid the education of young students. This research will provide a better understanding of what factors can improve the learning potential, health and well-being of Canadian youth.	Dr. J. Douglas Willms has worked extensively to determine what impact early childhood development has on education outcomes and how schooling affects development. His work has frequently focused on issues concerning equality of opportunity for children with differing socioeconomic backgrounds. He has also spent considerable time developing means of analyzing complex, multi-level, longitudinal data describing school-age children. Dr. Willms' research plan has three main components: to conduct social policy research in the areas of health and education that will help Canadian communities provide better education and care for their children; to advance the training of social scientists in the areas of statistical methods and research design; and to contribute to the efforts of low-income countries to establish monitoring programs in education and health.