



## Small TLEF Project – Final Report

Report Completion Date: (2017/09/30)

### 1. PROJECT OVERVIEW

#### 1.1. General Information

<b>Project Title:</b>	Evaluating a new, reduced-face-time, first-year computer science class for non-majors		
<b>Principal Investigator:</b>	Meghan Allen		
<b>Report Submitted By:</b>	Meghan Allen		
<b>Project Initiation Date:</b>	April 1, 2016	<b>Project Completion Date:</b>	August 31, 2017

#### 1.2. Project Summary

Student feedback on our first-year Computer Science courses led us to propose CPSC 103, a new, reduced-face-time, first-year Computer Science course for non-majors. CPSC 103 is complementary to our other first-year Computer Science courses and provides an avenue for non-majors to learn how to systematically design well-structured and well-tested programs. We hope that expanding our first-year Computer Science offerings will broaden participation in our courses and provide avenues for every interested student at UBC to take a Computer Science course that meets their needs.

The TLEF grant provided the financial resources necessary to significantly expand our course evaluation plan and engage students and teaching assistants in workshops that provided concrete, actionable suggestions to continue improving the course. The TLEF gave us the resources that were necessary to answer the four evaluation questions that we have listed in Section 3.2. The TLEF provided the means to hire GRA and UTA/URA students to analyze evaluation data, to develop course materials and infrastructure, and to provide additional instructional support for the first offering of the course.

#### 1.3. Team Members

Name	Title/Affiliation	Responsibilities/Roles
Meghan Allen	Instructor I, Computer Science and Vantage College	Roles: principal investigator, course developer, instructor, Appreciative Inquiry focus group facilitator  Additional responsibilities: dissemination
Steve Wolfman	Professor of Teaching, Computer Science	Roles: instructor, course developer, Appreciative Inquiry focus group facilitator  Additional responsibilities: dissemination
Jessica Dawson	12-month Lecturer and Science Teaching	Roles: Appreciative Inquiry focus group



	and Learning Fellow, Computer Science	facilitator  Additional responsibilities: design and implementation of course evaluation, analysis of course evaluation data, dissemination
Anasazi Valair	Undergraduate Academic Assistant (May – August, 2016) and Course Developer (staff role, May – August, 2017) , Computer Science	Roles: course developer, Appreciative Inquiry focus group facilitator  Additional responsibilities: analysis of course evaluation data, dissemination
Alfred Xing	Undergraduate Academic Assistant, Computer Science	Roles: course developer, programmer
Albert Xing	Undergraduate Academic Assistant, Computer Science	Roles: course developer, programmer
Alice Campbell	Instructional Designer, Dean’s office, Faculty of Science	Responsibilities: analysis of course evaluation data, dissemination
Ashley Shaw	Graduate Research Assistant, Department of Curriculum and Pedagogy, Faculty of Education	Responsibilities: literature review

**1.4. Courses Reached**

Course	Section	Academic Year	Term (Summer/Fall/Winter)
CPSC 103	101	2016/2017	Fall
CPSC 103	201	2016/2017	Spring
CPSC 103	V01	2016/2017	Summer
CPSC 103	101, 102	2017/2018	Fall
CPSC 103	201, 202	2017/2018	Spring
CPSC 103	future	future	all



**2. OUTPUTS AND/OR PRODUCTS**

**2.1.** Please **list** project outputs and/or products (e.g. resources, infrastructure, new courses/programs). Indicate the current location of such products and provide a URL if applicable.

Product(s)/Achievement(s):	Location:
Broadening participation by attracting a more diverse set of students to take a Computer Science course	(see Question 2 in section 3.2)
Improved student experience	A manuscript with a summary of improved non-major students’ outcomes and experiences is currently under review at the top Computer Science Education conference <sup>1</sup> .
Scholarly evaluation of the course, which has led to improvements in course curriculum and pedagogy	manuscript with summary of improved non-major students’ outcomes and experiences under review
Introducing UBC students, faculty, and staff to Appreciative Inquiry as a research methodology	(see section 3.3 for a list of past and future presentations)

**2.2. Item(s) Not Met**

Item(s) Not Met:	Reason:
n/a	

**3. PROJECT IMPACT**

**3.1. What were you hoping to change or where were you hoping to see an impact with this project?** – Please list the intended benefits of the project for students, TAs, instructors and/or community members.

The intended benefits of the project were to give students more choice when taking a first-year computer science class and provide an option for them to learn how to systematically design programs in a flexible and blended course that is designed for non-majors. Additionally, we intended to conduct a full and deep evaluation of CPSC 103 in order to continue to improve the course curriculum and pedagogy.

**3.2. Were these changes/impacts achieved? How do you know they occurred?** – To what extent were intended benefits achieved or not achieved? What evaluation strategies were used? How was data collected and analyzed? You are encouraged to include copies of data collection tools (e.g. surveys and interview protocols) as well as graphical representations of data and/or scenarios or quotes to represent and illustrate key themes.

Our intended outcomes and benefits have been met. Prior to launching CPSC 103, we investigated students’ experience, attitudes towards computer science, and outcomes in our introductory Computer

<sup>1</sup> In Computer Science, it’s common to publish in conferences and our top conferences are on par with, or more prestigious, than the top journals.



Science courses via pre- and post-term surveys and interviews<sup>2</sup>. Since the launch of CPSC 103, we have included the CPSC 103 students in the pre- and post-term surveys<sup>3</sup>. Therefore, we are able to compare the experiences, attitudes towards computer science, and outcomes of non-CS majors in our first-year programming course that is intended for computer science majors with the experiences, attitudes towards computer science, and outcomes of CPSC 103 students. Additionally, we conducted Appreciative Inquiry focus groups<sup>4</sup> with CPSC 103 students and TAs in order to understand their experiences more deeply.

We intended to answer four questions with our evaluation. Here we provide the four questions and our evidence-based answers to the questions.

### **1: *Did we improve our first-year Computer Science offerings by introducing this course?***<sup>5</sup>

CPSC 103 was designed for non-CS majors and provides an additional introductory course option for students. In both terms in 2016/2017 we conducted an evaluation of CPSC 103 and CPSC 110 (our first-year programming course for CS majors) to examine whether CPSC 103 was successful in improving outcomes—measured in terms of pass rates, satisfaction, and attitudes—relative to the non-CS majors who remained in CPSC 110. In both terms we conducted pre- and post-term surveys, and in CPSC 103 we also ran Appreciative Inquiry focus groups to gain deeper insight into the students' experiences in the course and identify what they most valued about its design.

Overall, 83% of all students passed CPSC 103 (n = 211) and 17% withdrew or failed. This contrasts with CPSC 110 (n=1369), where 75% passed and 25% withdrew or failed.

In CPSC 103, 132 (66%) of the 201 students still registered at the end of term completed the post-term survey, while in CPSC 110, 726 (56%) of the 1307 students still registered completed it. We asked respondents in the CPSC 110 survey to declare their intended major(s): those students who chose computer science as at least one of their majors were classified as CS majors (52%), while all other respondents were classified as non-CS majors (48%).

We asked students in both courses the same set of satisfaction and Computing Attitudes Survey<sup>6</sup> (CAS) questions. The CAS consists of statements on which there is an empirically-established expert opinion, and which cluster into five empirically-determined subscales measuring different facets of students' attitudes. Respondents rate their agreement with each statement on a 5-point likert scale (strongly agree to strongly disagree).

We used a subset of the statements from the three subscales most related to the types of attitudes we wanted to foster in non-majors. The real world connections subscale (4 statements) focuses on relationships between computing and the real world, e.g. "I think about the Computer Science that I

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<sup>2</sup> See Appendix D

<sup>3</sup> See Appendix D

<sup>4</sup> See Appendices B and C

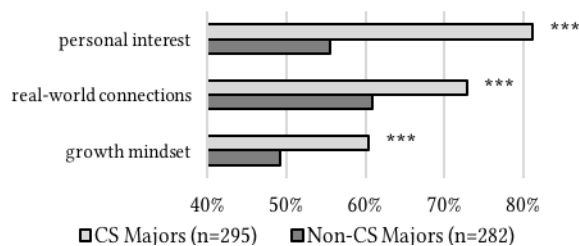
<sup>5</sup> Almost all of the response to this question was co-authored by Jessica Dawson, Meghan Allen, Alice Campbell, and Anasazi Valair and is part of the manuscript described in section 3.3.

<sup>6</sup> Dorn, B., & Elliott Tew, A. (2015). Empirical validation and application of the computing attitudes survey. *Computer Science Education*, 25(1), 1-36.

experience in everyday life," where the expert opinion is agreement. The personal interest subscale (3 statements) focuses on students' enjoyment and engagement with computing, e.g. "I enjoy solving Computer Science problems," where again, the expert opinion is agreement. The problem solving fixed mindset subscale (7 statements), which we call growth mindset, focuses on students' confidence and mindset when solving computing problems, e.g. "If I get stuck on a computer science problem, there is no chance I'll figure it out on my own," where the expert opinion is disagreement.

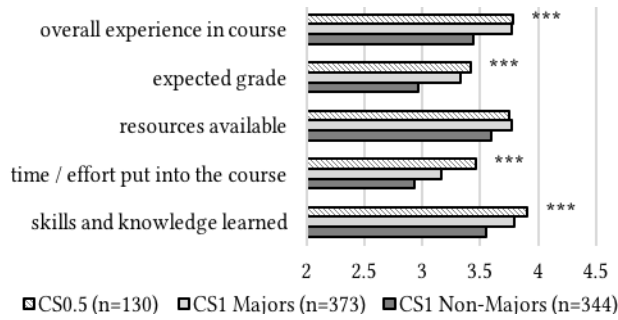
We scored the students' responses to the CAS statements following the standard procedure. We collapsed the responses into a 3-point range (disagree, neutral, agree), and then compared each student's response to the established expert opinion; a student's score on each subscale is calculated as the proportion of statements belonging to that subscale where the student's response matched that of the experts. For each factor, a higher percent agreement suggests more expert-like attitudes, i.e., more personal interest, a stronger appreciation of the relationship between computers and the real world, and more confidence and a more growth-oriented mindset when solving problems.

We analyzed the differences in expert agreement between CS majors and non-majors using unpaired Welch's t-tests (Figure 1). We found that non-CS majors had significantly less expert agreement than CS-majors on all subscales ( $p < 0.001$  for all).

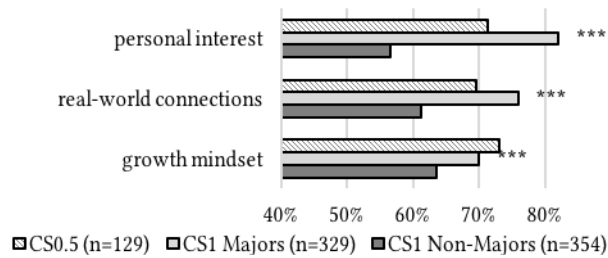


**Figure 1. Unpaired t-test of students' agreement with expert opinions on CAS factors in CS1 (2015/2016); \*\*\* $p < 0.001$ .**

We use one-way between-subjects ANOVAs to examine differences in satisfaction and attitudes between the CPSC 103 students and CS and non-CS majors in CPSC 110. Post-hoc pairwise comparisons were performed using the conservative Bonferroni correction. The results are shown in Figure 2 and Figure 3; questions were optional, so we report the number of responses for each.



**Figure 2. Between subjects ANOVA of satisfaction in 2017/2018; 1 = very unsatisfied; 5 = very satisfied;\*\*\*p < 0.001.**



**Figure 3. Between subjects ANOVA of students' agreement with expert opinions on CAS in 2017/2018; \*\*\*p < 0.001.**

Students' satisfaction varied significantly between groups for overall experience,  $F(2, 844) = 10.76, p < .001$ , the expected grade  $F(2, 844) = 13.33, p < .001$ ; the amount of time and effort put into the course,  $F(2, 844) = 11.97, p < .001$ ; and the skills and knowledge learned,  $F(2, 844) = 9.38, p < .001$ . There was no significant difference in satisfaction with the resources available when students needed help,  $F(2, 844) = 2.56, p = .078$ .

Post-hoc comparisons showed that the satisfaction of non-CS majors in CPSC 110 was significantly less than both CS majors in CPSC 110 and CPSC 103 students in their overall experience in the course ( $p < .001$  and  $p < .01$  respectively), their expected grade (both  $p < .001$ ), the amount of time and effort ( $p < .05$  and  $p < .001$  respectively), and the skills and knowledge ( $p < .01$  and  $p < .001$  respectively). The satisfaction with the time and effort required was also less for CS majors in CPSC 110 than students in CPSC 103; there were no other significant differences between these two groups.

We found significantly different levels of expert agreement on personal interest,  $F(2, 809) = 51.04, p < 0.001$ ; real world connections  $F(2, 809) = 20.41, p < 0.001$ ; and growth mindset  $F(2, 809) = 8.19, p < 0.001$ .

The post-hoc comparisons showed that non-CS majors in CPSC 110 scored significantly lower compared to both CS majors in CPSC 110 and CPSC 103 students on personal interest in computing (both  $p < 0.001$ ), on the connection between computer science and the real world ( $p < 0.001$  and  $p < 0.05$  respectively), and on growth mindset towards computing (both  $p < 0.01$ ). CS majors scored significantly higher on the personal interest ( $p < 0.01$ ) measure than CPSC 103 students, but we found no differences between these groups on the other two factors.



These evaluations have confirmed that we have met our goals in providing a new, introductory first-year class that meets the needs of non-CS majors at UBC. We will continue to evaluate the course so that we can continue to improve CPSC 103.

## 2. Are we broadening participation in our first-year Computer Science courses?

Our goals were to increase the number of women who take CPSC 103 and to increase the variety of academic backgrounds of the CPSC 103 students as compared to the CPSC 110 students.

Computer Science courses and majors typically have low participation from women. CPSC 110 has always attracted a fairly high percentage of female students. Over 2016W1, 2016W2, 2017S, and 2017W1 there were 2308 students in CPSC 110, 40% of whom were women<sup>7</sup>. Over the same time frame, 52% of the 456 CPSC 103 students were women. We are pleased to have reached a gender balance in CPSC 103 that roughly matches the gender balance of UBC students overall.

Over 2016W1, 2016W2, 2017S, and 2017W1, CPSC 103 and CPSC 110 had students from a similar number of programs, but the percentages of students from each program differed between the two courses. The two courses had similar representation of BA and BCOM students, a large difference in Science (BSC, BCS, VC-BSC) and BMS representation, and smaller differences in representation from BASC, BIE, EXCH and Other programs. A Pearson’s chi-squared test confirms that the registration representation differs ( $p < 0.001$ ) across the two courses.

**Table 1. Percentage of registrations in CPSC 103 and CPSC 110 by program (2016W1, 2016W2, 2017S, 2017W1)**

	Science programs <sup>8</sup>	BA	BASC	BCOM	BMS	BIE	EXCH	Other
CPSC 103 (n=456)	27.4%	26.5%	0.7%	9.2%	22.4%	3.9%	4.4%	5.5%
CPSC 110 (n = 2308)	57.3%	27.6%	2.0%	8.8%	0.4%	0.5%	0.4%	8.1%

Many of the CPSC 103 and CPSC 110 students haven’t declared a specialization yet, so we don’t have enough data about students’ specializations to do a meaningful analysis. It is promising, but not surprising, that the percentage of Science students is smaller in CPSC 103—the course intended for non-CS majors—than it is in CPSC 110. There are many factors that affect student registration, including program

<sup>7</sup> Our data is from the Faculty Service Center which presents gender as male or female. Therefore, our data is limited and does not accurately represent students whose gender identities are non-binary.

<sup>8</sup> BSC, BCS, and VC-BSC



requirements, registration time, and availability of seats so while we are pleased to see the diversity of programs represented in CPSC 103 we can't claim to know the cause of the diversity.

### ***3. What aspects of the course delivery and implementation are going well?<sup>9</sup>***

We have investigated this question via the post-term CPSC 103 surveys and the Appreciative Inquiry focus groups.

We analyzed CPSC 103 student responses to free-form questions on the post-term survey about suggestions for improvement, their experiences with the lectures, tutorials, and project, and any additional comments.

69% of students remarked on how the project allowed them to apply skills in the course to their personal interests, for example: "The project made me feel like everything I had learned was put towards a very interesting end-goal. It allowed me to understand the greater contexts within and beyond computer science and how it can be applied in different areas of life."; "[The] project allowed us to apply concepts that we learned into something unique and personal, which required synthesizing the course in our own way. Designing my own program was a helpful way to realize that coding could be manageable and interesting."

The Appreciative Inquiry focus group participants identified several common themes about CPSC 103 that they valued. Many of these aligned with our course design intentions, while some gave us new insight into non-majors' perspectives on their experiences learning CS that we intend to bring forward as we continue to iterate on the course.

The project came up frequently, with groups using themes of 'versatility', 'flexibility', 'universal appeal' and 'personal connection' to describe the project and their appreciation of being able to apply new knowledge to their own interests. Envisioning what this looked like in the future, one group wrote the provocative proposition that CPSC 103 "enables students to incorporate their own interests and teaches skills that are relevant to their personal goals".

The course resources also came up repeatedly, captured in themes like 'availability' (2 groups), 'accessibility', and 'diversity' of resources that allowed students to feel like they could get the type of help they needed when they wanted it. One group's proposition described CPSC 103 as "students actively learning how to think systematically by coding whenever they want, wherever they want, whatever they want."

### ***4. How can we improve this course for future offerings?***

The Appreciative Inquiry focus group participants identified some concrete ideas related to the themes above that could make the course better.

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<sup>9</sup> Almost all of the response to this question was co-authored by Jessica Dawson, Meghan Allen, Alice Campbell, and Anasazi Valair and is part of the manuscript described in section 3.3.





Many felt that the project already successfully connects with other academic disciplines, but the participants generated several suggestions for further improvement. For example, they suggested collaborating with lab courses to use real observational data, grouping sections into disciplinary clusters, or providing students with more chances to showcase their final projects. For the upcoming term, we plan to provide students with more chances to showcase their final projects.

Focus group participant also generated many new ideas for resources, such as weekly Q&A livestreams, online chats for students who had trouble attending office hours, videos or screencasts, or weekly bookings for dedicated CPSC 103 study spaces to work with their peers outside of class time. For the upcoming term, we are working on creating short screencasts and finding a dedicated study space for them to use outside of class time.

**3.3. Dissemination** – *Please provide a list of past and upcoming scholarly activities (e.g. publications, presentations, invited talks, etc.) in which you or anyone from your team have shared information regarding this project.*

#### **Posters**

Insights from Using Appreciative Inquiry in a Course Evaluation. Meghan Allen, Jessica Dawson, and Steve Wolfman. UBC Faculty of Science Education Open House Poster Session. April 7, 2017.

Insights from using Appreciative Inquiry in a Course Evaluation. Meghan Allen, Jessica Dawson, and Steve Wolfman. TLEF Poster Showcase. May 4, 2017.

#### **Presentations**

Insights From Using Appreciative Inquiry in a Course Evaluation. Meghan Allen, Jessica Dawson, and Steve Wolfman. UBC Okanagan Learning Conference Presentation. May 3, 2017.

Insights From Using Appreciative Inquiry in a Course Evaluation. Meghan Allen, Jessica Dawson, and Steve Wolfman. UBC Computer Science department teaching workshop. June 29, 2017.

#### **Workshops**

Playing to Your Strengths: Appreciative Inquiry as a Scholarly Tool for Your Computing Education Practice and Professional Development. Workshop proposal submitted to the Association for Computer Machinery's 2018 Special Interest Group on Computer Science Education conference. Baltimore, Maryland. February 21 - 24, 2018.



Playing to Your Strengths: Appreciative Inquiry as a Scholarly Tool for Your Computing Education Practice and Professional Development. Workshop planned for the UBC Computer Science Education Reading Group in 2017/2018.

Playing to Your Strengths: Appreciative Inquiry as a Scholarly Tool for Your Teaching Practice and Professional Development. Workshop to take place in Term 2 of 2017-2018 with support from Skylight.

### **Publications**

Jessica Dawson, Meghan Allen, Alice Campbell, Anasazi Valair. Designing an Introductory Programming Course to Improve Non-Majors' Experiences. Manuscript submitted to the Association for Computer Machinery's 2018 Special Interest Group on Computer Science Education conference. Baltimore, Maryland. February 21 - 24, 2018.

**4. TEACHING PRACTICES** – *Please indicate if **your** teaching practices or those of **others** have changed as a result of your project. If so, in what ways? Do you see these changes as sustainable over time? Why or why not?*

Through this project, I have learned the value of taking a strength-based focus in my teaching practice. While it's still important to reflect on what hasn't worked in a course or project, I will consciously take time to reflect on what is working well which will allow me to continue building on strengths. I will ask strength-based questions of students, both in class and on course evaluations, so that they can identify their strengths as students and strengths in the courses that they take.

My colleague, Steve Wolfman, has also started integrating a strength-based focus into his classes. For example in a third-year theoretical Computer Science course, he asks students about their best experience with the course material in a pre-term survey.

We intend to share our experiences with Appreciative Inquiry with the Computer Science Education Reading Group at UBC and with Computer Science educators at the top Computer Science Education conference. I am currently collaborating with Skylight to offer Appreciative Inquiry professional development workshops for the Faculty of Science in the spring of 2018. We hope that we will inspire others to start focusing on strengths as they evaluate their own teaching practices.

These changes are sustainable as they don't require any further resources to implement. The most difficult barrier is remembering to keep a strength-based focus as it is easy to fall back into searching for problems.

**5. PROJECT SUSTAINMENT** – *Please describe the sustainment strategy for the project components. How will this be sustained and potentially expanded (e.g. over the next five years). What challenges do you foresee for achieving the expected long-term impacts listed above?*



We are currently implementing changes to CPSC 103 based on what we learned about students' experiences. Once implemented, these updated course materials or policies will be available for all future course offerings.

We have received a Faculty of Science Skylight Development Grant and matching Computer Science departmental funding to continue the Appreciative Inquiry focus groups over the 2017/2018 academic year. We are also continuing our pre-and post-surveys to gather information from a wider group of students about their experiences in our introductory courses. We intend to continue to improve our courses based on what we learn in the upcoming evaluations.

We have questions that are inspired by Appreciative Inquiry built in to our pre- and post-term surveys and will be able to keep using these questions to gather feedback from students even without future funding.

We don't see any major challenges in continuing our work on this course.



**APPENDIX A: PROJECT COST & EFFORT** – Please update the following project financial details as needed.

<b>Budget item (list all items on original budget that were funded)</b>	<b>Amount budgeted</b>	<b>Amount expended</b>	<b>Balance remaining for this item (if any)</b>
Undergraduate Academic Assistant and Undergraduate Research Assistant Support <sup>10</sup>	6705	4538.30	2166.70
Course Developer <sup>11</sup>	0	3450.88	(-3450.88)
Additional TAs to help with first offering in 2016W1	13286	15000	(-1714)
Hire a consultant to help design the Appreciative Inquiry workshops <sup>12</sup>	2500	0	2500
Incentives for students to participate in our focus groups.	4240	3033.24	1206.76
<b>Total balance remaining (if any):</b>			708.58

<sup>10</sup> This cost is an estimate as we are waiting for the August, 2017 salaries and benefits to be posted to FMS. We believe it’s fairly accurate and will know an exact cost in October, 2017.

<sup>11</sup> We hired a previous Undergraduate Academic Assistant into a part-time staff position after she graduated to continue the project.

<sup>12</sup> We used other funding to pay for this line item.



## APPENDIX B: APPRECIATIVE INQUIRY FOCUS GROUP PROTOCOL

Setup: If possible, organize the room as an open circle of chairs, possibly with tables around the outside so people can turn to the tables if they need them. When participants arrive, ask them to read and sign the consent form and get some food.

### **Step 0 [25 minutes:] Welcome and chat**

Note: this is a key piece to creating the appreciative atmosphere

Intro: “As you may already know, CPSC 103 is a very new course, with the first full offering last fall. We’re excited about the course and are looking for ways to make it even better. The approach that we’re taking for this review of the course is strength-based and our intent is to take action based on what we hear in this session.” Then, segue into discussion storytelling icebreaker.

Icebreaker: Participants pick an image or pull one from an envelope. “We’ll start strength-based session by focusing on you as the people who are participating; what does that image represent for you when you were at your best?” Go round the room and have each participant share their image and short story about it. Really focus on the story here to set up for the interviews.

Working agreement: Collaboratively create an agreement on a flip chart that describes how we’ll work together for three hours at our best.

### **Step 1 [5 minutes]: Share affirmative topic**

“Events like this usually focus on identifying problems, errors, mistakes, and what’s going wrong. We are doing that for CPSC 103 in other venues, but that isn’t our goal today. Instead, we’re doing something else that’s very important but often overlooked: identifying what’s going well and reinforcing that to make the course the best it can be. We found that this is a very valuable exercise and a surprisingly difficult one. So, we’ll work with you to try to keep the focus on positives: successes, strengths, and what’s working well. Help us out if anyone accidentally slips back into the negative approach! In particular, our topic is `CPSC 103 at its best.’”

Discuss session overview briefly: Emphasize that we are focusing on what’s working well but let them know that they will have the opportunity to give their hopes for the class and also suggest changes.

[START OF APPRECIATIVE INQUIRY’S DISCOVERY PHASE]

### **Step 3 [30 minutes]: Storytelling interviews**



Break participants into groups of threes for interviews. [If numbers require, have facilitators join the remaining participants]. Try to diversify the groups as much as possible (e.g. don't have all the TAs in the

same group. Hand out the interview guides (see Appendix C) and pens and ask participants to take turns being the Interviewer, Interviewee, and Observer. The Observer takes notes of high-level themes that they hear. Be sure to remind participants that this isn't a conversation; the interviewer should be actively listening and prompting the speaker to tell a story about CPSC 103 at its best. Facilitators circulate and keep people telling stories. Don't let it devolve into asking/answering questions.

#### **Step 4 [10 minutes]: Groups generate themes**

The groups of three generate themes from their storytelling interviews. Ask: "What struck you?" Observers pick out themes from entirety of the interviews, not just from individual questions. Each observer takes a turn to share the key themes they heard. As a group, decide on the main 3-5 themes that emerged from the interviews. Provide a half-piece of flip-chart paper to record 3-5 key themes.

#### **Step 5 [10 minutes]: Gallery walk of themes**

Share themes with the whole group by doing a gallery walk of the flip-charts. Give markers or stickers so participants can add three marks for their top priority themes (i.e. what they want to make sure moves into the future to make CPSC 103 at its best even better). Validate that all the ideas are good and now we want you to prioritize what's most important.

#### **[BREAK - 10 minutes]**

[START OF APPRECIATIVE INQUIRY'S DREAM PHASE]

#### **Step 6 [15 minutes]: Image representing CPSC 103 at its best**

Create new groups based on the theme or small cluster of related themes that participants want to take forward (note: small groups, but not pairs) and as a group create a visual (not verbal/word-based) representation of CPSC 103 at its best on the top half of a flip chart paper. Frame the stage for participants because the image may feel awkward/weird. Tell them we're using the right side of our brains before we use the left so that we can be creative and open, will make the writing stage easier.

#### **Step 7 [15 minutes]: Provocative proposition**

Each group creates a provocative proposition, which provokes action towards CPSC 103 at its best related to the theme of the group. Reminder: a single, bold statement in present tense that is based on what they've found in the other stages. "Imagine you're THERE in the preferred future." Ask them to generate a full sentence that provokes action. (Remind that these are drafts.) Write it on the bottom half of the flip chart paper. Put all flipcharts up around the room for everyone to see.



[START OF APPRECIATIVE INQUIRY'S DESIGN PHASE]

Step 8 [10 minutes]: Brainstorm ideas that enable the provocative propositions

Individually brainstorm big or small ideas in a couple of words without the details (i.e. ways to make the preferred future happen) on post-its that "enable the provocative proposition". Let them know that they can give ideas for all provocative propositions and images, not just the one their group created.

**Step 9 [15 minutes]: Clustering design ideas**

Ask participants to start clustering ideas as a small group. As a whole, cluster the ideas by drawing out sufficient clarification/elaboration from participant to make them actionable by course staff.

[NOTE on steps 8 and 9: Ensure that this is framed in a way that we can usefully take lessons away from it.]

**Step 10 [5 minutes] Conclusion**

Honour everyone's contributions and thank them. Remain present as they pack up so that they can chat with the facilitators.

NOTE: Appreciative Inquiry's Destiny phase will be performed by course staff after the focus groups. This phase focuses on implementing the ideas that were generated in the Design phase.



## APPENDIX C: APPRECIATIVE INQUIRY INTERVIEW GUIDE

**Topic:** CPSC 103 at its best.

**Instructions:** Please take turns telling each other stories about CPSC 103 at its best. We are really looking for stories here, so think of a particular story that you'd like to tell. We will assign you distinct roles for the interviews and we will describe those roles before we start.

### Interview Questions

1. Tell me a story that illustrates CPSC 103 at its best. When were you most engaged and excited in CPSC 103?
2. What did you value about yourself and others in that story? What did you value about CPSC 103?
3. What is the core factor that allows CPSC 103 to be at its best?
4. What 3 wishes do you have for CPSC 103 at its best?





**APPENDIX D: EXAMPLE PRE- AND POST-TERM SURVEYS**



## Computer Science Student Experience - Pre Term Survey (2016 W2)

### Page 1

#### Computer Science Student Experience Project

All current CPSC 103 students are invited to complete this survey.

**Your course instructor is offering bonus points of 1% in the course for completing this survey.** An additional bonus will be offered for completing the companion survey at the end of the term

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#### Principal Investigator:

Warren Code, Science Centre for Learning and Teaching, 604.822.4691, [warcodescience@science.ubc.ca](mailto:warcodescience@science.ubc.ca)

#### Co-investigators:

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Jessica Dawson, Science Teaching and Learning Fellow and Lecturer, Department of Computer Science, 604-822-0694, [jqdawson@cs.ubc.ca](mailto:jqdawson@cs.ubc.ca)

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**Introduction:** We would welcome your participation in a study of introductory courses in Computer Science. The results of this study may be published in some form and presented publicly, but without any information that could be used to identify the participants.

**Purpose:** You are being invited to take part in this research study because you are in a course offered by the department of Computer Science. This study will seek to understand who takes introductory CS courses and why, and to evaluate students' attitudes towards learning CS, as well as their experience and performance in their introductory CS courses. Study results will help to ensure an effective teaching and learning experience for future students and may result in direct revisions to courses.

**Study Procedures:** Your participation will involve completing two surveys. The first survey will occur at the beginning of the term, and a second survey will occur at the end of the term. You are welcome to complete the second survey even if you did not complete the first survey. Each survey will take 10-15 minutes.

**Potential Risks and Benefits:** There are no known risks to participants in this study. The benefits to you are indirect. Input from this study will enable faculty members to improve their teaching and learning activities in introductory courses for the benefit of future students.

**Confidentiality:** Your confidentiality will be respected. Your course instructor will not see any responses until after the final grades for the course have been submitted. All data/documents will be kept in locked filing cabinets by one of the researchers listed in the study team who will not be one of the instructors of your current courses. Any electronic data/information will be kept on password-protected computers. You will not be identified by name in any reports of the completed study. For study purposes, we may use your student number to link your responses to your grades and GPA, demographic information from the Student Information System and language assessments that you took starting at UBC provided by the UBC Office of Planning and Institutional Research. We may also use your student number to link your responses to analytics data regarding your use of the online course resources (edX and Connect), data you provide throughout the term on the workload of the course, and any responses you provide through participation in other activities in this study, such as focus groups or interviews. In these cases, after your responses are matched with the data, all the identifiers will be deleted for future analysis.

**Remuneration/Compensation:** For your participation in each survey, your course instructor may offer you bonus points in the course. You are eligible for this bonus even if you do not consent to have your responses included in the study.

**Contact for information about the study:** If you have any questions or desire further information with respect to this study, you may contact the principal investigator or any of the relevant co-investigator(s) mentioned above.

**Contact for concerns about the rights of research subjects:** If you have any concerns or complaints about your rights as a research participant and/or your experience while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or if long distance e-mail [RSIL@ubc.ca](mailto:RSIL@ubc.ca) or call toll free 1-877-822-8598.

**Consent:** Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time without penalty.

Please ensure you understand this consent form before beginning the survey. Your consent to participate in this study is assumed once you have agreed to the conditions of the survey, given informed consent and completed and submitted the questionnaire online. You may download and save a copy of this consent form for your records: [\[Download PDF\]](#)

Please select one:

- (a) I DO consent to having my responses included in the study. I understand that I am under no obligation to consent and will receive the participation bonus for completing the survey.

the survey with or without consent.

- (b) I DO NOT consent to having my responses included in the study. I understand that I am under no obligation to consent and will receive the participation bonus for completing the survey with or without consent.

## Background

Thank you for participating in this survey! We appreciate your feedback

Please answer the questions to the best of your ability. We required your Student ID and First and Last name, but the remaining questions in the survey are optional - if you do not answer a question, or do not understand the question, you may skip it.

### What is your First and Last name? (required)

### What is your 8-digit UBC Student ID? (required)

### What is your current or intended area of study at the University of British Columbia?

You may select multiple areas if you plan on doing a double or combined major.

- I haven't decided yet
- Business
- Cognitive Systems
- Computer Science
- Education
- Engineering
- Fine / Performing / Visual Arts
- Health Sciences / Medicine / Nursing / Pharmacy
- Humanities
- Life Sciences
- Mathematics
- Media Studies (BMS degree)
- Physical Sciences
- Social Sciences
- Statistics
- Other, please specify...

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

**Attitudes towards Computer Science and Programming**

Here are a number of statements that may or may not describe your beliefs about learning computer science. No previous experience is required for CPSC 103, so there are some statements that you don't yet have an opinion on or do not understand.

You are asked to rate each statement according to the following rating scale:

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Choose one of the above five choices that best expresses your feeling about the statement. If you don't understand a statement, leave it blank. If you understand, but have a strong opinion, choose "Neutral".

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly
After I study a topic in computer science and feel that I understand it, I have difficulty solving problems on the same topic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Errors generated by computers are random, and when they happen there's not much I can do to understand why.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I want to apply a method used for solving one computer science problem to another problem, the problems must involve very similar situations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can usually figure out a way to solve computer science problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I solve a computer science problem, I break it into smaller parts and solve them one at a time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not spend more than five minutes stuck on a computer science problem before giving up or seeking help from someone else.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are times I solve a computer science problem more than one way to help my understanding.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Choose one of the above five choices that best expresses your feeling about the statement. If you don't understand a statement, leave it blank. If you understand, but have a strong opinion, choose "Neutral".

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly
I think about the computer science I experience in everyday life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tools and techniques from computer science can be useful in the study of other disciplines (e.g. biology, art, business)□.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When working on a computer science problem I find it useful to brainstorm about solution strategies before writing code.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find the challenge of solving computer science problems motivating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly disagree	Disagree	Neutral	Agree	Strongly
When studying computer science, I relate the important information to what I already know rather than just memorizing it the way it is presented.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy solving computer science problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reasoning skills used to understand computer science can be helpful to me in my everyday life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Choose one of the above five choices that best expresses your feeling about the statement. If you don't understand a statement, leave it blank. If you understand, but have a strong opinion, choose "Neutral".

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly
Learning computer science is just about learning how to program in different languages.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am working on a computer science program, I try to decide what reasonable output values would be.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm trying to learn something new in computer science, I find it useful to write a small program to see how it works.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A significant problem in learning computer science is being able to memorize all the information I need to know.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We use this statement to discard the surveys of people who are not reading the questions. Please select "Agree" for this question to preserve your answers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding computer science basically means being able to recall something you've read or been shown.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I get stuck on a computer science problem, there is no chance I'll figure it out on my own.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Choose one of the above five choices that best expresses your feeling about the statement. If you don't understand a statement, leave it blank. If you understand, but have a strong opinion, choose "Neutral".

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly
The subject of computer science has little relation to what I experience in the real world.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is usually only one correct approach to solving a computer science problem.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To learn computer science, I only need to memorize solutions to sample problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I worry that mistakes I make when writing a program may damage my computer.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am interested in learning more about computer science.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

### Expectations

The following questions ask you about your reasons for taking CPSC 103 and your expectations for the course.

#### Why are you taking CPSC 103?

You may select more than one reason, even if you are taking the course because it is required.

- It is required for my program
- A friend recommended it to me
- I think it will be easy
- I heard the professor is good
- I think it will be useful for my academic program or career
- Out of interest
- Other, please specify...

#### What are the top three goals that are most important to you to achieve in CPSC 103 by the end of the semester?

Please select between 0 and 3 items.

- Getting a particular grade (please specify the grade)
- Learning the required skills and concepts
- Staying on top of the course material and assignments
- Creating a computer program that does something useful
- Learning or improving your study skills
- Finding out if you're interested in Computer Science
- Working hard
- Making friends
- Other, please specify...

Current number checked: 0 Minimum: 0 | Maximum: 3

How confident are you that you will be able to achieve your top three goals from the previous question?

- Very confident
- Somewhat confident
- Neither confident nor unconfident
- Somewhat unconfident
- Very unconfident

#### What grade do you expect to get in CPSC 103?

- 90 – 100%
- 80 – 89%
- 70 – 79%
- 60 – 69%
- 50 – 59%

< 50%

**What skills or concepts do you hope to learn or improve in CPSC 103?**

Type here

**How do you expect to apply the skills and concepts you learn or improve on in CPSC 103 in the future?**

- In my career (current work or future career)
- In personal programming projects
- In day-to-day life situations (unrelated to programming)
- In future non-CS courses
- In future CS courses
- Unsure
- N/A - will not apply in the future



**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

### Previous Experience

The following questions ask you about your previous experiences designing programs. No previous experience with programming is expected in CPSC 103. However, we are interested in knowing about any previous experience you do have creating computer programs.

#### How much previous experience do you have writing computer programs?

- No previous experience
- Less than 6 months
- 6 months - 2 years
- More than 2 years

#### What types of experience writing computer programs do you have?

If you have no previous experience, you may skip this question.

- University or college course(s)
- High school course(s)
- Elementary or middle school course(s)
- Summer camp or other short program (e.g., workshop)
- Online courses (e.g., Coursera)
- Online tutorials (e.g. Codecademy, Hour of Code)
- Completing personal projects
- At work / for a job
- Other, please specify...

#### Tell us about the best experience you've had creating something (anything) with a computer.

This could be a one-time event, or an ongoing activity, or any other experience you've had related in any way to creating something with a computer. We do not expect it to be a computer program - it could be absolutely anything.

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

### Demographics

The remaining questions ask you about your first languages and the languages you consider yourself fluent in.

#### What was the first language(s) that you spoke as a child?

- Cantonese
- English
- French
- Korean
- Mandarin
- Spanish
- Other, please specify...

#### What languages do you speak fluently?

- Cantonese
- English
- French
- Korean
- Mandarin
- Spanish
- Other, please specify...

Please press Submit to complete the survey.

Thank you for participating!



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## CPSC 103 - Computer Science Student Experience - Post-Term Survey (2016 W2)

### Page 1

#### Computer Science Student Experience Project

All current CPSC 103 students are invited to complete this survey.

**Your course instructor is offering bonus points of 1% in the course for completing this survey.** This bonus is being offered in addition to the bonus that was offered for completing the companion survey at the beginning of the term.

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#### Principal Investigator:

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#### Co-investigators:

Meghan Allen, Instructor, Department of Computer Science, 604-822-4912, [meghana@cs.ubc.ca](mailto:meghana@cs.ubc.ca)

Jessica Dawson, Science Teaching and Learning Fellow and Lecturer, Department of Computer Science, 604-822-0694, [jqdawson@cs.ubc.ca](mailto:jqdawson@cs.ubc.ca)

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**Introduction:** We would welcome your participation in a study of introductory courses in Computer Science. The results of this study may be published in some form and presented publicly, but without any information that could be used to identify the participants.

**Purpose:** You are being invited to take part in this research study because you are in a course offered by the department of Computer Science. This study will seek to understand who takes introductory CS courses and why, and to evaluate students' attitudes towards learning CS, as well as their experience and performance in their introductory CS courses. Study results will help to ensure an effective teaching and learning experience for future students and may result in direct revisions to courses.

**Study Procedures:** Your participation will involve completing two surveys. The first survey will occur at the beginning of the term, and a second survey will occur at the end of the term. You are welcome to complete the second survey even if you did not complete the first survey. Each survey will take 10-15 minutes.

**Potential Risks and Benefits:** There are no known risks to participants in this study. The benefits to you are indirect. Input from this study will enable faculty members to improve teaching and learning activities in introductory courses for the benefit of future students.

**Confidentiality:** Your confidentiality will be respected. Your course instructor will not see any responses until after the final grades for the course have been submitted. All documents will be kept in locked filing cabinets by one of the researchers listed in the study team who will not be one of the instructors of your current courses. Any electronic data/information will be kept on password-protected computers. You will not be identified by name in any reports of the completed study. For study purposes, we may use your student number to link your responses to your grades and GPA, demographic information from the Student Information System and language assessments that you took starting at UBC provided by the UBC Office of Planning and Institutional Research. We may also use your student number to link your responses to analytics data regarding use of the online course resources (edX and Connect), data you provide throughout the term on the workload of the course, and any responses you provide through participation in other activities in this study, such as focus groups or interviews. In these cases, after your responses are matched with the data, all the identifiers will be deleted for future analysis.

**Remuneration/Compensation:** For your participation in each survey, your course instructor may offer you bonus points in the course. You are eligible for this bonus even if you do not consent to have your responses included in the study.

**Contact for information about the study:** If you have any questions or desire further information with respect to this study, you may contact the principal investigator or any relevant co-investigator(s) mentioned above.

**Contact for concerns about the rights of research subjects:** If you have any concerns or complaints about your rights as a research participant and/or your experience while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or if long distance e-mail [RSIL@ubc.ca](mailto:RSIL@ubc.ca) or call toll free 1-877-822-8598.

**Consent:** Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time without penalty.

Please ensure you understand this consent form before beginning the survey. Your consent to participate in this study is assumed once you have agreed to the conditions of informed consent and completed and submitted the questionnaire online. You may download and save a copy of this consent form for your records: [\[Download PDF\]](#)

Please select one:

- (a) I DO consent to having my responses included in the study. I understand that I am under no obligation to consent and will receive the participation bonus for completing the survey.

the survey with or without consent.

- (b) I DO NOT consent to having my responses included in the study. I understand that I am under no obligation to consent and will receive the participation bonus for completing the survey with or without consent.

## Background

Thank you for participating in this survey! We appreciate your feedback

Please answer the questions to the best of your ability. We required your Student ID and First and Last name, but the remaining questions in the survey are optional - if you do not answer a question, or do not understand the question, you may skip it.

### What is your First and Last name? (required)

### What is your 8-digit UBC Student ID? (required)

### What is your current or intended area of study at the University of British Columbia?

You may select multiple areas if you plan on doing a double or combined major.

- I haven't decided yet
- Business
- Cognitive Systems
- Computer Science
- Education
- Engineering
- Fine / Performing / Visual Arts
- Health Sciences / Medicine / Nursing / Pharmacy
- Humanities
- Life Sciences
- Mathematics
- Media Studies (BMS degree)
- Physical Sciences
- Social Sciences
- Statistics
- Other, please specify...

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

**Attitudes towards Computer Science and Programming**

Here are a number of statements that may or may not describe your beliefs about learning computer science. No previous experience is required for CPSC 103, so there are some statements that you don't yet have an opinion on or do not understand.

You are asked to rate each statement according to the following rating scale:

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Choose one of the above five choices that best expresses your feeling about the statement. If you don't understand a statement, leave it blank. If you understand, but have a strong opinion, choose "Neutral".

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly
After I study a topic in computer science and feel that I understand it, I have difficulty solving problems on the same topic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Errors generated by computers are random, and when they happen there's not much I can do to understand why.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I want to apply a method used for solving one computer science problem to another problem, the problems must involve very similar situations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can usually figure out a way to solve computer science problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I solve a computer science problem, I break it into smaller parts and solve them one at a time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not spend more than five minutes stuck on a computer science problem before giving up or seeking help from someone else.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are times I solve a computer science problem more than one way to help my understanding.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Choose one of the above five choices that best expresses your feeling about the statement. If you don't understand a statement, leave it blank. If you understand, but have a strong opinion, choose "Neutral".

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly
I think about the computer science I experience in everyday life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tools and techniques from computer science can be useful in the study of other disciplines (e.g. biology, art, business)□.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When working on a computer science problem I find it useful to brainstorm about solution strategies before writing code.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find the challenge of solving computer science problems motivating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly disagree	Disagree	Neutral	Agree	Strongly
When studying computer science, I relate the important information to what I already know rather than just memorizing it the way it is presented.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy solving computer science problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reasoning skills used to understand computer science can be helpful to me in my everyday life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Choose one of the above five choices that best expresses your feeling about the statement. If you don't understand a statement, leave it blank. If you understand, but have a strong opinion, choose "Neutral".

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly
Learning computer science is just about learning how to program in different languages.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am working on a computer science program, I try to decide what reasonable output values would be.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm trying to learn something new in computer science, I find it useful to write a small program to see how it works.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A significant problem in learning computer science is being able to memorize all the information I need to know.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We use this statement to discard the surveys of people who are not reading the questions. Please select "Agree" for this question to preserve your answers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding computer science basically means being able to recall something you've read or been shown.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I get stuck on a computer science problem, there is no chance I'll figure it out on my own.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Choose one of the above five choices that best expresses your feeling about the statement. If you don't understand a statement, leave it blank. If you understand, but have a strong opinion, choose "Neutral".

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly
The subject of computer science has little relation to what I experience in the real world.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is usually only one correct approach to solving a computer science problem.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To learn computer science, I only need to memorize solutions to sample problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I worry that mistakes I make when writing a program may damage my computer.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am interested in learning more about computer science.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

(goals)

**What were the top three goals that you hoped to achieve this semester?**

Please select between 0 and 3 items.

- Getting a particular grade (please specify the grade)
- Learning the required skills and concepts
- Staying on top of the course material and assignments
- Creating a computer program that does something useful
- Learning or improving your study skills
- Finding out if you're interested in Computer Science
- Working hard
- Making friends
- Other, please specify...

Current number checked: 0 Minimum: 0 | Maximum: 3

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

**Course project topic**

The following questions ask you about your chosen information source for the CPSC 103 project.

**Which information source did you choose for your CPSC 103 project?**

- Works of art at the Museum of Modern Art
- Daily weather data
- Concentration of CO2 in the atmosphere (1958-2015)
- Information about songs
- Motor Vehicle Fatalities in BC
- Births per woman by country
- U.S. presidential endorsements by newspapers
- GDP, unemployment, and population by country
- Other, please specify...

Please briefly explain why you chose this information source instead of the others.

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

### Helpfulness of course activities and resources

The following questions ask you about the helpfulness of the different activities and resources for your learning in CPSC 103.

#### Helpfulness of course activities

How helpful or unhelpful were the following required elements of the course activities for your learning in CPSC 103?

	Very unhelpful	Unhelpful	Neither unhelpful nor helpful	Helpful	Very helpful
Lectures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tutorials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Project	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pre-class readings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pre-class problems and writing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Peer review	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please explain your previous answer in the next three questions:

a. Why were the **lectures** helpful or unhelpful for your learning in CPSC 103?

Type here

b. Why was the **project** helpful or unhelpful for your learning in CPSC 103?

Type here

#### Helpfulness of course resources

How helpful or unhelpful were the following resources for your learning in CPSC 103?

	Very unhelpful	Unhelpful	Neither unhelpful nor helpful	Helpful	Very helpful	Not applicable (never used)
Studying with peers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instructor office hours	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TA office hours	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extra practice problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EdX discussion forum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

### Experience

The following questions ask you about your experience in CPSC 103 this term.

#### What grade do you expect to get in CPSC 103?

- 90 – 100%
- 80 – 89%
- 70 – 79%
- 60 – 69%
- 50 – 59%
- < 50%

#### Time spent on CPSC 103

On average, how many hours per week did you spend on the course outside of scheduled class time (i.e. do not include time spent in lectures or tutorials)

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- More than 20

#### Satisfaction

How satisfied or unsatisfied are you with the following aspects of your experience in CPSC 103?

	Very unsatisfied	Unsatisfied	Neither unsatisfied or satisfied	Satisfied	Very sat
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	Very unsatisfied	Unsatisfied	Neither unsatisfied or satisfied	Satisfied	Very sat
the skills and knowledge that you learned in CPSC 103	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the amount of time / effort that you had to put into the course	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the resources available when you had questions or needed help	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the grade that you expect to earn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
your overall experience in CPSC 103	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**What were the most valuable skills or concepts that you learned (or improved) in CPSC 103?**

Type here

**How do you expect to apply the skills and concepts you learned (or improved) in CPSC 103 in the future?**

- In my career (current work or future career)
- In personal programming projects
- In day-to-day life situations (unrelated to programming)
- In future non-CS courses
- In future CS courses
- Unsure
- N/A - will not apply in the future

**Tell us about your best experience creating something (anything) in CPSC 103.**

Type here

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

**Do you intend to take more courses in Computer Science after taking CPSC 103?**

- Yes, definitely
- Very likely
- Somewhat likely
- Neither likely or unlikely
- Somewhat unlikely
- Very unlikely
- No, definitely not

**What changes could be made in the course to assist the learning of future students in CPSC 103?**

For each change, please explain why you think we should make this change.

Type here

**What aspects of CPSC 103 did you most appreciate and think are important to keep for future offerings?**

For each aspect, please explain why you appreciated this aspect.

Type here

**Other Comments**

Please share any additional comments you have about your experience in CPSC 103 that you would want us to know.

Type here

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

### Follow up course to CPSC 103

The following questions are related to a proposed follow-up course to CPSC 103.

#### Would you be interested in taking a course that directly follows CPSC 103?

- No
- Maybe
- Yes

Please briefly explain you would or would not be interested in taking a follow up course to CPSC 103.

Type here

#### Interest in creating different types of programs

In a future follow on course to CPSC 103, we would like students to learn how to design programs that extend beyond data analysis.

Please indicate how interested or uninterested you would be in learning to design each of the following types of programs:

	Very uninterested	Somewhat uninterested	Neither uninterested nor interested	Somewhat interested	Very interested
Digital analysis of music	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Art generation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Visualization of data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Editing photographs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Puzzle solving	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Simulation (e.g., simulating a biological system, such as animal populations)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Working with information downloaded directly from an online source (as opposed to information read from a file)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please press Submit to complete the survey.

Thank you for participating!





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## Computer Science Student Experience - Pre Term Survey (2016 W2)

### Page 1

#### Computer Science Student Experience Project

All current CPSC 110 students are invited to complete this survey.

**Your course instructor is offering bonus points of 1% in the course for completing this survey.** An additional bonus will be offered for completing the companion survey at the end of the term

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#### Principal Investigator:

Warren Code, Science Centre for Learning and Teaching, 604.822.4691, [warcodescience@science.ubc.ca](mailto:warcodescience@science.ubc.ca)

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**Introduction:** We would welcome your participation in a study of introductory courses in Computer Science. The results of this study may be published in some form and presented publicly, but without any information that could be used to identify the participants.

**Purpose:** You are being invited to take part in this research study because you are in a course offered by the department of Computer Science. This study will seek to understand who takes introductory CS courses and why, and to evaluate students' attitudes towards learning CS, as well as their experience and performance in their introductory CS courses. Study results will help to ensure an effective teaching and learning experience for future students and may result in direct revisions to courses.

**Study Procedures:** Your participation will involve completing two surveys. The first survey will occur at the beginning of the term, and a second survey will occur at the end of the term. You are welcome to complete the second survey even if you did not complete the first survey. Each survey will take 10-15 minutes.

**Potential Risks and Benefits:** There are no known risks to participants in this study. The benefits to you are indirect. Input from this study will enable faculty members to improve teaching and learning activities in introductory courses for the benefit of future students.

**Confidentiality:** Your confidentiality will be respected. Your course instructor will not see any responses until after the final grades for the course have been submitted. All data/documents will be kept in locked filing cabinets by one of the researchers listed in the study team who will not be one of the instructors of your current courses. Any electronic data/information will be kept on password-protected computers. You will not be identified by name in any reports of the completed study. For study purposes, we may use your student number to link your responses to your grades and GPA, demographic information from the Student Information System and language assessments that you took starting at UBC provided by the UBC Office of Planning and Institutional Research. We may also use your student number to link your responses to analytics data regarding use of the online course resources (edX and Connect), data you provide throughout the term on the workload of the course, and any responses you provide through participation in other activities in this study, such as focus groups or interviews. In these cases, after your responses are matched with the data, all the identifiers will be deleted for future analysis.

**Remuneration/Compensation:** For your participation in each survey, your course instructor may offer you bonus points in the course. You are eligible for this bonus even if you do not consent to have your responses included in the study.

**Contact for information about the study:** If you have any questions or desire further information with respect to this study, you may contact the principal investigator or the relevant co-investigator(s) mentioned above.

**Contact for concerns about the rights of research subjects:** If you have any concerns or complaints about your rights as a research participant and/or your experience while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or if long distance e-mail [RSIL@ubc.ca](mailto:RSIL@ubc.ca) or call toll free 1-877-822-8598.

**Consent:** Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time without penalty.

Please ensure you understand this consent form before beginning the survey. Your consent to participate in this study is assumed once you have agreed to the conditions of informed consent and completed and submitted the questionnaire online. You may download and save a copy of this consent form for your records: [\[Download PDF\]](#)

Please select one:

- (a) I DO consent to having my responses included in the study. I understand that I am under no obligation to consent and will receive the participation bonus for completing the survey.

the survey with or without consent.

- (b) I DO NOT consent to having my responses included in the study. I understand that I am under no obligation to consent and will receive the participation bonus for completing the survey with or without consent.

## Background

Thank you for participating in this survey! We appreciate your feedback.

Please answer the questions to the best of your ability. We required your Student ID and First and Last name, but the remaining questions in the survey are optional - if you do not answer a question, or do not understand the question, you may skip it.

### What is your First and Last name? (required)

### What is your 8-digit UBC Student ID? (required)

### What is your current or intended area of study at the University of British Columbia?

You may select multiple areas if you plan on doing a double or combined major.

- I haven't decided yet
- Business
- Cognitive Systems
- Computer Science
- Education
- Engineering
- Fine / Performing / Visual Arts
- Health Sciences / Medicine / Nursing / Pharmacy
- Humanities
- Life Sciences
- Mathematics
- Media Studies (BMS degree)
- Physical Sciences
- Social Sciences
- Statistics
- Other, please specify...

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

**Attitudes towards Computer Science and Programming**

Here are a number of statements that may or may not describe your beliefs about learning computer science. You are asked to rate each statement according to the following rating scale:

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Choose one of the above five choices that best expresses your feeling about the statement. If you don't understand a statement, leave it blank. If you understand, but have a strong opinion, choose "Neutral".

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly
After I study a topic in computer science and feel that I understand it, I have difficulty solving problems on the same topic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Errors generated by computers are random, and when they happen there's not much I can do to understand why.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I want to apply a method used for solving one computer science problem to another problem, the problems must involve very similar situations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can usually figure out a way to solve computer science problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I solve a computer science problem, I break it into smaller parts and solve them one at a time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not spend more than five minutes stuck on a computer science problem before giving up or seeking help from someone else.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are times I solve a computer science problem more than one way to help my understanding.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Choose one of the above five choices that best expresses your feeling about the statement. If you don't understand a statement, leave it blank. If you understand, but have a strong opinion, choose "Neutral".

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly
I think about the computer science I experience in everyday life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tools and techniques from computer science can be useful in the study of other disciplines (e.g. biology, art, business) <input type="checkbox"/> .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When working on a computer science problem I find it useful to brainstorm about solution strategies before writing code.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find the challenge of solving computer science problems motivating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When studying computer science, I relate the important information to what I already know rather than just memorizing it the way it is <input type="checkbox"/> presented.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly disagree	Disagree	Neutral	Agree	Strongly
I enjoy solving computer science □ problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reasoning skills used to understand computer science can be helpful to me in my everyday life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Choose one of the above five choices that best expresses your feeling about the statement. If you don't understand a statement, leave it blank. If you understand, but ha strong opinion, choose "Neutral".

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly
Learning computer science is just about learning how to program in different languages□.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am working on a computer science program, I try to decide what reasonable output values would be□.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm trying to learn something new in computer science, I find it useful to write a small program to see how it works.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A significant problem in learning computer science is being able to memorize all the information I need to know.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We use this statement to discard the surveys of people who are not reading the questions. Please select "Agree" for this question to preserve your answers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding computer science basically means being able to recall something you've read or been shown.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I get stuck on a computer science problem, there is no chance I'll figure it out on my own.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Choose one of the above five choices that best expresses your feeling about the statement. If you don't understand a statement, leave it blank. If you understand, but ha strong opinion, choose "Neutral".

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Neutral	Agree	Strongly
The subject of computer science has little relation to what I experience in the real world□.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is usually only one correct approach to solving a computer science problem.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To learn computer science, I only need to memorize solutions to sample problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I worry that mistakes I make when writing a program may damage my computer□.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am interested in learning more about computer science.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

### Expectations

The following questions ask you about your reasons for taking CPSC 110 and your expectations for the course.

#### Why are you taking CPSC 110?

You may select more than one reason, even if you are taking the course because it is required.

- It is required for my program
- A friend recommended it to me
- I think it will be easy
- I heard the professor is good
- I think it will be useful for my academic program or career
- Out of interest
- Other, please specify...

#### What are the top three goals that are most important to you to achieve in CPSC 110 by the end of the semester?

Please select between 0 and 3 items.

- Getting a particular grade (please specify the grade)
- Learning the required skills and concepts
- Staying on top of the course material and assignments
- Creating a computer program that does something useful
- Learning or improving your study skills
- Finding out if you're interested in Computer Science
- Working hard
- Making friends
- Other, please specify...

Current number checked: 0 Minimum: 0 | Maximum: 3

How confident are you that you will be able to achieve your top three goals from the previous question?

- Very confident
- Somewhat confident
- Neither confident nor unconfident
- Somewhat unconfident
- Very unconfident

#### What grade do you expect to get in CPSC 110?

- 90 – 100%
- 80 – 89%
- 70 – 79%
- 60 – 69%
- 50 – 59%

< 50%

**What skills or concepts do you hope to learn or improve in CPSC 110?**

Type here

**How do you expect to apply the skills and concepts you learn or improve on in CPSC 110 in the future?**

- In future CS courses
- In future courses besides CS
- In my career (current work or future career)
- In personal programming projects
- In day-to-day life situations (unrelated to programming)
- Unsure
- N/A - will not apply in the future



**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

### Previous Experience

The following questions ask you about your previous experiences designing programs. No previous experience with programming is expected in CPSC 110. However, we are interested in knowing about any previous experience you do have creating computer programs.

#### How much previous experience do you have writing computer programs?

- No previous experience
- Less than 6 months
- 6 months - 2 years
- More than 2 years

#### What types of experience writing computer programs do you have?

If you have no previous experience, you may skip this question.

- University or college course(s)
- High school course(s)
- Elementary or middle school course(s)
- Summer camp or other short program (e.g., workshop)
- Online courses (e.g., Coursera)
- Online tutorials (e.g. Codecademy, Hour of Code)
- Completing personal projects
- At work / for a job
- Other, please specify...

#### Tell us about the best experience you've had creating something (anything) with a computer.

This could be a one-time event, or an ongoing activity, or any other experience you've had related in any way to creating something with a computer. We do not expect it to be a computer program - it could be absolutely anything.

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

### Demographics

The remaining questions ask you about your first languages and the languages you consider yourself fluent in.

#### What was the first language(s) that you spoke as a child?

- Cantonese
- English
- French
- Korean
- Mandarin
- Spanish
- Other, please specify...

#### What languages do you speak fluently?

- Cantonese
- English
- French
- Korean
- Mandarin
- Spanish
- Other, please specify...

Please press Submit to complete the survey.

Thank you for participating!



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## Computer Science Student Experience - Post Term Survey (2016 W2)

### Page 1

#### Computer Science Student Experience Project

All current CPSC 110 students are invited to complete this survey. This is the second of two surveys. The first survey occurred at the beginning of the term. You are welcome to complete this survey even if you did not complete the first survey.

**Your course instructor is offering bonus points of 1% in the course for completing this survey.** This bonus is in addition to any points received for the first survey at the beginning of the term.

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#### Principal Investigator:

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#### Co-investigators:

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Jessica Dawson, Science Teaching and Learning Fellow and Lecturer, Department of Computer Science, 604-822-0694, [jqdawson@cs.ubc.ca](mailto:jqdawson@cs.ubc.ca)

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**Introduction:** We would welcome your participation in a study of introductory courses in Computer Science. The results of this study may be published in some form and presented publicly, but without any information that could be used to identify the participants.

**Purpose:** You are being invited to take part in this research study because you are in a course offered by the department of Computer Science. This study will seek to understand who takes introductory CS courses and why, and to evaluate students' attitudes towards learning CS, as well as their experience and performance in their introductory CS courses. Study results will help to ensure an effective teaching and learning experience for future students and may result in direct revisions to courses.

**Study Procedures:** Your participation will involve completing two surveys. The first survey will occur at the beginning of the term, and a second survey will occur at the end of the term. You are welcome to complete the second survey even if you did not complete the first survey. Each survey will take 10-15 minutes.

**Potential Risks and Benefits:** There are no known risks to participants in this study. The benefits to you are indirect. Input from this study will enable faculty members to improve teaching and learning activities in introductory courses for the benefit of future students.

**Confidentiality:** Your confidentiality will be respected. Your course instructor will not see any responses until after the final grades for the course have been submitted. All data/documents will be kept in locked filing cabinets by one of the researchers listed in the study team who will not be one of the instructors of your current courses. Any electronic data/information will be kept on password-protected computers. You will not be identified by name in any reports of the completed study. For study purposes, we may use your student number to link your responses to your grades and GPA, demographic information from the Student Information System and language assessments that you took starting at UBC provided by the UBC Office of Planning and Institutional Research. We may also use your student number to link your responses to analytics data regarding use of the online course resources (edX and Connect), data you provide throughout the term on the workload of the course, and any responses you provide through participation in other activities in this study, such as focus groups or interviews. In these cases, after your responses are matched with the data, all the identifiers will be deleted for future analysis.

**Remuneration/Compensation:** For your participation in each survey, your course instructor may offer you bonus points in the course. You are eligible for this bonus even if you do not consent to have your responses included in the study.

**Contact for information about the study:** If you have any questions or desire further information with respect to this study, you may contact the principal investigator or a relevant co-investigator(s) mentioned above.

**Contact for concerns about the rights of research subjects:** If you have any concerns or complaints about your rights as a research participant and/or your experience while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or if long distance e-mail [RSIL@ubc.ca](mailto:RSIL@ubc.ca) or call toll free 1-877-822-8598.

#### (Consent)

**Consent:** Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time without penalty.

Please ensure you understand this consent form before beginning the survey. Your consent to participate in this study is assumed once you have agreed to the conditions of informed consent and completed and submitted the questionnaire online. You may download and save a copy of this consent form for your records: [\[Download PDF\]](#)

Please select one:

- (a) I DO consent to having my responses included in the study. I understand that I am under no obligation to consent and will receive the participation bonus for completing the survey with or without consent.
- (b) I DO NOT consent to having my responses included in the study. I understand that I am under no obligation to consent and will receive the participation bonus for completing the survey with or without consent.

## Background

Thank you for participating in this survey! We appreciate your feedback

Please answer the questions to the best of your ability. We require your Student ID and First and Last name, as well as your enrollment in Vantage, but the remaining questions in the survey are optional - if you prefer not to answer a question, or do not understand the question, you may skip it.

### What is your First and Last name? (required)

### What is your 8-digit UBC Student ID? (required)

### Are you enrolled in Vantage College? (required)

Yes

No

### What is your current or intended area of study at the University of British Columbia?

You may select multiple areas if you plan on doing a double or combined major.

I haven't decided yet

Business

Cognitive Systems

Computer Science

Education

Economics

Engineering

Fine / Performing / Visual Arts

Health Sciences / Medicine / Nursing / Pharmacy

Humanities

Life Sciences

Mathematics

Media Studies (BMS degree)

Physical Sciences

Social Sciences

Statistics

Other, please specify...

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

**Attitudes towards Computer Science and Programming**

Here are a number of statements that may or may not describe your beliefs about learning computer science. You are asked to rate each statement according to the following rating scale:

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Choose one of the above five choices that best expresses your feeling about the statement. If you don't understand a statement, leave it blank. If you understand, but have a strong opinion, choose "Neutral".

Please choose the appropriate response for each item:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly
After I study a topic in computer science and feel that I understand it, I have difficulty solving problems on the same topic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Errors generated by computers are random, and when they happen there's not much I can do to understand why.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I want to apply a method used for solving one computer science problem to another problem, the problems must involve very similar situations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can usually figure out a way to solve computer science problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I solve a computer science problem, I break it into smaller parts and solve them one at a time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not spend more than five minutes stuck on a computer science problem before giving up or seeking help from someone else.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are times I solve a computer science problem more than one way to help my understanding.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Choose one of the above five choices that best expresses your feeling about the statement. If you don't understand a statement, leave it blank. If you understand, but have a strong opinion, choose "Neutral".

Please choose the appropriate response for each item:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly
I think about the computer science I experience in everyday life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tools and techniques from computer science can be useful in the study of other disciplines (e.g. biology, art, business) <input type="checkbox"/> .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When working on a computer science problem I find it useful to brainstorm about solution strategies before writing code.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find the challenge of solving computer science problems motivating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When studying computer science, I relate the important information to what I already know rather than just memorizing it the way it is <input type="checkbox"/> presented.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Disagree	Disagree	Neutral	Agree	Strongly
I enjoy solving computer science □ problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reasoning skills used to understand computer science can be helpful to me in my everyday life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Choose one of the above five choices that best expresses your feeling about the statement. If you don't understand a statement, leave it blank. If you understand, but have a strong opinion, choose "Neutral".

Please choose the appropriate response for each item:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly
Learning computer science is just about learning how to program in different languages□.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am working on a computer science program, I try to decide what reasonable output values would be□.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm trying to learn something new in computer science, I find it useful to write a small program to see how it works.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A significant problem in learning computer science is being able to memorize all the information I need to know.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We use this statement to discard the surveys of people who are not reading the questions. Please select "Agree" for this question to preserve your answers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding computer science basically means being able to recall something you've read or been shown.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I get stuck on a computer science problem, there is no chance I'll figure it out on my own.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Choose one of the above five choices that best expresses your feeling about the statement. If you don't understand a statement, leave it blank. If you understand, but have a strong opinion, choose "Neutral".

Please choose the appropriate response for each item:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly
The subject of computer science has little relation to what I experience in the real world□.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is usually only one correct approach to solving a computer science problem.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To learn computer science, I only need to memorize solutions to sample problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I worry that mistakes I make when writing a program may damage my computer□.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am interested in learning more about computer science.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

(goals)

**What were the top three goals that you hoped to achieve this semester?**

Please select between 1 and 3 items.

- Getting a particular grade (please specify)
- Learning the required skills and concepts
- Staying on top of the course material and assignments
- Creating a computer program that does something useful
- Learning or improving your study skills
- Finding out if you're interested in Computer Science
- Working hard
- Making friends
- Other (please specify one goal)

Current number checked: 0 Minimum: 1 | Maximum: 3

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

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### Experience

The following questions ask you about your experience in CPSC 110 this term.

#### Tell us about your best experience creating something (anything) in CPSC 110.

Type here

#### What grade do you expect to get in CPSC 110?

- 90 – 100%
- 80 – 89%
- 70 – 79%
- 60 – 69%
- 50 – 59%
- < 50%

#### Time spent on CPSC 110

On average, how many hours per week did you spend on the course outside of scheduled class time (i.e. do not include time spent in lectures, labs or tutorials)

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20

More than 20

## Satisfaction

How satisfied or unsatisfied are you with the following aspects of your experience in CPSC 110?

	Very unsatisfied	Unsatisfied	Neither unsatisfied or satisfied	Satisfied	Very sat
the skills and knowledge that you learned in CPSC 110	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the amount of time / effort that you had to put into the course	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the resources available when you had questions or needed help	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
the grade that you expect to earn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
your overall experience in CPSC 110	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(skills)

## What are the top 3 skills or concepts that you learned (or improved) on the most this semester?

Please select between 1 and 3 items.

- Problem solving (e.g. breaking large problems down into manageable pieces)
- How to write readable, well-structured programs
- How to learn and program in a new language
- Fundamental computer science concepts (e.g., data types, searching, sorting, recursion)
- How computers work
- A new way(s) of thinking
- Patience and discipline
- Working independently
- Study and time management strategies
- Other, please specify . . .

Current number checked: 0 Minimum: 1 | Maximum: 3

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

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### Helpfulness of course activities and resources

The following questions ask you about the helpfulness of the different activities and resources for your learning in CPSC 110.

#### Helpfulness of course activities

How helpful or unhelpful were the following required elements of the course activities for your learning in CPSC 110?

	Very unhelpful	Unhelpful	Neither unhelpful nor helpful	Helpful	Very helpful
Lectures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Labs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Graded Problem sets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Videos in EdX required as preparation by your instructor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please explain your previous answer in the next two questions:

a. Why were the **lectures** helpful or unhelpful for your learning in CPSC 110?

Type here

b. Why were the **labs** helpful or unhelpful for your learning in CPSC 110? We are particularly interested in whether you found the design review exercises helpful or unhelpful.

Type here

#### Helpfulness of course resources

How helpful or unhelpful were the following resources for your learning in CPSC 110?

	Very unhelpful	Unhelpful	Neither unhelpful nor helpful	Helpful	Very helpful	Not applicable (never used)
Working with a designated partner on problem sets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Studying with peers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instructor office hours	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TA office hours (DLC)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Practice problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EdX discussion board	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Videos in EdX that you chose to watch as extra practice or review	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

**Vantage College Activities and Resources**

The following questions ask you about the different Vantage College activities and resources and their helpfulness for your learning in CPSC 110.

**Helpfulness for mastering the English language**

How helpful or unhelpful were the following course activities for improving your mastery of the English language?

	Very unhelpful	Unhelpful	Neither unhelpful nor helpful	Helpful	Very helpful
VANT 140 content tutorial for Computer Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lectures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Labs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Graded Problem Sets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**VANT 140 Content Tutorial**

In the VANT 140 Content Tutorial you participated in different types of exercises led by TAs.

How helpful or unhelpful were the following exercises for your mastery of the CPSC 110 course content?

	Very unhelpful	Unhelpful	Neither unhelpful nor helpful	Helpful	Very helpful
Classroom based discussion led by the TA	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Paper based individual programming exercises	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Paper based group programming exercises	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Group based critique of sample solutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grading of each others quizzes with a given grading rubric	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Group presentations of solutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

**Do you intend to take more courses in Computer Science after taking CPSC 110?**

- Yes, definitely
- Very likely
- Somewhat likely
- Neither likely or unlikely
- Somewhat unlikely
- Very unlikely
- No, definitely not

**What changes could be made in the course to assist the learning of future students in CPSC 110?**

For each change, please explain why you think we should make this change.

Type here

**What aspects of CPSC 110 did you most appreciate and think are important to keep for future offerings?**

For each aspect, please explain why you appreciated this aspect.

Type here

**Other Comments**

Please share any additional comments you have about your experience in CPSC 110.

Type here



**Instructions:** Please answer the questions to the best of your ability. If you prefer not to answer a question, or do not understand the question, you may skip it.

### Demographics

The remaining questions ask you about your first languages and the languages you consider yourself fluent in.

#### What was the first language(s) that you spoke as a child?

- Cantonese
- English
- French
- Korean
- Mandarin
- Spanish
- Other, please specify...

#### What languages do you speak fluently?

- Cantonese
- English
- French
- Korean
- Mandarin
- Spanish
- Other, please specify...

Please press Submit to complete the survey.

Thank you for participating!



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