FALL 2017 – Teaching Assistant Minimum Requirements

Updated: June 26, 2017

APPLICATION DATES: June 26 – July 10, 2017

APPOINTMENT DATES: Sept 5 – Dec 22, 2017

General Requirements
All applicants:
- must submit their current Curriculum Vitae and an “unofficial transcript” at time of application through our online TA application system
- will choose their “TOP 5” course preferences on their application after reviewing minimum requirements, course outlines and course schedules
- must have excellent written and one-to-one oral communications skills in order to support students and instructors throughout the semester whether in-person or by email
- must have excellent time management and organizational skills
- for courses with labs, TAs MUST be available for all lab times until day/times are assigned to TAs by the course instructor

Education Requirements
- Teaching Assistants must have an undergraduate degree in computer science or an equivalent post-secondary degree from a recognized institution OR demonstrated industry experience specific to the course(s) applied for. Applicants must have broad and specific knowledge of the individual course requirements and pre-requisites in order to provide optimum TA support for students and course instructors
- Or a senior undergraduate student who has a better than average overall CGPA and can demonstrate competence through courses taken. Applicants must have broad and specific knowledge of the individual course requirements and pre-requisites in order to provide optimum TA support for students and course instructors.

All TAs must be available in-person for the duration of the semester and/or appointment dates. This includes in-person attendance at all labs, tutorials, mid-term(s), final exam, marking sessions, etc. for the semester. Requests for absences throughout the semester will only be approved in extenuating circumstances and will require School and Instructor approval.

Please ensure that you review the course calendar entry and course outline for details about each course.
http://www.sfu.ca/computing/current-students/undergraduate-students/student-resources.html

UNDERGRADUATE COURSE REQUIREMENTS

*Graduate courses are found at the end of this document*

CMPT 102 - Introduction to Scientific Computer Programming
- experience with Matlab programming language
- experience with numeral algorithm packages, problem solving and debugging strategies
Corequisite: MATH 152 or 155 (or 158)

CMPT 110 – Programming in Visual Basic
- Experience with programming in Visual Basic
Prerequisite: BC Math 12 or any 100 level Math course

CMPT 120 - Introduction to Computing Science and Programming I
- basic Python programming
- MUST be available for all lab times until day/times are assigned to TAs by the course instructor
- should have good communication skills, and be keen to assist students, particularly those with no programming experience
Prerequisite: BC Math 12 or equivalent
CMPT 125 - Introduction to Computing Science and Programming II
- experience with programming in C and C++
- experience with Linux or Unix operating systems
Corequisite: CMPT 127; Prerequisite: CMPT 120

CMPT 127 – Computing Laboratory
- experience with programming in C and C++
- experience with Linux or Unix operating systems
- MUST be available for all lab times until day/times are assigned to TAs by the course instructor
Corequisite: CMPT 125; Prerequisite: CMPT 120

CMPT 128 – Introduction to Computer Programming for Engineers
- Experience programming in C and in C++
- Experience using Visual Studio
- Excellent communication skills (able to clearly describe concepts in introductory programming using C and C++)
Prerequisite: BC Math 12 or equivalent.

CMPT 165 – Introduction to the Internet and the World Wide Web
- working knowledge of creating web pages with HTML, CSS and Javascript

CMPT 166 – An Animated Introduction to Programming
- knowledge of basic processing (or Java) programming
- an interest elementary graphics and animation
- MUST be available for all lab times until day/times are assigned to TAs by the course instructor
Prerequisite: Recommended: BC Math 12 or equivalent

CMPT 225 – Data Structures and Programming
- experience with programming in C++, including object oriented programming and generics
- familiarity with standard data structures and ADTs
- solid background in algorithm design and analysis
Prerequisite: MACM 101 and (CMPT 125 and 127), CMPT 129 or CMPT 135)) or (ENSC 251 and ENSC 252)

CMPT 275 – Software Engineering I
- Experience with the software development process, project planning and project management
- Experience with software implementation, testing and data normalization processes
Prerequisites: One 2 Course, CMPT 225 (MACM 101 or (ENSC 251 and ENSC 252)) and (MATH 151 or MATH 150). MATH 154 or MATH 157 with at least a B+ may be substituted for MATH 150 or 151.

CMPT 276 – Introduction to Software Engineering
- cloud computing
- experience with the software development process, project planning and project management
- experience with software implementation, testing and data normalization processes
- experience with ruby on rails, HTML, CSS, and Javascript
- model-View-controller (MVC) experience
- agile development
- experience with UML and revision control
Prerequisite: One W Course, CMPT 225 (MACM 101 or (ENSC 251 and ENSC 252)) and (MATH 151 or MATH 150). MATH 154 or MATH 157 with at least a B+ may be substituted for MATH 150 or 151

CMPT 295 – Introduction to Computer Systems
- ability to program in assembly language, preferably x86-64
- ability to program in C
- experience with Linux or Unix operating systems
- knowledge of computer architecture
- experience with some schematic capture software package
Prerequisite: Either (MACM 101 and ((CMPT 125 and CMPT 127) or CMPT 135) or (MATH 151 and CMPT 102)
CMPT 300 – Operating Systems I
- programming knowledge in C
- experience with Linux or UNIX
- knowledge of multi-programmed operating systems
- experience with concurrent programming in C (both multiple processes and multiple threads)
Prerequisite: CMPT 225 and (MACM 101 or (ENSC 251 and ENSC 252))

CMPT 307 – Data Structures and Algorithms
- experience with introduction and mathematical preliminaries, asymptotic notation, models of computation and basic probability theory and mathematical maturity
- experience with priority queues: Heaps
- experience with randomized algorithms, dynamic programming, etc.
- good familiarity with data structures
- sold background in algorithm design and analysis
- knowledge of classical algorithms and standard algorithmic paradigms such as greedy heuristics, dynamic programming and linear programming
Prerequisite: CMPT 225, MACM 201, MATH 151 (or MATH 150) and MATH 232 or 240

CMPT 310 – Artificial Intelligence Survey
- experience in conducting research
- experience with at least two Artificial Intelligence areas of research and AI topics at an introductory level such as; Logic, Search, Planning, Constraint satisfaction, Natural Language, Learning, reasoning under uncertainty, etc.
- knowledge of machine learning
Prerequisite: CMPT 225 and (MACM 101 or ENSC 251 and ENSC 252))

CMPT 318 – ST: Data Science. Concentration Area: Information Systems
- programming in Python
- familiarity with basic techniques of statistical inference and machine learning

CMPT 320 – Social Implications – Computerized Society
- proficiency in English at the upper division level; the ability to read and comprehend assignments/papers
- ability to provide constructive written feedback on assignments/ papers
Prerequisite: A CMPT course and 45 units

CMPT 354 – Database Systems I
- general knowledge of relational databases
- knowledge of SQL, preferable Microsoft SQL Server
- knowledge of XML
- knowledge of the entity/relationship (E/R) approach
- ideally: some exposure to normalization
- experience with SQL
- familiarity with relational algebra and/or calculations
Prerequisite: CMPT 225 and (MACM 101 or ENSC 251 and ENSC 252))

CMPT 361 – Introduction to Computer Graphics
- experience with tools that model 2D, 3D or higher dimensional data processes
- experience with the modeling and rendering of computer graphics, graphics pipeline, etc

CMPT 363 – User Interface Design
- experience with goals and principles of UI design, current perspective,
- experience with the design of useable human-computer interfaces and user-centered design techniques, interaction design, etc.
- Prerequisite: CMPT 225
CMPT 365 – Multimedia Systems
- A good understanding of multimedia systems design, especially knowledge of some multimedia library in both C++ and in Java;
- working knowledge of multimedia hardware and software
- a good understanding of representing, processing and transmitting multimedia data such as text, graphics, sound and music, image and video.
Prerequisite: CMPT 225

CMPT 371 – Data Communications and Networking
- familiar with network layers and protocols, in particular, TCP/IP protocol stack
- experience with socket programming, C/C++/Java
Prerequisite: CMPT 225, (CMPT 150, ENSC 150 or CMPT 295) and MATH 151 (MATH 150). MATH 154 or 157 with a grade of at least B+ may be substituted for MATH 151 (MATH 150)

CMPT 363 –
- experience with goals and principles of UI design, current perspective
- experience with the design of useable-human-computer interfaces and user-centered design techniques, interaction design, etc
- knowledge of various prototyping/ wireframing techniques and software (e.g., Axure, Balsamiq)
- knowledge of usability testing and/or other methods of user studies
Prerequisite: CMPT 225

CMPT 376W - Technical Writing and Group Dynamics
- ability to read and comprehend assignments/essays/exams
- ability to provide constructive written feedback on assignments/ essays/exams (including feedback on grammar, and structure)
- ability to read and understand assigned readings in order to use the material in grading, and for responding to student questions in person and via email
- a good understanding of English grammar and syntax
Prerequisite: CMPT 275 or 276

CMPT 383 – Comparative Programming Languages
- knowledge of a variety of programming languages
- knowledge of basic programming techniques, e.g. procedural, functional, object-oriented
Prerequisite: CMPT 225 and (MACM 101 or (ENSC 251 and ENSC 252))

CMPT 405 – Design and Analysis of Computing Algorithms (cross-listed with CMPT 705)
- solid background in algorithm design and analysis
- knowledge of classical algorithms and standard algorithmic paradigms such as greedy heuristics, dynamic programming, linear programming
- familiarity with NP-completeness and polynomial-time reductions
Prerequisite: CMPT 307

CMPT 406 – cross-listed with CMPT 813
- experience with mathematical preliminaries, convex hull algorithms, intersection problems, closest point problems and their applications.

CMPT 407 – Computational Complexity (cross-listed with CMPT 710)
- solid background in discrete math;
- solid background in basic algorithms and algorithm design techniques;
- working knowledge of basic probability theory, combinatorics, logic, and algebra;
- working knowledge of basic complexity theory (NP-completeness, complexity classes, Turing machine, circuit);
- some knowledge of quantum computing is helpful.

CMPT 412 – Computational Vision
- Strong background in basic computer vision and image processing concepts such as; convolution, Fourier
- Transforms, BRDF, object recognition, optical flow, etc
CMPT 413 – cross-listed with CMPT 825
- Expertise in machine learning and natural language processing
- Python programming
- Linux/BSD software development experience

CMPT 417 – cross-listed with CMPT 827
- familiarity with propositional and basic first order logic
- know what P and NP are
Prerequisite: CMPT 225

CMPT 433
- proficient with Linux C/C++ programming (threads, processes, sockets
- proficient with Linux command line and problem solving desired:
- Experience with BeagleBone black or similar knowledge of basic circuits (resistors & LEDs); embedded programming experience.
Prerequisite: (CMPT 250 or CMPT 295) and 300

CMPT 441 – crosslisted with 711
- experience with algorithmic aspects of bioinformatics, particularly genome and protein sequences
- working knowledge of Hidden Markov Models, phylogeny reconstruction and structural bioinformatics
- experience with algorithm analysis and dynamic programming
Prerequisite: CMPT 307

CMPT 443
- A good understanding of transaction management
- Familiar with ACID and the possible trade-offs
- Experience with query optimization and query rewriting and processing
Prerequisite: CMPT 300 and 354

CMPT 464
Experience with geometric modelling,
Processing for computer graphics (such as Bezier and B-spline techniques, subdivision curves, etc.
Multi-resolution modeling and digital geometry processing

CMPT 470 – Web-based Information Systems
- web development: basic concepts and working knowledge of HTML, CSS, Javascript
- server-side web development, preferably using and MVC framework
- basic knowledge of HTTP
Prerequisite: (CMPT 275 or 276) and CMPT 354

CMPT 475 – Requirements Engineering
- experience with the software development process, project planning and project management
- experience with software implementation, testing and data normalization processes
Prerequisite: CMPT 275 or 276 and MACM 201 and 15 units of upper division courses

CMPT 479/886 – Automated Software Analysis + Security – cross-listed with CMPT 886
- experience writing a compiler (using LLVM preferred)
- a thorough understanding of C++

GRADUATE LEVEL COURSES

CMPT 705 – Design and Analysis of Algorithms (cross-listed with CMPT 405)
- experience in algorithm design and analysis
- experience with programming paradigms such as greedy and dynamic programming and classical algorithms
- experience with randomized/parallel algorithms, game theory and linear programming

CMPT 710 – Computational Complexity (cross-listed with CMPT 407)
- solid background in discrete math;
- solid background in basic algorithms and algorithm design techniques;
- working knowledge of basic probability theory, combinatorics, logic, and algebra;
- working knowledge of basic complexity theory (NP-completeness, complexity classes, Turing machine, circuit);
• some knowledge of quantum computing is helpful.

CMPT 726

CMPT 732
- Experience with programming in Python.
- Familiar with basic machine learning algorithms.
- Familiar with distributed processing frameworks such as Apache Hadoop or Apache Spark.
**3 TAs are required for this lab course**

CMPT 741
- Experience with basic concepts and techniques of data mining
- Experience using raw data to extract patterns, trends and knowledge for decision support

CMPT 825 – Natural Language Processing – Cross listed with CMPT 413