Spring 2018 – Teaching Assistant Minimum Requirements

Updated: Oct 24, 2017

APPLICATION DATES: Oct 24 – Nov 7, 2017

APPOINTMENT DATES: Jan 2 – Apr 26, 2018

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 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

• experience programming in C and in C++
• experience with implementing and using basic methods for solving mathematical problems
• excellent communication skills (able to clearly describe concepts in introductory programming using C and C++)
Prerequisite: CMPT 120
CMPT 135 – Introduction to Computer Programming II
• familiar with C++ programming, including pointers, classes, and objects.
  Prerequisite: CMPT 130

CMPT 165 – Introduction to the Internet and the World Wide Web
• working knowledge of creating web pages with HTML, CSS and JavaScript
• basic programming in JavaScript
• basic server-side web programming experience and/or knowledge of HTTP

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

MACM 101 – Discrete Mathematics I
• solid background in Discrete Mathematics including deductive logic, set theory and basics of computational complexity, propositional and predicate logic, counting, number theory, relations, etc.
• must have very good teaching and interpersonal skills as need in the tutorials
• must be enthusiastic about assisting a group of students with diverse academic backgrounds
  Prerequisite: BC Math 12 (or equivalent), or any of MATH 100, 150, 151, 154, 157

CMPT 213 – Object Oriented Design in Java
• strong experience with Java
• confident with design patterns (such MVC and observer)
• experienced with OOD
  Prerequisite: CMPT 225

CMPT 218 – Special Topics in Computing Science
• web development: basic concepts and working knowledge of HTML, CSS, JavaScript
• server-side web development
• familiar with different parts client/server model and requests/responses
• basic knowledge of HTTP
• basic knowledge of Node.js

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
• fluent in Python
  Prerequisite: MACM 101 and (CMPT 125 and 127), CMPT 129 or CMPT 135) or (ENSC 251 and ENSC 252)

CMPT 276 – Introduction to Software Engineering (Burnaby)
• 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 276 – Introduction to Software Engineering (Surrey)
• Strong practical experience with Android programming
• Experience with an agile development process
• Experience with JUnit
• Experience with Git
  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
- solid 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.
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 322W – Professional Responsibility & Ethics
- A good understanding of English grammar and syntax
- Ability to critically evaluate and provide constructive feedback on substantial student writing projects

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 calculus
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 373 – Software Development Methods
- experience with various software development methods and the principles behind them
- experience with Linux and programming with C++
- ability to read, evaluate and provide constructive feedback on written essays
Prerequisite: CMPT 275 or 276

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 379 – Principles of Compiler Design
- expertise in writing a compiler for high level programming language
- compiler tools such as Lex and Yacc
- LLVM code generation library
- knowledge of formal languages, regular expressions, context-free grammars
Prerequisite: MACM 201, (CMPT 150, CMPT 295 or ENSC 215) and CMPT 225

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 384 – Symbolic Computing
- experience with functional programming in languages such as Haskell, ML or Lisp
- knowledge of formal languages, regular expressions, context-free grammars, predicate logic

CMPT 404 – Cryptography + Cryptographic Protocols
- Good background in mathematics, basic of probability, asymptotic notation
- Good knowledge of algorithms and their analysis
- Some background in complexity theory, polynomial time reductions hardness of computational problems

CMPT 409 – ST: Theoretical CMPT
- Knowledge of current topics in theoretical computing science

CMPT 411/721 – Knowledge Representation (cross-listed)
- working knowledge of classical propositional and first-order logic
- general background in Artificial Intelligence
- working knowledge of principles of knowledge representation and reasoning
- some working knowledge of answer set programming

CMPT 431 – Distributed Systems
- experience with distributed file systems – motivation and characteristics and their architecture and design goals
- high level programming skills and knowledge
- experience with project management
Prerequisite: CMPT 300, 371
CMPT 454
• 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 466 – Animation
• Completed “CMPT361 Introduction to Computer Graphics” or an equivalent course
• Knows the basics of computer animation or is willing to attend the classes to learn animation
• C++ programing or Java programing
• Research experience in computer graphics or animation is a plus.

CMPT 469/888 – ST: Computational Photography
• experiences with C++
• knowledge of basic Computer Vision or Computer Graphics

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 471 – Networking II
• experience with the administration and operating protocols which surround TCP/IP in the internet protocol suite
• working knowledge and experience with Linux operating system, shell programming and socket programming
Prerequisite: CMPT 300 and 371

CMPT 473 – Software Quality Assurance
• a comprehensive understanding of the quality of software, the tools, technologies and techniques used in assessment
Prerequisite: CMPT 373

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 489/886 – ST: Compiler Technology for SIMD Parallel Programming
• knowledge of formal languages, regular expressions, context-free grammars, predicate logic
• experience with LLVM code generation library
• familiarity with processor instruction set architectures including SIMD features

GRADUATE LEVEL COURSES

CMPT 706 – 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 733 – Programming for Big Data 2
• 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 756 – Big Data Systems

CMPT 822 – Computational Vision

CMPT 828 – Illumination in Images + Video

CMPT 829 – ST: Bioinformatics

CMPT 829 – ST: Methods in Computational Genomics
CMPT 843 – Database + Knowledge-Base Systems
- expertise in database systems (e.g., data model, parallel database systems, transaction, query optimization)
- familiar with big data technologies (e.g., large-scale dataflow engines, columnar store, key-value store)

CMPT 882 – ST: Sensing + Control for Human Robot Interaction

CMPT 884 - ST: Machine Learning in Life Sciences

CMPT 886 – ST: Large Scale Graph Processing

CMPT 888 – ST: Human Computer Interactions

CMPT 888 – ST: