



FACULTY OF ARTS & SCIENCE
Teaching Assistant – CUPE 3902, Unit 1
January 1, 2026 – April 30, 2026

STA2312HS L0101 – Advanced Computational Methods for Statistics II

The course will discuss the technical side of statistical methods focusing on two key aspects: optimization and implementation. The first part of the course will introduce necessary background for understanding and devising algorithms for modern statistical methodology. It will cover core concepts and tools from convex optimization such as convexity of sets and functions, Lagrange multipliers method, Newton's method, proximal gradient descent, coordinate descent, alternating direction method of multipliers. In addition, it will include the review of key topics in linear algebra such as matrix and vector norms, quadratic forms and positive semidefinite matrices, matrix calculus (gradient, Hessian and determinant), matrix decompositions (QR, Cholesky, eigen and singular value). The second part of the course will focus on topics from statistical methodology with an emphasis on computational aspects. The covered concepts will include model assessment and selection (bias-variance trade-off, cross-validation and bootstrap), feature selection (penalized generalized linear models, elastic net, group and fused lasso, least angle regression), dimension reduction (principal component analysis, independent component analysis, factor analysis), data compression (k-means, hierarchical, and spectral clustering). The course will involve a significant practical component, which will include labs and coding assignments where students will master their skills in implementing statistical optimization algorithms.

Delivery Mode: In-Person

Qualifications

- Academic background in Statistical Sciences
- PhD student (or graduate) in actuarial science, statistics or biostatistics

Relevant Criterion

Previous experience is the more relevant criterion than the need to acquire experience in respect of this posted position.

Duties

Duties are in person unless otherwise indicated and will include any or all of the following:

Preparation for classes, preparation of written or audio-visual materials, designing and maintaining course websites, attending lectures, running tutorial sessions, facilitating and evaluating student engagement on online discussion boards, participating in training sessions, meeting with the instructors, teaching, leading discussions, and supervising laboratories, rating students' work, holding office hours, consulting with students (including electronic consultation), writing and grading tests, examinations and lab sets, grading essays and term papers, invigilating midterm and final exams, setting up experiments, conducting field trips, and conferring with the supervisor in charge, as required by the employee's teaching duties.

Duties of this position shall be performed on the St. George Campus.

Instructor:	TBD
Estimated Course Enrolment:	60
Meeting Schedule:	Friday: 10 AM - 1 PM (tentative)
Lecture:	N/A
Tutorials:	1 @ 20 hours
Approximate Hours of Work:	1
Approximate Number of Positions:	



Statistical Sciences UNIVERSITY OF TORONTO

Rate of Pay:

UG/SGS I/II - \$53.92/hour (+4% vacation pay)

Application Process

Application information is available at <https://www.statistics.utoronto.ca/employment-opportunities/cupe-positions-unit-1>. The deadline to submit your application is **July 18, 2025**. For more information, you may contact:

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The University strives to be an equitable and inclusive community, and proactively seeks to increase diversity among its community members. Our values regarding equity and diversity are linked with our unwavering commitment to excellence in the pursuit of our academic mission. The University is committed to the principles of the Accessibility for Ontarians with Disabilities Act (AODA). As such, we strive to make our recruitment, assessment and selection processes as accessible as possible and provide accommodations as required for applicants with disabilities. If you require any accommodations at any point during the application and hiring process, please contact uoft.careers@utoronto.ca. During employment, to request accommodation from the University, contact the supervisor or department chair and/or Health & Wellbeing Programs & Services at hwb@utoronto.ca. For more information about accommodations at U of T, please visit our Accommodation webpage.

The hiring criteria for Teaching Assistant positions are academic qualifications, the need to acquire experience, previous experience and previous satisfactory employment under the provisions of this Collective Agreement.

Candidates who are members of Indigenous, Black, racialized and 2SLGBTQ+ communities, persons with disabilities, and other equity seeking groups are encouraged to apply, and their lived experience shall be taken into consideration as applicable to the position.

The University of Toronto is strongly committed to diversity within its community and especially welcomes applications from racialized persons / persons of colour, women, Indigenous / Aboriginal People of North America, persons with disabilities, 2SLGBTQ+ persons, and others who may contribute to the further diversification of ideas.

This job is posted in accordance with the CUPE 3902 Unit 1 Collective Agreement.

The position(s) posted above is (are) tentative, pending final course determinations and enrolments.

Positions posted here are open to Graduate Students in the School of Graduate Studies, Postdoctoral Fellows and Undergraduate Students in the University of Toronto.

Preference in hiring shall be given to Graduate Students enrolled in the School of Graduate Studies of the University of Toronto or those who have made application to be enrolled in the School of Graduate Studies of the University of Toronto.

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