

PHY189: Introduction to Research Methods in Physical and Mathematical Sciences



PURSUE STEM

A brand-new University of Toronto course that will give LBD students a head-start and advantage in their university studies!

- Free for LBD students
- Help students
 - Better engage with their courses and labs.
 - Be more competitive for research, scholarship, and work opportunities.

Course Description

An introduction to research challenges and methods in physical and mathematical sciences. Topics include documenting scientific work, literature searches, building a basic measurement system, mathematical modelling and measurement of simple physical systems, basic computational analysis of data, debugging (measurements, analysis, code, ...), evaluating uncertainties, ethical and social issues in science, and communicating scientific work orally and in writing.

- Students who complete the course will receive a 0.5 course credit that counts toward a University of Toronto undergraduate degree and may be transferable to other universities or colleges.
- Although based on methods in physical and mathematical sciences, the course should also be very useful preparation for studies in engineering or technology, life, medical, or social sciences, or any other field where problem-solving and quantitative studies and analysis are important.
- This hands-on interactive course will be offered on 12 Saturdays from September 2022 to April 2023 (see attached draft schedule).
 - Currently scheduled 1-5 pm but may be moved earlier in the day if there is a clear preference by students.
 - The sessions will alternate between online and in-person on the University of Toronto St. George Campus.
- Students will earn at least a B if they complete all the work in the course with sincere effort and on time.
 - About 100 hours of total effort over 8 months (including class time)
 - Course can be dropped without penalty until 20 February 2023.

The course will not be offered if there is insufficient interest.



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For more information,
please attend the information session,
or contact
Prof. David Bailey <d Bailey@physics.utoronto.ca>



PHY 189 Draft Schedule

Saturdays	
Week 1 – Sep 17	Introduction, What is science? Start scaffolded lab project.
Week 2 – Oct 1	Literature Searching, Documenting scientific work.
Week 3 – Oct 15	Modelling & Coding. Literature search Assignment Due.
Week 4 – Oct 29	Uncertainty. Notebook Check, Self-check with Instructor.
Week 5 – Nov 5	Debugging: code, apparatus, methods, analysis,
Week 6 – Dec 3	Analysis & Coding. Modelling exercise due.
Week 7 – Jan 14	Ethical and Social Issues in Science. Lab project due.
Week 8 – Jan 28	Start final project
Week 9 – Feb 11	Scientific ethical/social issues Essay Due, Self-check with Instructor.
Feb 20	Drop Date.
Week 10 – Feb 25	Scientific communications: writing and presentations.
Week 11 – Mar 4	Pulling everything together
Week 12 – Apr 1	Final Project Presentations; Final Report due 10 April

Plan is for odd-numbered weeks to be in-person, even weeks on-line.

Draft dates for assignments are indicated. Final dates will be given at first session.