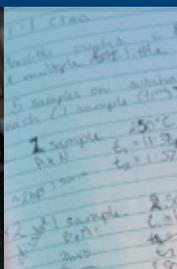
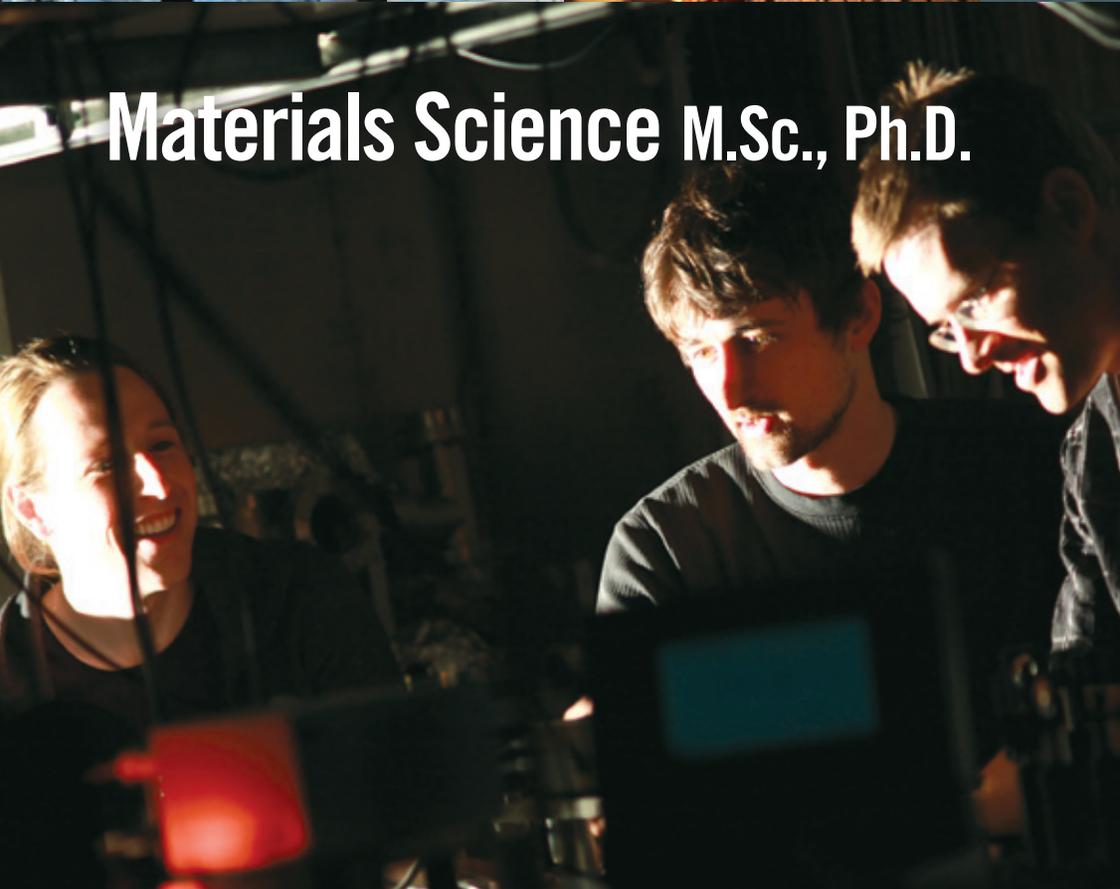


SCHOOL OF  
GRADUATE STUDIES  
AT TRENT UNIVERSITY



# Materials Science M.Sc., Ph.D.



TRENT UNIVERSITY 

[trentu.ca/materialscience](http://trentu.ca/materialscience)

## Materials Science at Trent

The Materials Science program at Trent University prepares graduates for careers as researchers and scientists in a dynamic field. At the core of this program, students investigate matter and materials across a broad range of scales, interactions and applications. The ongoing effort to develop new materials and techniques, as well as improve on existing ones, means this discipline welcomes the innovative, the resourceful and the inventive.



### Core Science, Competitive Edge

Offered jointly by Trent University and the University of Ontario Institute of Technology (UOIT), this two-year Master's program is designed for science or engineering graduates who want to deepen their knowledge and capacity for research in a discipline that interconnects the fields of chemistry, physics, biology and engineering. The program's focus on core science and the skills to communicate science aims to give graduates the tools required to stay at the forefront of research and development efforts while opening up career opportunities across a number of industries.

The program prepares students for the challenges of a field that is constantly evolving and exploring ground-breaking territory. Taking an interdisciplinary approach, the program guides students to:

- Refine problem solving skills
- Develop capacity for experimental design
- Enhance research capabilities
- Advance independent work initiatives

### Benefit from Two Institutions

The joint Trent/UOIT program leverages the strengths of both institutions by bringing together two multidisciplinary faculties that share deep industry experience and academic excellence. In a field that is defined by innovation and driven by intellectual rigour the Trent/UOIT program is geared to those who are looking for an M.Sc. or Ph.D. that blends the fundamentals of basic science – namely physics and chemistry, as well as biology and engineering – with the vast potential of materials research.

## Centres of Research Excellence

Trent University is home to twelve unique research centres that foster collaboration in an interdisciplinary, academic community, including:

- The Trent Centre for Biomaterials Research [trentu.ca/biomaterials](https://trentu.ca/biomaterials)
- The Canadian Environmental Modelling Centre [trentu.ca/research](https://trentu.ca/research)
- The Centre for Materials Research [trentu.ca/tcmr](https://trentu.ca/tcmr)
- The Natural Resources DNA Profiling and Forensic Centre [trentu.ca/research](https://trentu.ca/research)



## Learning Alongside the Experts

Through this joint program, students work firsthand with experts in the field, benefiting from their practical experience and engaging in original research while earning a degree. Some of the research currently underway includes:



- Dr. Suresh Narine focuses on the utilisation of plant oils to create “environmentally-friendly” materials such as polymers, lubricants, adhesives and drug delivery matrices for everyday use. He is director of the Trent Centre for Biomaterials Research, Ontario Research Chair in Green Chemistry and Engineering, and NSERC/GFO/ERS Senior Industrial Research Chair in Lipid Derived Biomaterials.



- Dr. Bill Atkinson studies fundamental interactions in high-temperature superconductors and related materials. Student researchers work alongside Dr. Atkinson to study how nanoscale defects affect the physical properties of these advanced materials.



- Dr. Ralph Shiehl investigates and manipulates quantum systems using a variety of laser light sources. He exploits the coherent property of laser light to make otherwise opaque samples completely transparent, and investigates the behaviour of quantum mechanical wave packets in atomic and molecular systems.



- Dr. Andrew Vreugdenhil synthesizes hybrid organic-inorganic materials using sol-gel chemical techniques with complexes of titanium and silicon. By combining these materials with molecular and nanoscale additives, his research team can tailor the optical, electronic and physical properties of these materials for many different applications.

A photograph of three scientists in white lab coats. On the left, a woman with dark hair is smiling broadly. In the center, a man with dark hair is also smiling. On the right, a man with glasses and a goatee is smiling and looking towards the other two. They appear to be in a laboratory setting, looking at a piece of equipment that is partially visible in the foreground. The background is slightly blurred, showing what might be lab equipment or a cleanroom environment.

Our programs offer opportunities to collaborate with experts in their fields, inspiring new understanding while pushing the boundaries of academic possibility and discovery.

# Progressive.

## **One of Canada's Most Research Intensive Universities**

Trent University has consistently been recognized as a centre of high-calibre research and scholarship. The total research funding to Trent has more than doubled over a five-year period and the success of Trent faculty in attracting research funding from diverse sources continues to be remarkable. Trent's ten Canada Research Chairs cover a broad spectrum of disciplines, reflecting the institution's careful balance between research in the humanities, sciences, and social sciences. As federal and provincial governments continue to make knowledge transfer and outreach a priority for post-secondary institutions, Trent will continue to draw on its key strengths to further its research accomplishments and reputation nationally and internationally.

## Sharing Ideas, Building Connections

One of the key components of our joint Materials Science program is the emphasis on developing effective communication skills. Being able to present ideas clearly is essential to career success, which is why students are given ample opportunity to refine both their written and oral communication abilities. In each year of the program there is a seminar course during which all students present to their peers at least once on their research topic.

Developing connections to a wider community of researchers who are involved in similar research is also pivotal to this program. Students are encouraged to attend conferences, workshops and talks by visiting scientists in order to showcase their work and learn from other researchers in the field.

## Countless Career Paths

Earning an M.Sc. or Ph.D. in Materials Science is a springboard to any number of careers. Graduates can look forward to exploring opportunities in a range of fields, particularly in research and development. Careers in materials science include:

- Electronics industry
- Nanotechnology
- Energy sector
- Biotechnology
- Biomaterials
- Metallurgy
- Medical technology
- Coatings industry
- Research
- Academia

Naturally, the M.Sc. is also a valuable precursor to Ph.D. studies in traditional disciplines such as chemistry and physics, as well as interdisciplinary fields.

## The Learning Environment

With faculty based at both the Trent campus in Peterborough and the UOIT campus in Oshawa, students have access to an excellent range of experimental and computational facilities to meet the broad scope of Materials Science research and applications. Both campuses have undergone significant expansion in recent years to foster growth in the sciences, while giving students the opportunity to conduct their work in modern, state-of-the-art research laboratories.

Given the unique team-teaching approach that involves the two institutions, traditional teaching methods will be augmented by distance learning using SHARCNET (Shared Hierarchical Academic Research Computer Network) - a high-performance computing consortium.

## Financing Your Future: Funding, Support, Scholarships

The Materials Science Program is committed to providing students with the means to successfully attain their professional credentials and enjoy a comfortable lifestyle as they pursue their degree. To help achieve those goals, Trent provides a minimum of \$16,000 per year in funding for up to two years. Sources of funding include:

- Graduate Teaching Assistantships
- Research Assistantships
- Institutional Funds
- Research Funds

We strongly encourage all students to apply to provincial and federal granting agencies such as OGS and NSERC; we also recommend that foreign students investigate granting agency options in their own country.

To understand in greater detail the funding options available, please visit [trentu.ca/graduatestudies](https://trentu.ca/graduatestudies).



Test the limits of conventional disciplines,  
and participate in a culture of intellectual  
questioning and exchange. Explore your  
graduate studies options at Trent.

# Innovative.





## Life at Trent University

Trent University has earned a reputation for exceptional teaching and innovative research activity. The University as a whole nurtures a collaborative atmosphere in which students from across the country and around the world are encouraged to engage in interdisciplinary learning while enjoying a variety of social and cultural activities. For graduate students in particular, Trent affords a rich research and learning environment that facilitates an interdisciplinary perspective on just about any topic of interest, resulting in a broader range of options upon completion of your Trent degree. Graduate students at Trent also have access to a college dedicated primarily to graduate studies. Located in downtown Peterborough, Catharine Parr Traill College is a hub of activity for all graduate students.

## Admission Requirements

Applicants to the M.Sc. program in Materials Science must hold an Honours B.Sc. degree in chemistry, physics or engineering, or possess equivalent qualifications as determined by the Admissions Council. Candidates must hold at least a B+ average (77% or greater) in the last two years of their B.Sc. program, be well recommended, and be accepted by a prospective supervisor who will guarantee Research Assistantship support for the duration of the student's program. As this program emphasizes the importance of communicating science, all applicants are expected to provide evidence of oral and written proficiency in English. The deadline for applications to the Materials Science M.Sc. is February 1.

Applicants to the Ph.D. program must hold a M.Sc. level degree in Materials Science or a related discipline from a Canadian university or equivalent, with a minimum of a B+ average. Prior to being accepted into the program, Ph.D. students must find a professor who specializes in the applicant's desired area of research, is willing to act as a supervisor and is able to provide the required financial support.

For more detailed information regarding the programs, the people, the facilities and coursework that makes choosing graduate studies at Trent an exceptional start to any career, please visit [trentu.ca/materialscience](http://trentu.ca/materialscience).



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