Electrical and Computer Engineering 2021 Class Profile

May 2021

Introduction

The concept of a Class Profile, a census of sorts of the graduating class, was pioneered by the Systems Design Class of 2017, and similar profiles have since been made by various departments such as Software, Biomedical, Mechatronics, and Management Sciences.

For the first time ever, we are pleased to present an ECE Class Profile to highlight the backgrounds, accomplishments, and personalities of our unique and diverse class.

Within ECE, there are two programs of study: Computer Engineering and Electrical Engineering. While both programs share the same schedule for the first three terms, starting at the fourth term the programs begin to diverge.

Furthermore, the class is split into two cohorts: the Stream 8 class and the Stream 4 class. The latter starts their first work term after four months of study, while the former does eight months of study.

This Class Profile project is not affiliated nor endorsed by the University of Waterloo or the Department of Electrical and Computer Engineering. This survey is not meant to be a scientific study and data may not necessarily extrapolate to the entire class.

Methodology Note

Two separate surveys were conducted from which data is drawn for this profile.

The first is the ECE Exit Survey, administered by the Department of Electrical and Computer Engineering, from which we were permitted to use the aggregated data. This Exit Survey received 319/325 responses (98% response rate).

The second was an independently student-led Class Profile Survey, which received 152/325 responses (46.8% response rate). Proportion-wise, the Class Profile survey was largely representative of the class in most demographic areas (such as program, stream, and gender), with the exception of International students being underrepresented.

To distinguish between data from the two surveys, the sample number has been included on most graphs.

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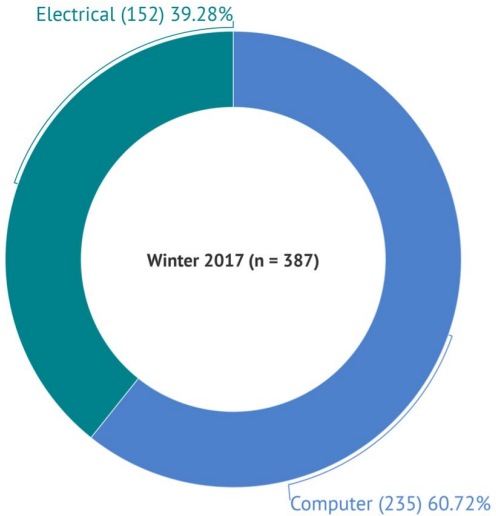
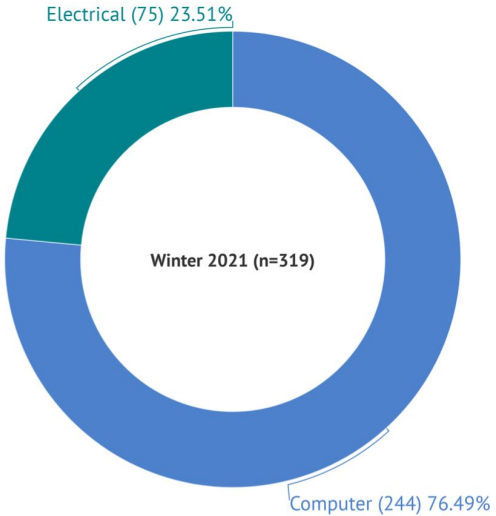
Demographics

Computer vs. Electrical



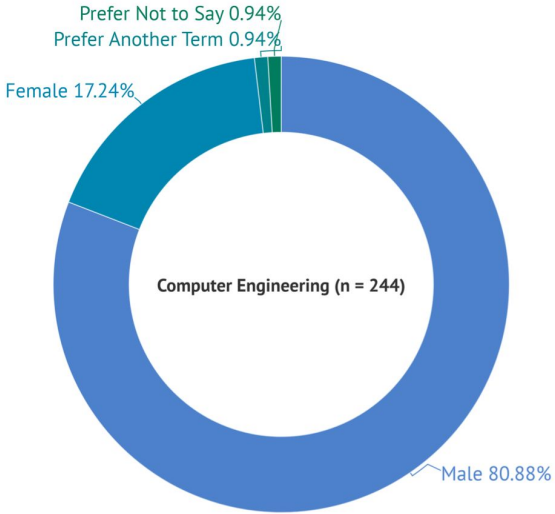


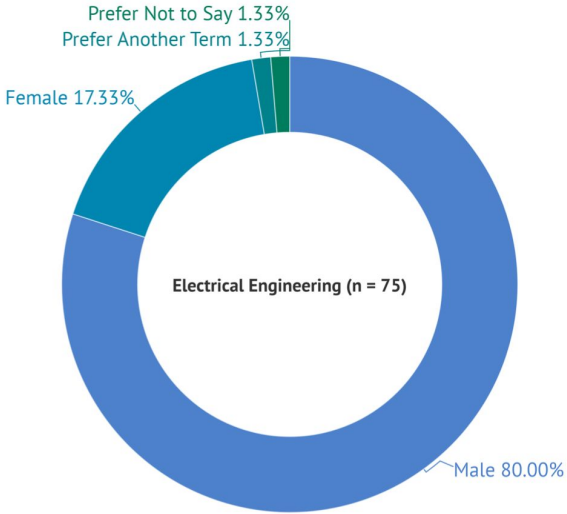
Within the ECE Department, there are two programs of study: Computer Engineering and Electrical Engineering. The two programs share the same courses up to and including the 2A academic term, meaning that transferring between the two programs is possible without penalty until then.

The proportion of Computer Engineering students increased between the second term of the program (Winter 2017) and the last term (Winter 2021).

Note: Winter 2017 data from Institutional Planning[1]

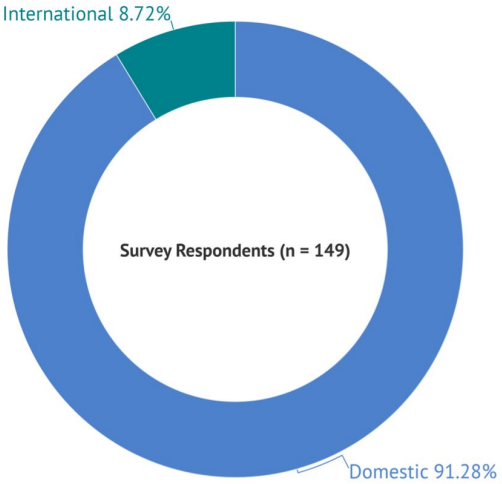
Gender

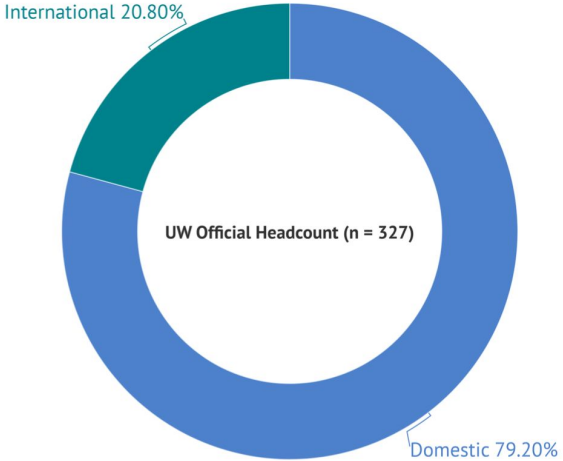




Both programs are still very much male-dominated, with around 80% of respondents in both classes identifying as male.

Domestic vs. International

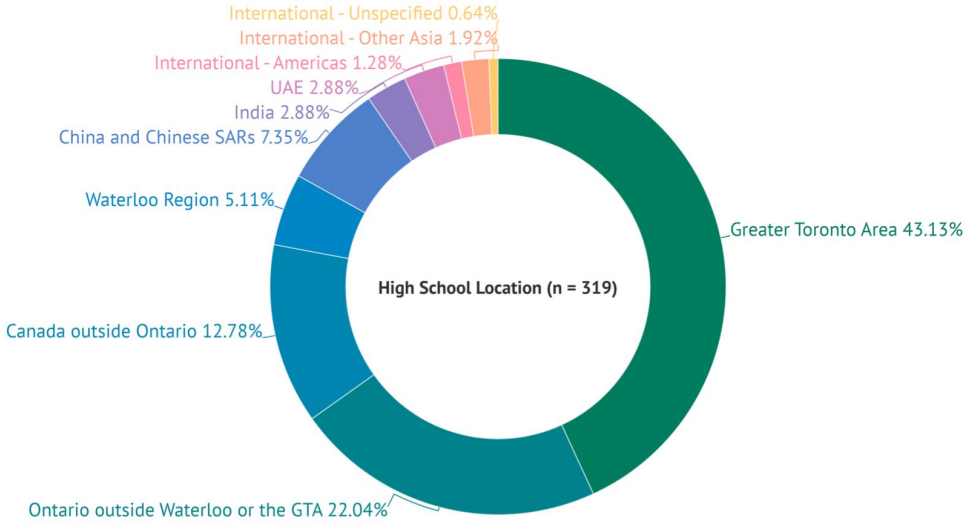




Domestic students are either Canadian Citizens or Permanent Residents. Regretfully, International students are underrepresented in the class profile survey.

The data from the Class Profile Survey is supplemented with data from Student Headcounts from University of Waterloo Institutional Planning[1]

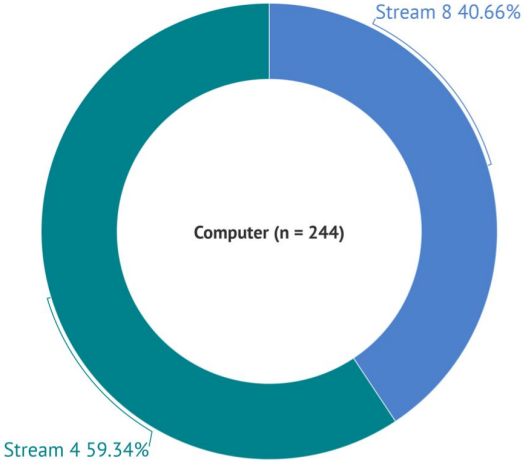
Where did we go to high school?

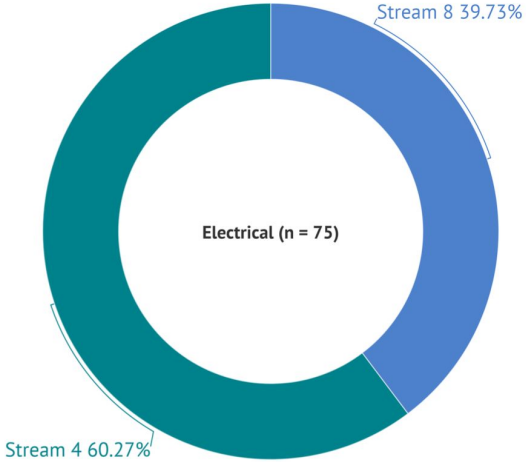


The Greater Toronto Area is by far the most popular region where students attended high school.

For privacy, only countries and regions with at least two respondents are listed independently, with single responses grouped under one of the “International” categories.

Cohort

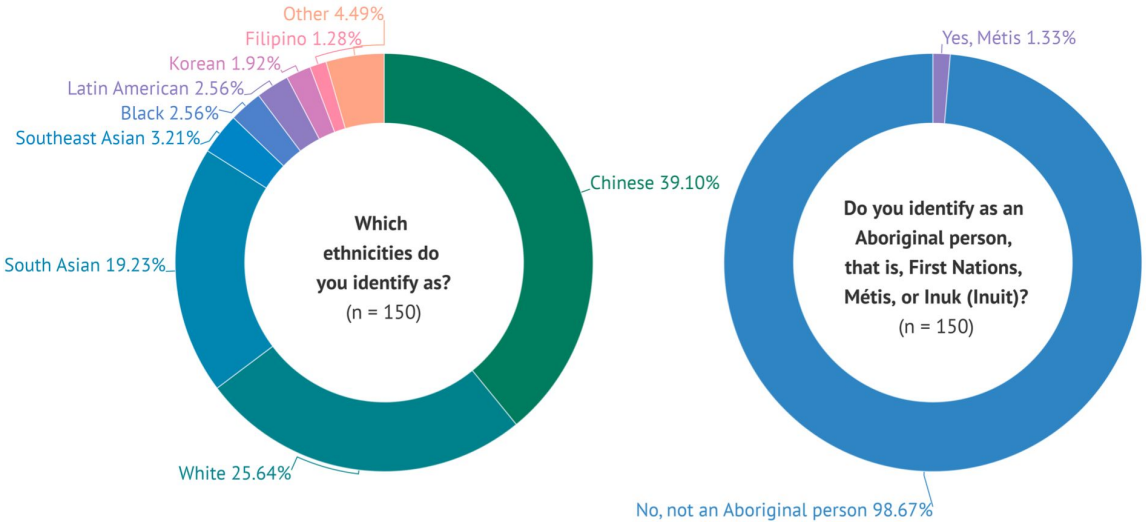




Both Electrical and Computer Engineering classes are split into two streams.
Stream 4 goes on a work term right away after their first term of study, while Stream 8 goes on their first work term after two terms of study.

Both streams meet in fourth year, with Stream 4 doing their 3B and 4A study terms back-to-back.

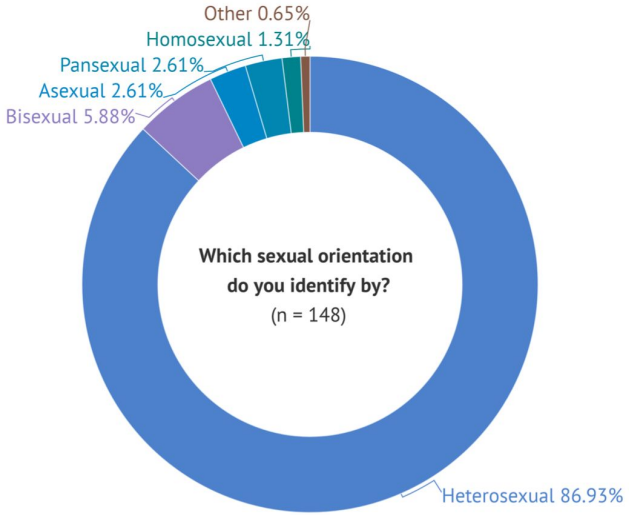
Ethnicities and Aboriginal Ancestry



For context, in the 2016 Canadian Census, **4.9%** of the Canadian population identified as an Aboriginal person[2].

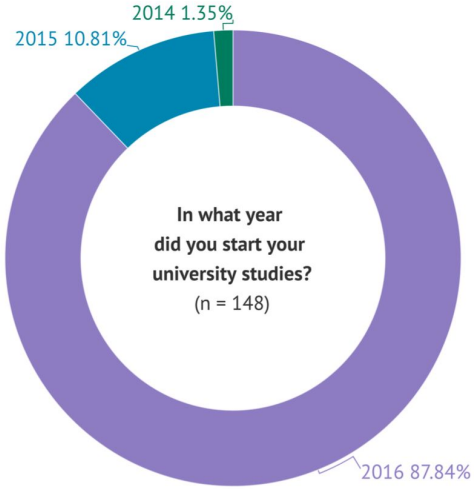
Note: The questions and response categories in these two questions are based on the Canadian Census.
South Asian (e.g. Indian, Pakistani, etc.); Southeast Asian (e.g. Vietnamese, Cambodian, Laotian, Thai, etc.)
This is also a reminder to Canadian readers to check your mail and complete the 2021 Census!

Sexual Orientation



Students' self-reported sexual orientation

Years Since Starting University



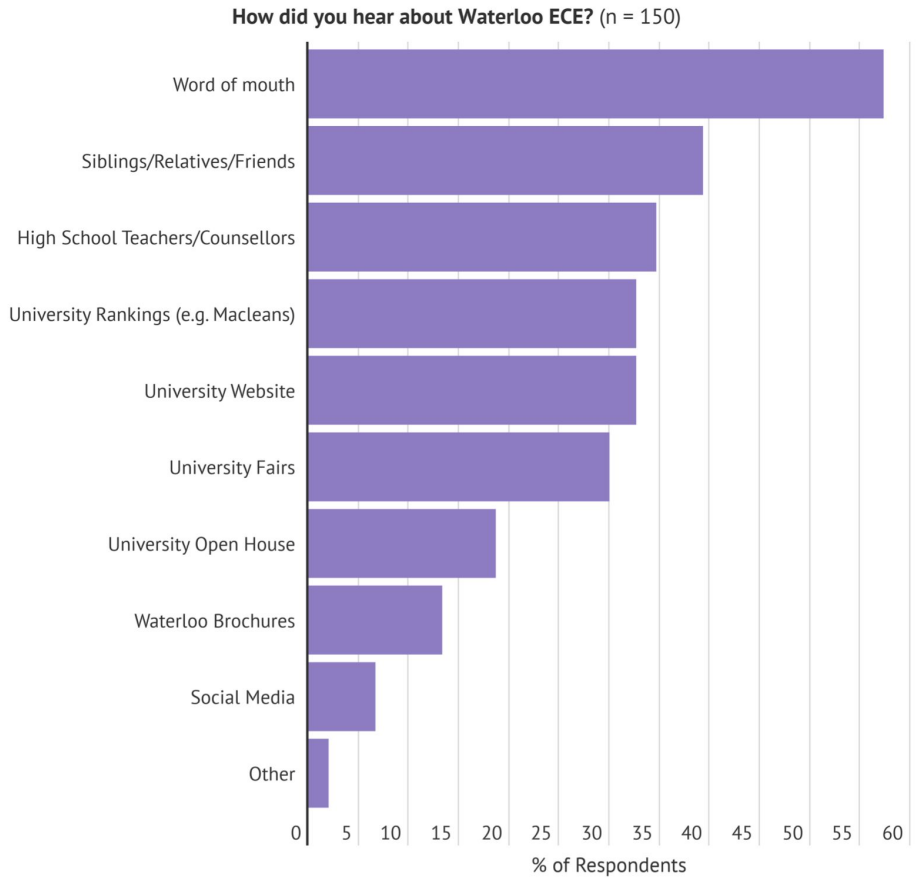
Not everyone finishes their program in the set time, and that's okay!
The ECE Program at Waterloo is meant to take 4 ⅔ years, meaning that those who graduated on time started their studies in 2016.

However, course credits start to expire after 7 years, so it is advised that you finish your program before then.

How did you hear about Waterloo ECE?

Many respondents said that they heard about Waterloo ECE by word of mouth from others.

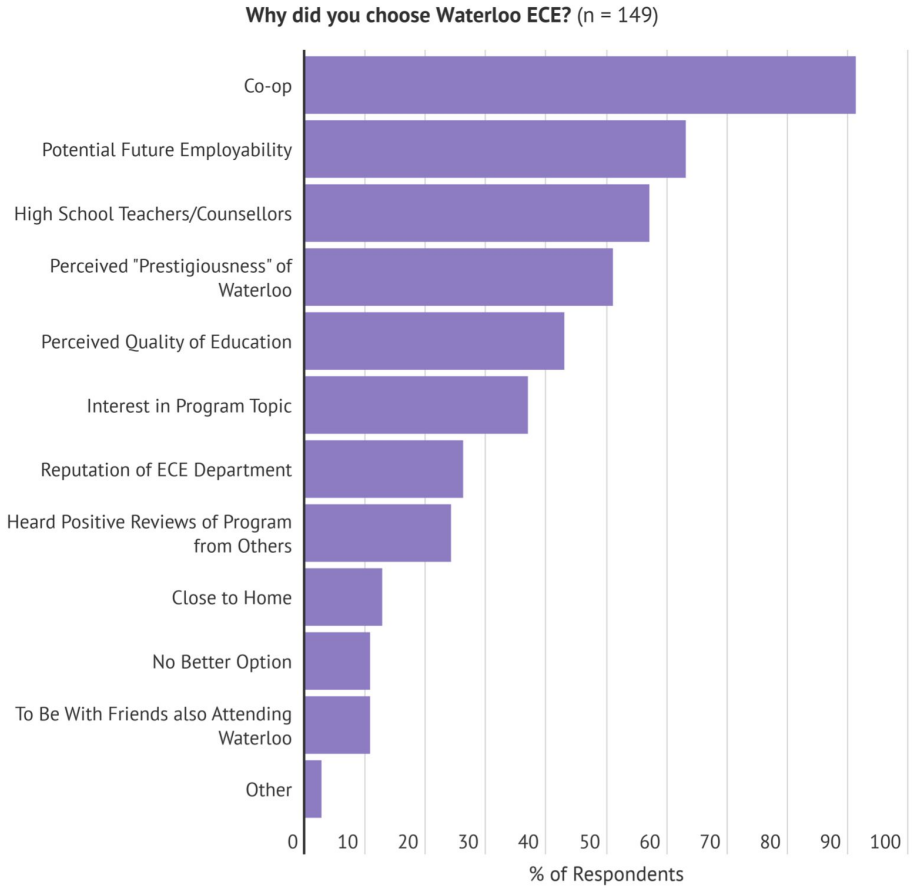
Multiple selections were allowed.



Why Waterloo ECE?

Co-op was by far the most popular reason respondents chose Waterloo ECE, with over 90% saying that it was a reason for choosing this program.

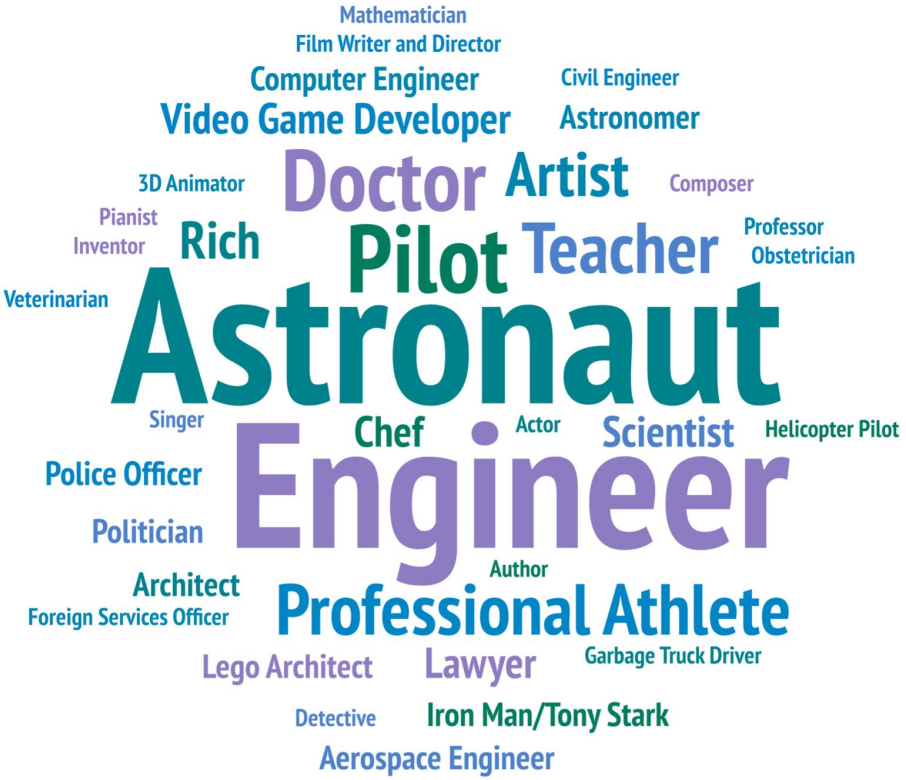
Only roughly 1/3rd of respondents said that they chose ECE because they were interested in the program topic.



Dream Careers

Perhaps unsurprisingly, the most popular career ECE students wanted to do as a kid was **engineer**, followed by **astronaut.**

Shout-out to the *multiple* respondents who said they wanted to grow up to be Iron Man/Tony Stark. I hope that works out for you one day.

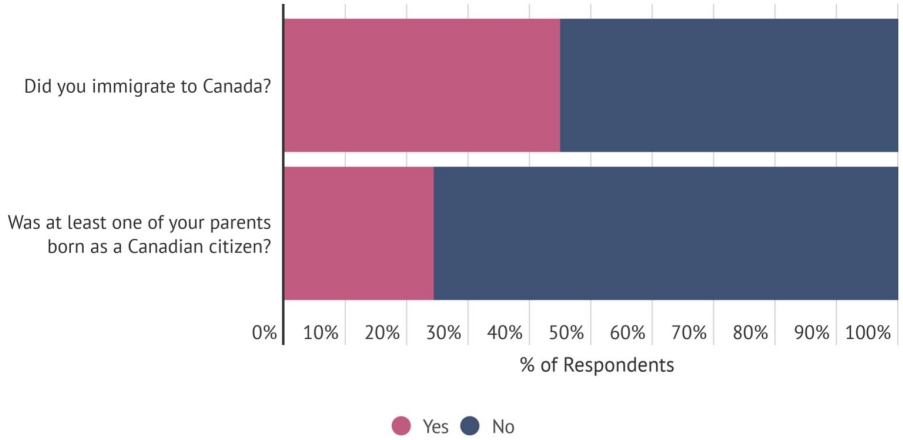


Before Waterloo

I swear that I will be faithful and bear true allegiance...

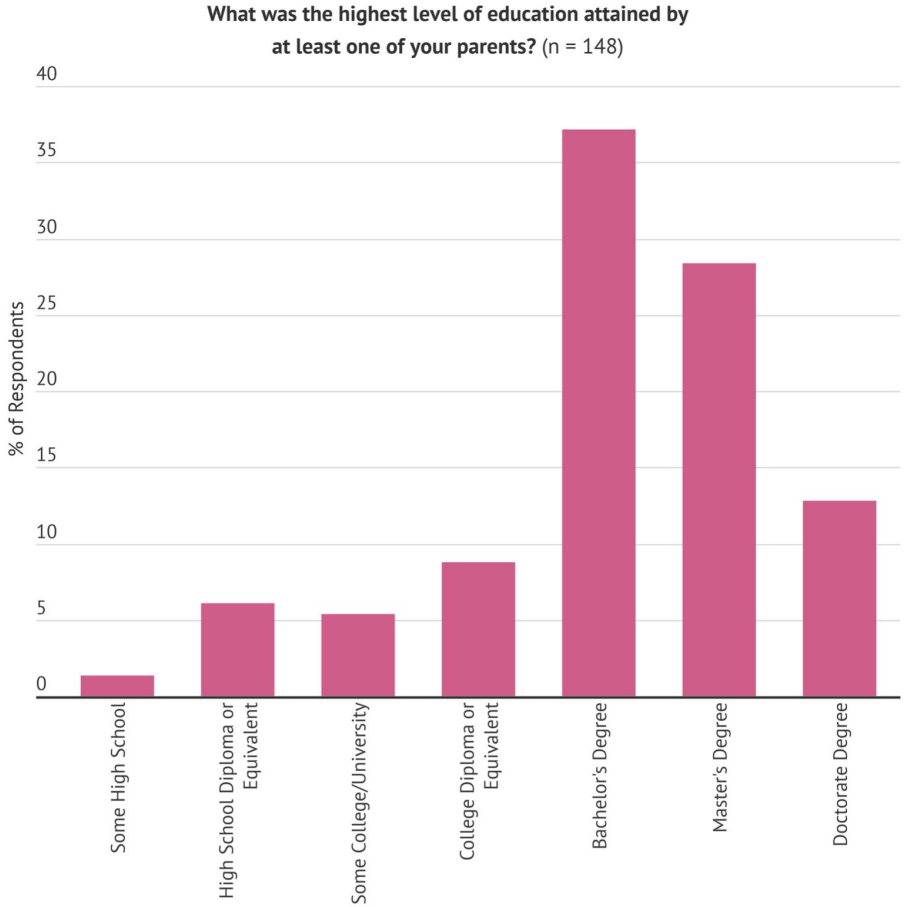
Just under half of respondents indicated that they immigrated to Canada. For those who did immigrate, the average age of doing so was 7.6 years old.

Only one quarter of respondents are at least second-generation Canadians.



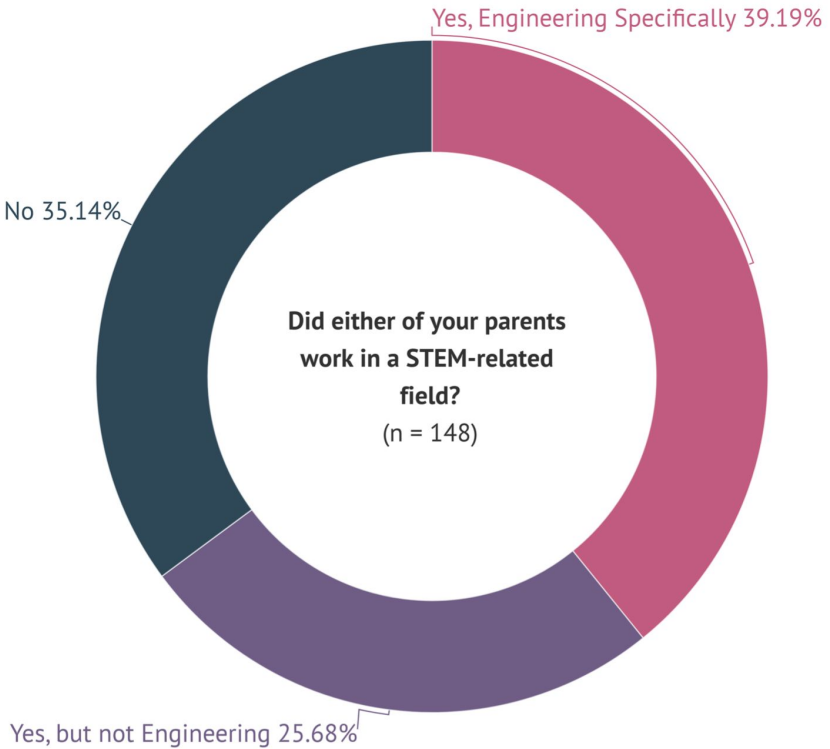
The apple doesn't fall far from the tree

Perhaps unsurprisingly, a vast majority of respondents also had at least one parent complete a university degree.



A chip off the old block

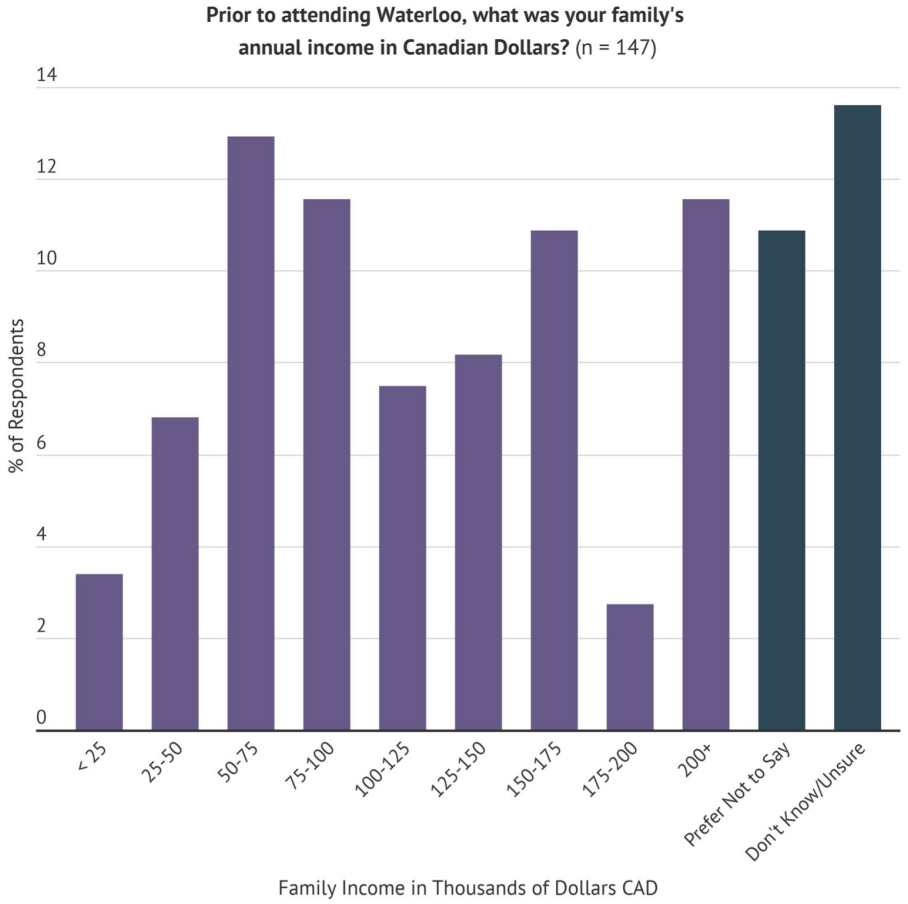
Perhaps also unsurprisingly, many respondents also had at least one parent work in an engineering or STEM (Science, Technology, Engineering, Math) related field.



Family Wealth

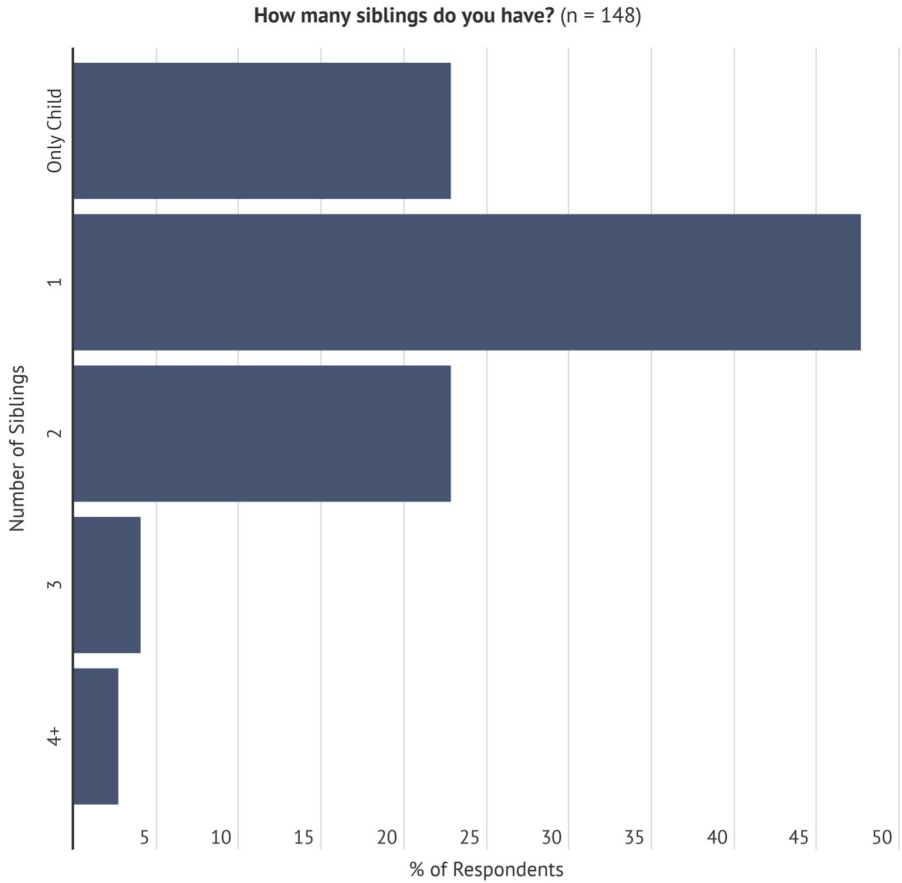
Students largely came from upper-middle-class or wealthy families.

For context, in 2016 the median Canadian household income for a two-parent family with the elder parent in the 45 to 54 age range was $114,400[3].



Siblings

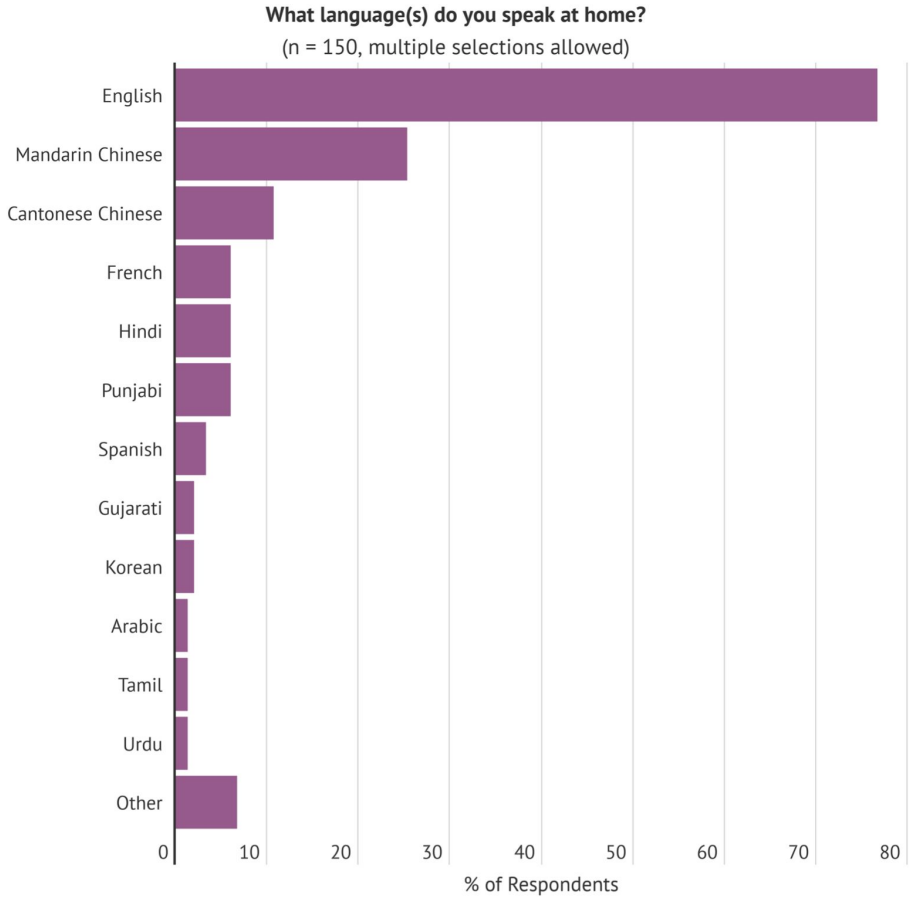
A majority of respondents have at least one sibling, while **23%** are only children.



Quelle(s) langue(s) sprechen Sie?

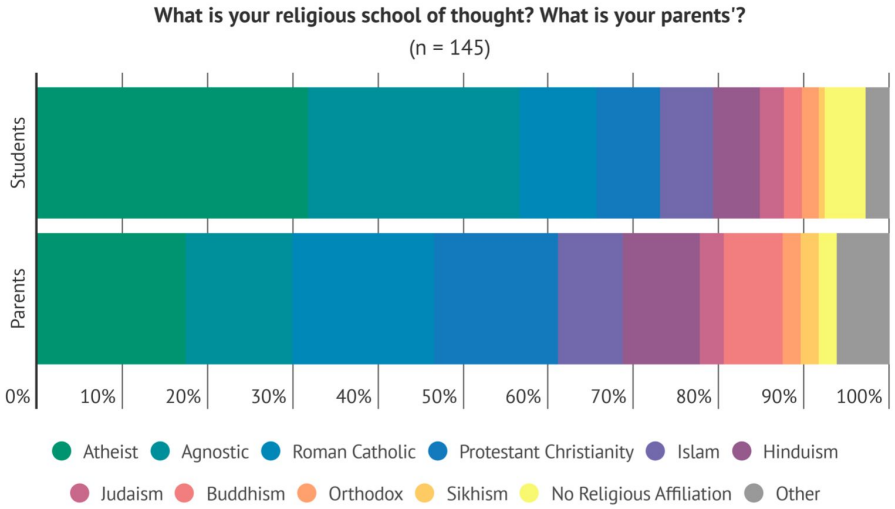
Ironically, no one reported speaking German at home.

Slightly over three quarters of respondents speak English at home, with other languages including Macedonian, Vietnamese, Romanian, Serbian, Russian, and a few others.



Religion

Survey respondents largely were less religious than their parents, with over half saying that they were either Atheist, Agnostic, or had no religious affiliation.

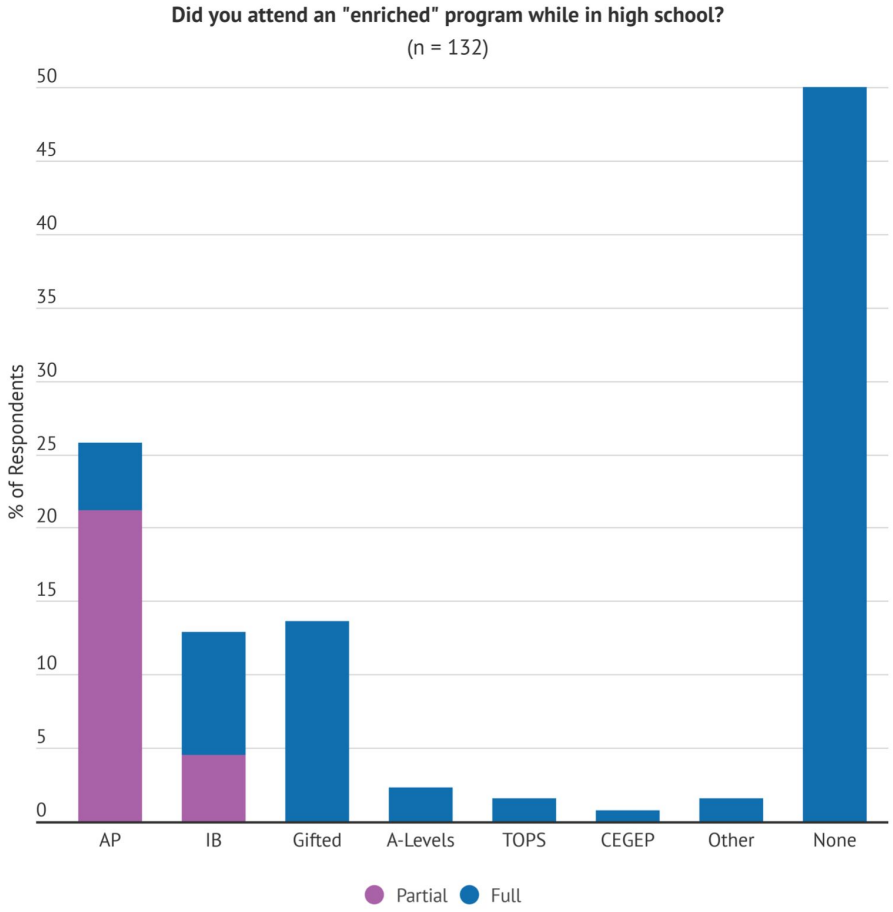


Enriched Programs

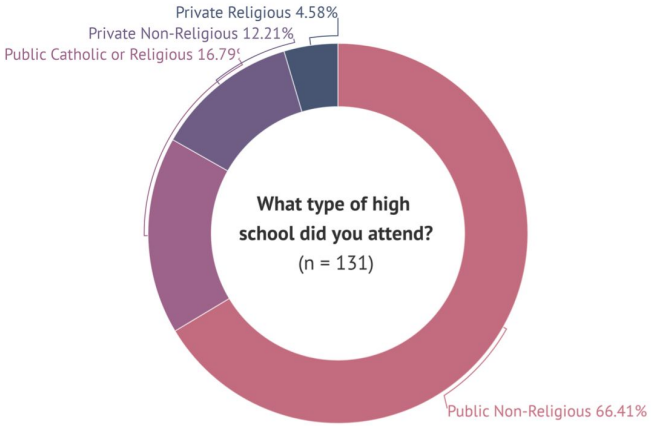
Exactly half of respondents said that they attended an enriched program while in high school.

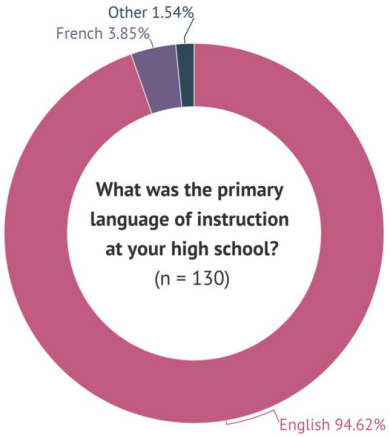
Note: “Partial” AP is defined as taking between 1 and 5 AP courses, while “Complete” AP is defined as taking 6 or more AP courses.

“Partial” IB is defined as taking at least one IB-level course.



High School



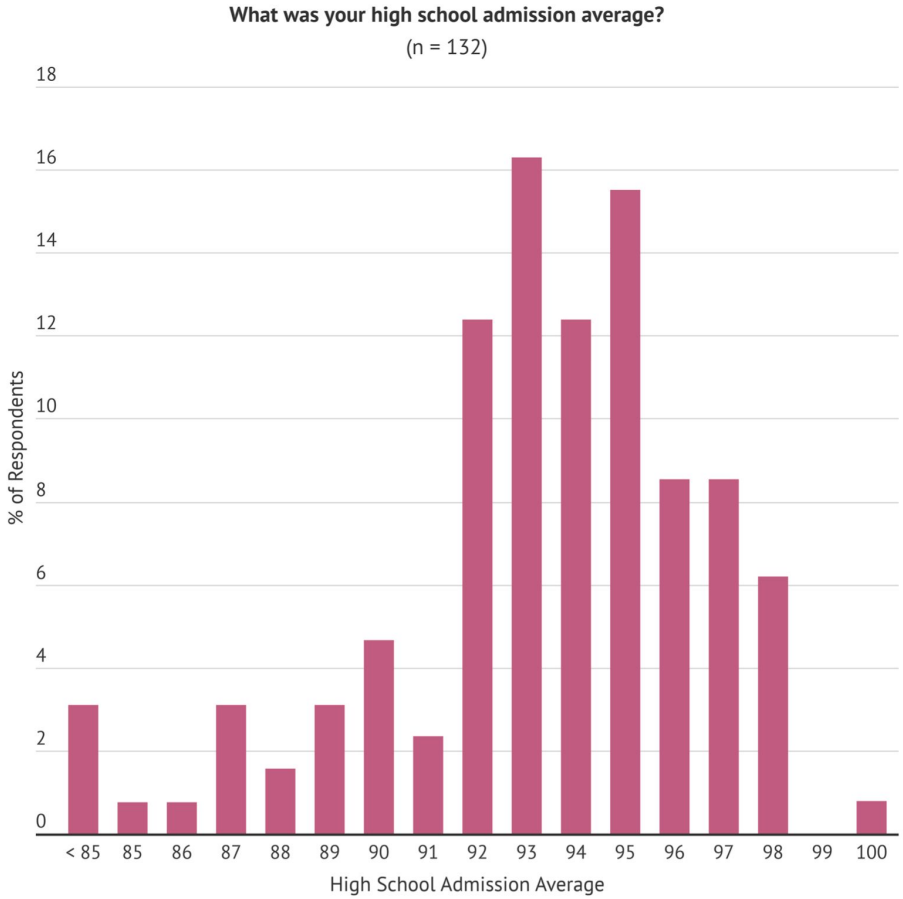


Most respondents attended a public school, while almost everyone spoke English at their high school.

High School Averages

Keep in mind that this was the entrance averages five years ago.

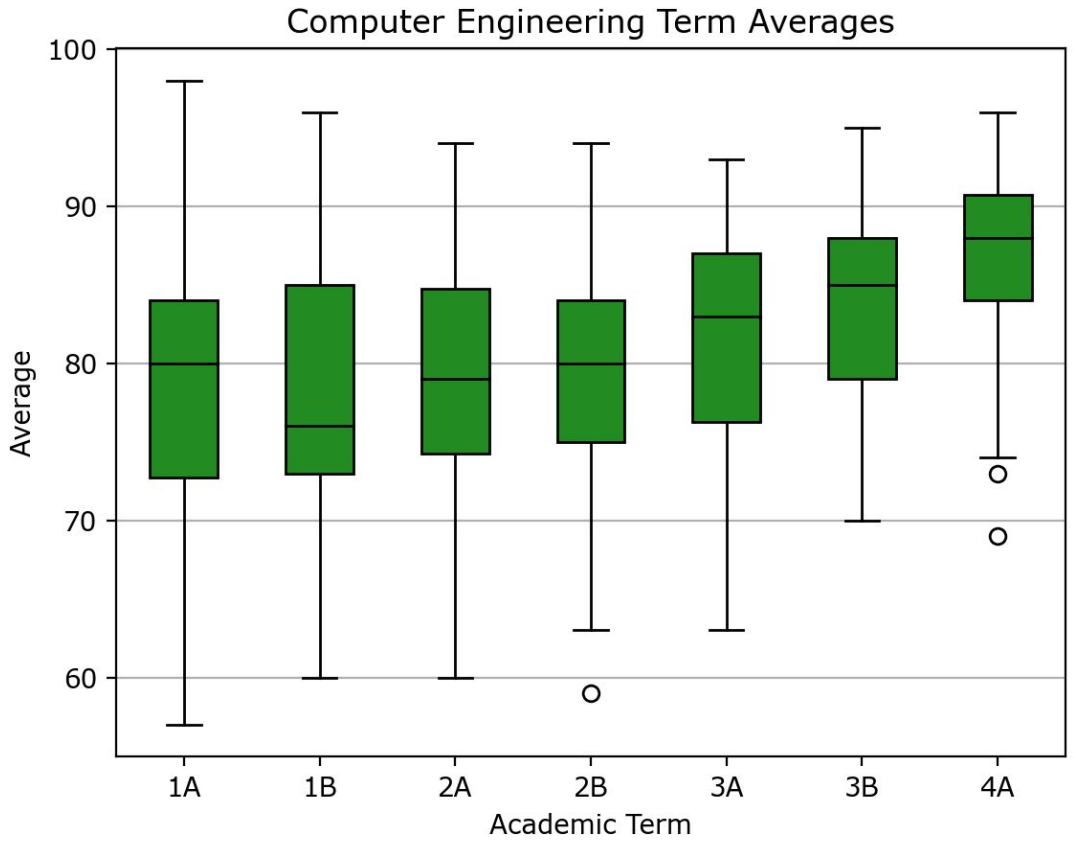
As of Fall 2021, having a high school average of 95% will give you a 50% chance of being admitted to ECE, according to Director of Admissions (and coming up later, one of our top-five favourite instructors), Professor Bill Bishop.[4]



Academics

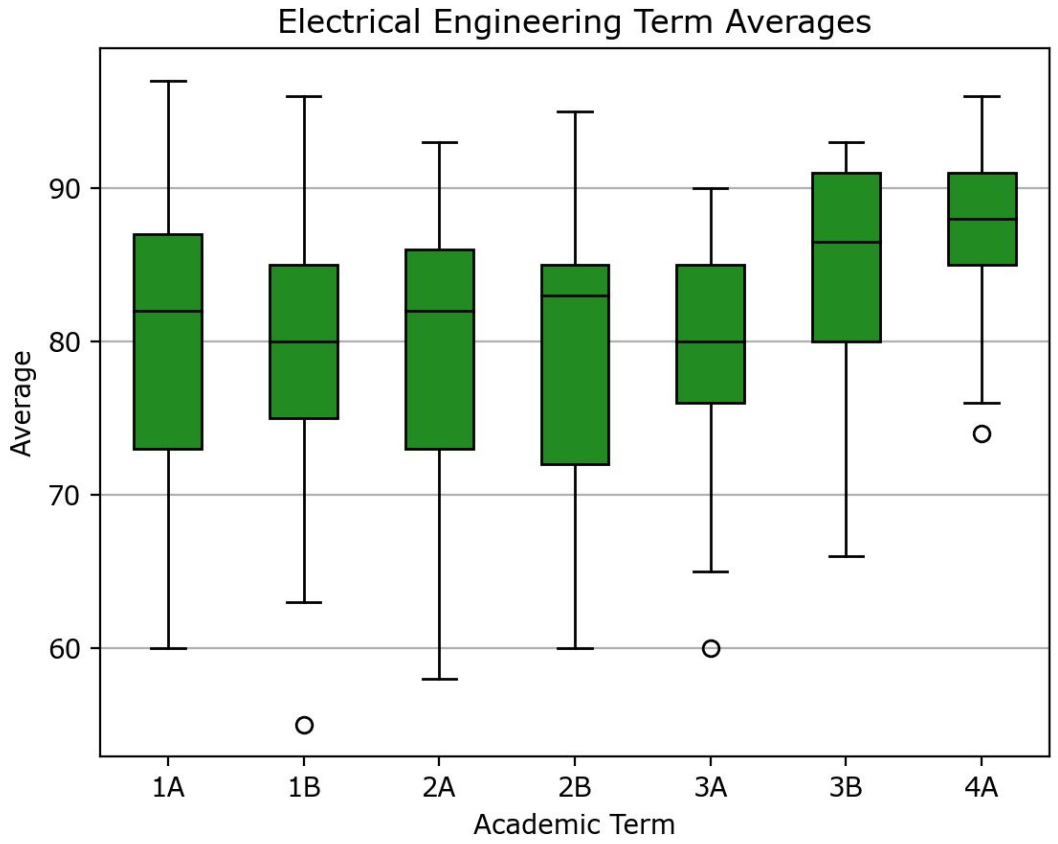
University Averages Computer Engineering

Overall, averages increased as terms progressed. In 4A (May-Aug 2020), which was affected by COVID-19 and learning went online, averages increased significantly.



University Averages Electrical Engineering

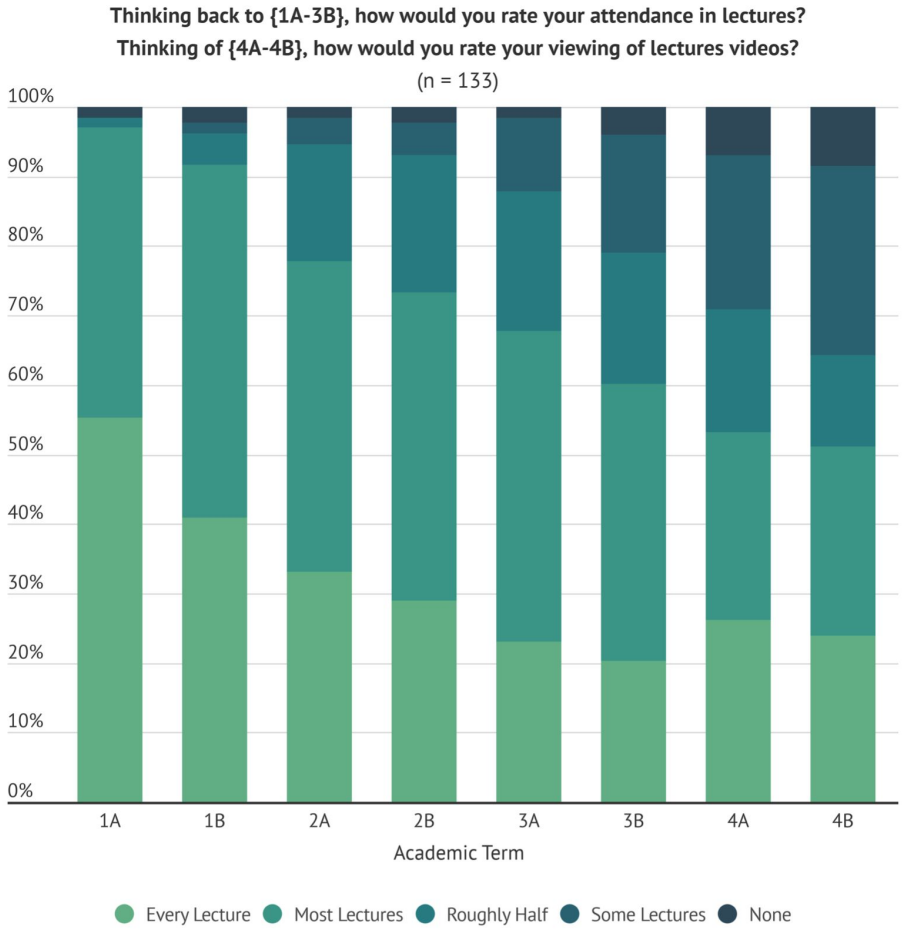
Similar to Computer Engineering respondents, term averages increased significantly in 4A, the term affected the COVID-19.



Attendance

Attendance in lectures declined as the degree progressed. For 4A and 4B (terms affected by COVID), students were asked to rate how many video lectures they watched.

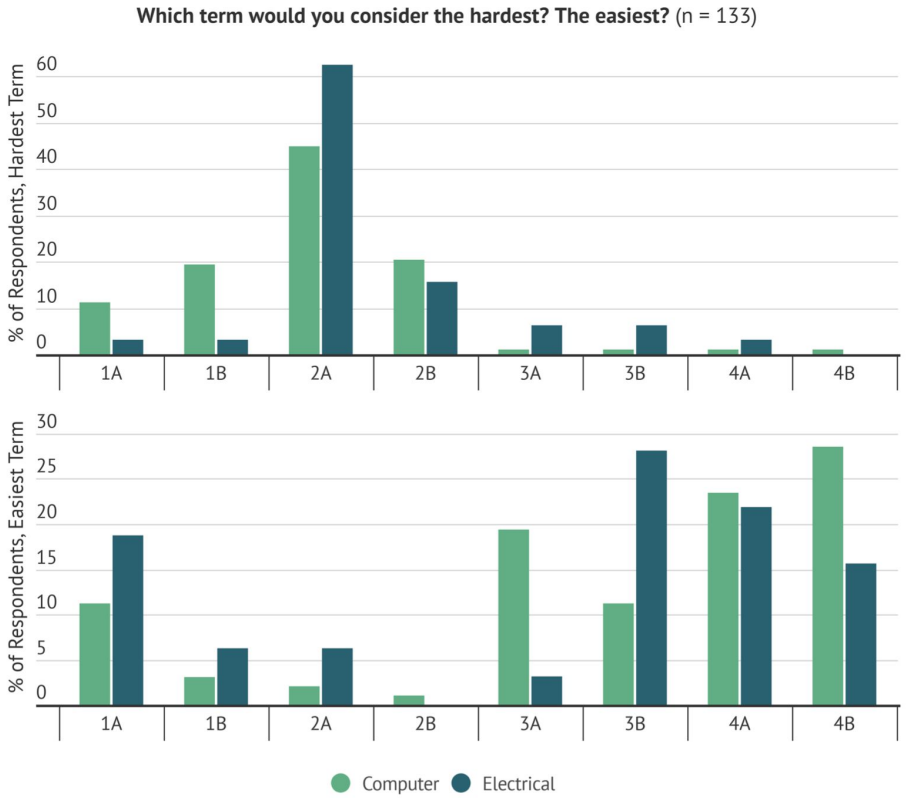
Indeed, in the first pandemic-stricken term of 4A, we observe that the percentage of respondents watching every lecture increased from the term before.



Hardest/Easiest Term

Both Electrical and Computer respondents found the earlier terms harder, and the later terms easier, with both classes agreeing that the infamous 2A term was the hardest. This was the term that all students had to take six courses instead of five. (This has since been changed in the curriculum revamp).

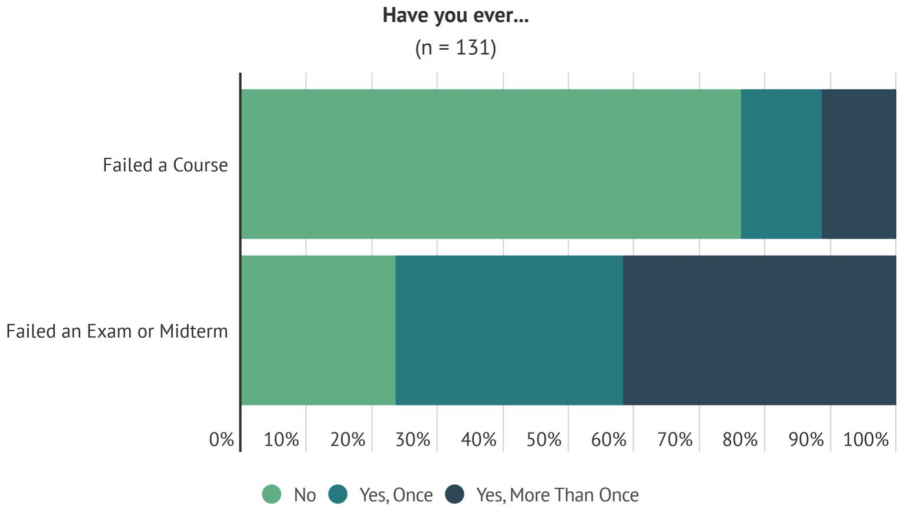
But does it get easier, or do you just get more used to it?



There's no such thing as failure, only temporary setbacks

Almost 3 in 4 respondents admitted to failing an exam or midterm!

This just goes to show that even if you fail a test or a course, it's not the be-all, end-all. Be sure to keep your head up!



Favourite Professors

When asked which professors/instructors respondents would commend, **Derek Wright** was the favourite, followed by **Jeff Zarnett, Douglas Harder, Bill Bishop,** and **Scott Chen**.

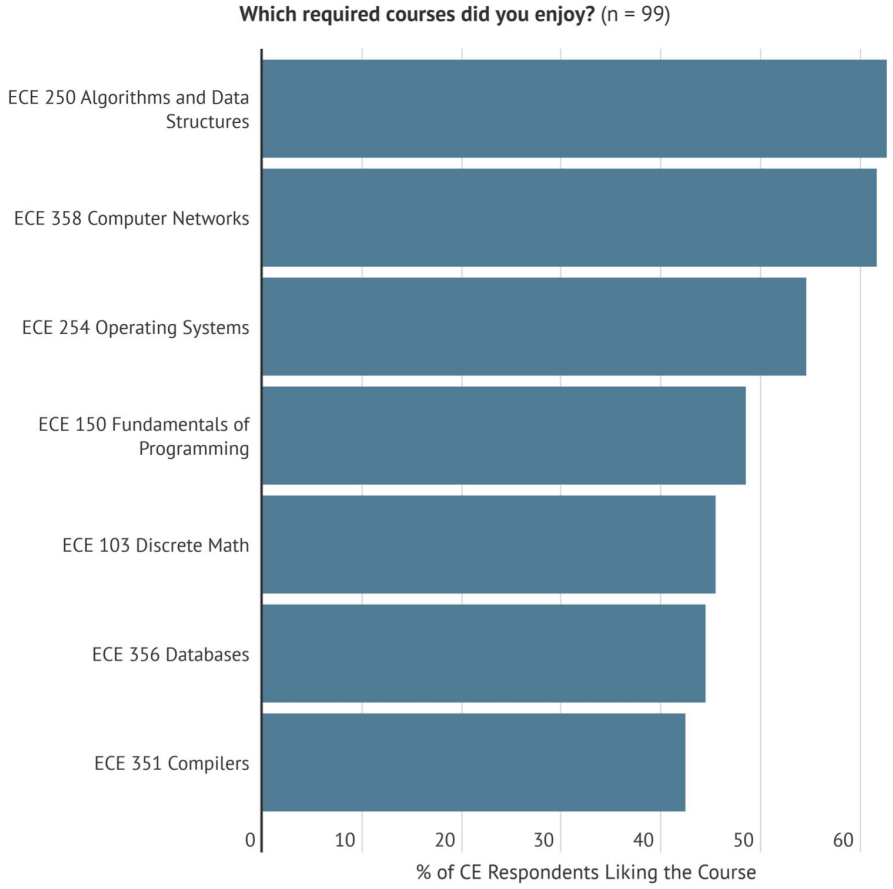
Keep in mind that not all instructors have a fair chance for votes, as not an equal amount of students take courses taught by each instructor.

Multiple responses were allowed. Top 25 responses shown.

Favourite Required Courses Computer Engineering

The most popular **required (core) course** among **Computer Engineering** respondents was ECE 250. Six of the top seven top courses were software-related.

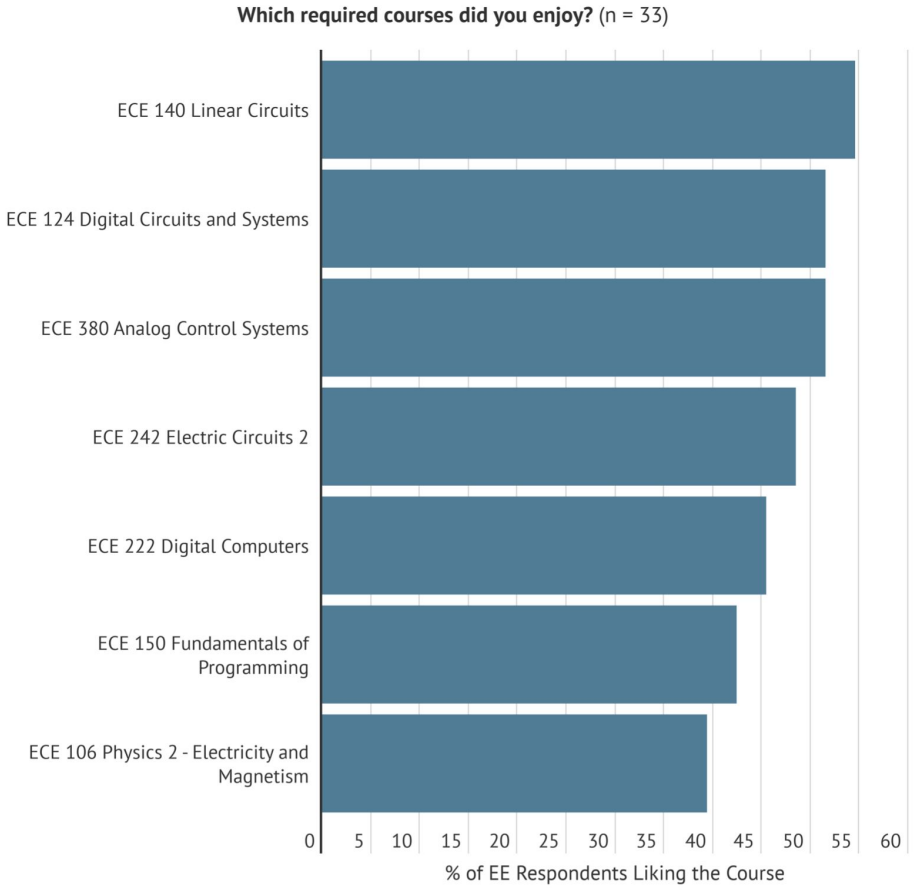
Notes: ECE 254 has been replaced with ECE 252 (Systems Programming and Concurrency)/ECE 350 (Real-Time Operating Systems) and ECE 103 with ECE 108 (Discrete Mathematics and Logic 1) in the new curriculum.



Favourite Required Courses Electrical Engineering

The most popular **required (core) course** among **Electrical Engineering** respondents was ECE 240.

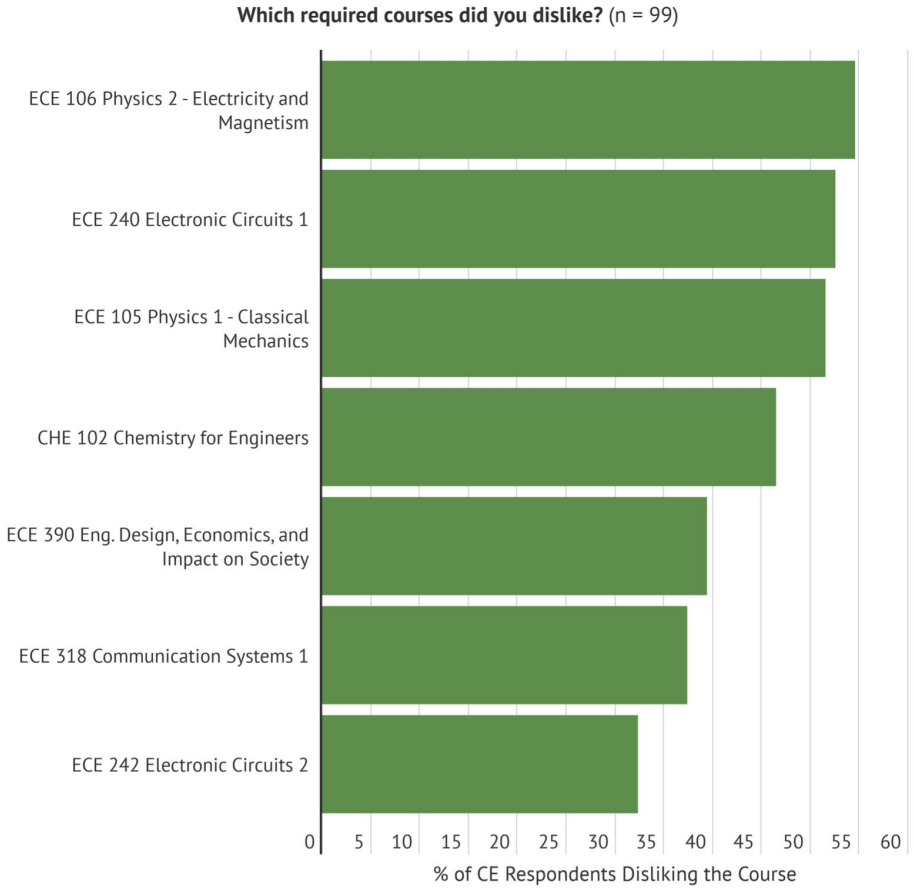
Circuits (x40 series) and hardware (x20 series) courses were largely popular.



Least Favourite Required Courses Computer Engineering

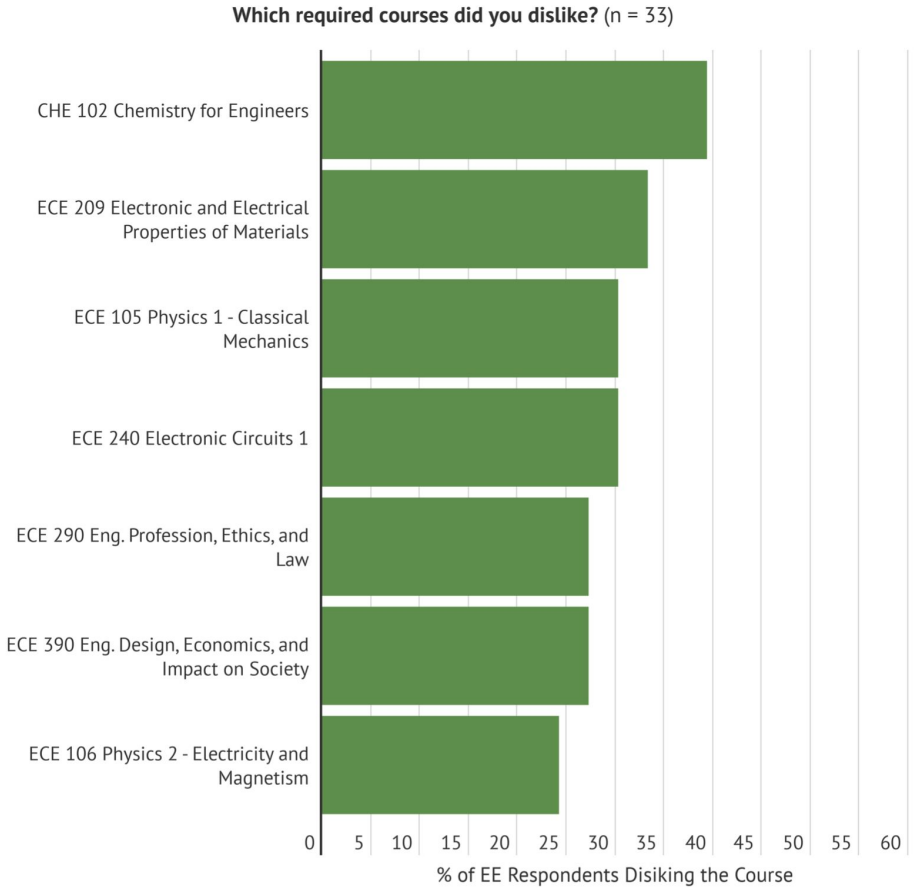
Both first-year Physics courses saw a majority of Computer Engineering respondents dislike.

Circuits courses were also unpopular, which is the reverse situation among Electrical Engineers.



Least Favourite Required Courses Electrical Engineering

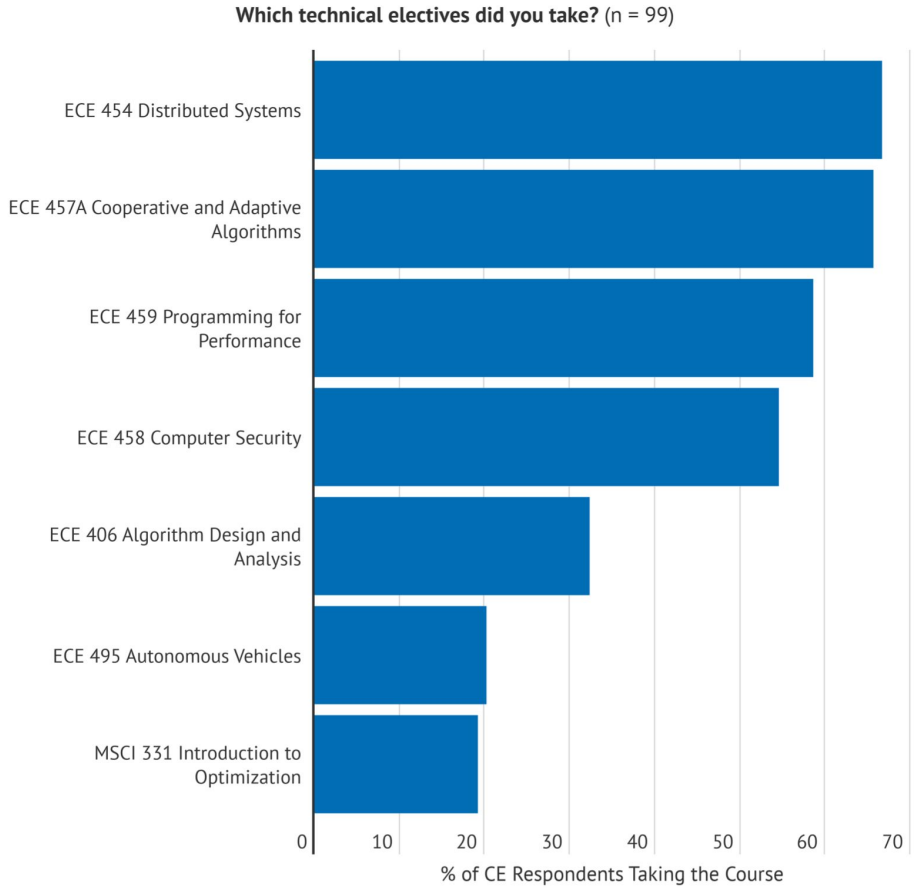
Interestingly enough, ECE 106 appeared on the top-seven list in both the Favourite required course and Least Favourite required course lists for Electrical Engineering respondents.



Most Popular Technical Electives Computer Engineering

Students are required to take five technical electives as part of the degree program.

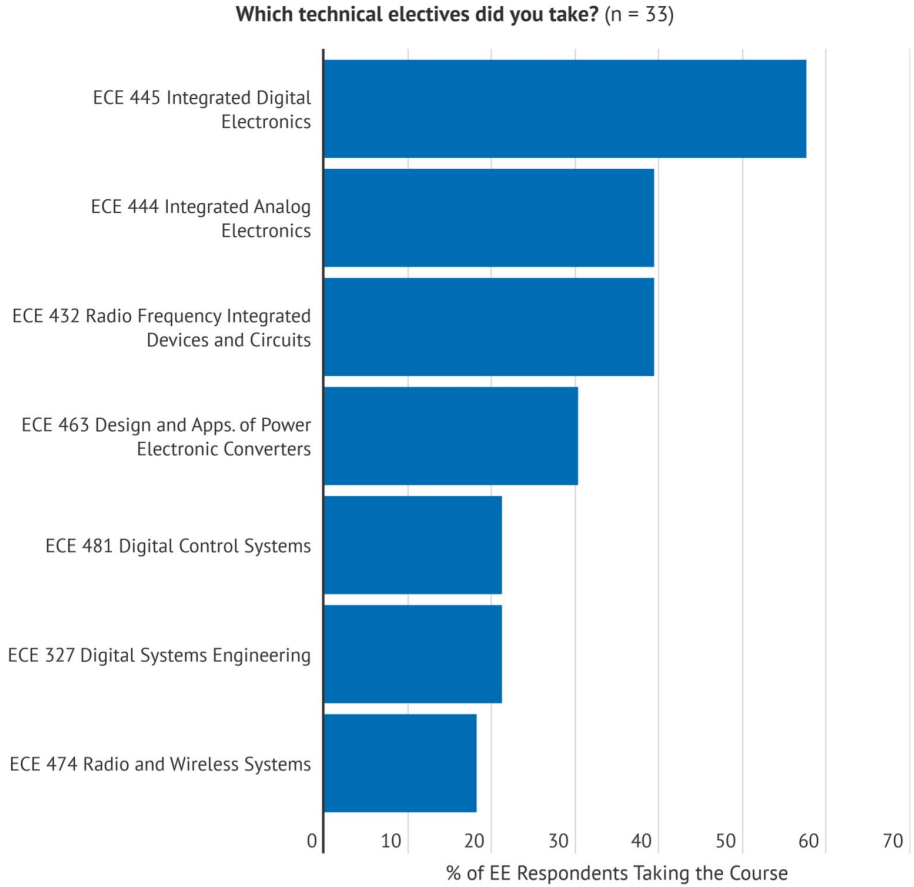
Four technical electives, all software-related, saw more than half of respondents enroll in. Enrolment in technical electives among Computer students was largely bimodal - a class was either extremely popular or had a small handful of students.



Most Popular Technical Electives Electrical Engineering

Students are required to take five technical electives as part of the degree program.

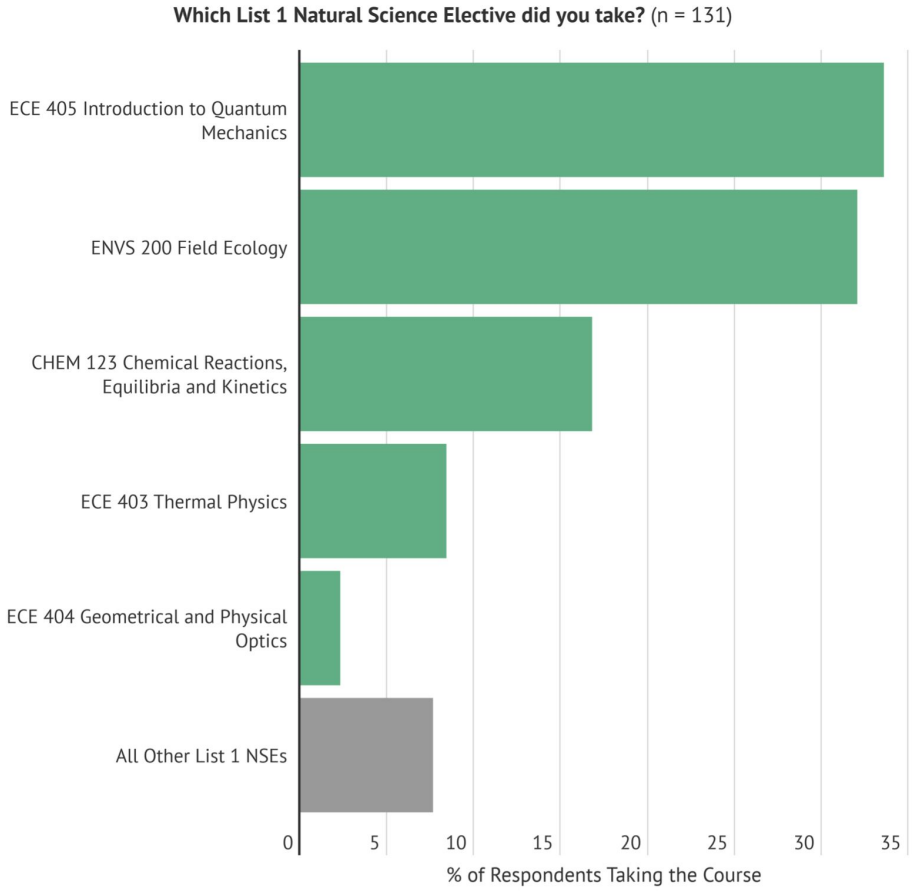
Two upper-year circuits courses were most popular among Electrical Engineering, with over half of respondents taking ECE 445.



List 1 Natural Science Elective

All ECE students must select at least one Intensive (List 1) Natural Science Elective.

Of the 10 possible courses, ECE 405 was the most popular, followed by ENVS 200.

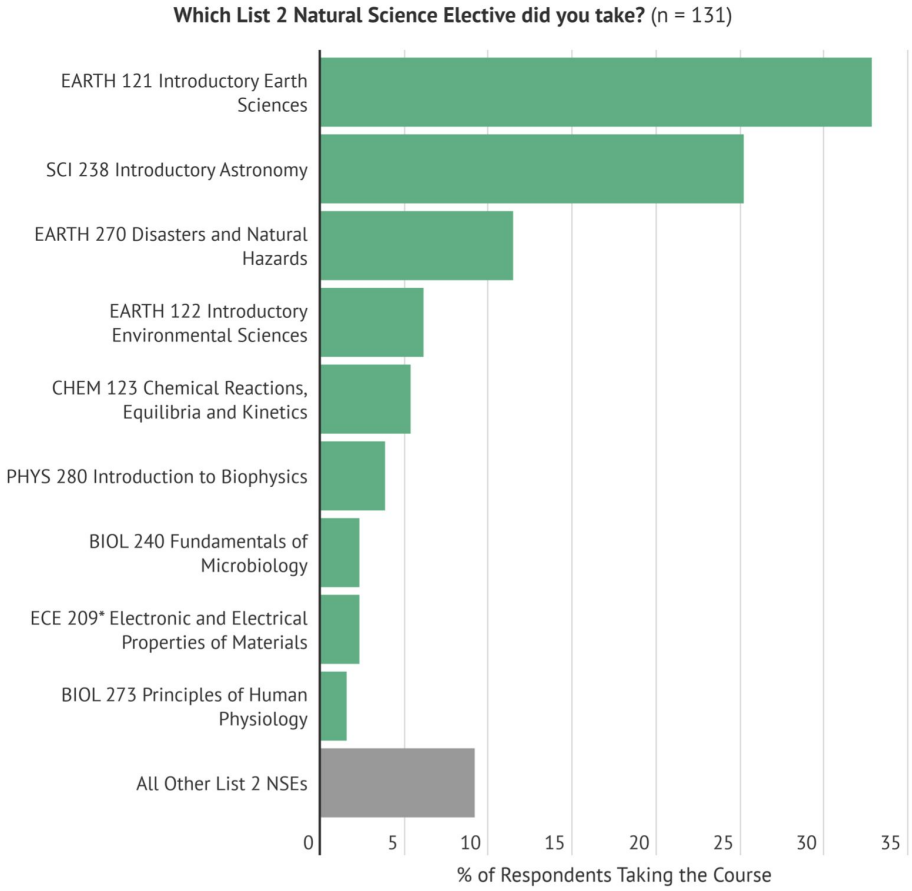


List 2 Natural Science Elective

All ECE students can choose at most one List 2 Natural Science Elective to fulfill their two-course natural science requirement.

Out of the 36 listed courses, just 9 account for over 90% of respondents, with the most popular course being EARTH 121.

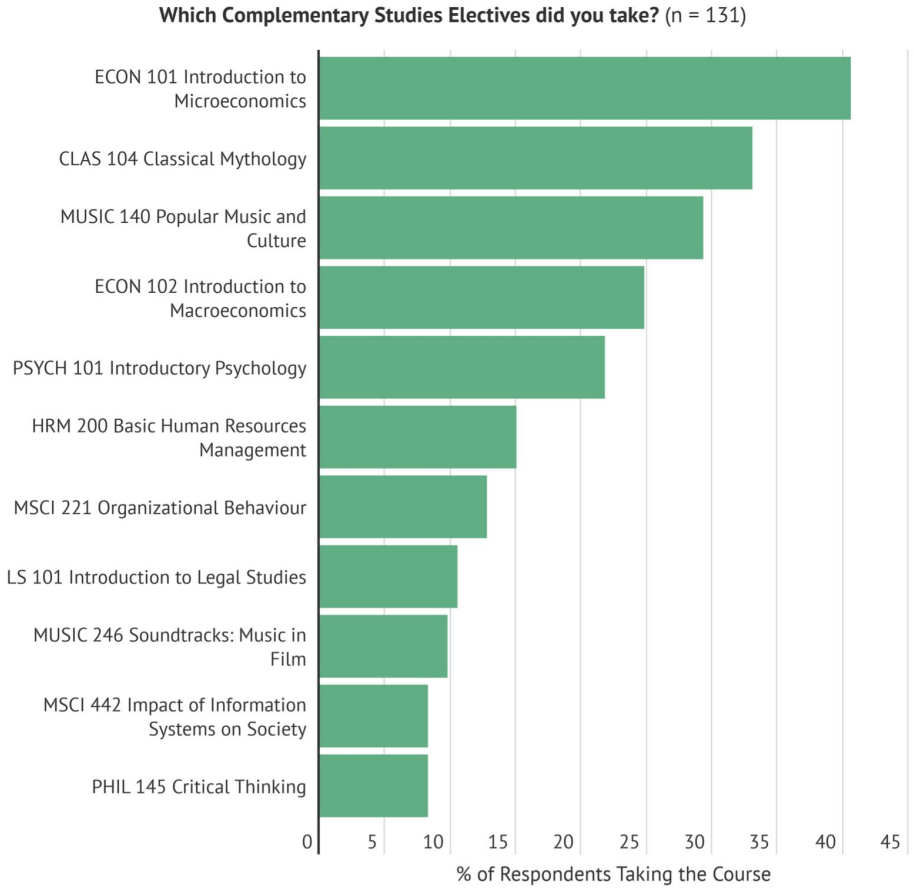
*ECE 209 is only available as an NSE for Computer Engineering students as it is a core course in the Electrical Engineering curriculum.



Complementary Studies Electives

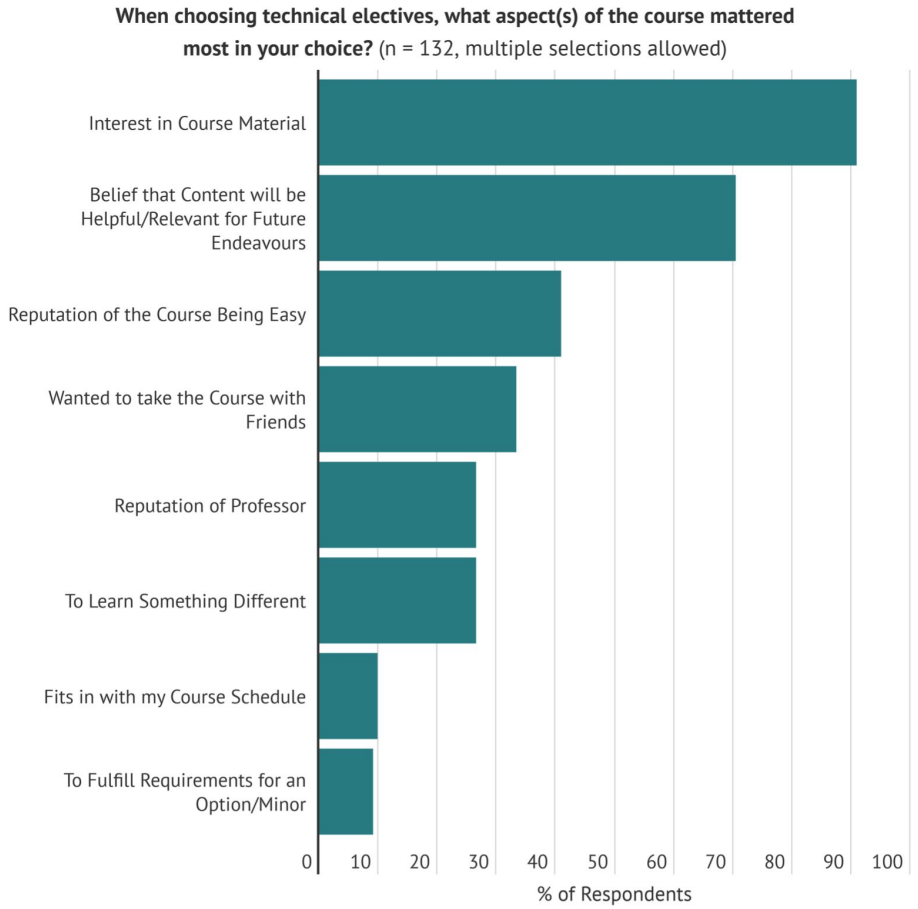
All ECE students are required to take at least four complementary studies electives. These are courses in the Humanities, Social Sciences, Impact, and other Complementary Studies.

The 11 most popular CSEs among respondents are shown (MSCI 442 and PHIL 145 are tied for tenth).



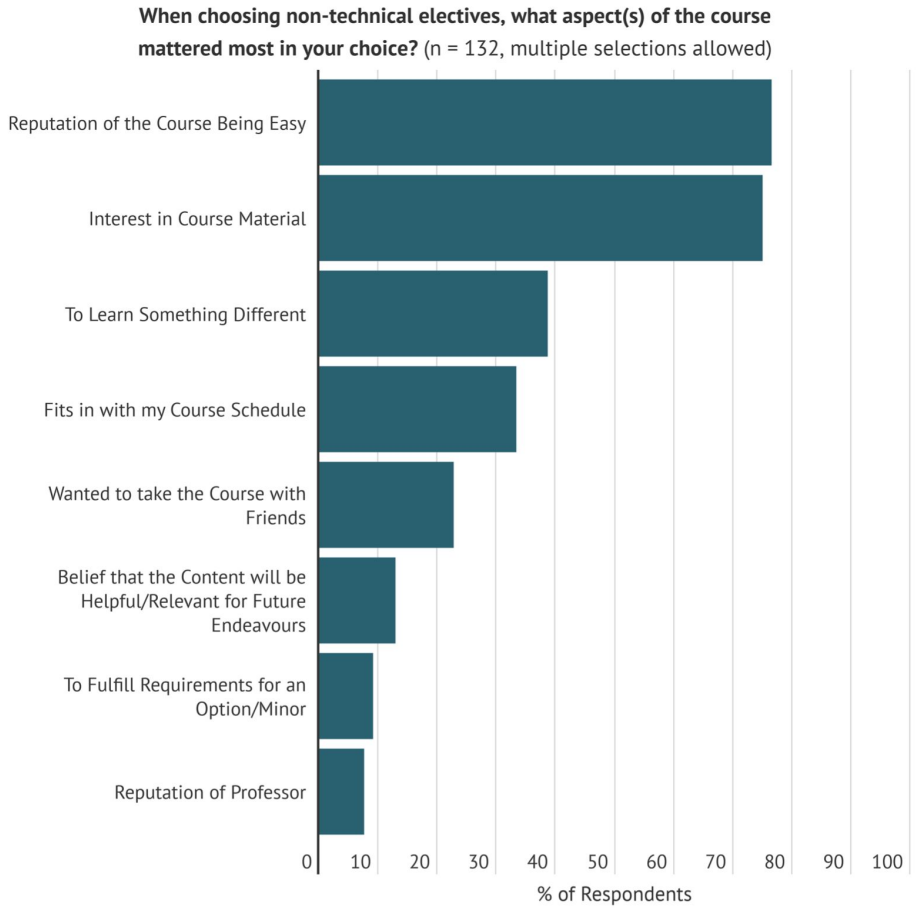
Choosing Technical Electives

When asked how they choose **technical electives**, respondents said that their **interest in course material** was the most important factor, with over 90% of respondents saying it was an important reason.



Choosing Non-Technical Electives

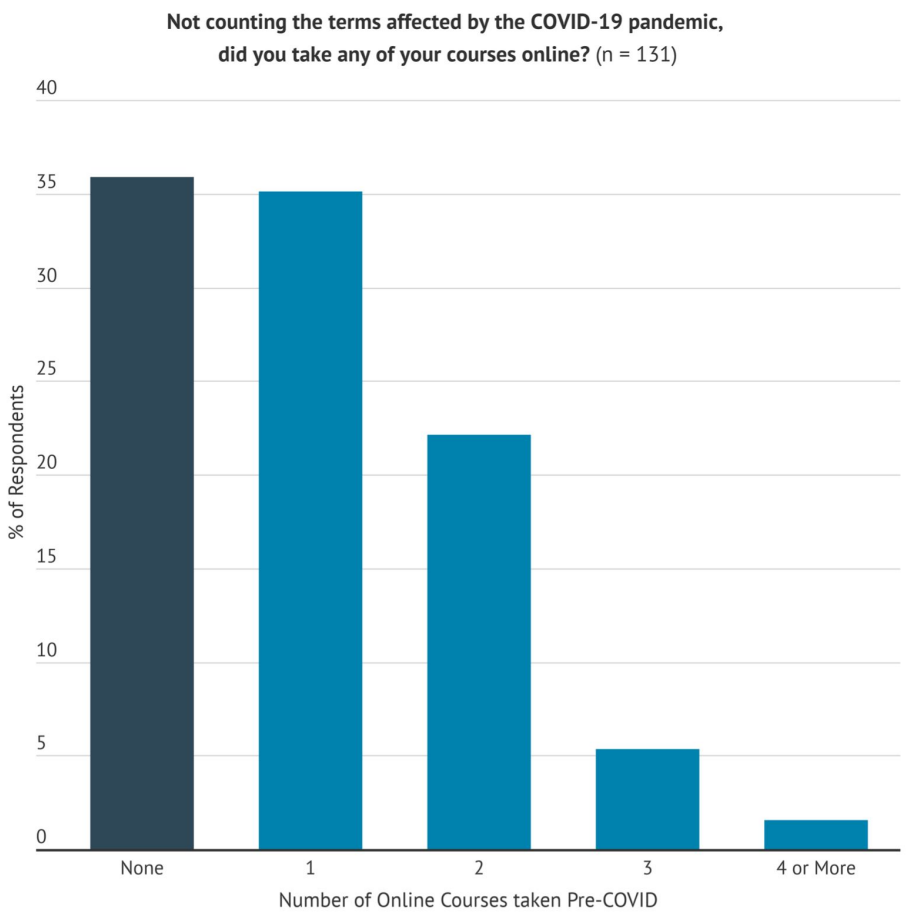
On the other hand, when it comes to choosing **non-technical electives**, the reputation of a course being easy or not was the most important factor among respondents.



Learning Online Before it was Cool

Even before the pandemic, online learning was offered through the Centre for Extended Learning.

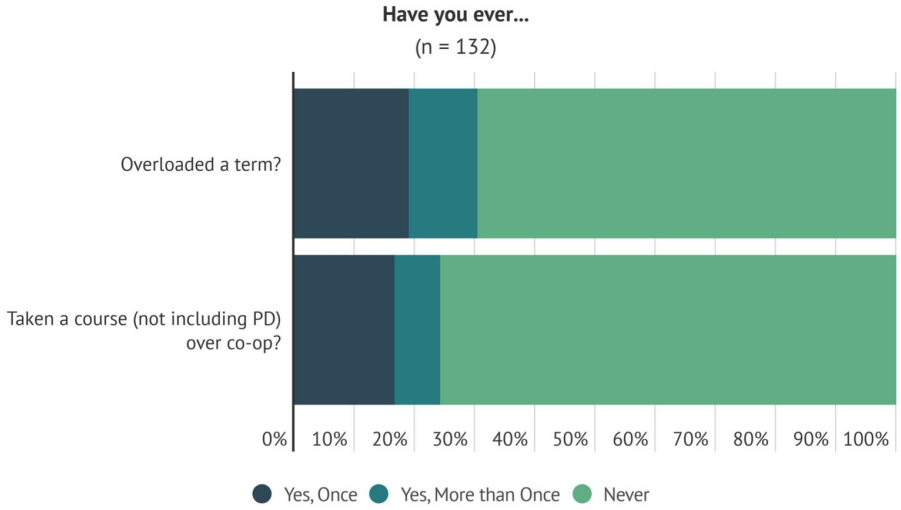
A majority of respondents took at least one of their courses online even before the COVID pandemic hit.



Working Above and Beyond

Overloading is when a student takes more courses than what the standard engineering schedule permits.
This typically requires the approval of an academic advisor and an average of at least 80% in the term prior.
The benefit, however, is that the additional course is “free” in that no additional tuition is charged.

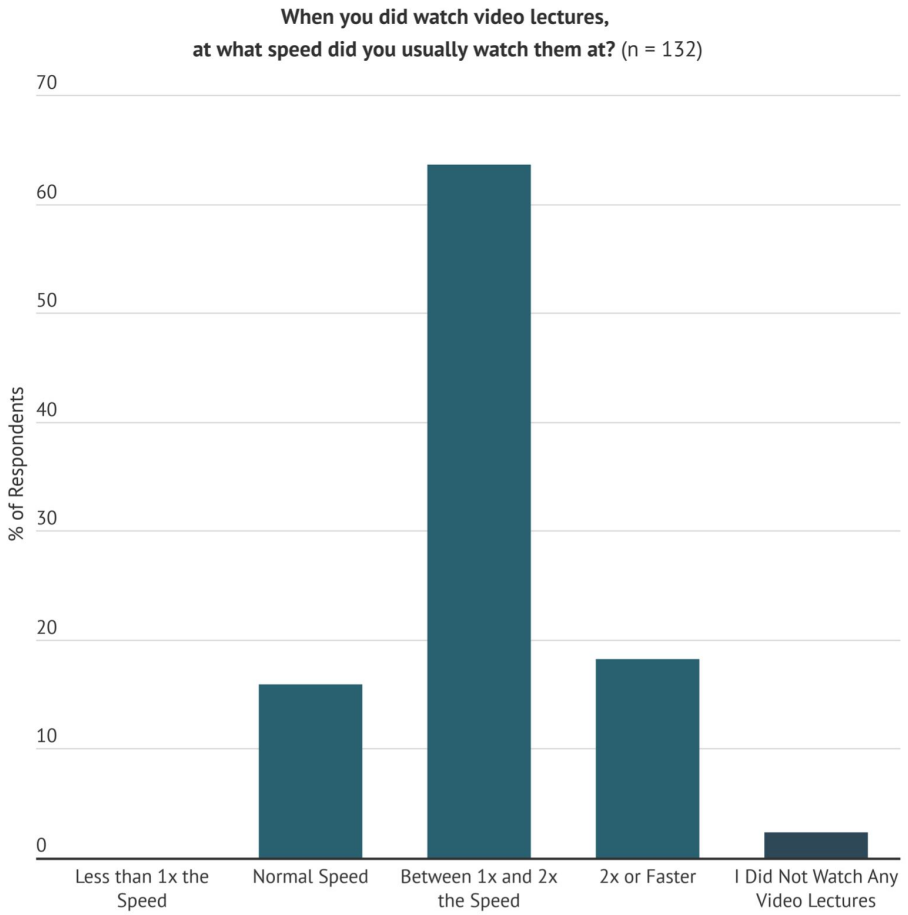
Furthermore, students are allowed to take up to one course (not including PD) on a work term without needing the approval of their employer.



Watching Lectures

At $8,420.54 a term, ECE is probably one of the world's most expensive video streaming services.

While it was presented as an option, no one responded with saying that they watch at slower than normal speed.



Exchange

9% of respondents said that they went on exchange.

Institutions students went on exchange to include the University of Hong Kong, PolyU (Hong Kong), Pohang (South Korea), National University of Singapore, University of Technology of Compeigne (France)

"Unfortunately it was cut short due to COVID19. The isolation was tough (Singapore moved all classes online by the end of January) along with maintaining long distance relationship - I felt isolated and forgotten by my UW friends. My favourite memory there is trying out new foods." - *Anonymous*, Nanyang Technology University. Singapore

"FABULASTIC! There's no better opportunity to experience a brand new world than going on exchange. I met kangaroos, penguins and friends coming from different backgrounds. Enjoyed the beautiful scenery like the Great Barrier Reefs and Sydney Opera House. There's so much to explore yet [you] only have 4 months of time to do so. Put it shortly, I can't be more excited if I'm given the chance to go on a second or third exchange trip." - *Roger Jiang*, Monash University, Australia

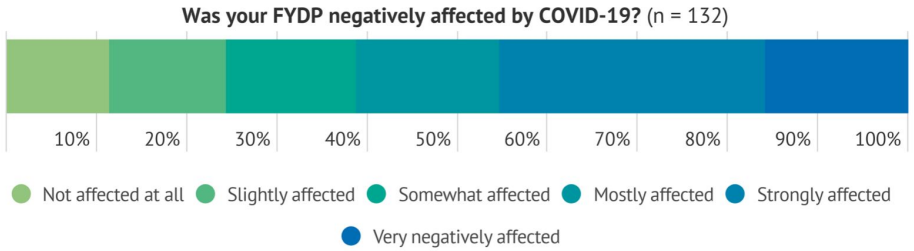
"I have a light course load and was able to travel and see multiple Western European cities. I made loads of international friends. The only hassle was having to do co-op interviews at night time throughout October, meaning preparing for and attending interviews prevented me from traveling and going out some nights until I got a job. Finding a 4 month semester program (6-month semesters are the EU standard) and dealing with the French administration was super stressful but extremely worth it. - *Anonymous*, INSA Lyon, France

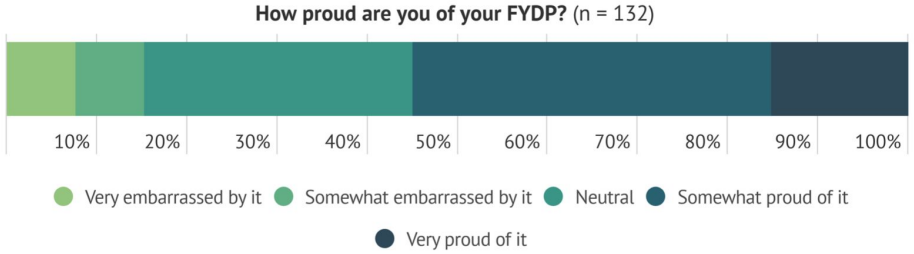
Fourth Year Design Project

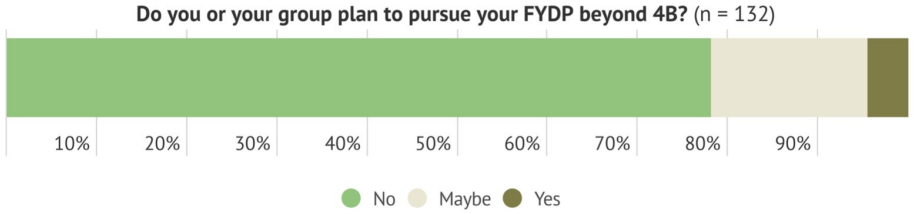
Unfortunately, many respondents said that the pandemic negatively affected their fourth year design project.

However, a majority of respondents said that they were proud of their FYDP. (Congratulations everyone!)

Only 4.5% of respondents say that they wish to pursue their FYDP beyond 4B.

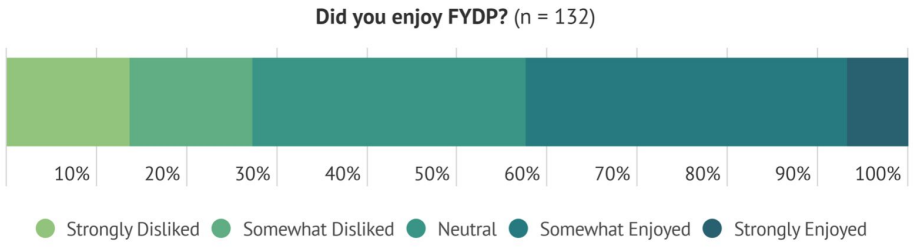


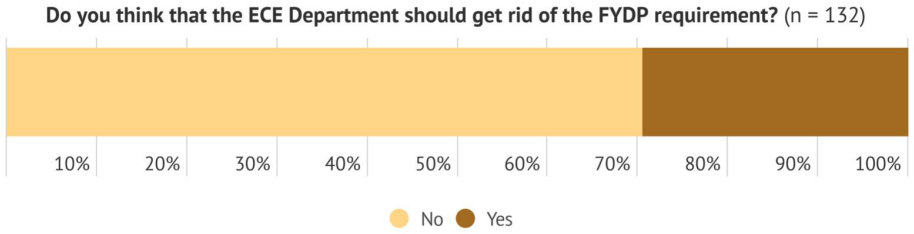




Fourth Year Design Project

Despite all the whinging on the ECE Slack, only a small minority of respondents said that they disliked the concept of the FYDP, and only a similar minority think the requirement should be gotten rid of.



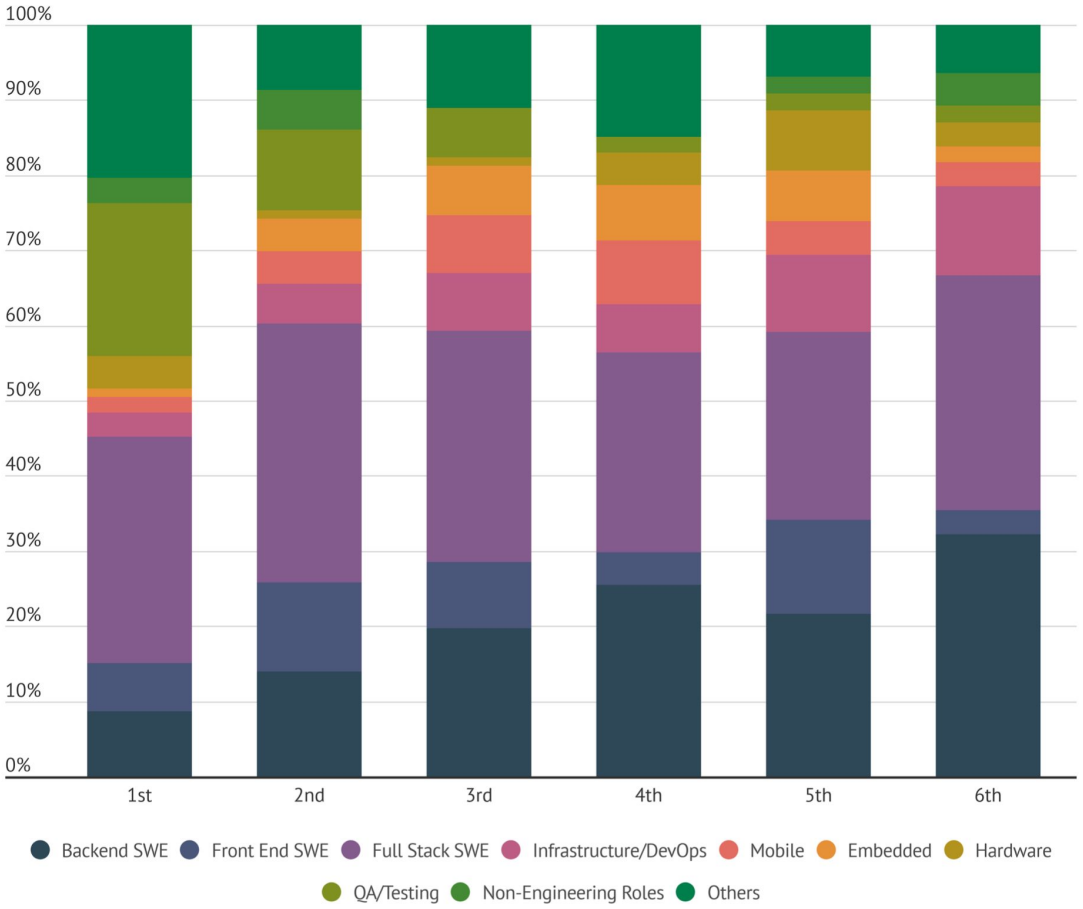


Co-op

Types of Co-ops for Computer Engineers

Perhaps reflecting the realities of the current job market, the vast majority of CE students worked in software engineering-related roles. Very few respondents did embedded or hardware co-ops.

Non-Engineering roles include Project Management, Teaching, and Technical Writing.

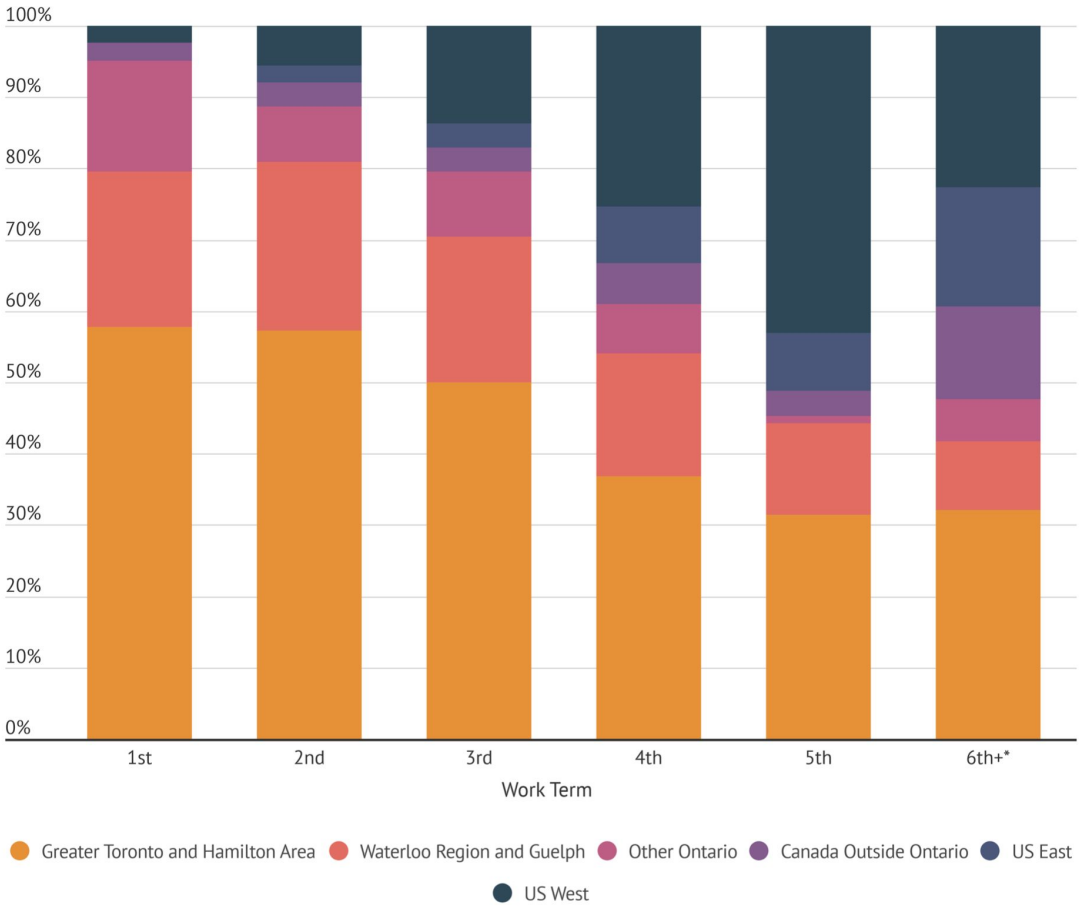


Computer Engineering Co-op Locations

For the sixth work term, which was affected by the COVID-19 pandemic, respondents were asked to indicate where they would have worked had the pandemic not occurred.

By the fifth worth term, over half of respondents worked in the United States.

Note:
US East = NY, MA, IL, OH, TX, FL, NC, GA
US West = WA, OR, CA

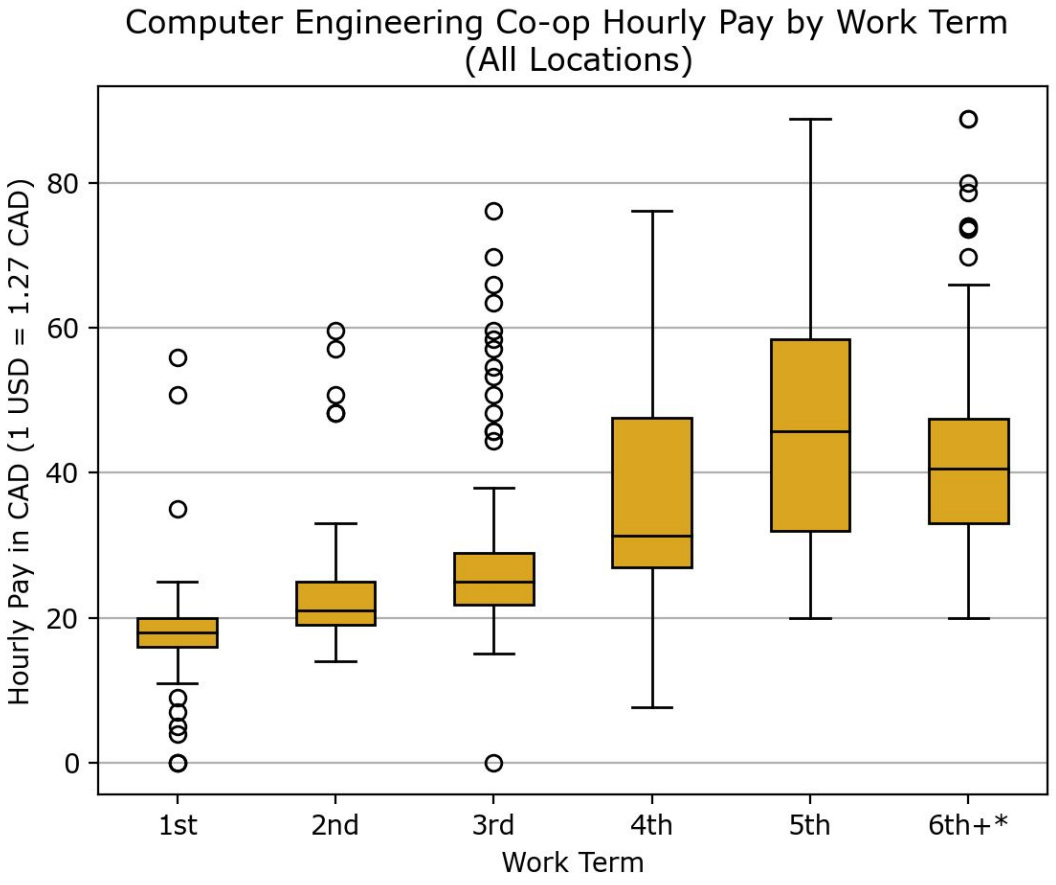


Co-op Pay for Computer Engineering (All Locations)

The median pay is shown in this graph. The average pay in CAD (with 1 USD = 1.27 CAD) was **18.17, 23.29, 27.18, 37.05, 46.44, 43.65**, respectively.

Co-op pay increased dramatically between the 4th and 5th work term as more students worked in the United States, and declined slightly in the 6th work term as the COVID pandemic hit.

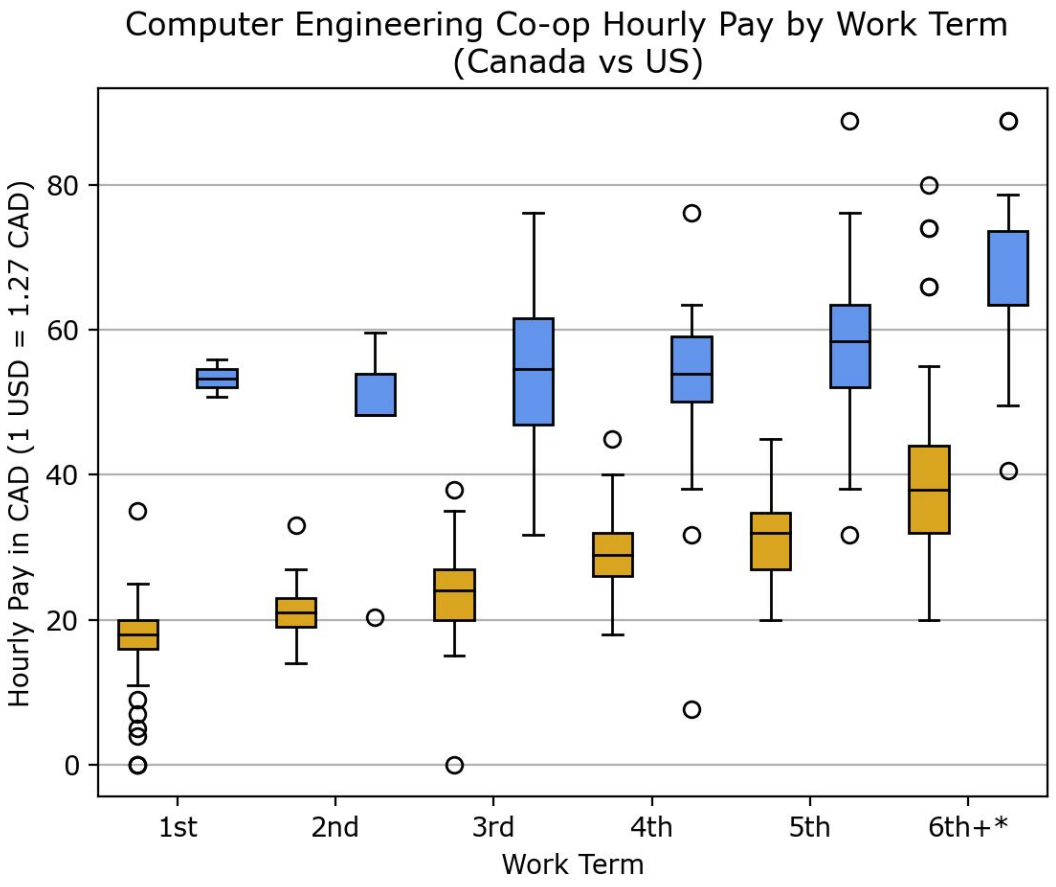
Note: A small handful of respondents did a seventh work term, which have been included in figures for the sixth work term.



Co-op Pay for Computer Engineering (By Country)

Interns were paid considerably more in the United States compared to Canada. In fact, many American intern salaries are higher than Canadian full-time salaries :(

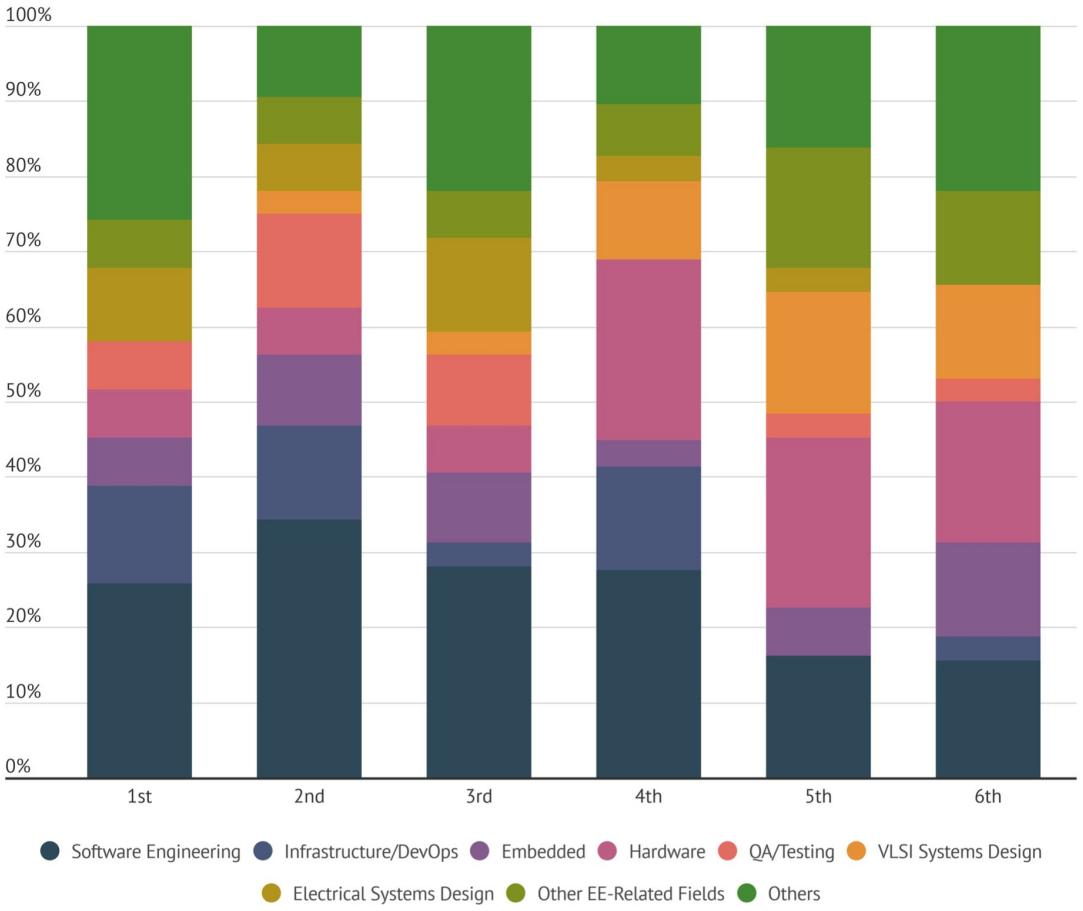
You probably can figure this out already, but yellow columns are for Canadian work terms and blue for American work terms.



Types of Co-ops for Electrical Engineers

Electrical Engineering students worked a wider variety of co-op placements than their Computer counterparts.

Other EE-related fields include High Voltage Engineering, Power Systems Engineering, Design Verification, and RF/Radio Circuit Design.

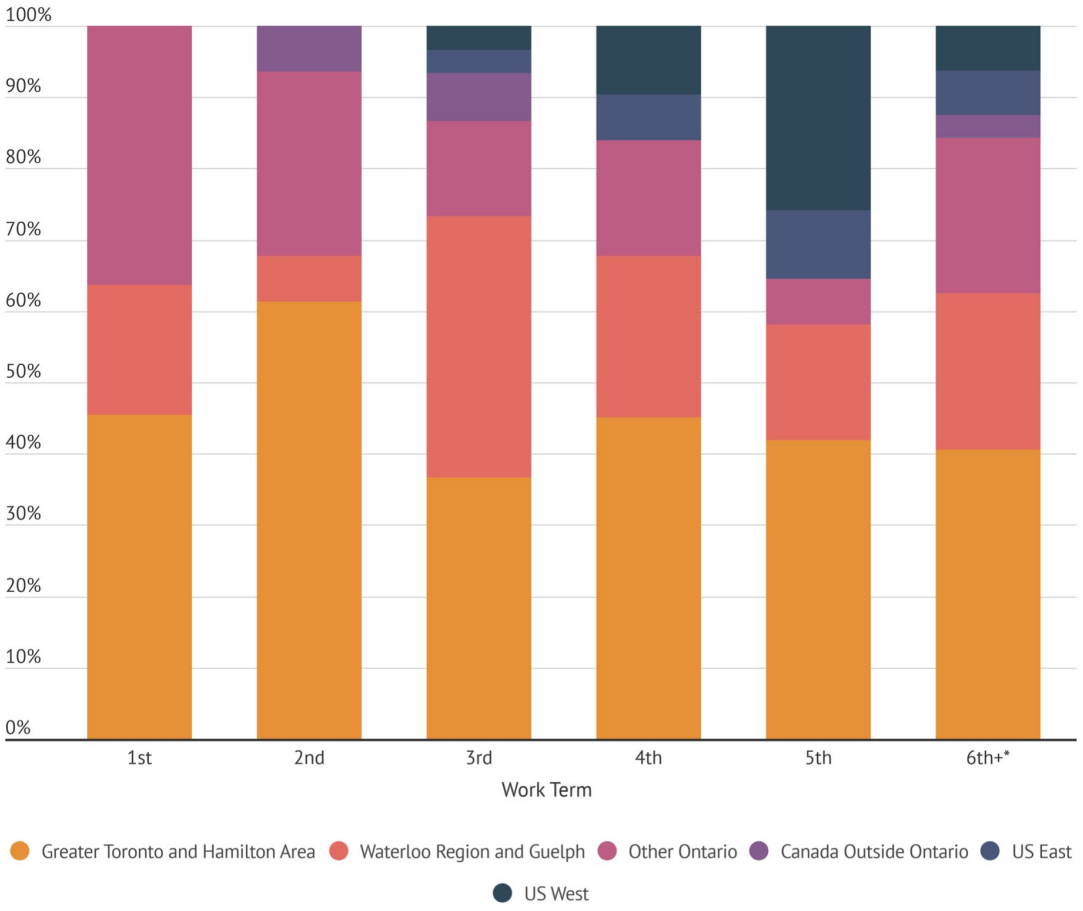


Electrical Engineering Co-op Locations

For the sixth work term, which was affected by the COVID-19 pandemic, respondents were asked to indicate where they would have worked had the pandemic not occurred.

Unlike the Computer Engineering class, most EE students did their work terms in Canada.

Note:
US East = NY, MA, IL, OH, TX, FL, NC, GA
US West = WA, OR, CA

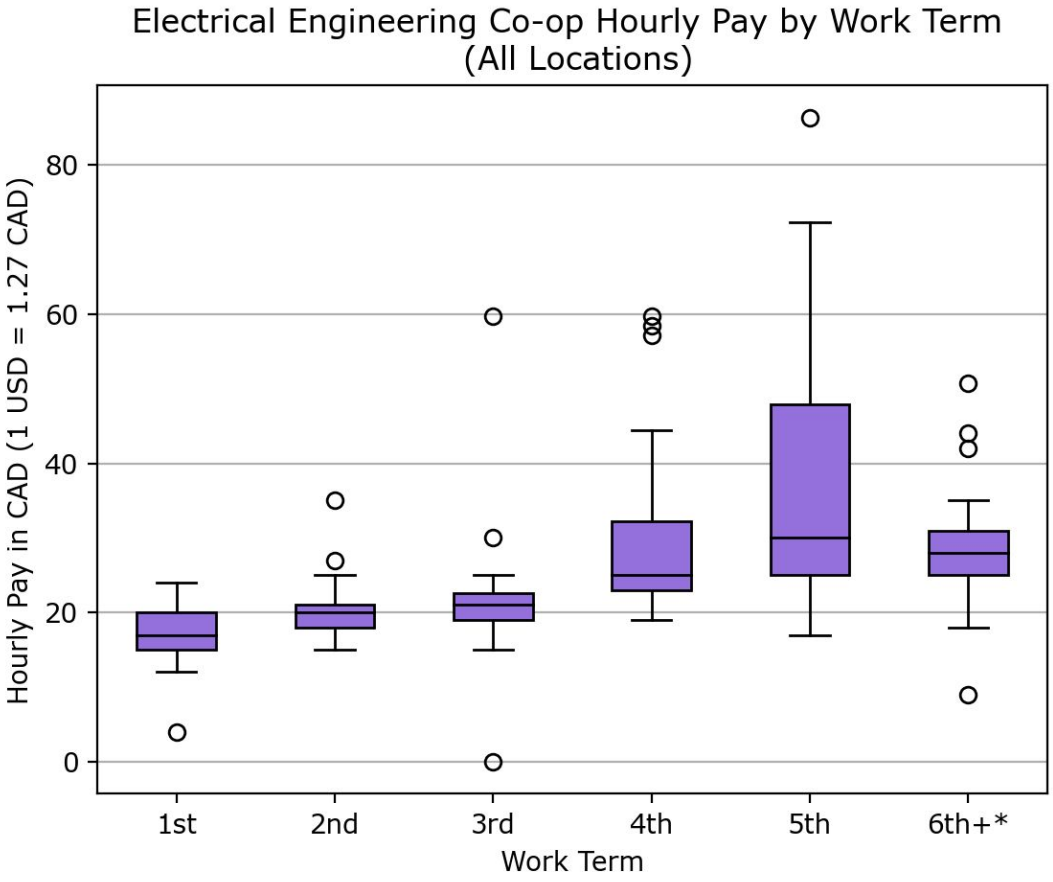


Co-op Pay for Electrical Engineering (All Locations)

As fewer Electrical Engineering students worked in the United States, the median co-op salaries were lower than that of Computer Engineering students.

The average hourly pay each term in CAD (with 1 USD = 1.27 CAD) was **16.78**, **20.34**, **21.55**, **29.49**, **37.06** and **28.32**.

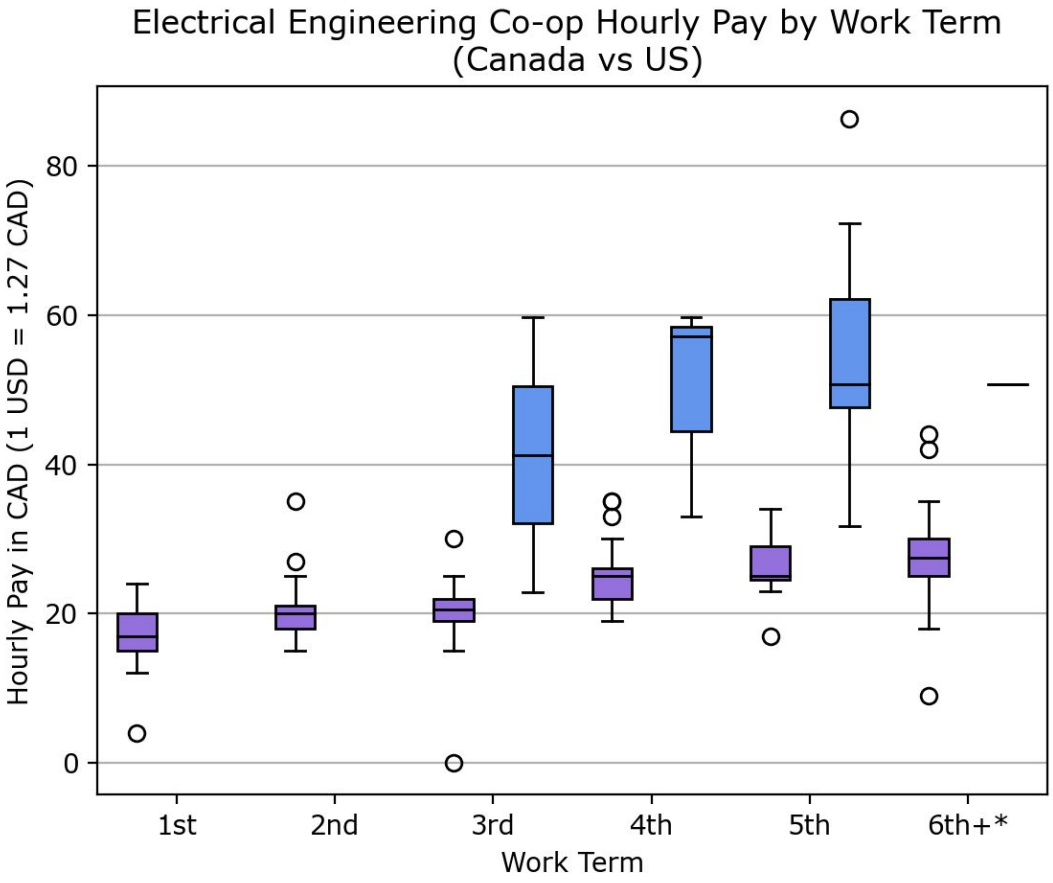
Salaries increased as work terms progressed, except for the sixth work term which was affected by the pandemic.



Co-op Pay for Electrical Engineering (By Country)

No one in Electrical Engineering worked in the United States for the first or second work terms.

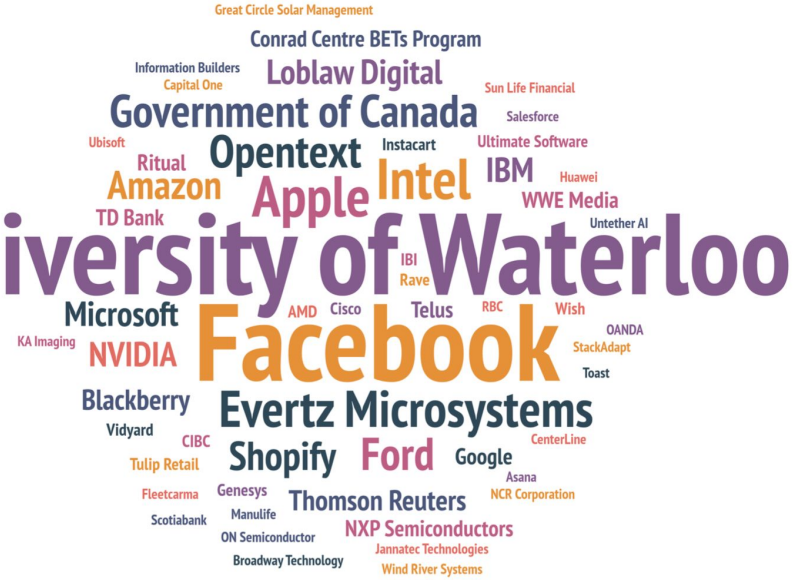
Purple columns are for Canadian work terms and blue columns are for American work terms.



Co-op Employers

The company that hosted the most work terms among respondents was… the University of Waterloo itself. Facebook, Apple, Intel, and Evertz round up the top five.

Only companies that hosted at least three work terms among respondents are shown.

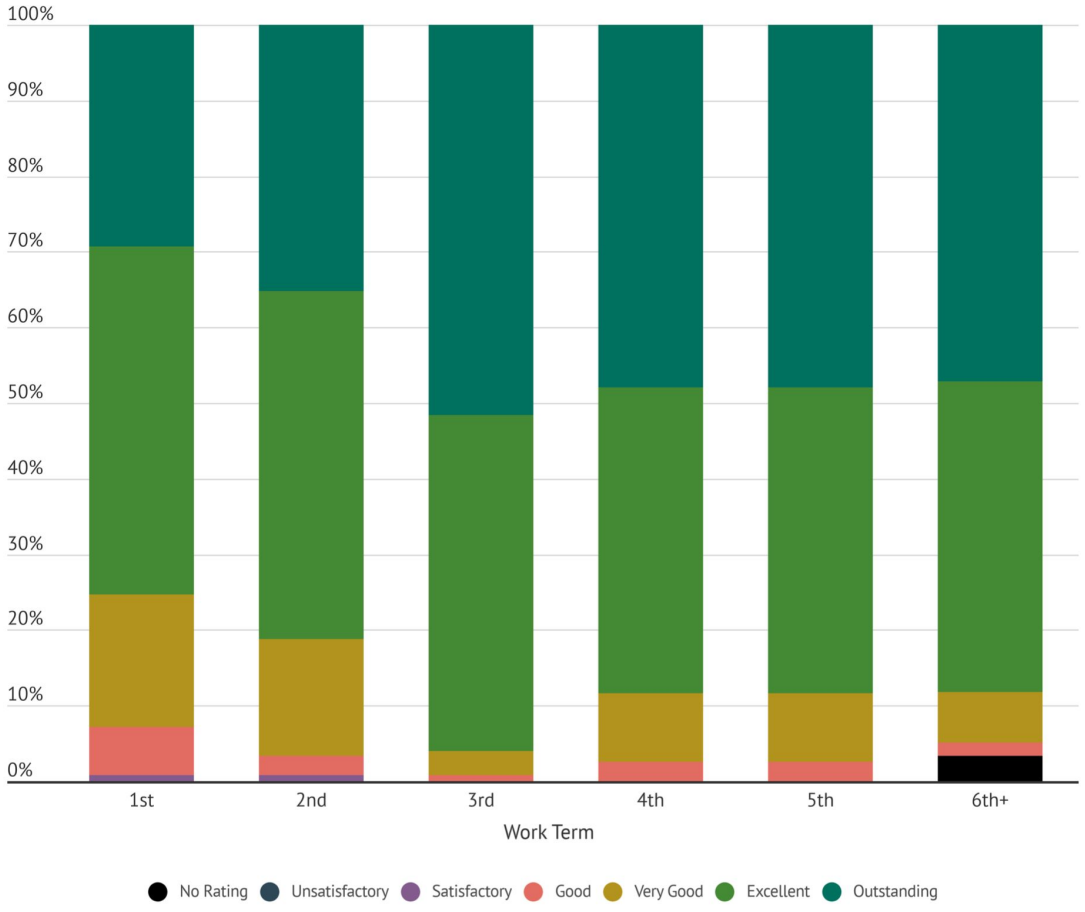


How were we rated on work terms?

A vast majority of respondents received a work term rating of “Excellent” or higher.

No respondent received an “Unsatisfactory” rating.

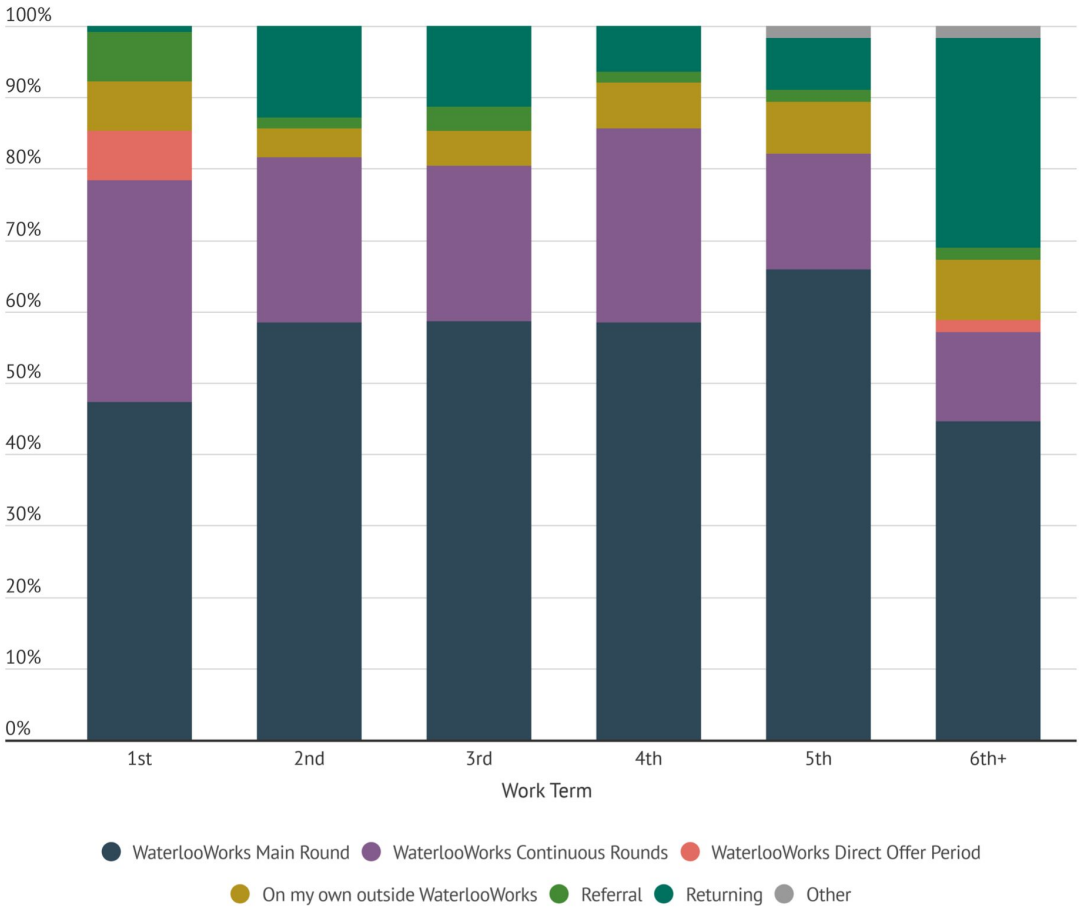
Almost half of respondents reported receiving an “Outstanding” rating in the last four work terms.



How did we find jobs?

The proportion of students finding jobs in the main round of WaterlooWorks matching increased between the first and fifth work terms.

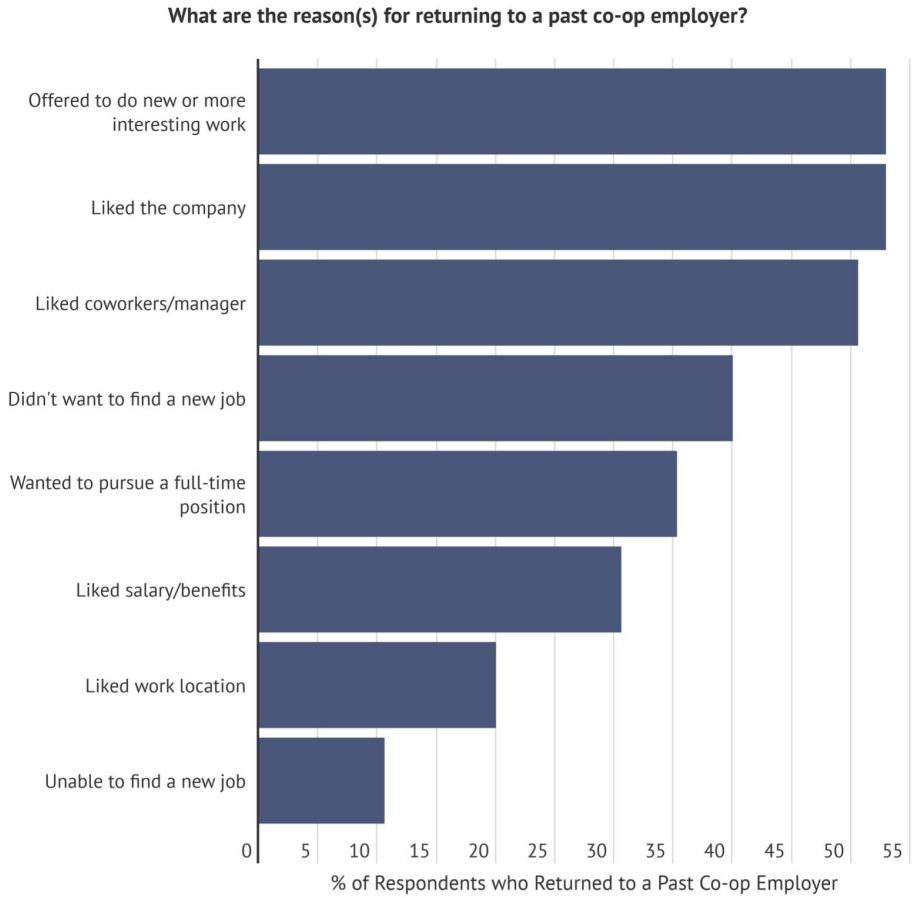
For the sixth worth term (Sep-Dec 2020) that was affected by COVID, nearly 30% of the class returned to a past co-op employer.



Returning to past co-op employers

Being offered to do new or more interesting work or liking the company was tied as the number one reason respondents returned to a past co-op employer.

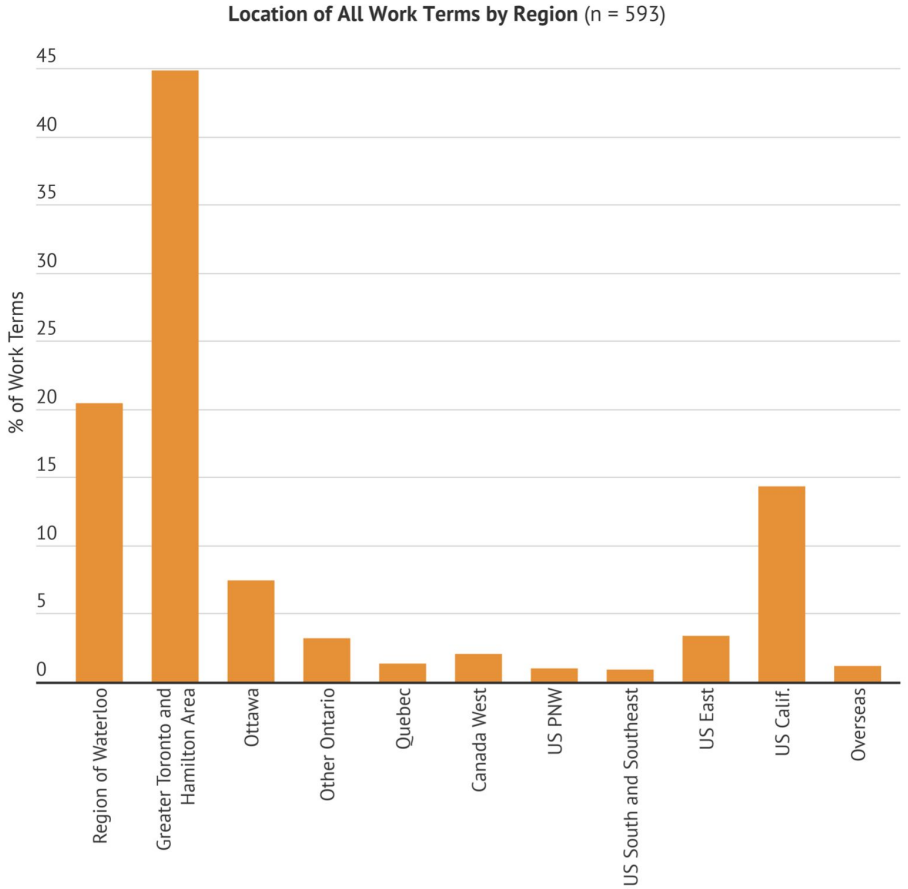
Multiple selections were allowed. Question was only asked to those who have returned to a past co-op employer.



Aggregate Co-op Terms By Region

593 work term locations were reported by all students across all work terms, with a plurality of jobs taking place in the Greater Toronto and Hamilton Area.

Across all work terms, **21%** of placements took place in the United States.

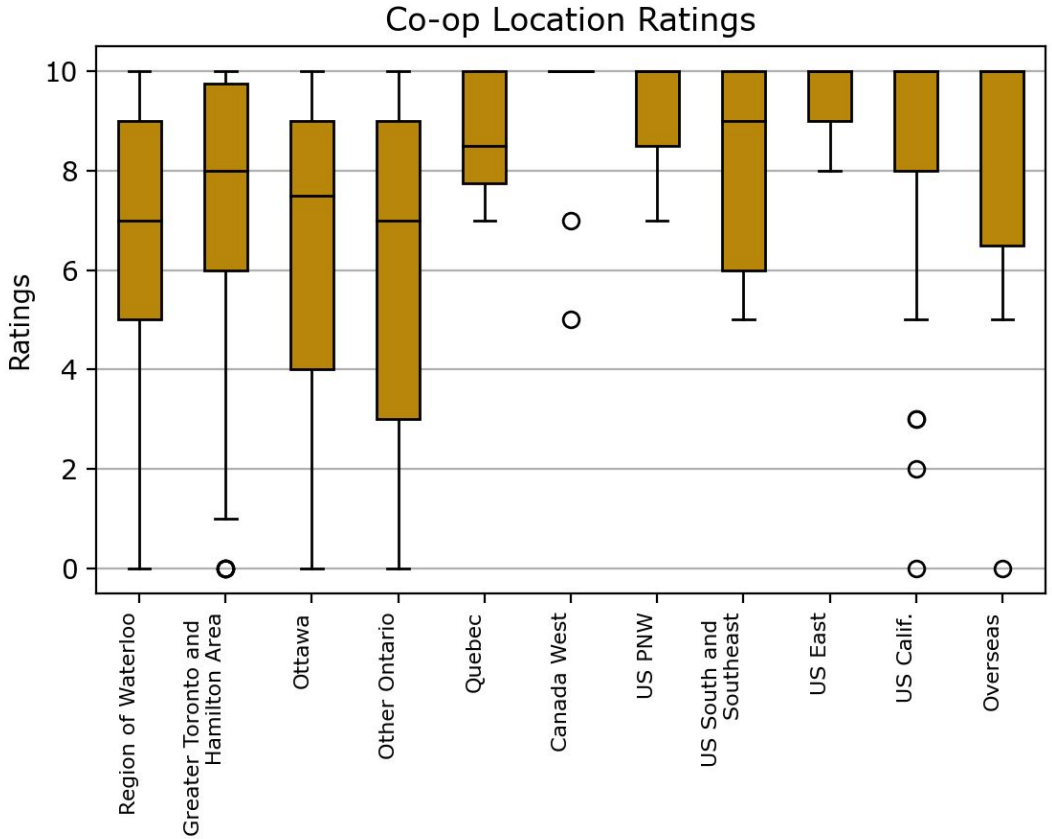


Where did we enjoy working? (By Region)

Regions in the United States enjoyed largely positive location ratings.

Only location ratings for work terms one through five were used, since the sixth work term was affected by COVID and internships were mostly conducted remotely.

Please refer to the previous slide for the sample size of each region.



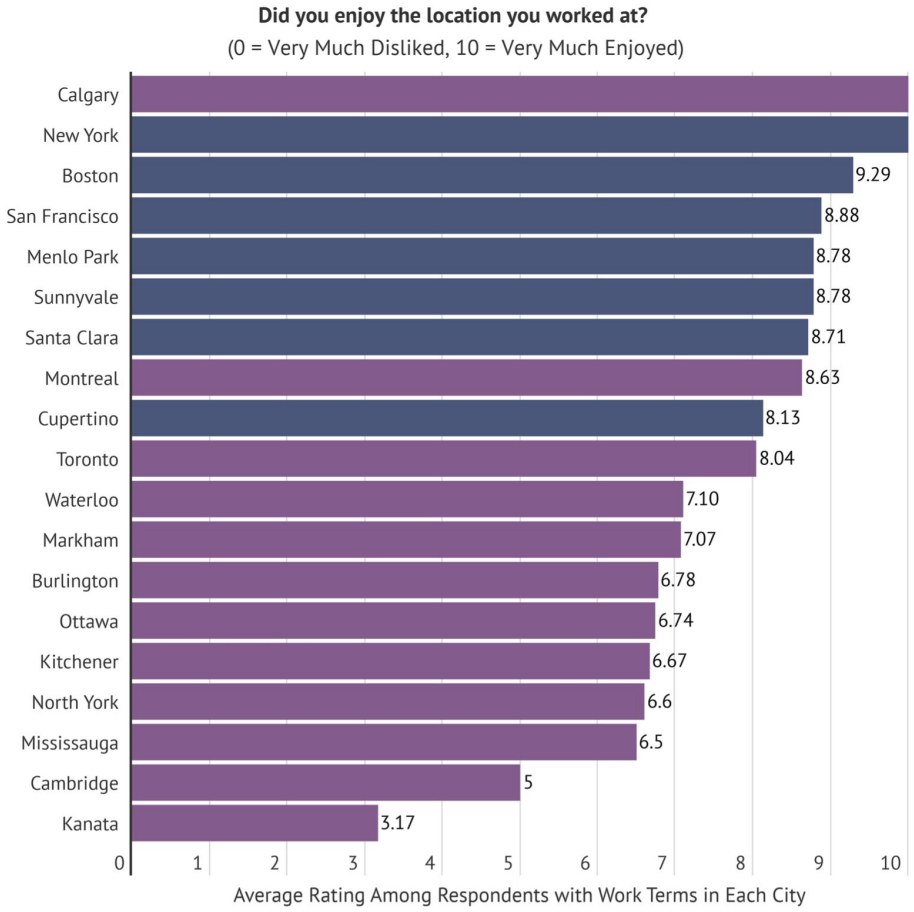
Where did we enjoy working? (By City)

Calgary and New York tied for favourite cities to work in, both with a perfect average rating of 10/10 amongst respondents who have worked there.

Otherwise, with the exception of Montreal, the most popular cities are in the United States.

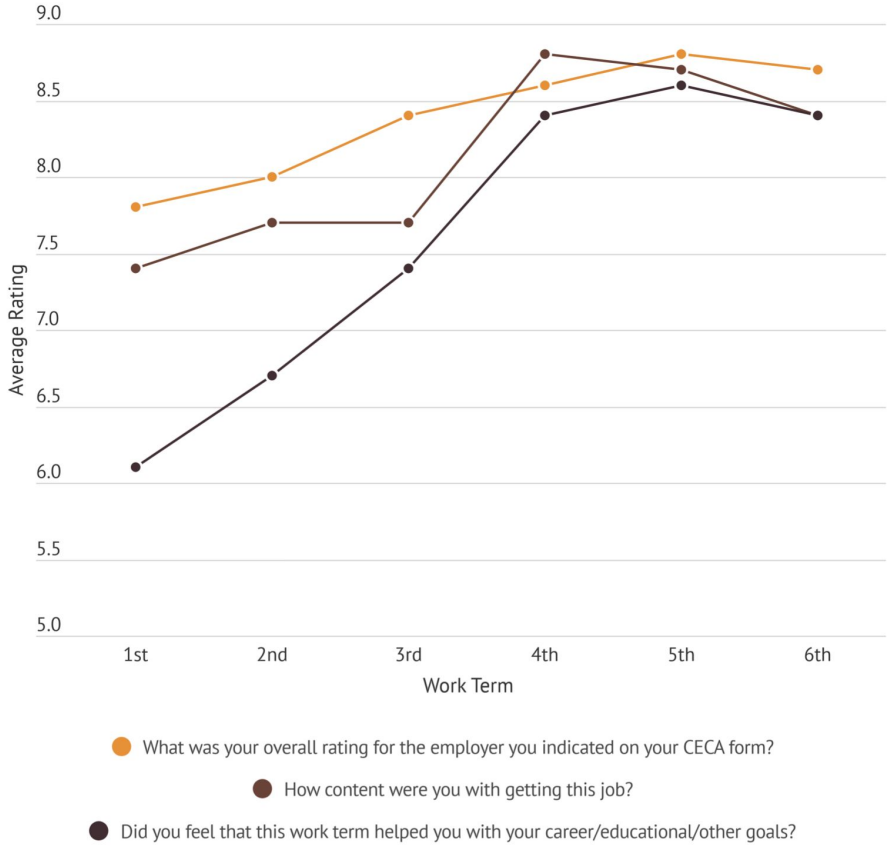
The *least favourite* city to work in, by a hilariously large margin, was Kanata, Ontario, where dreams go to die.

Only cities with at least five ratings are shown.



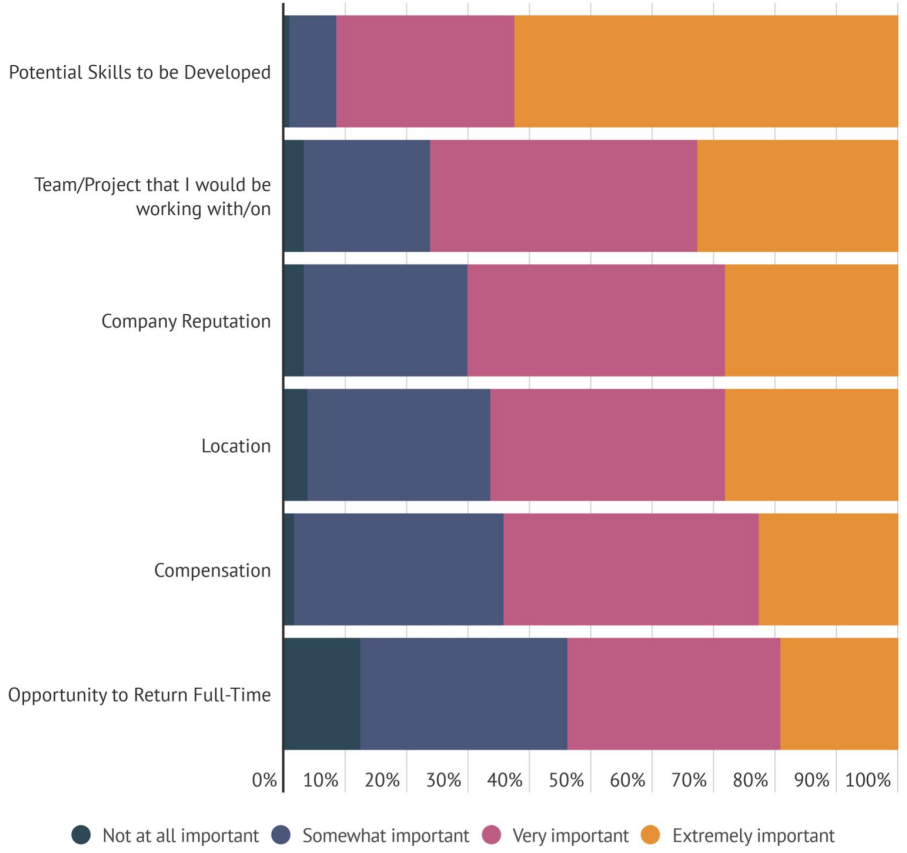
Were we happy with our placements?

Overall satisfaction with co-op placements increased steadily as the program went on, with a slight dip in the sixth work term, perhaps due to most internships occurring remotely due to the pandemic.



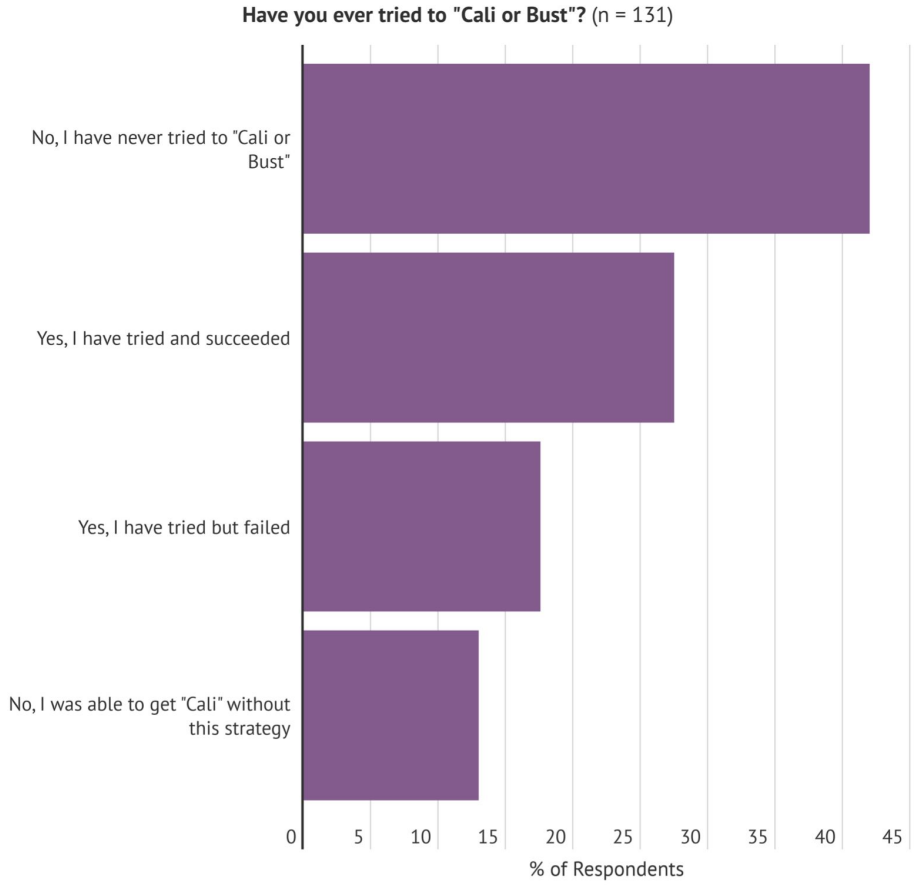
What factors affected your choice of co-op?

Assuming they had a choice, respondents said that the potential skills to be developed was the most important factor affecting their choice of co-op placement.



“Cali or Bust”?

The term “Cali or Bust” is often used as a meme referring to trying to land a job in the United States above all else. Some have taken the idea literally. While we let the respondent define for themselves what “Cali or Bust” means, **45%** of respondents have admitted to trying the strategy.



Miscellaneous Co-op Stats

21% said they were **late to at least one interview** without an excused reason

12% said that they **missed an interview** without an excused reason

3% said that they have been kicked out or banned from WaterlooWorks at some point

19% said that they have been "**screwed over**" by CECA at some point (we did not define what "screwed over" meant, so we advise to take this figure with "a grain of salt")

10.7% said that they did additional work during their co-op terms not related to ECE. During academic terms, this value was **18.2%**.

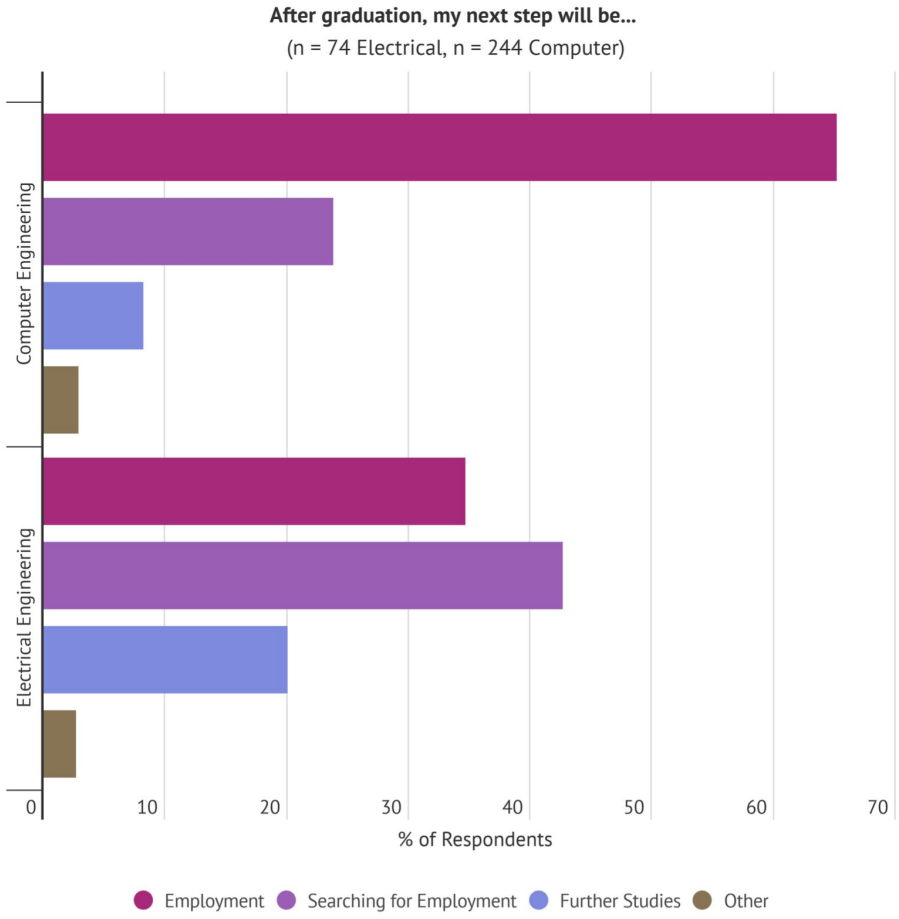
75.6% said that the COVID-19 pandemic affected their search for their last co-op.

Future Plans

The Next Steps

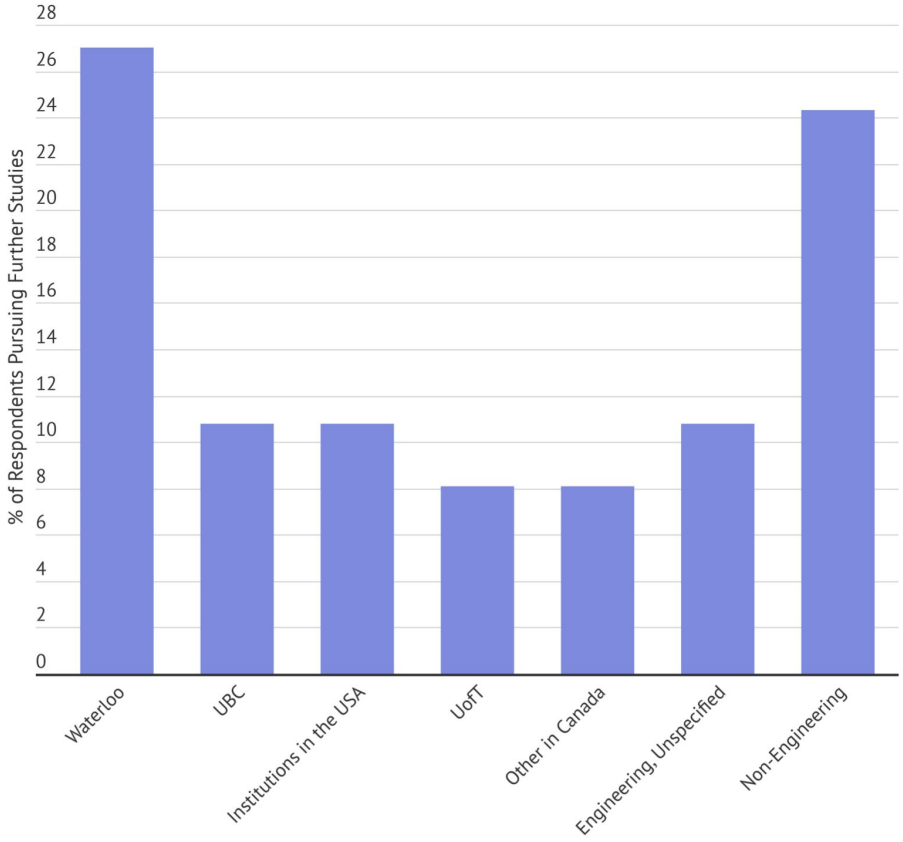
Perhaps due to the pandemic, a significant portion of the class were still intent on searching for employment at time of survey. (late March 2021).

This is especially so in Electrical Engineering, where more students are searching for employment than those with full-time employment and 20% are pursuing further studies.



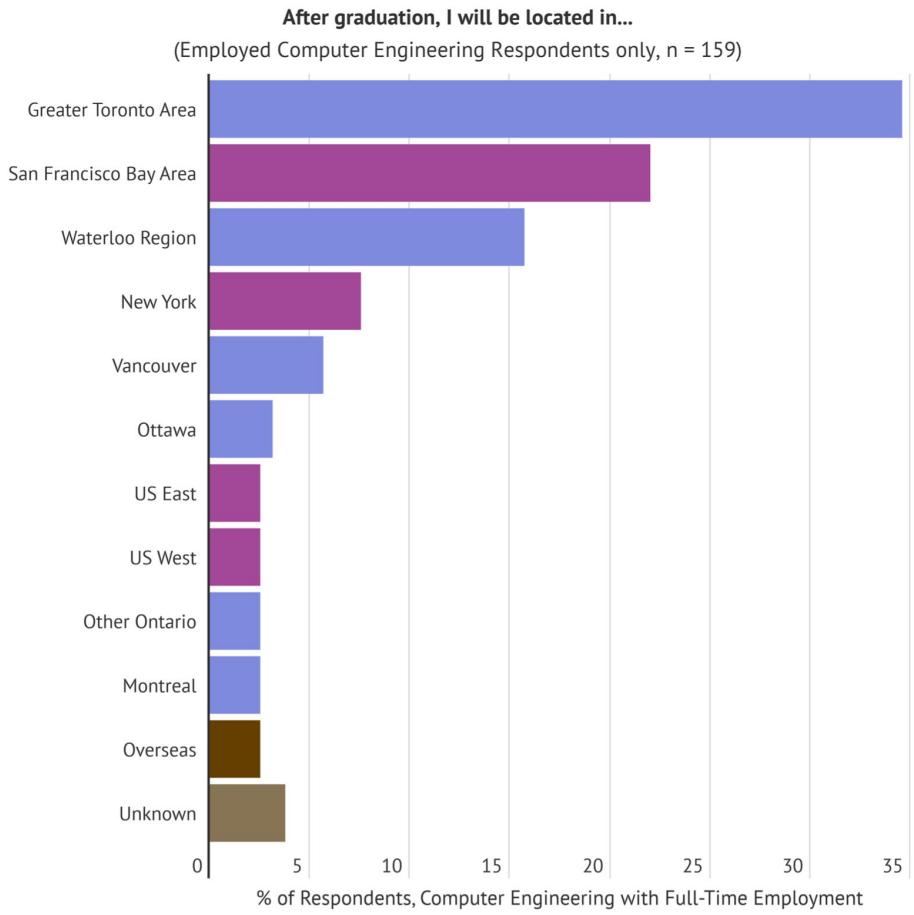
Further Studies

Of respondents pursuing further studies, continuing at Waterloo was the most popular option. A significant percentage is also pursuing a non-engineering academic program, such as Law School.



Location of Full-Time Employment Computer Engineering

Following the SE 2020 Class Profile, Canadian politicians can once again sleep soundly at night and go back to ignoring the “Brain Drain” issue, since only exactly 1/3rd of respondents with a full-time job in CE will be going to the USA.



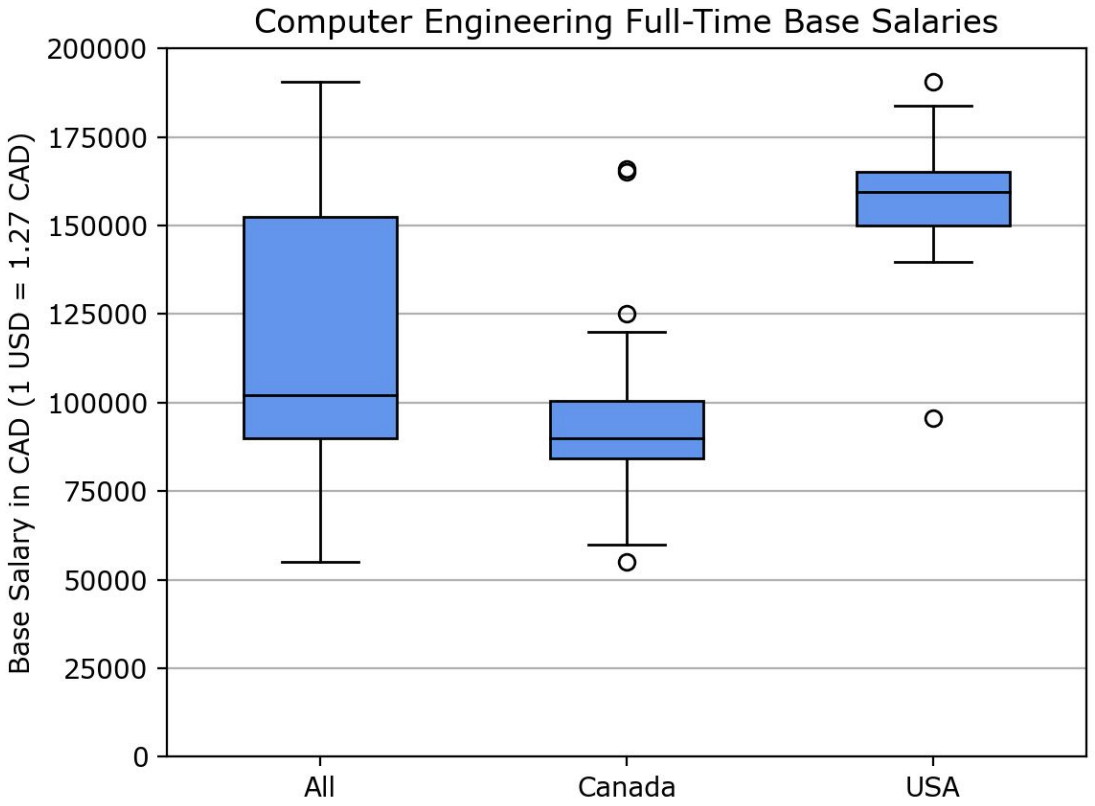
Full-Time Base Salaries For Computer Engineering

The average salaries (in CAD) are **$92,600 in Canada and $158,200 in the US**.

The overall average among all employed Computer Engineering respondents is **$117,300**.

For context, the **average Canadian income** in 2019 for the age range of **25 to 34** is $47,000[5].

All dollar amounts in CAD, with 1 USD = 1.27 CAD

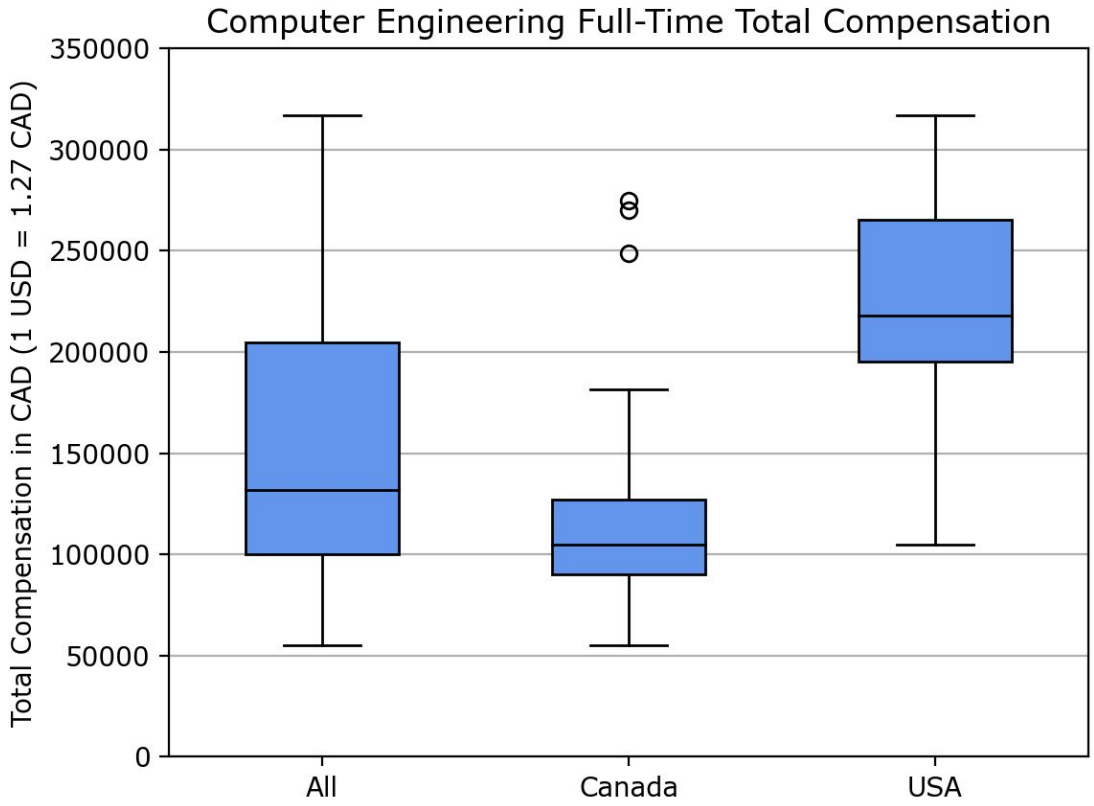


Full-Time Total Compensation For Computer Engineering

The average total compensation is **$113,200** in Canada (+$20,100 over base) and **$228,900** in the US (+$70,800 over base).

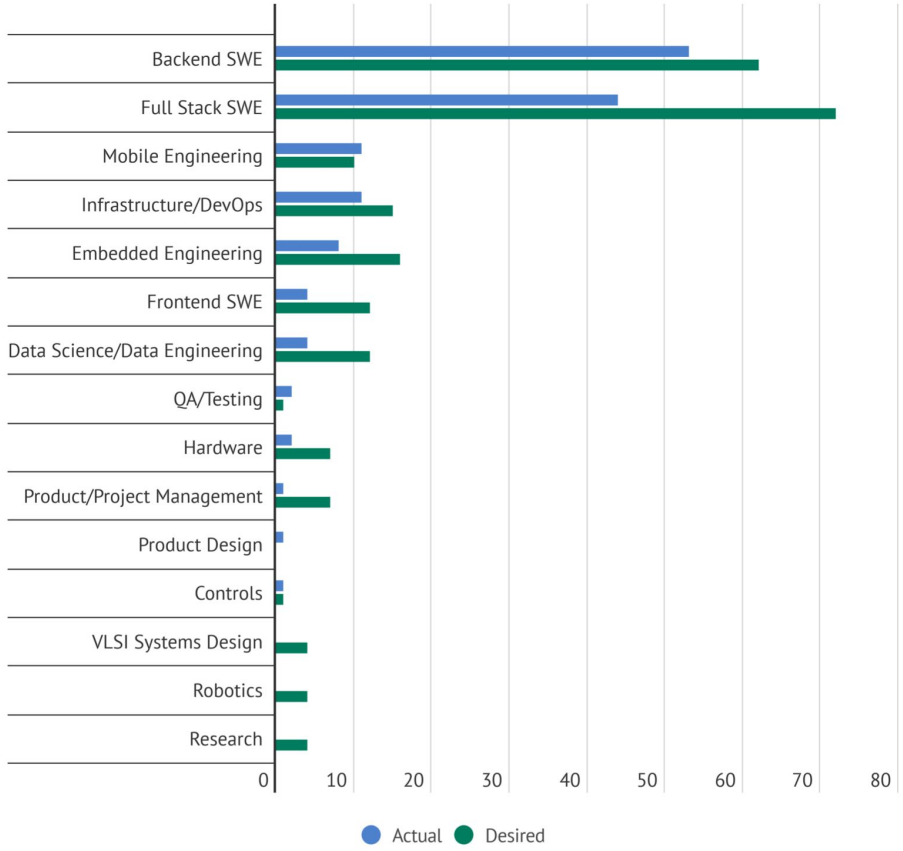
Overall, the full-time total first year compensation for computer engineering graduates is **$156,900**.

All dollar amounts in CAD with 1 USD = 1.27 CAD



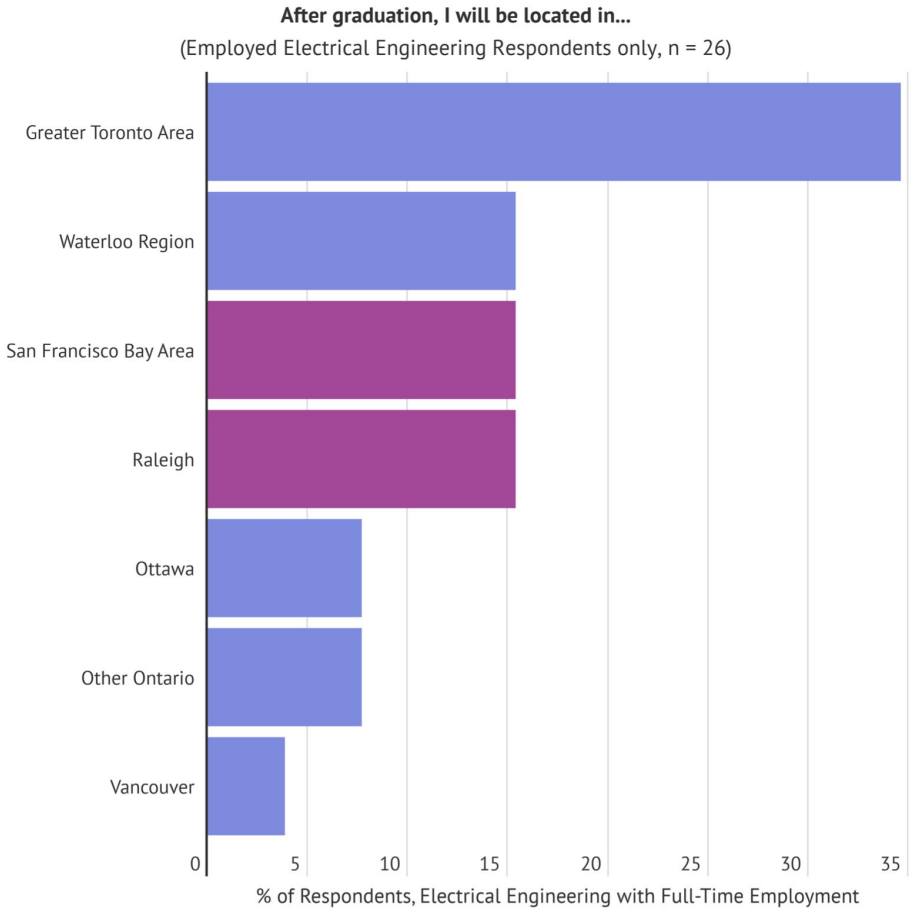
Category of Full-Time Employment Computer Engineering

Among employed Computer Engineering students, Backend Software Engineering was the most popular category of full-time employment, while Full Stack Software Engineering was the most desired job category.



Location of Full-Time Employment Electrical Engineering

Among Electrical Engineering students who have found employment, 31% are going to the United States: either to the Bay Area or the Research Triangle Park in Raleigh, North Carolina.

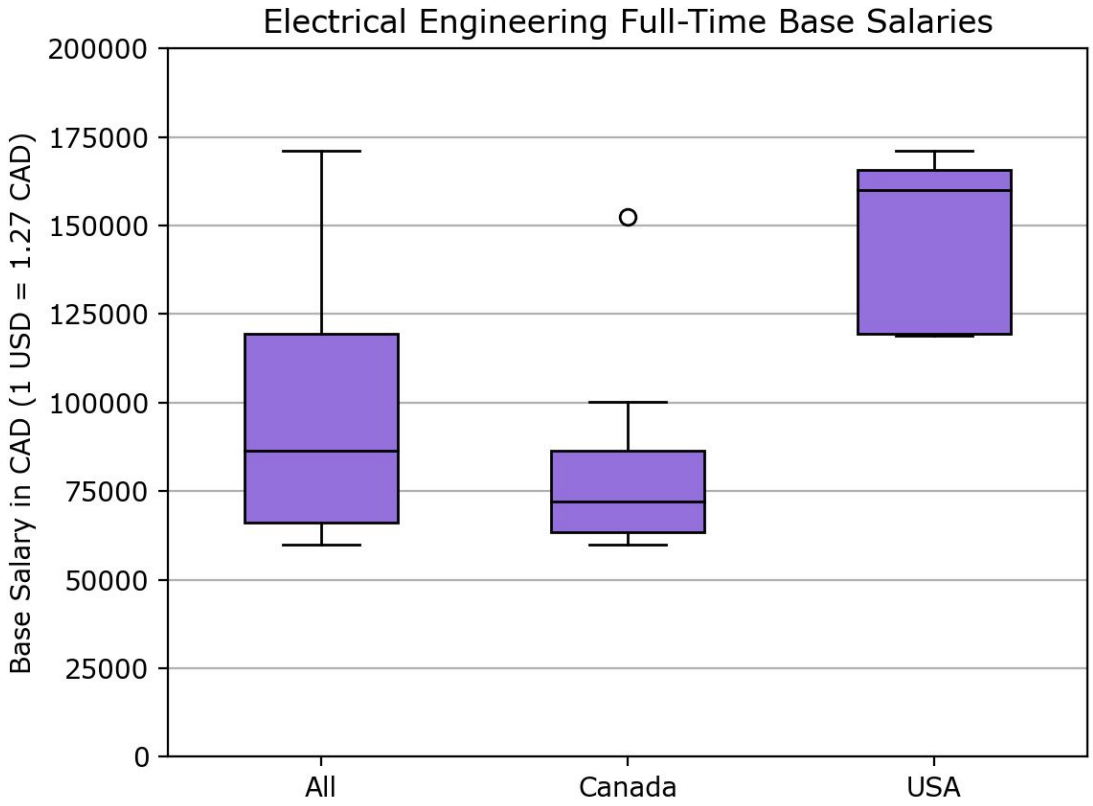


Full-Time Base Salaries For Electrical Engineering

The average salaries are **$79,200 in Canada and $145,700 in the US**.

The overall average among all employed Electrical Engineering respondents is **$100,400**.

All dollar amounts in CAD with 1 USD = 1.27 CAD

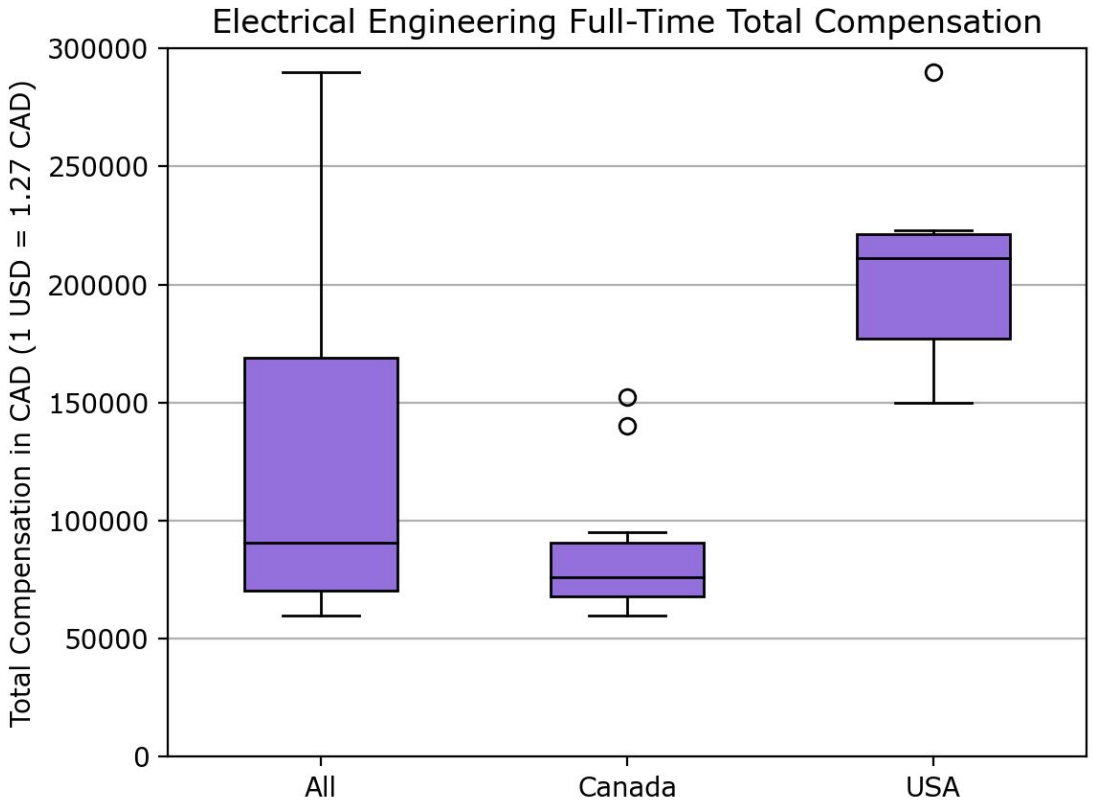


Full-Time Total Compensation For Electrical Engineering

The average total compensation is **$84,800** in Canada (+$5,600 over base) and **$207,000** in the US (+$61,200 over base).

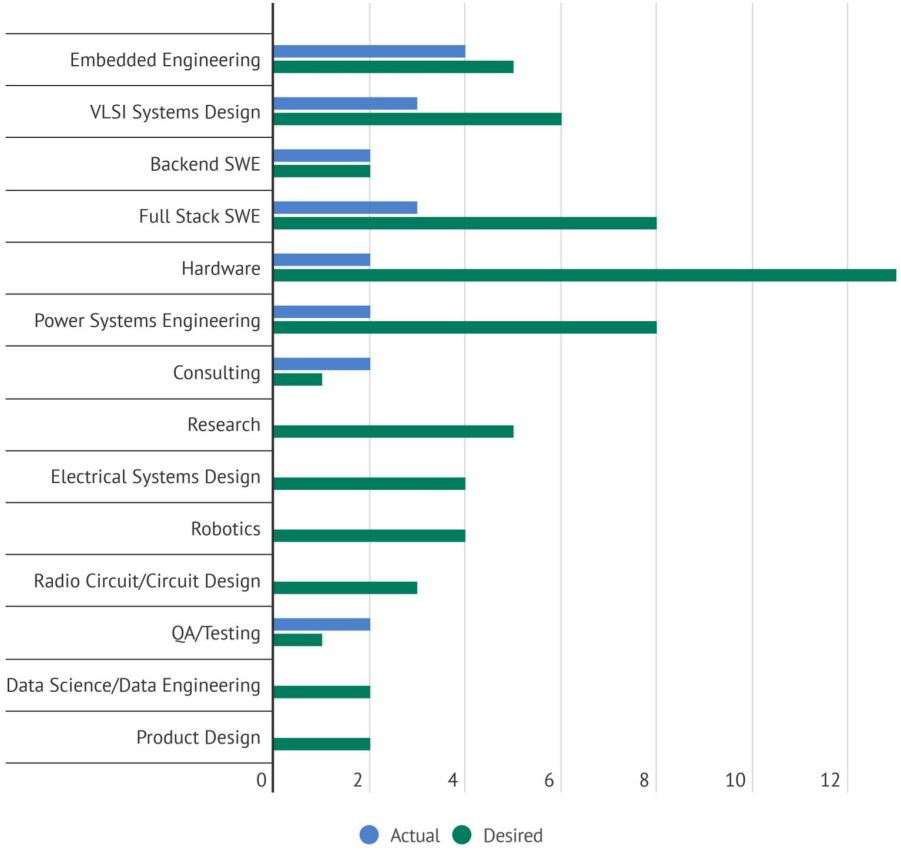
Overall, the average full-time total first year compensation for electrical engineering graduates is **$123,700**.

All dollar amounts in CAD with 1 USD = 1.27 CAD



Category of Full-Time Employment Electrical Engineering

Hardware is the most desired field for Electrical Engineering students to work in, yet relatively few have a job in that field.



Which companies for full-time?

Survey respondents shared 104 different companies that they will be working for full-time.

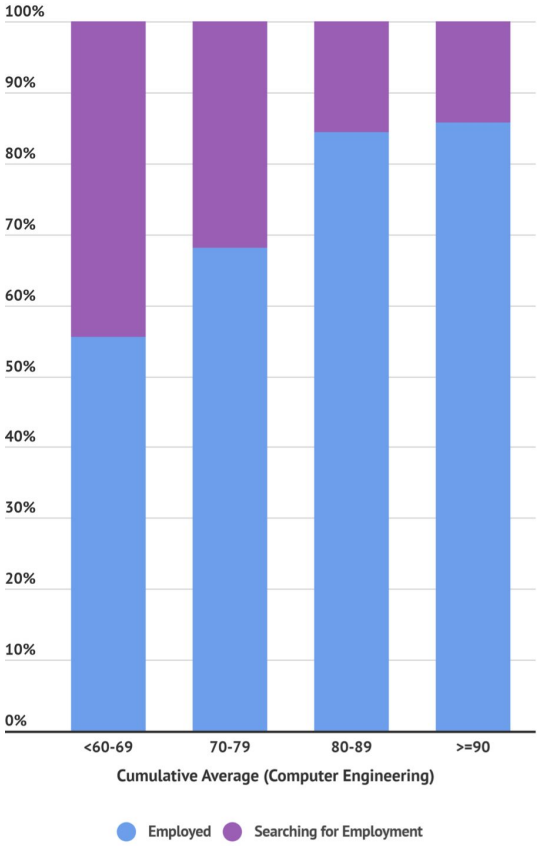
The most popular full-time employer was Facebook, followed by Shopify and Amazon.

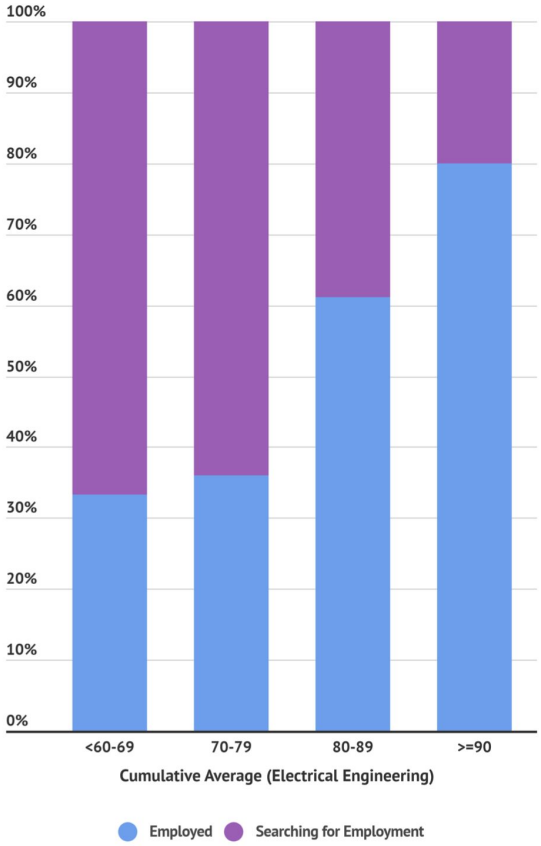
For privacy, only companies with at least two respondents are shown.

Cumulative Average vs. Employability

It appears that there may be a correlation between a students' cumulative average and whether or not they have found a full-time job.

For this graph, only students who responded with "Employment" or "Searching for Employment" are included. Students pursuing further studies or provided other answers are not included.



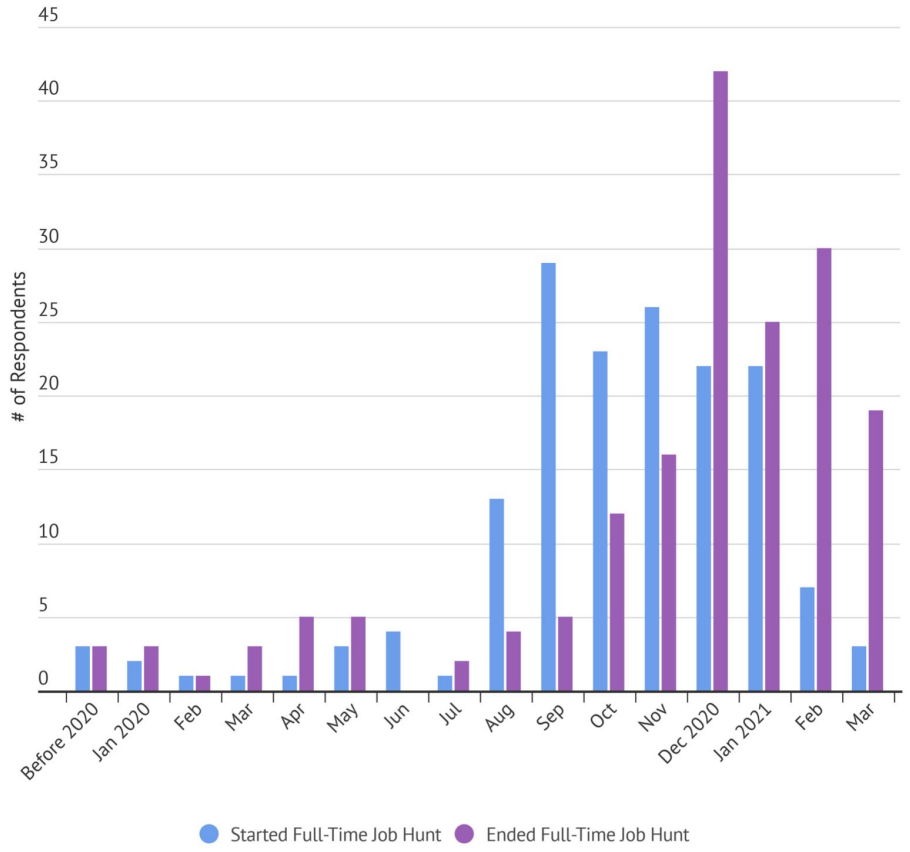


Full-Time Job Hunt

Not including those still searching, the average time it took for someone to find a full-time job was **2 months.**

Not including those who may have received an offer immediately without conducting a search (e.g. received a return offer from a past co-op employer), the average was **2.5 months**.

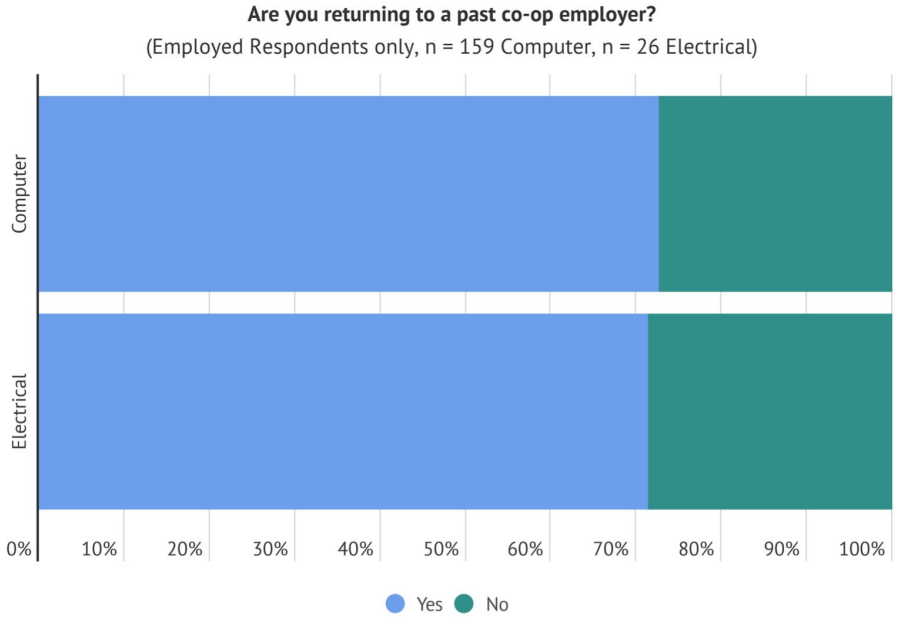
Note: some respondents provided only an ending month and not a starting month, hence total values may not equal.



Returning Interns

73% of Computer Engineering students
and
71% of Electrical Engineering students

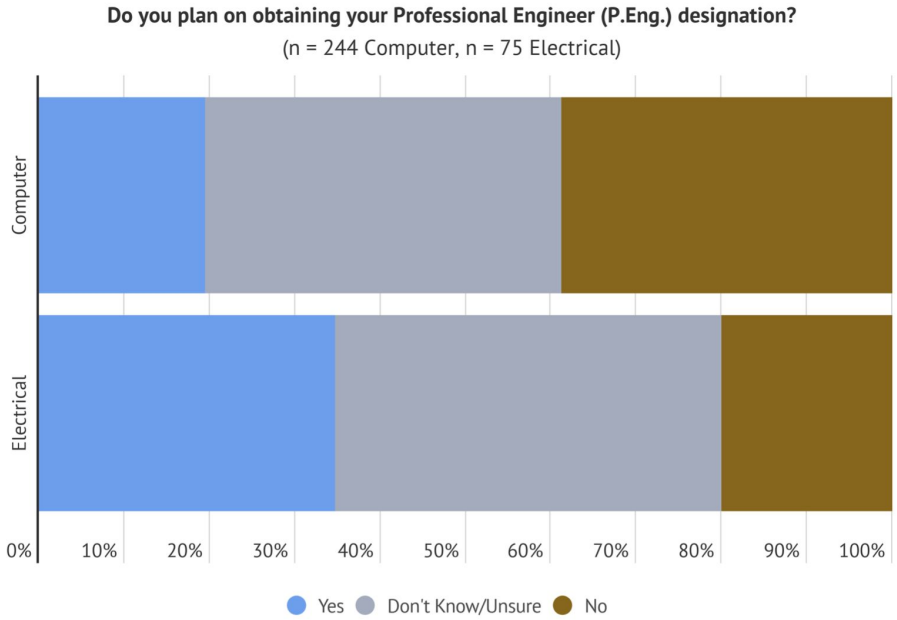
who are employed are returning to a past co-op employer.



P.Eng.

Less than **20% of Computer Engineers** indicated that they intend to obtain their Professional Engineering (P.Eng.) designation in the future.

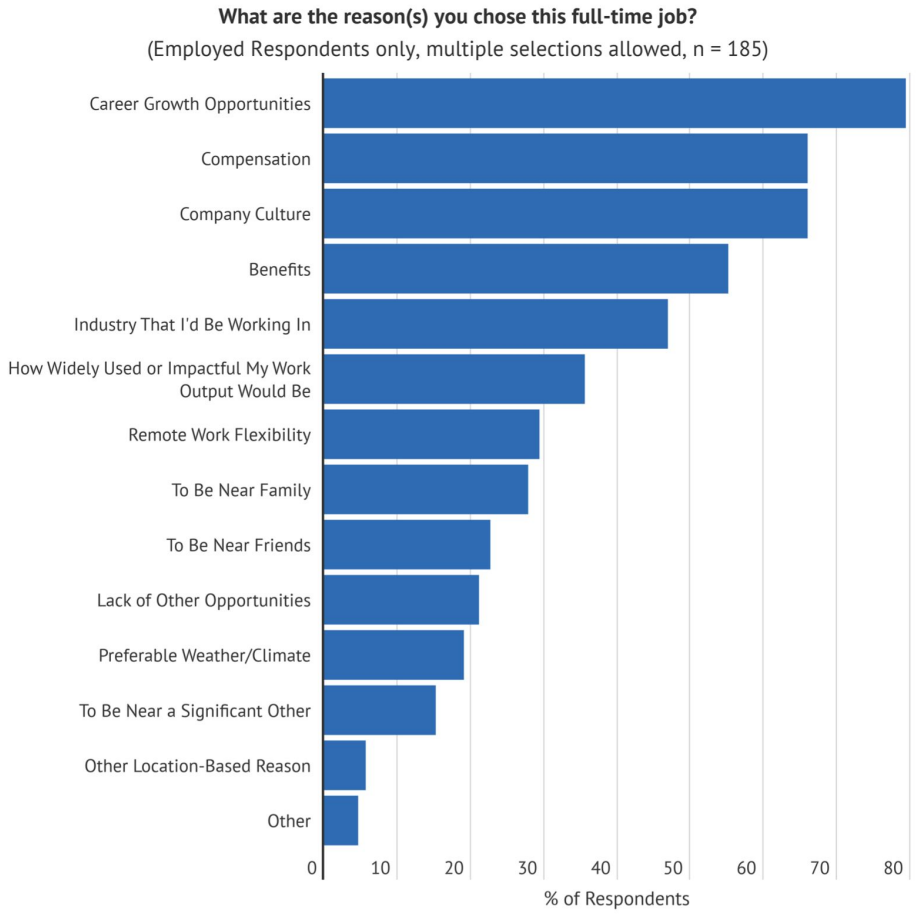
This proportion is higher in **Electrical Engineering, with 35%** of respondents planning on doing so.



Important Job Factors

Of those who found a full-time job, almost 80% said that c**areer growth opportunities** was an important factor in choosing their job.

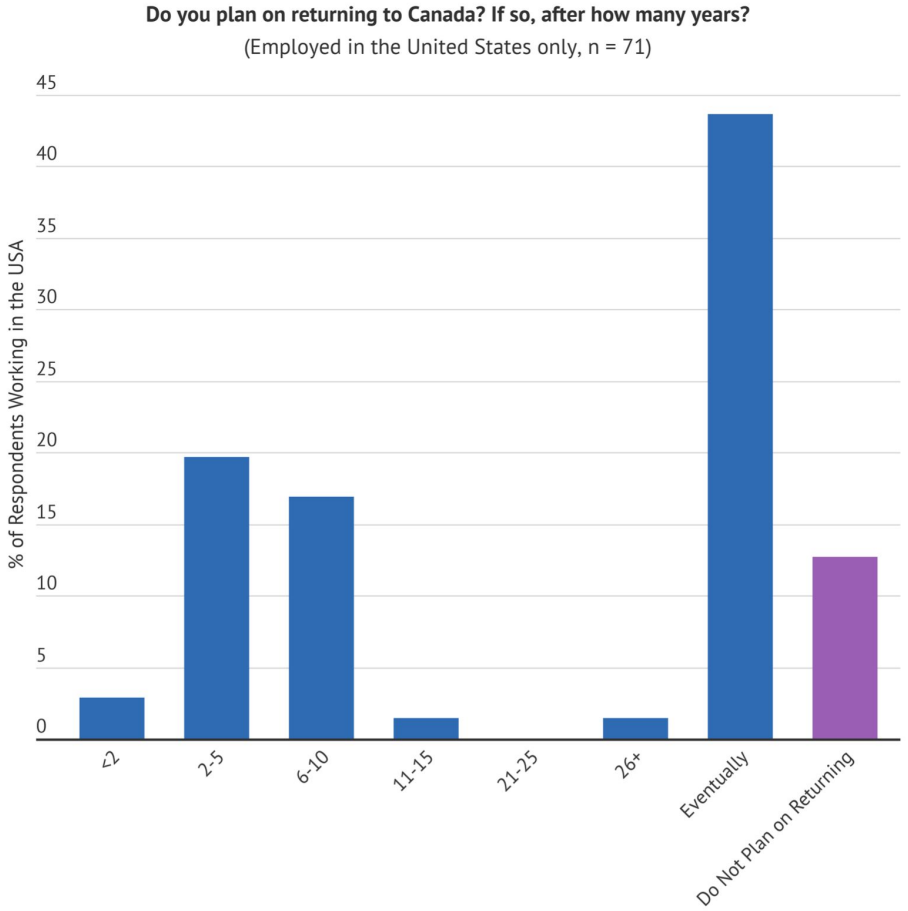
Multiple selections were allowed.



Oh say can you see...

For those going to the United States, most plan on eventually returning to Canada, with **44% planning on returning but without a definite timeline.**

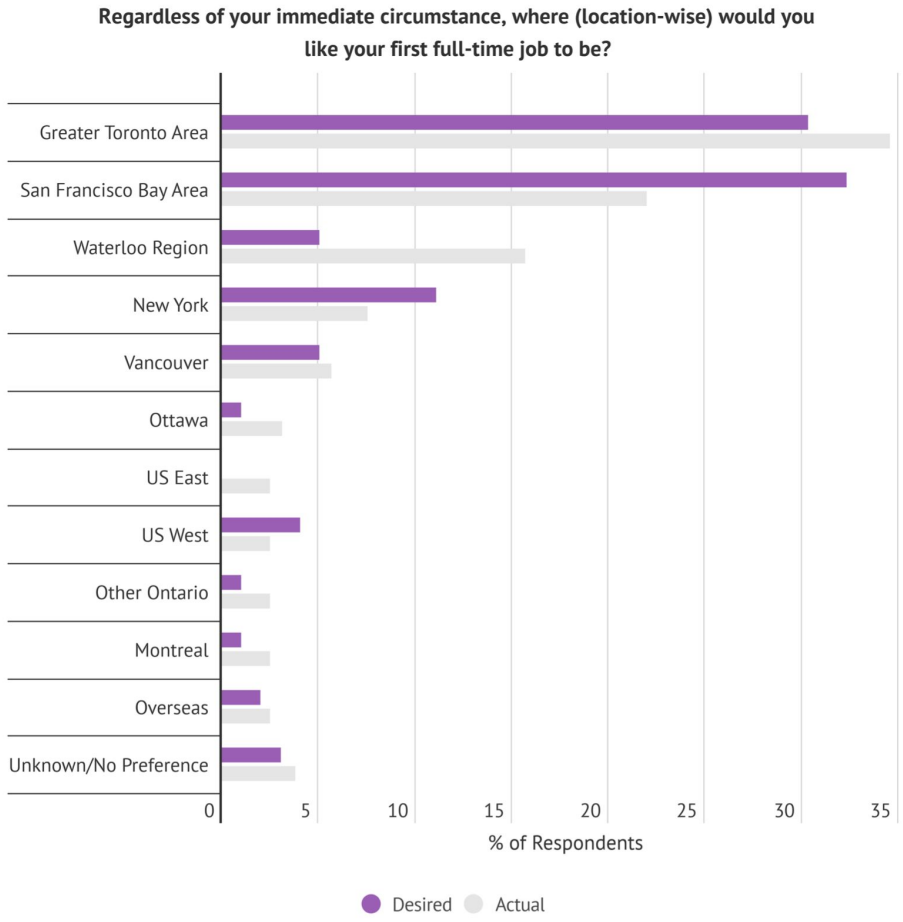
Only **13%** say that they do not plan on ever returning to Canada.



Desired Work Locations

Contrary to popular belief, not everyone wants to work in the United States, with only **34.6%** of respondents wanting to work in the United States. About 30% of respondents saying that they would prefer to work in the GTA.

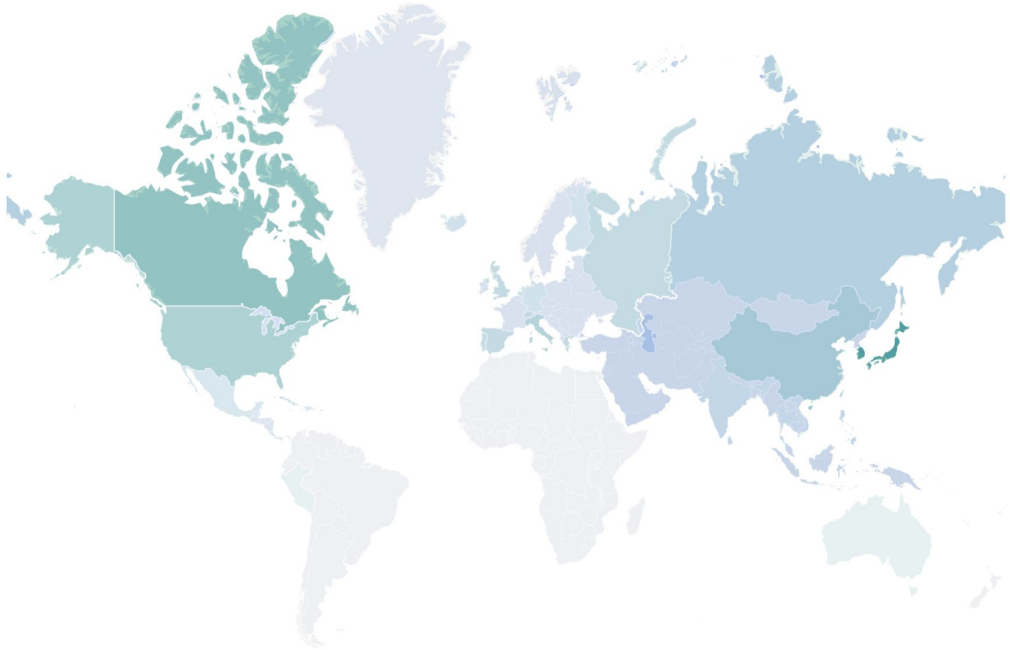
Nonetheless, there is still a higher proportion of respondents wanting to work in the US than there are actually working south of the border.



Grad Trip

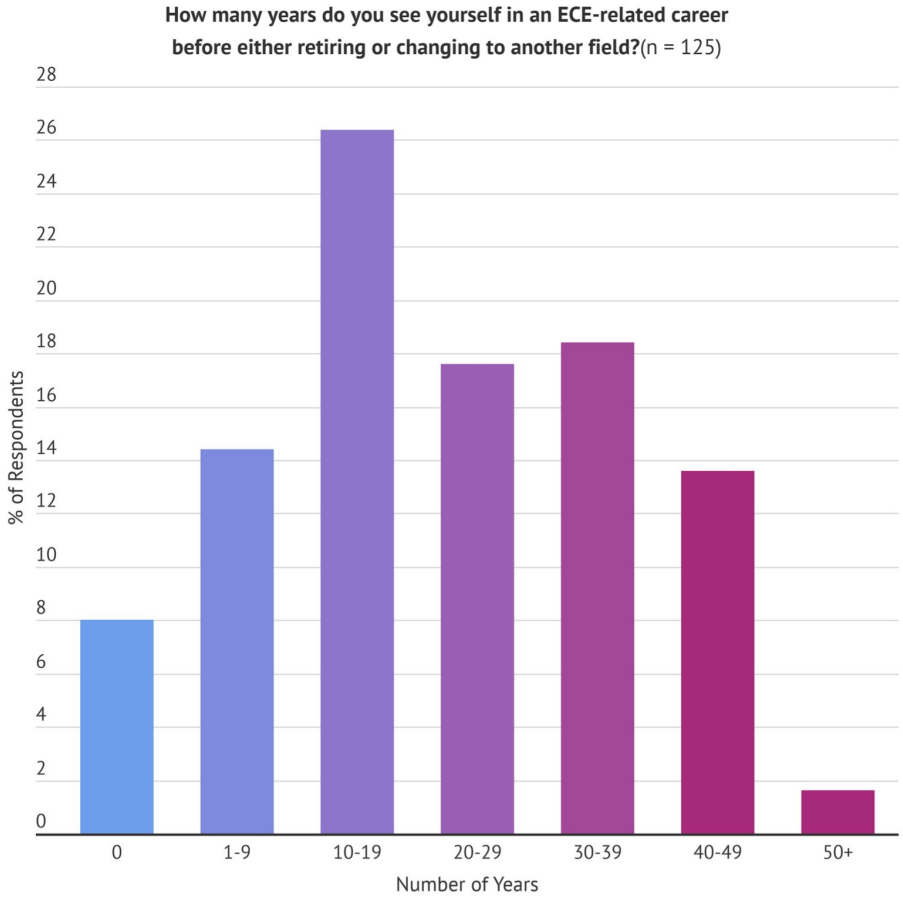
Once this pandemic business is over, Japan is the most popular destination for grad trips, followed by Europe and South Korea.

Some respondents answered with a continent rather than a country, so some entire continents have been shaded in. No one is interested in going to Mongolia, for example.



Countdown to Leaving

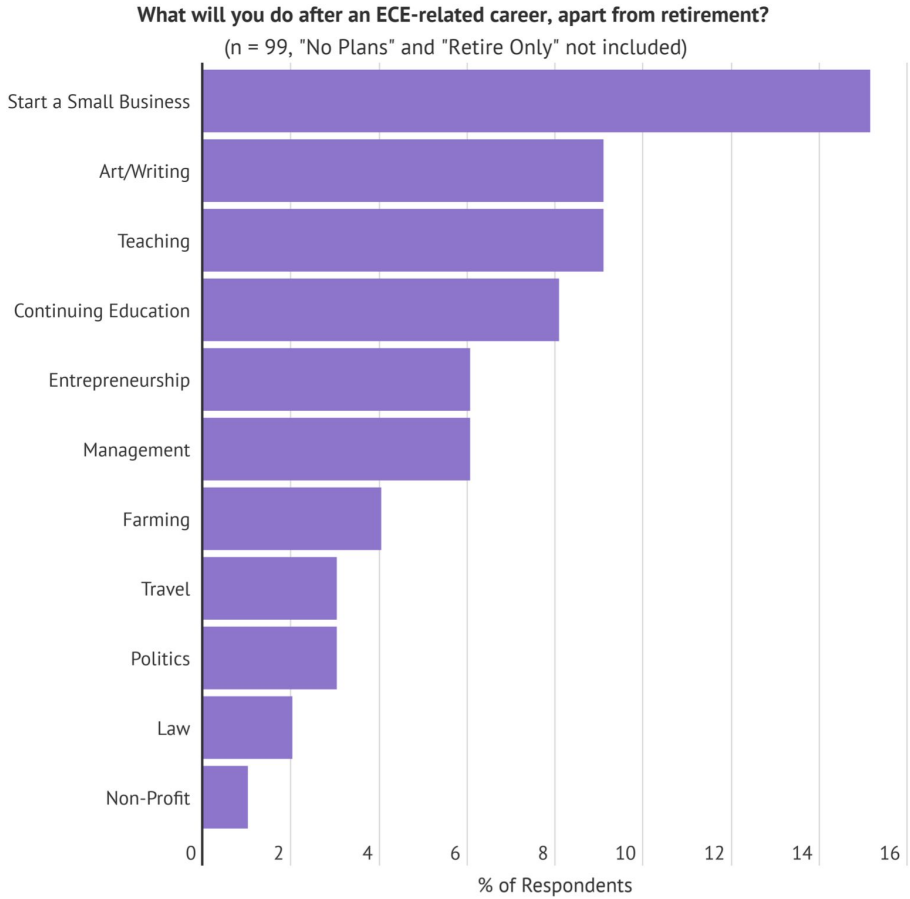
Most respondents see themselves spending less than 30 years in an ECE-related career field, including some saying that they will be pivoting away from ECE immediately after graduating.



Looking forward to Retirement Already

Respondents had a wide variety of plans for after an ECE-related career, such as starting a small business (ideas included bubble tea stores, bakeries, food trucks, and ice cream shops), venture capitalist investing, farming, becoming an author/screenwriter, or just traveling and biking to their heart's content.

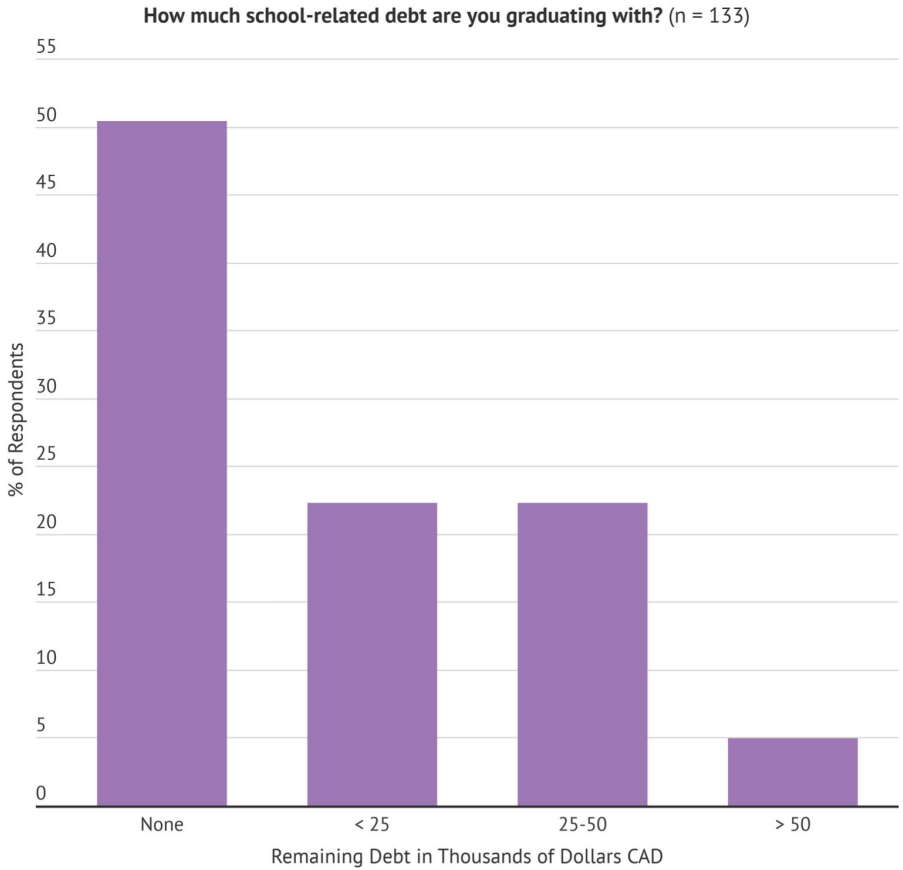
34% of respondents said that they had no plans or wished just to retire, which is not shown on the graph to avoid skewing the x-axis.



Reflections on Undergrad

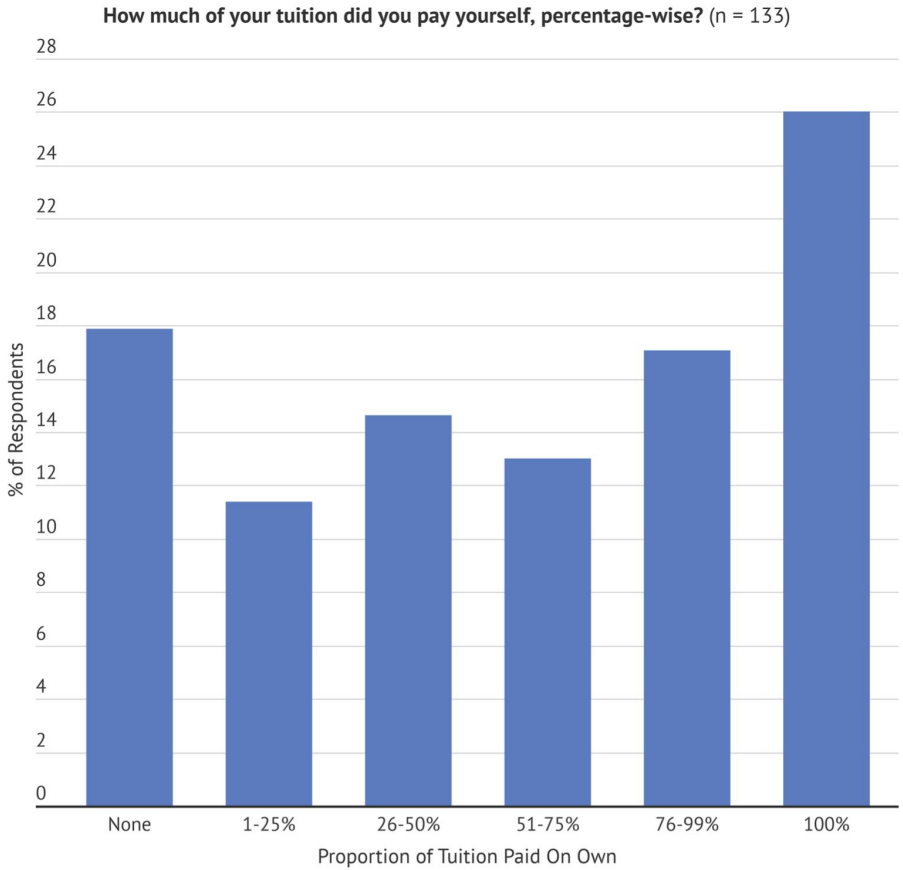
Debt

Over half of the class is graduating debt-free!



Self-Funding Tuition

A plurality of students paid their entire tuition on their own, while about 18% say that they paid none of their tuition themselves.

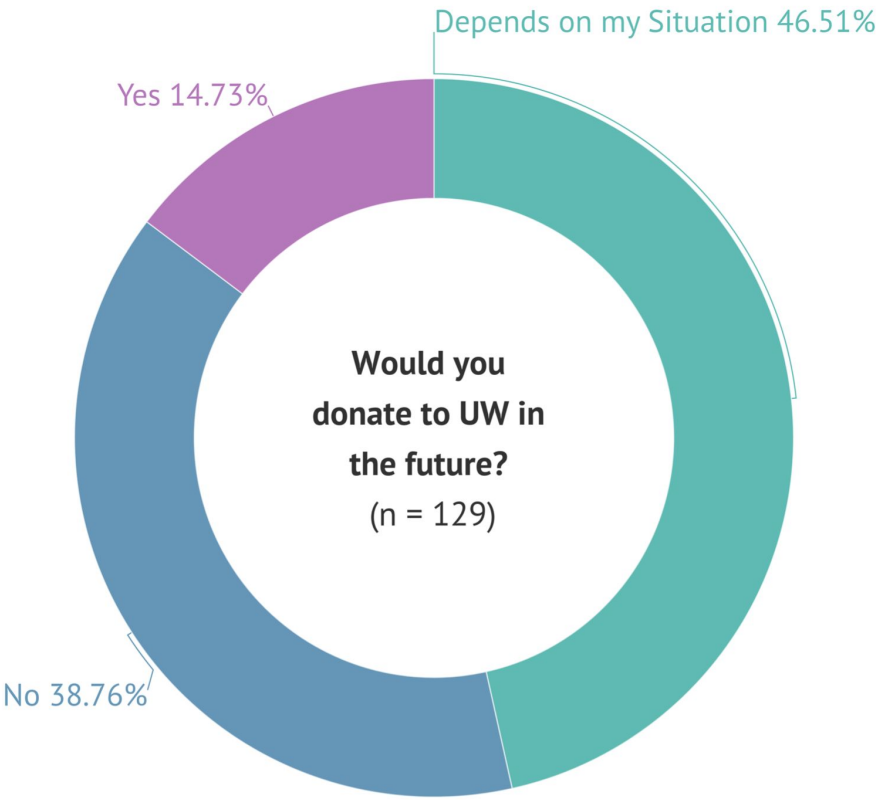


I am once again asking for your financial support...

As if we haven't paid enough tuition already, the University needs your help to build E8! (and E9, E10, ...)*

Only **15%** of respondents say that they will donate, while most say that it depends on their future situation.

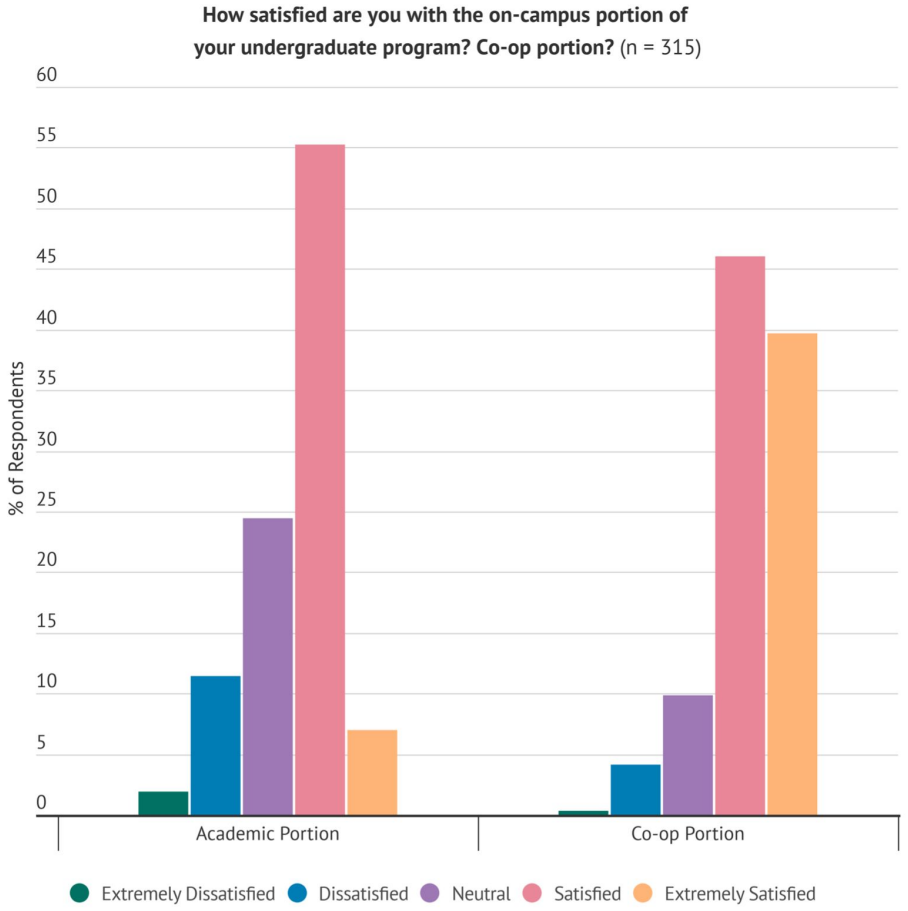
*Disclaimer: This is meant to be a joke. We have no idea how the University spends donation money. Please don't revoke our degrees.



Customer Satisfaction

Overall, **86%** of the class said that they were either satisfied or extremely satisfied with the **co-op portion** and **65%** said so for **the academic portion**.

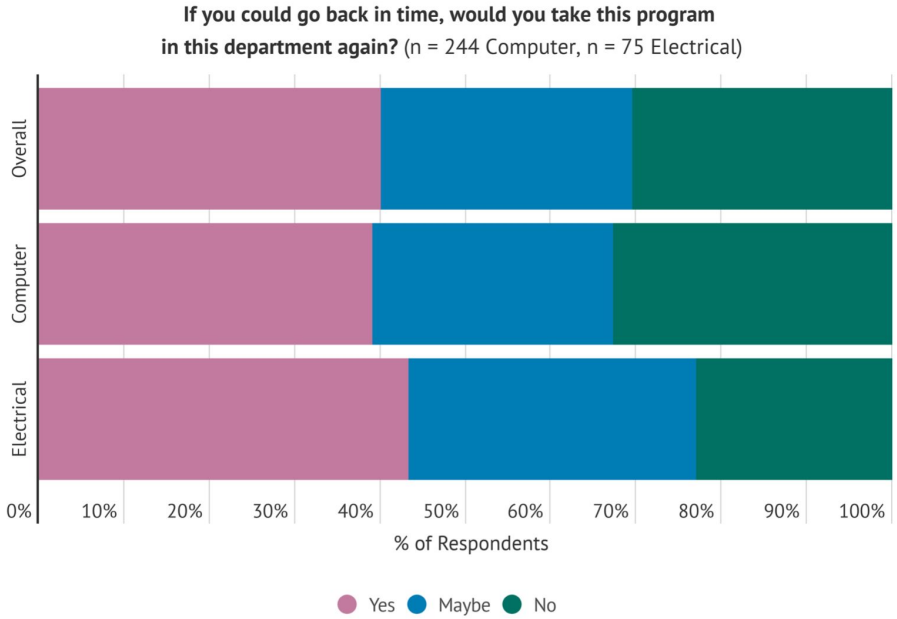
Students were asked to try to not consider the impact of the pandemic in their responses.



Buyer's Remorse?

Incredibly, **33%** of the Computer Engineering class would not do their program again. **28%** say Maybe and **39%** say Yes.

This figure is lower for Electrical Engineering, with only **23%** they wouldn't do their program again, **34%** saying Maybe, and **43%** saying Yes.

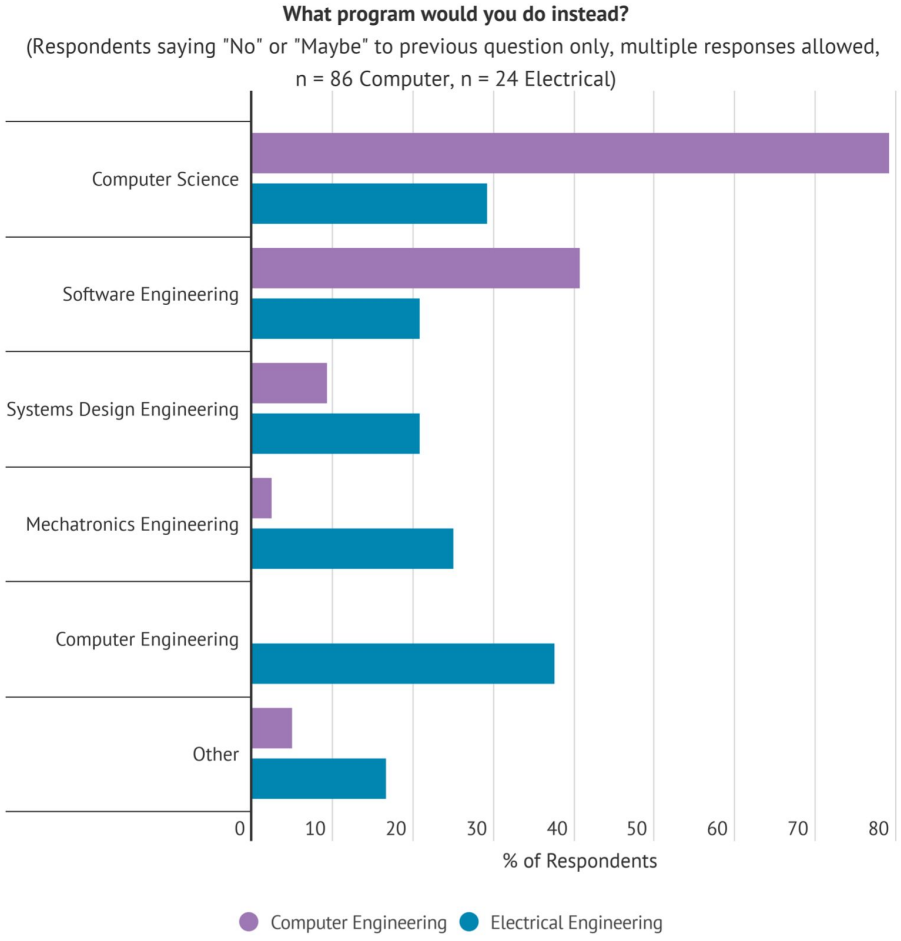


Buyer's Remorse?

Of those who said that they wouldn't or maybe wouldn't do Computer Engineering again, **79%** said that they would do CS instead, followed by **41%** saying SE. "More flexibility" and "not interested in circuits/hardware" were common themes of why.

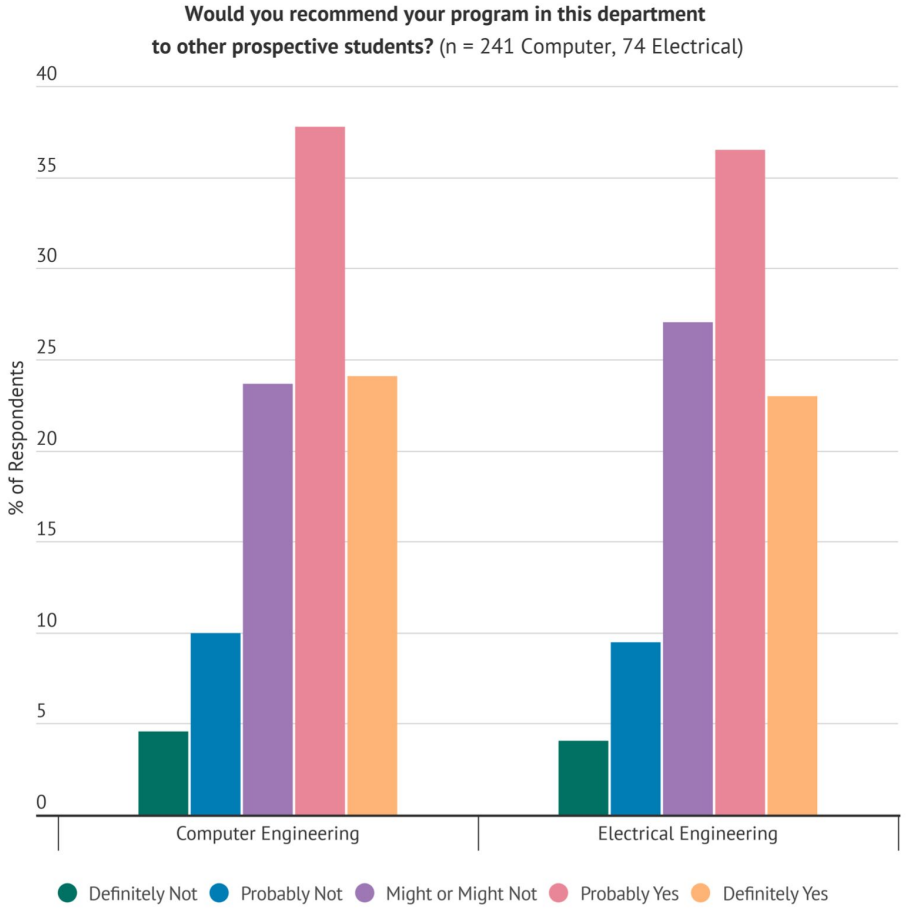
On the Electrical side, the most popular choice was Computer Engineering, (conversely, only one CE respondent said they'd wished they had done EE), with Tron being second-most popular.

Other responses include Management Engineering, Math, and Biomedical Engineering



Would you recommend?

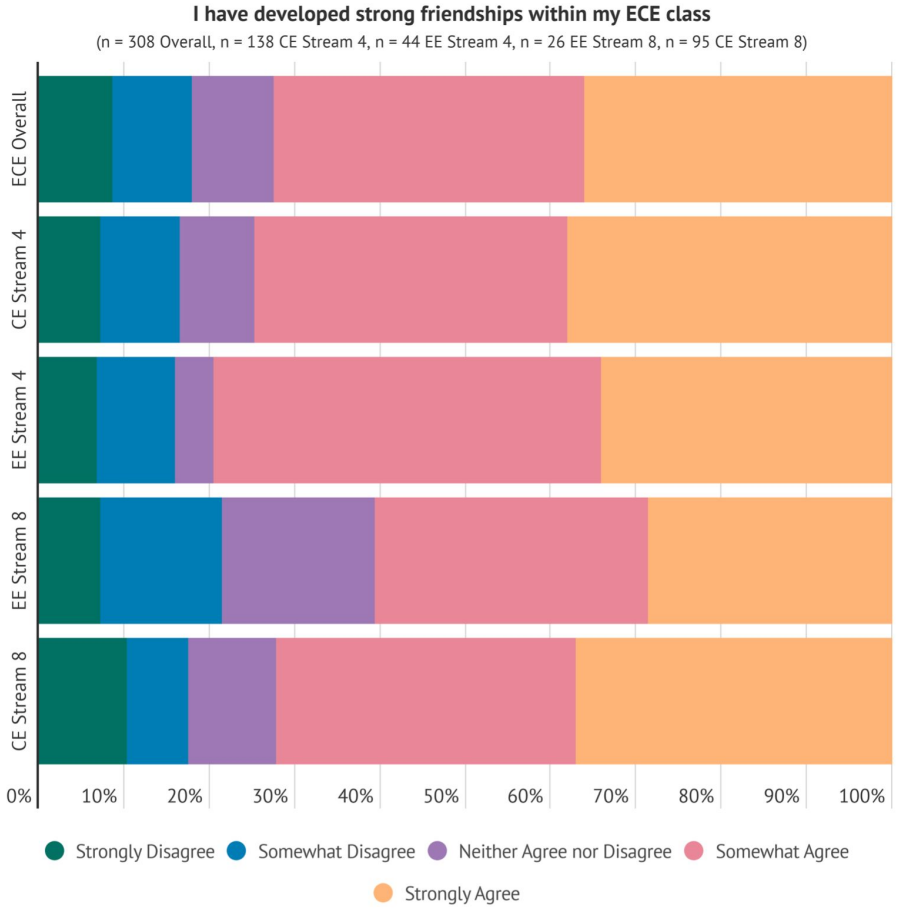
Overall, respondents from both programs would probably or definitely recommend their program to prospective students, with **62% of Computer Engineers and 59% of Electrical Engineers** saying so.



Friendships

Maybe the real degree was the friends we made along the way.

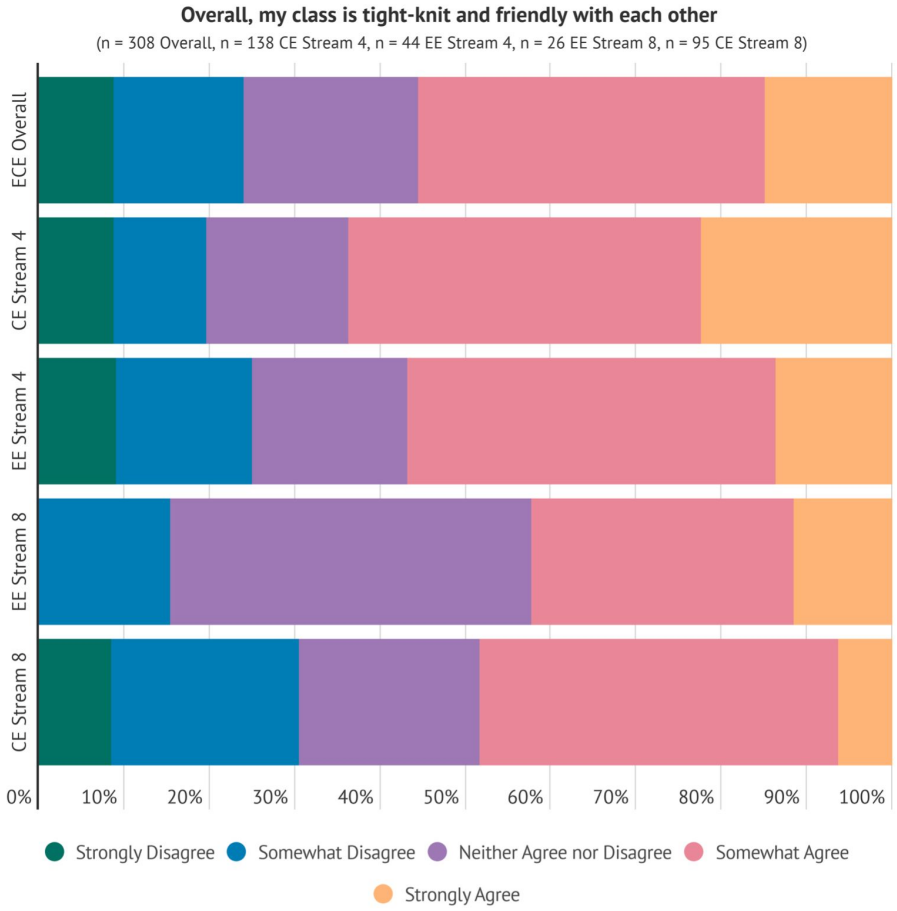
Most students were able to develop strong friendships within their ECE class during their undergraduate degree.



Cohort Cohesiveness

In both Stream 4 classes, a majority of respondents said that they agreed that their class was tight-knit and friendly.

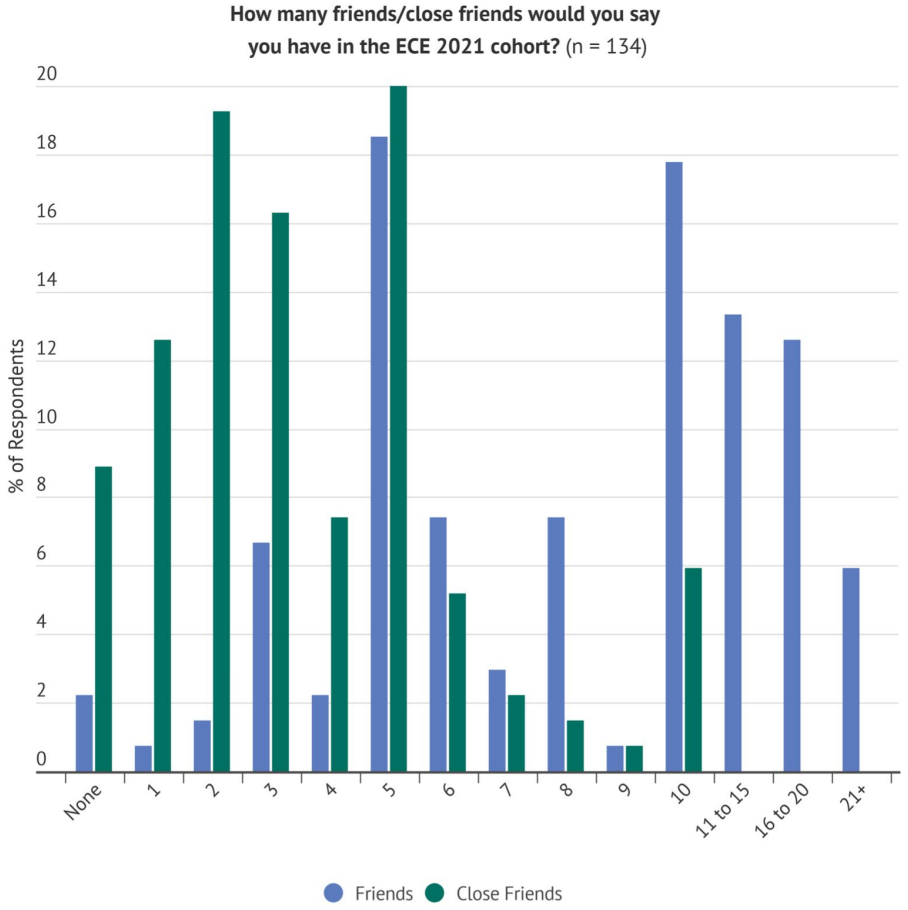
In both Stream 8 classes, less than half of respondents said the same, with only **6%** of Stream 8 Computer Engineering respondents strongly agreeing with the sentiment.



Friends in the Cohort

On the survey, we suggested that the definition of a “Close Friend” is someone you would feel comfortable in confiding in when things get tough.

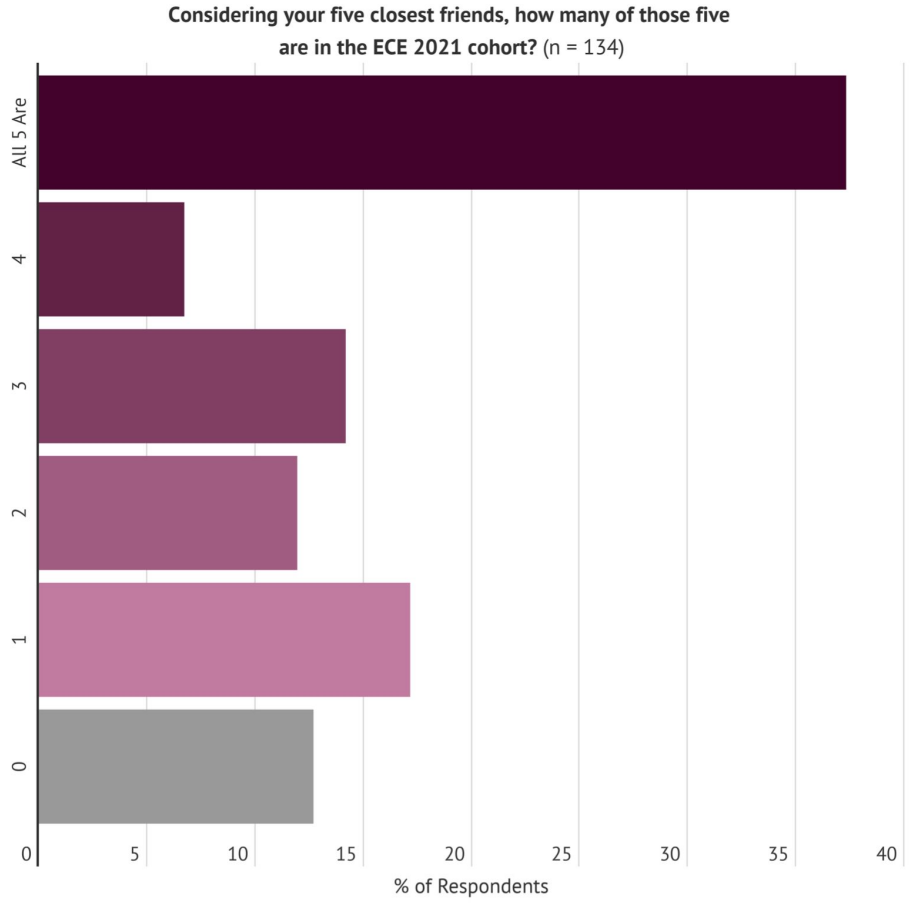
Almost all respondents had at least one friend in the cohort.



Close Friends

Considering their five closest friends, many said that all five were within the ECE 2021 cohort.

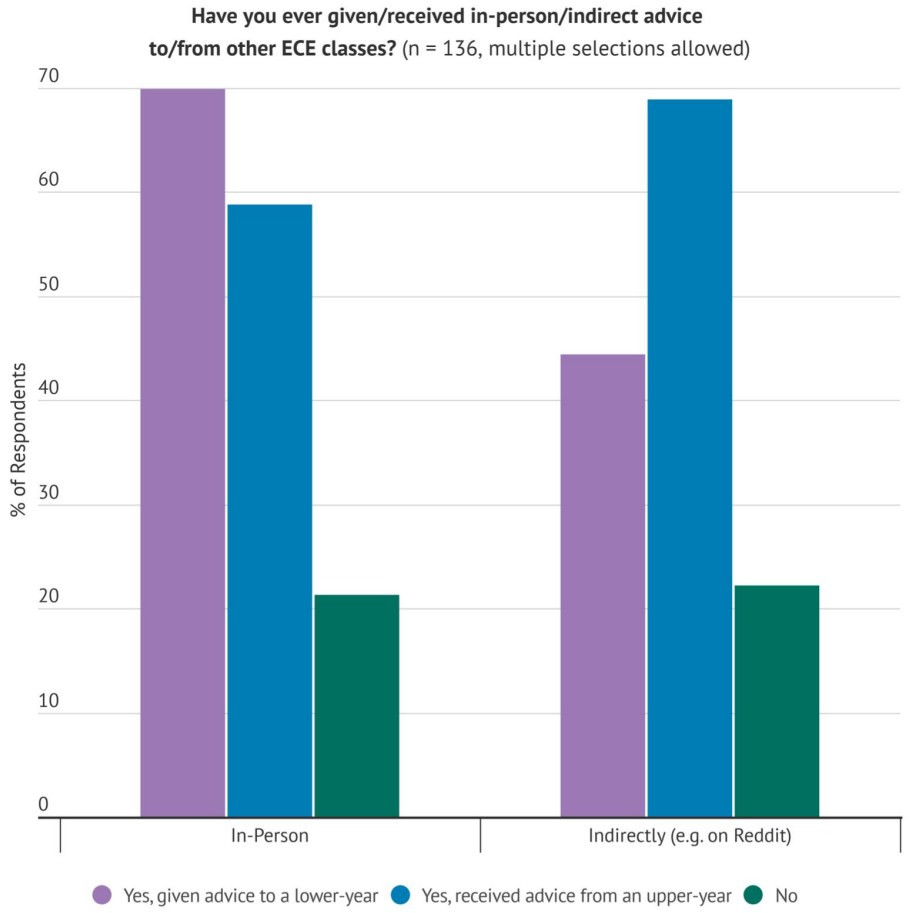
In retrospect, we did not account for the possibility that someone doesn't have at least five friends, but we hope that isn't the case for anyone!



Cross Class Interaction

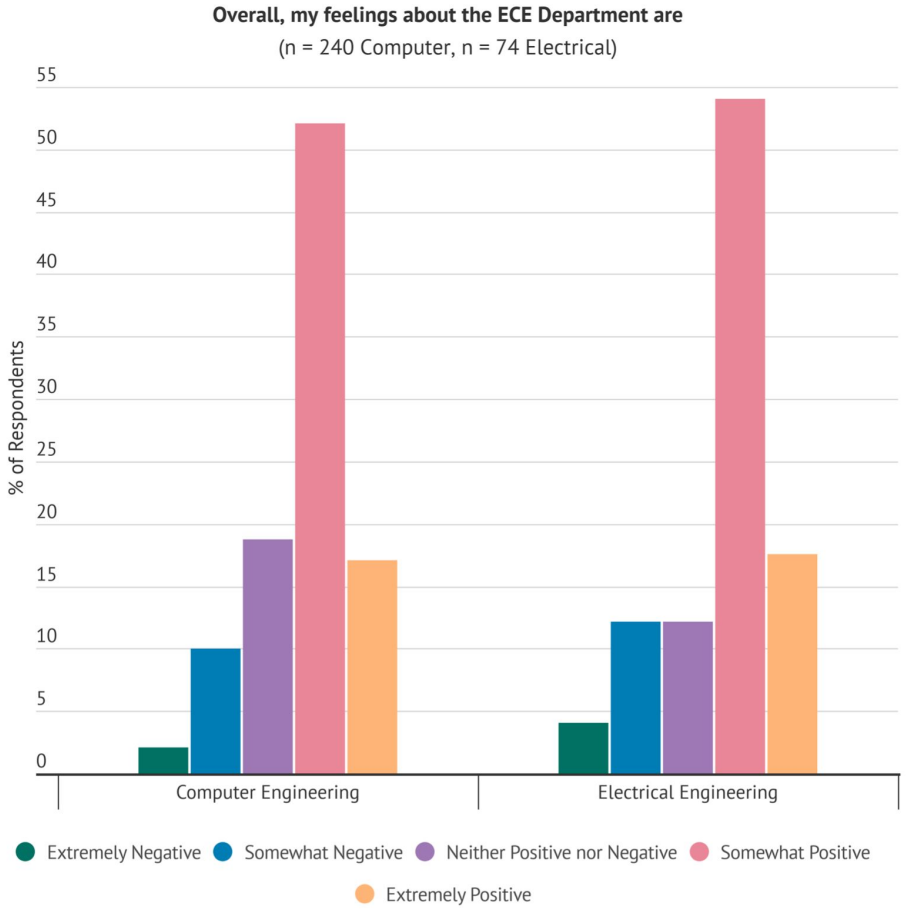
Online platforms, such as the UWaterloo subreddit, are popular forums for sharing and receiving academic and life advice from upper years.

In addition, both the UW Engineering Society and ECE Society hosts cross-class events to promote upper- and lower-year interaction.



Feelings about the ECE Department

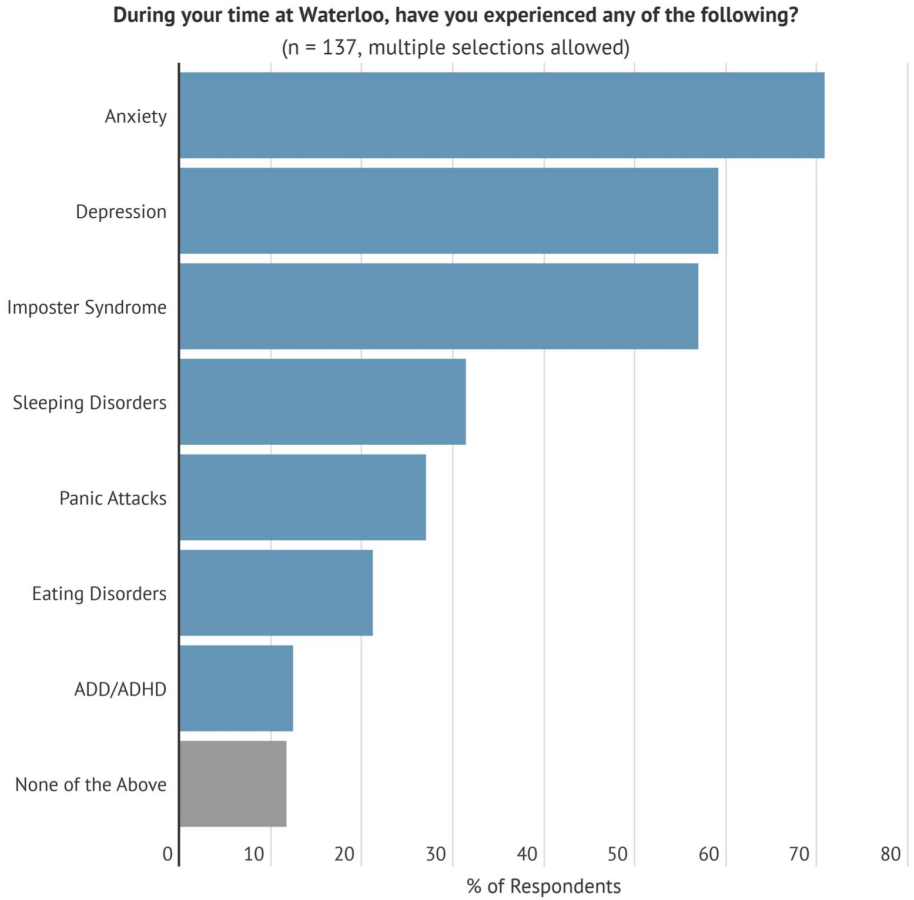
Overall, students viewed the ECE Department (such as professors, lecturers, lab instructors, and department staff) in a positive light.



Mental Health

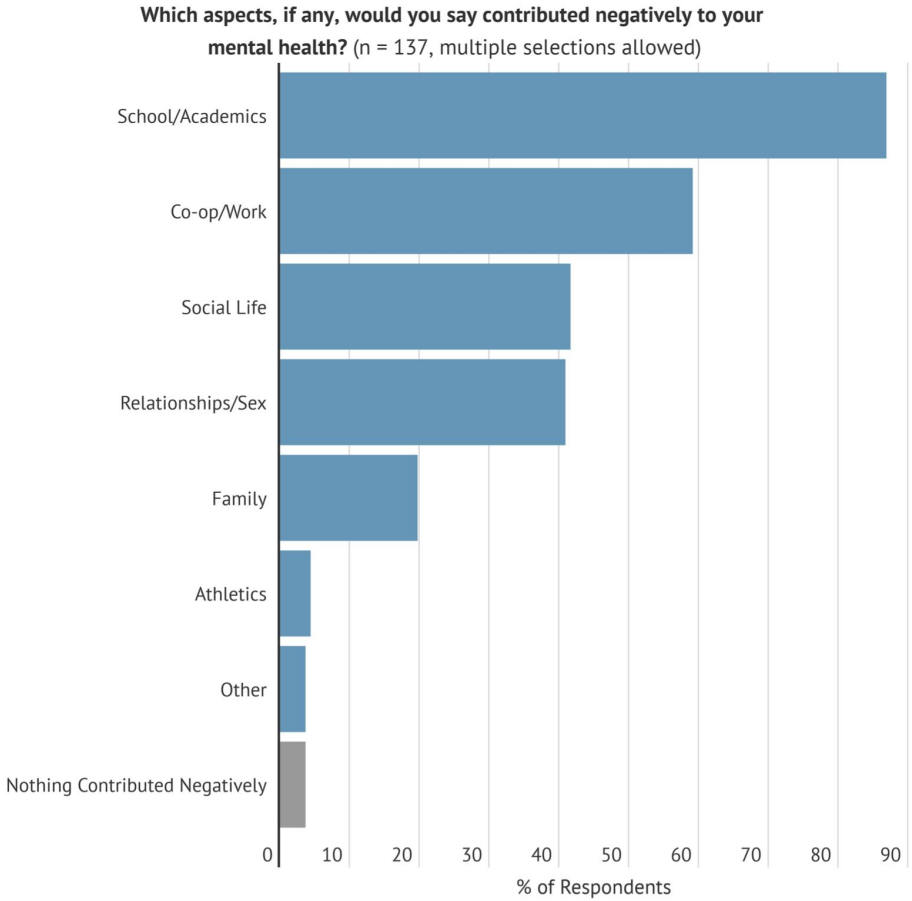
Mental Health

A majority of respondents say that they have experienced **Anxiety, Depression, or Imposter Syndrome** at some point during the undergraduate career.



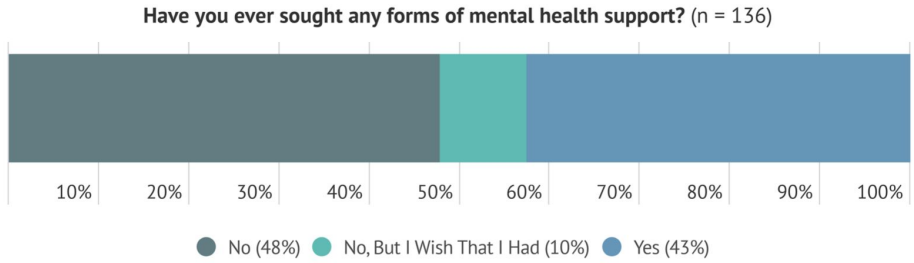
Mental Health Contributors

Almost all respondents said that **School and Academics** contributed negatively to their mental health.



Looking for help

Just under half of the class sought help for mental health issues.



Looking for help

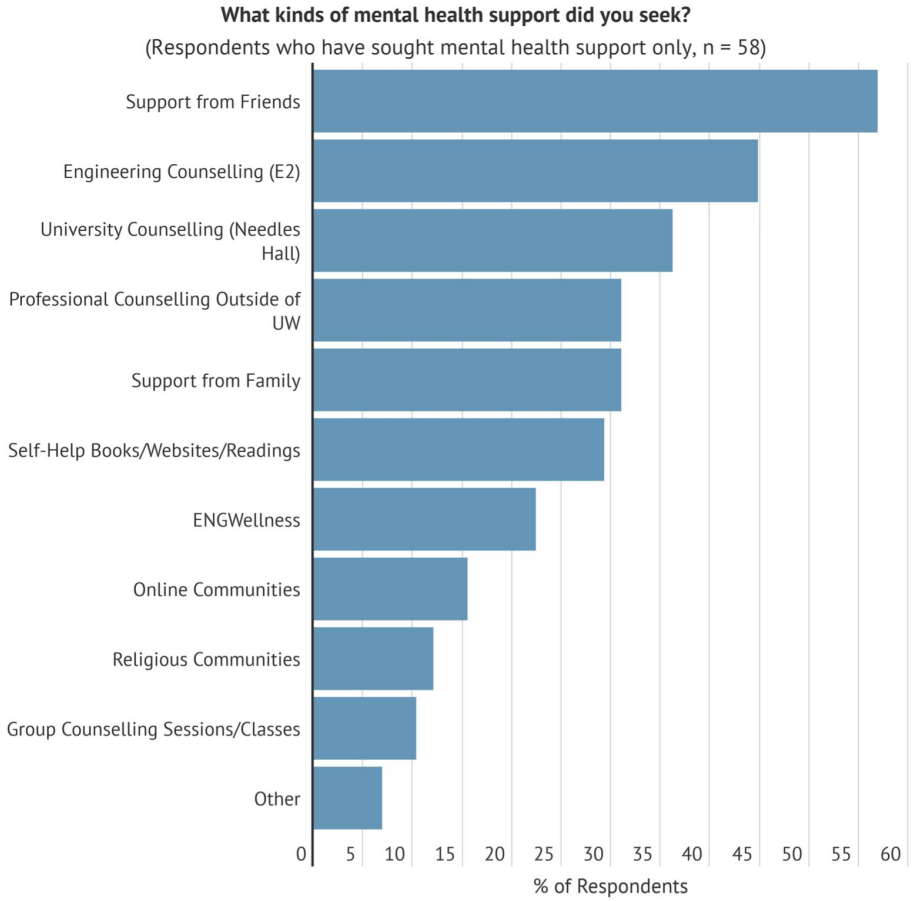
Of those who said that they sought help, a majority sought support from friends, with **Engineering Counselling** being the second most popular.

Links:

Engineering Counselling

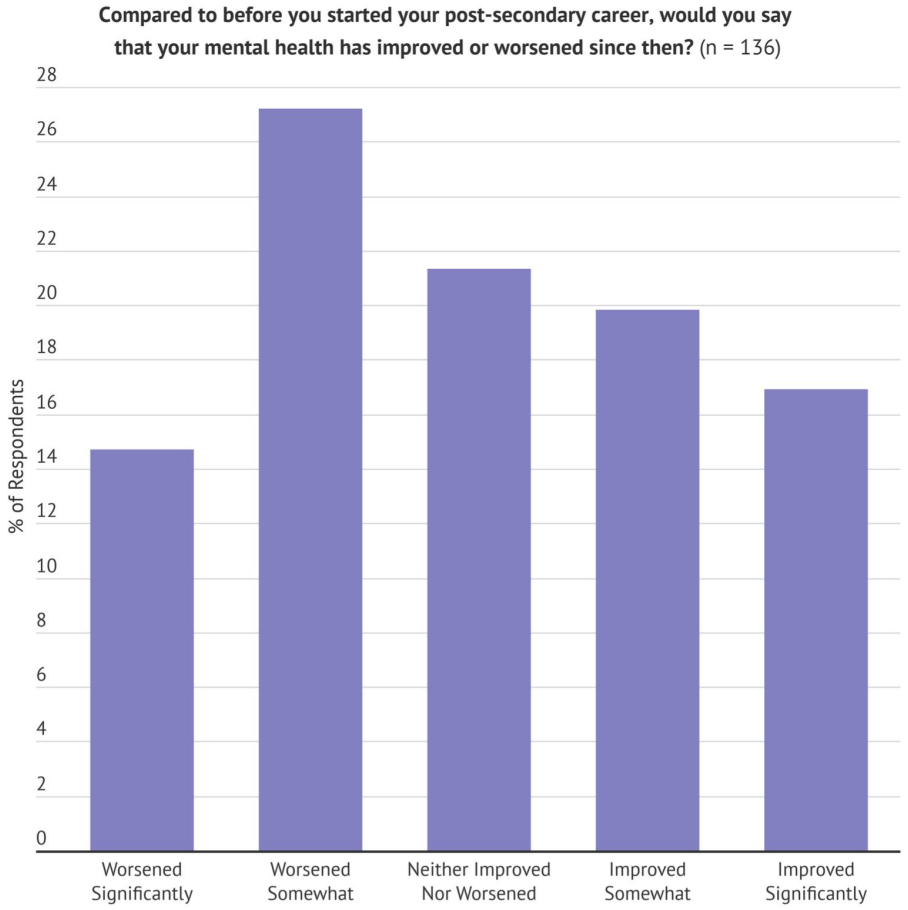
UW Counselling Services

ENGWellness



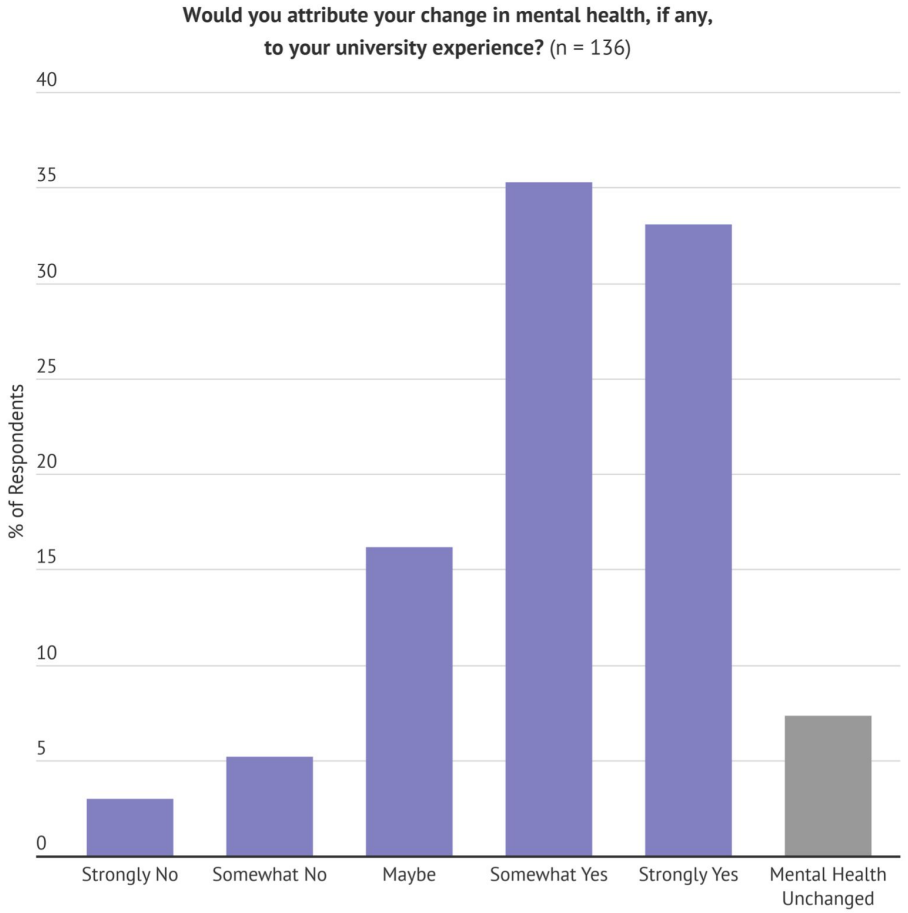
Changes in Mental Health

Slightly more people saw their mental health worsen over their university years, but about 37% saw their mental health improve.



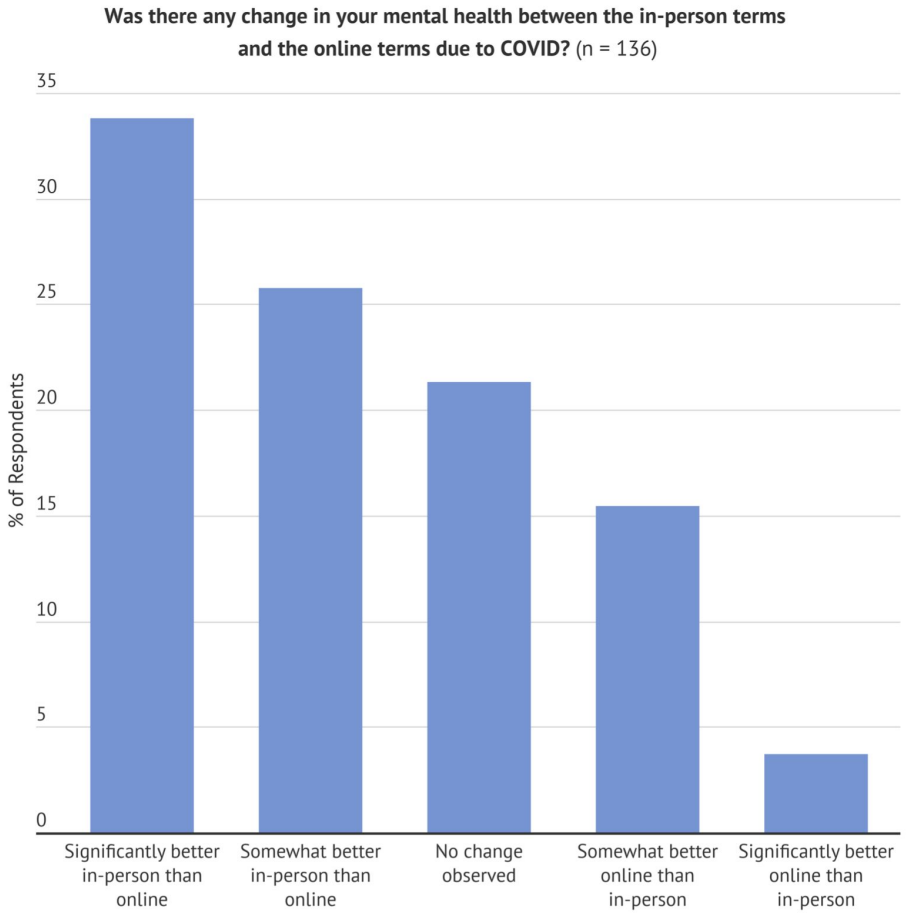
Changes in Mental Health

Respondents largely attributed changes in their mental health to their university experience.



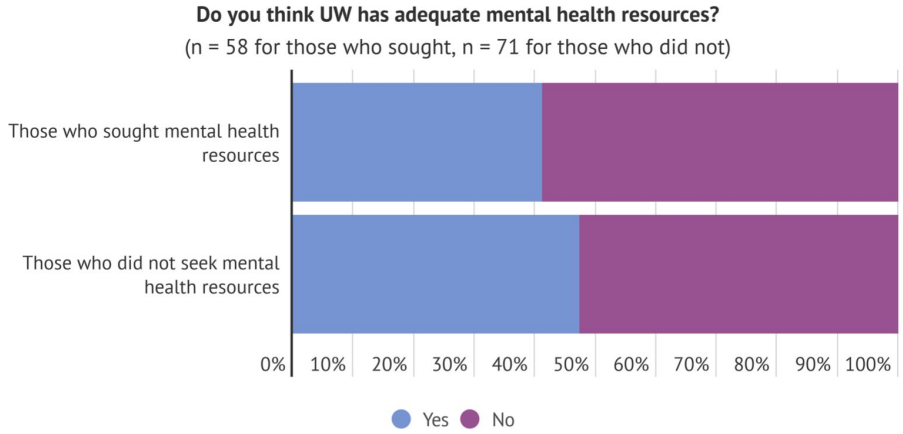
Remote Learning and Mental Health

Respondents mostly said that their mental health was better during in-person terms than online terms.



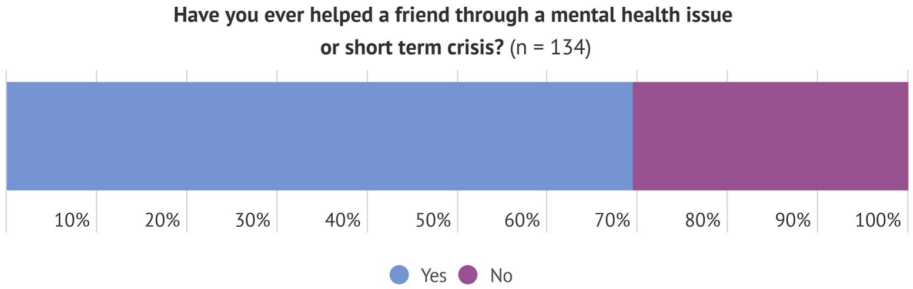
Adequacy of Mental Health Services

Among those who sought mental health resources, **41%** believe that UW has enough mental health resources. Among those who did not seek mental health resources, that figure is **47%.**



Helping a friend

70% of respondents have helped a friend through a mental health issue or short term crisis.

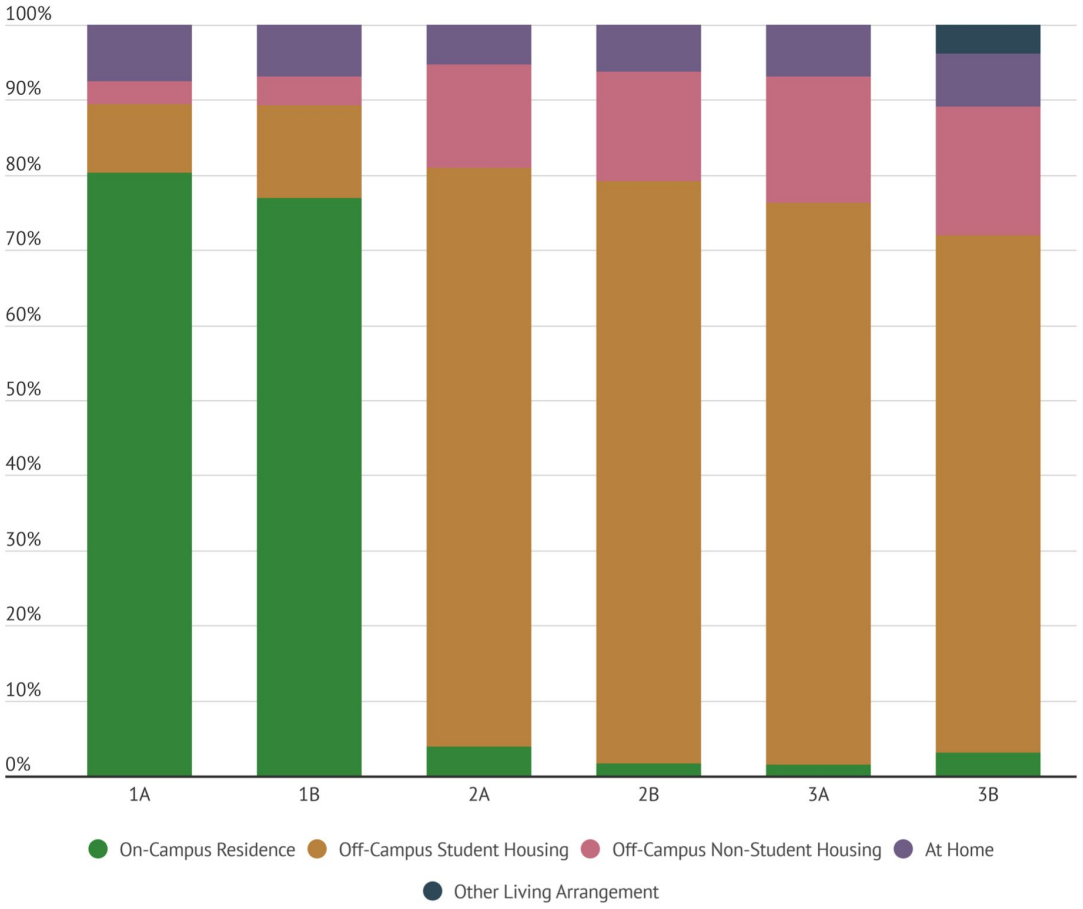


Lifestyle

The Living Situation Pre-Pandemic

Living in on-campus residences was extremely popular in first-year, but exceedingly rare in upper years.

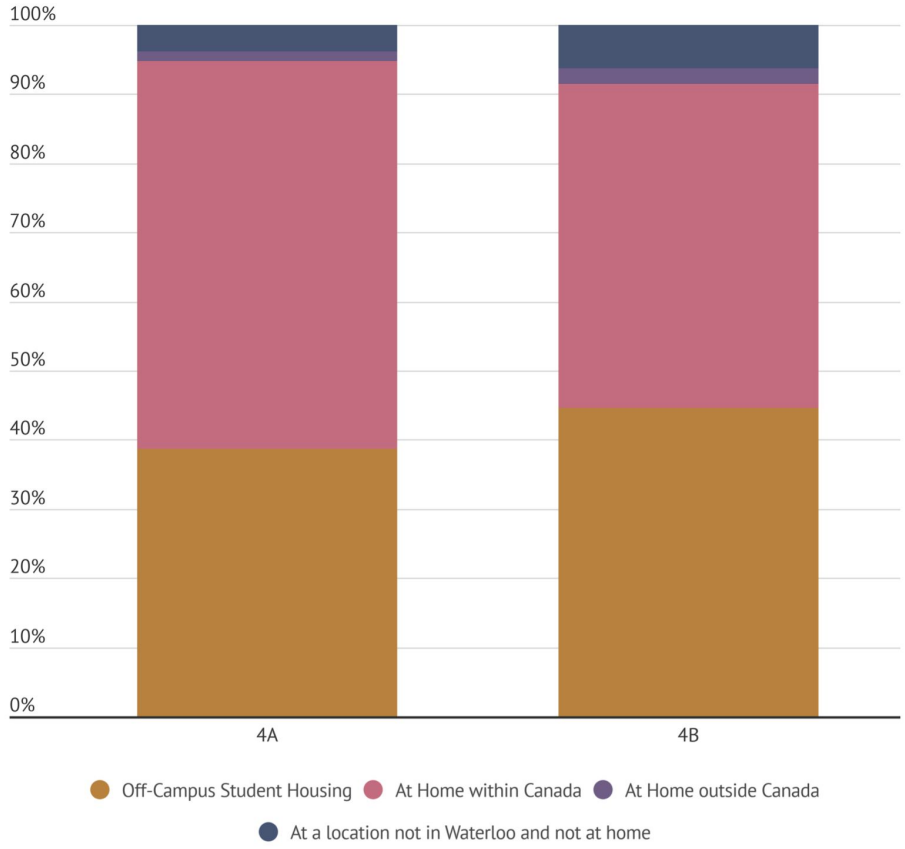
For Stream 4s, their 3B term took place between January and April 2020. For this question, they were asked to consider their living situation prior to the COVID pandemic.



The Living Situation In-Pandemic

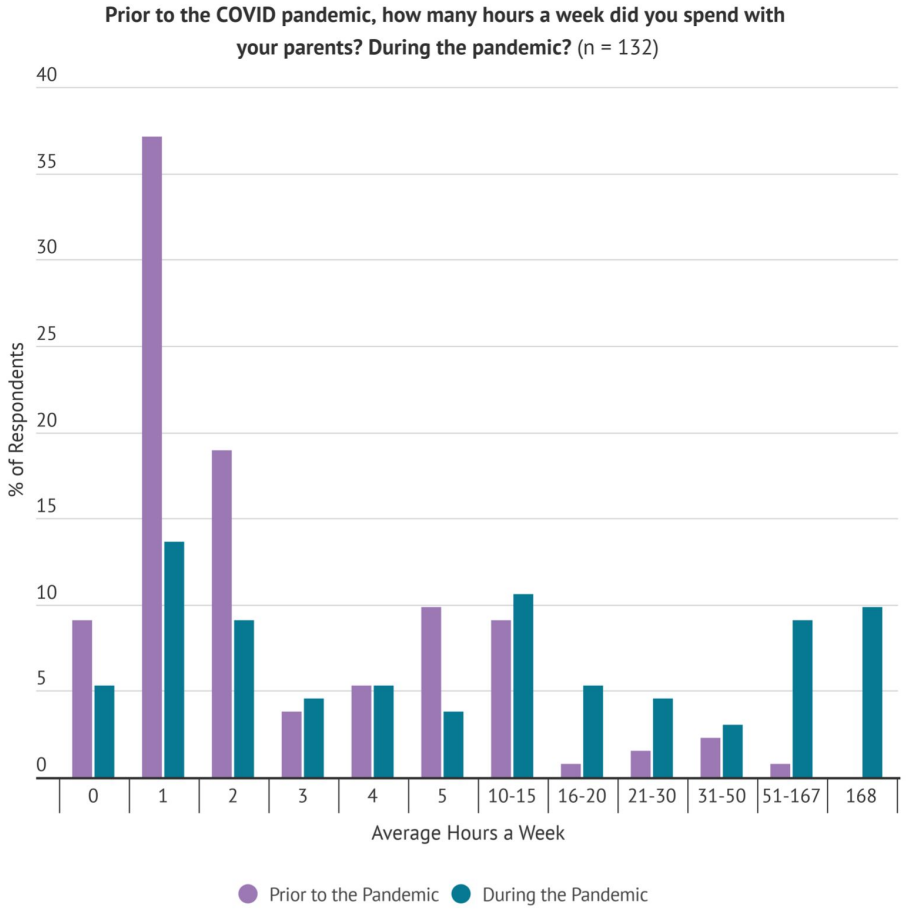
While student residences were open, no respondents reported living in one during the COVID-19 pandemic.

A majority of students opted to stay home during both terms, while some still returned to Waterloo to live with friends.



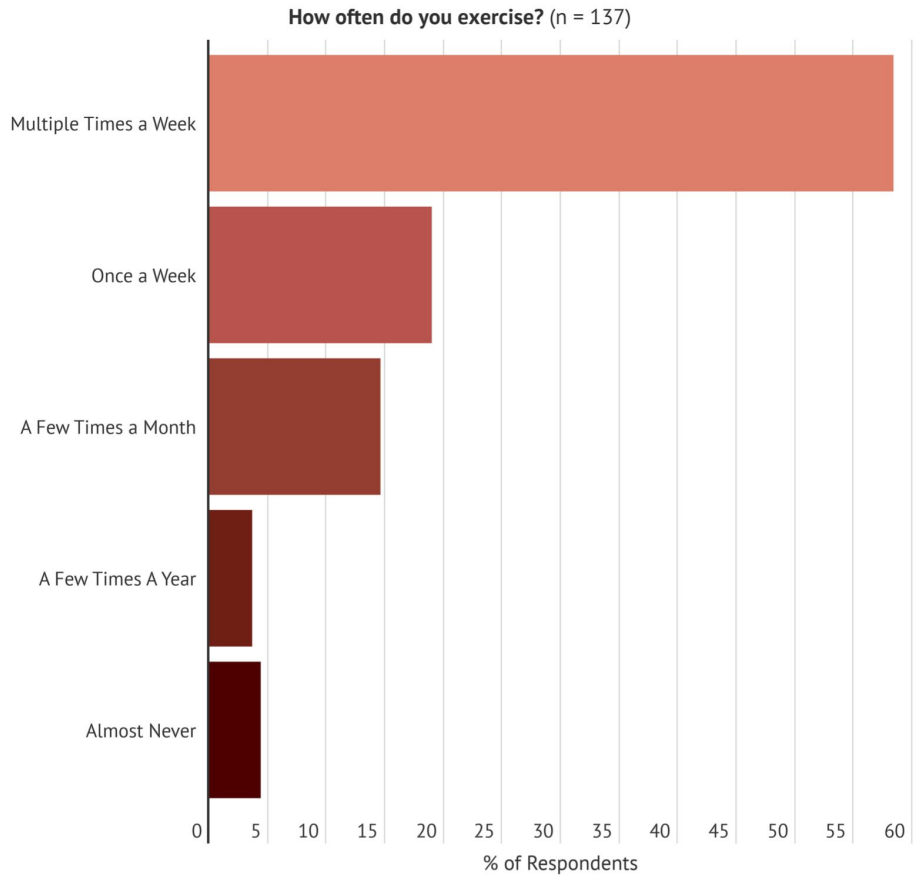
Spending time with Parents

Respondents spent a lot more time with their parents once the pandemic hit.



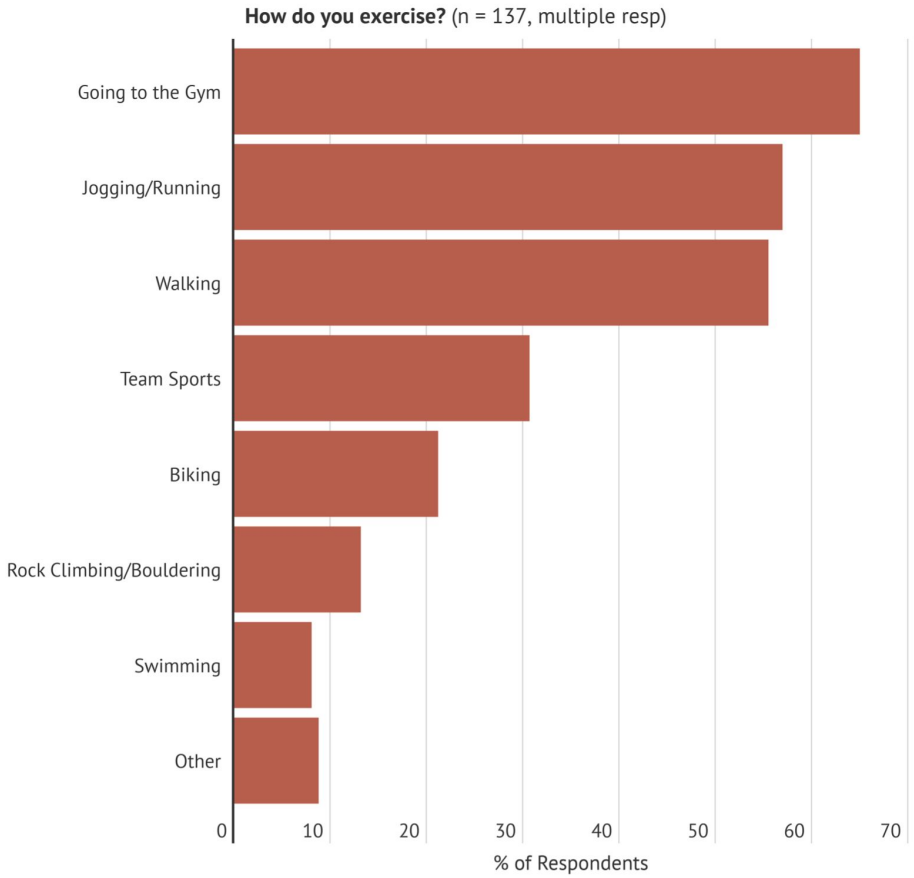
Exercise

Despite the stereotypes, ECE students actually exercise! Or at least we claim to.



She's a runner 🏃‍♀️
She's a trackstar ⭐

Going to the gym was the most popular form of exercise, followed by jogging, running, and walking.

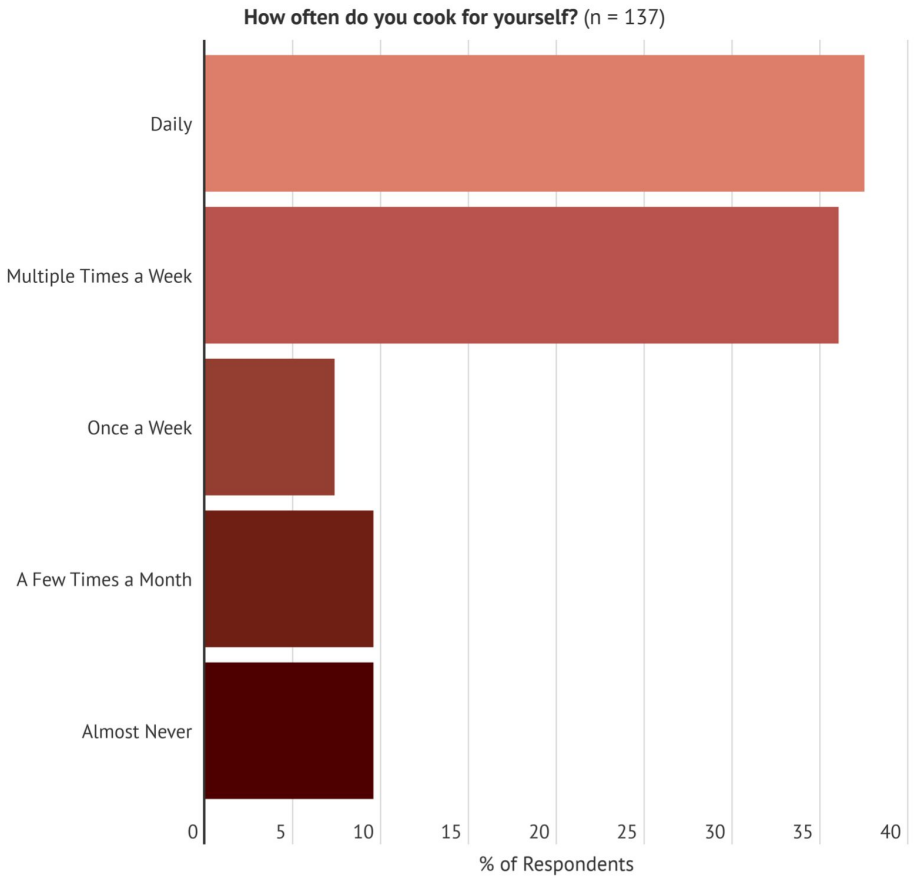


Cooking

As my wise landlord in Kanata once said, “There are two types of people in the world, those who live to eat and those who eat to live”.

Most students say that they can cook for themselves at least once a week.

One respondent said that it wasn’t that they didn’t like to cook; they just plain didn’t like eating.

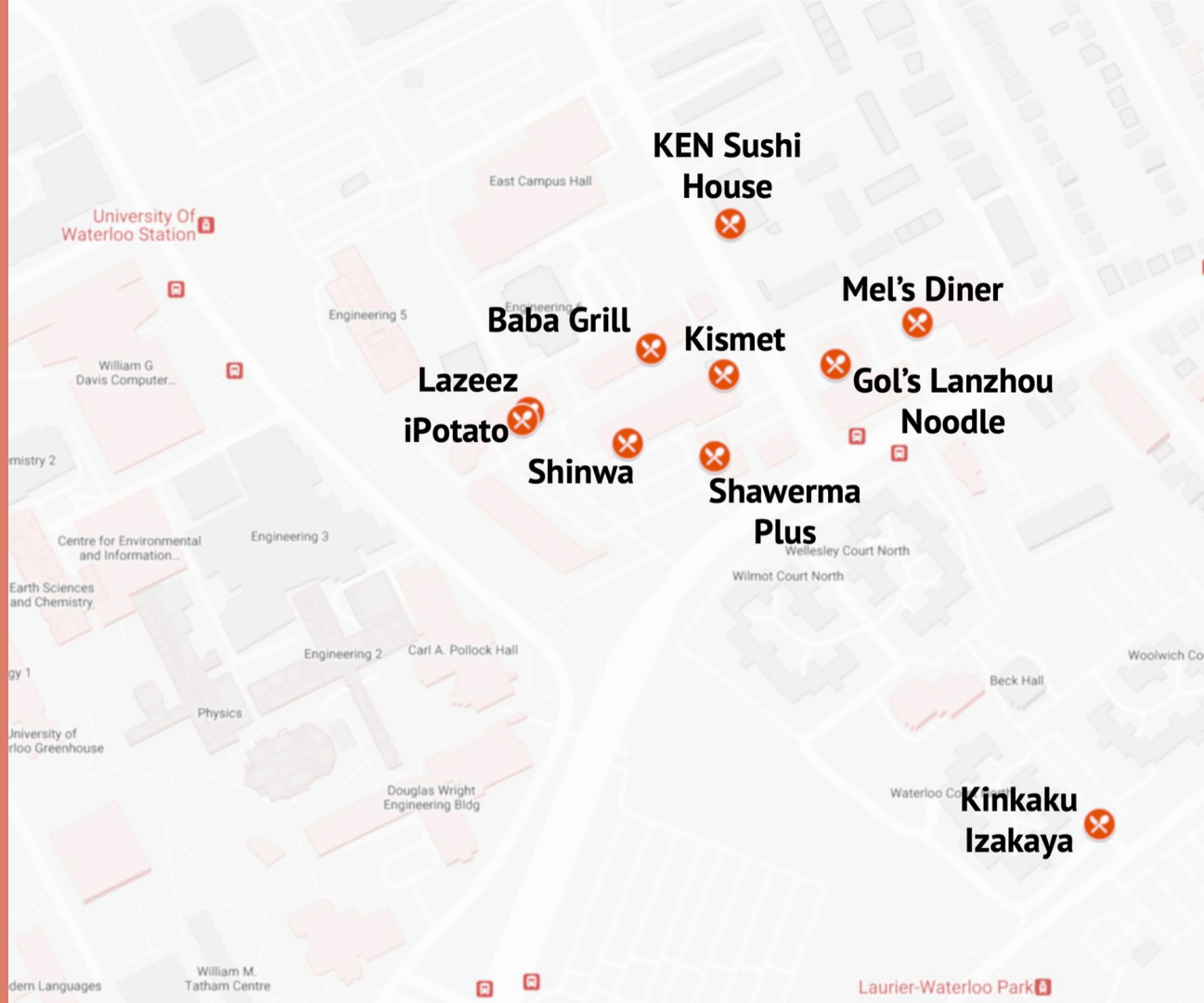


Eating Out

There was a three-way tie for favourite restaurant, with Gol's Lanzhou Noodle, Ken Sushi, and Shawerma Plus each receiving nine votes.

The top ten restaurants are shown.

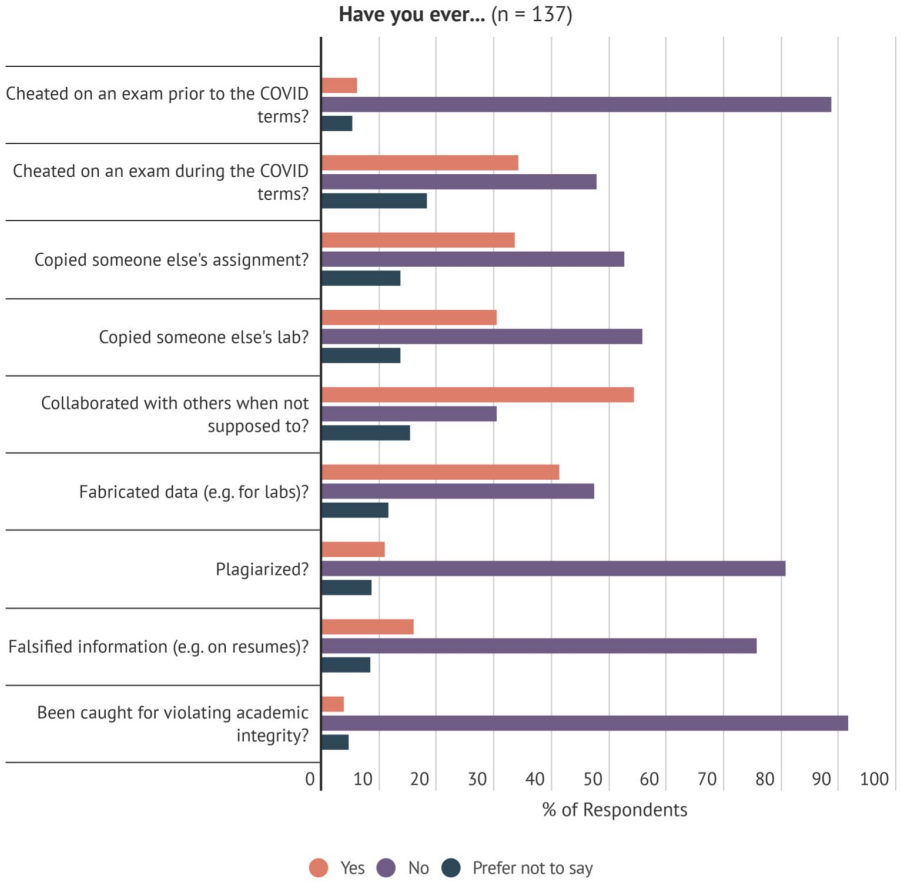
Note: Map is not to scale. Obviously (and unfortunately), Kinkaku is not located in UWP - it is much further southeast in Kitchener.



Integrity

As one might imagine with fully-online learning, cheating on exams increased significantly during online terms, with a suspiciously high percentage of “Prefer not to Say” 👀

Yet, very few respondents reported having every getting caught for violating academic integrity.



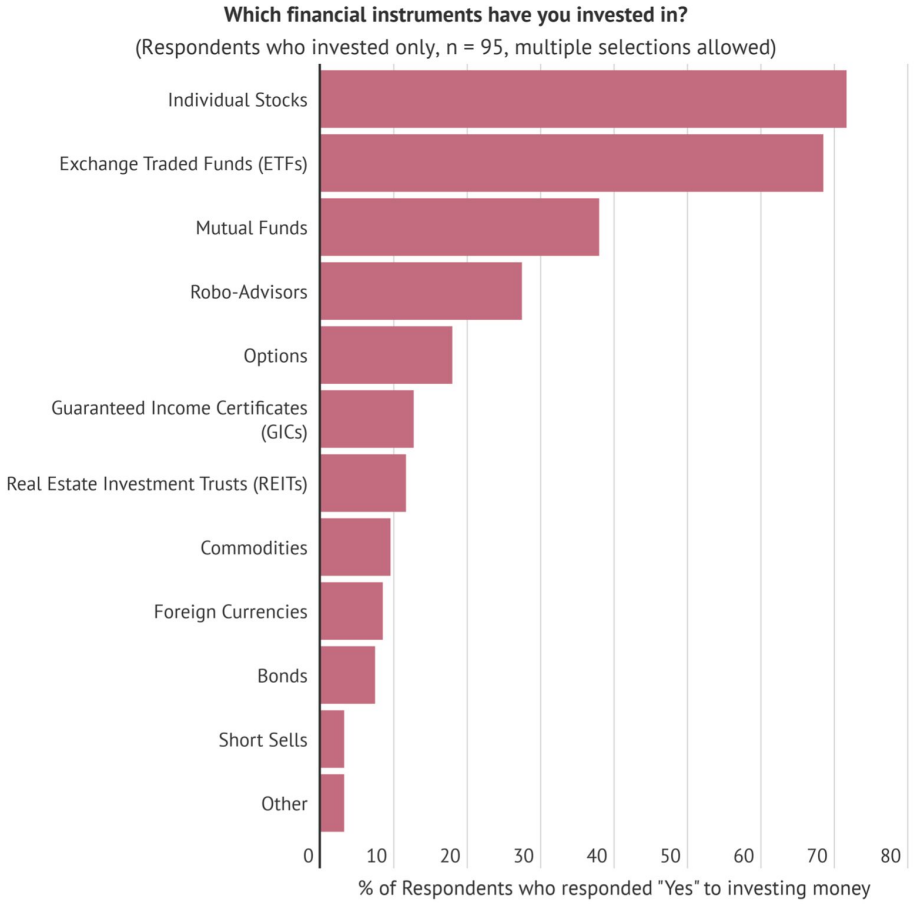
Investing

We like the stock 🚀 🚀 🚀

70% of respondents said that they have invested their money.

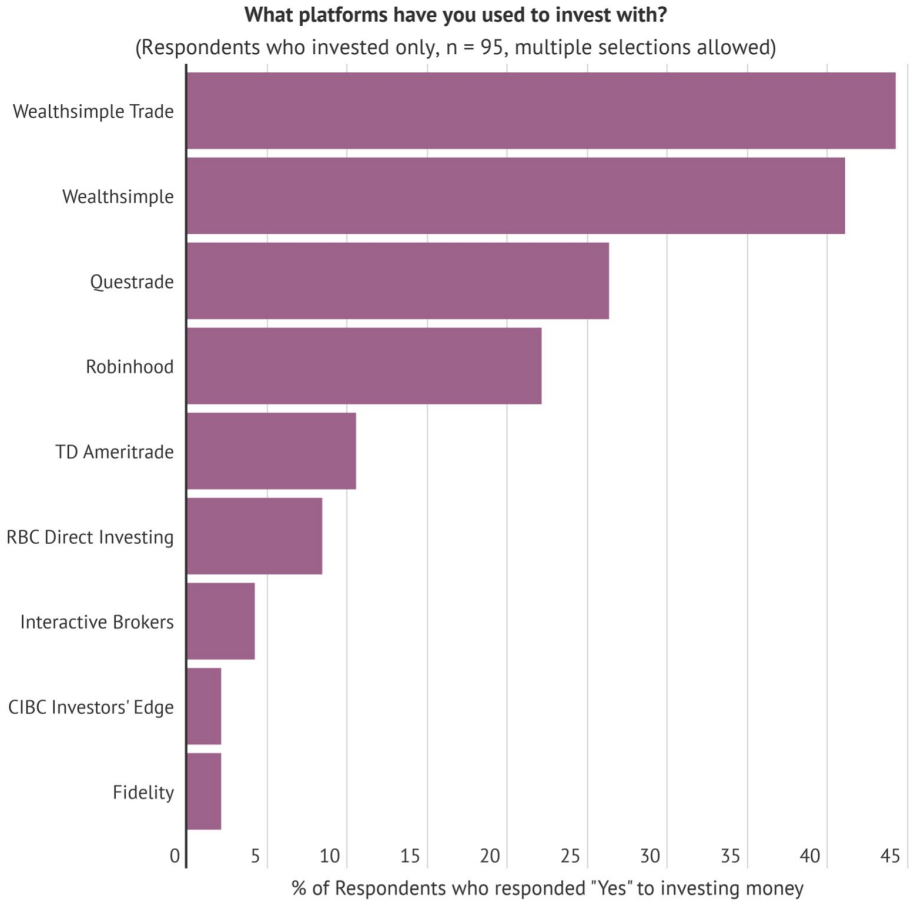
Of those who said they invested, the most popular financial instrument was individual stocks, followed by ETFs.

A few brave individuals said that they dabble with options and short sells.



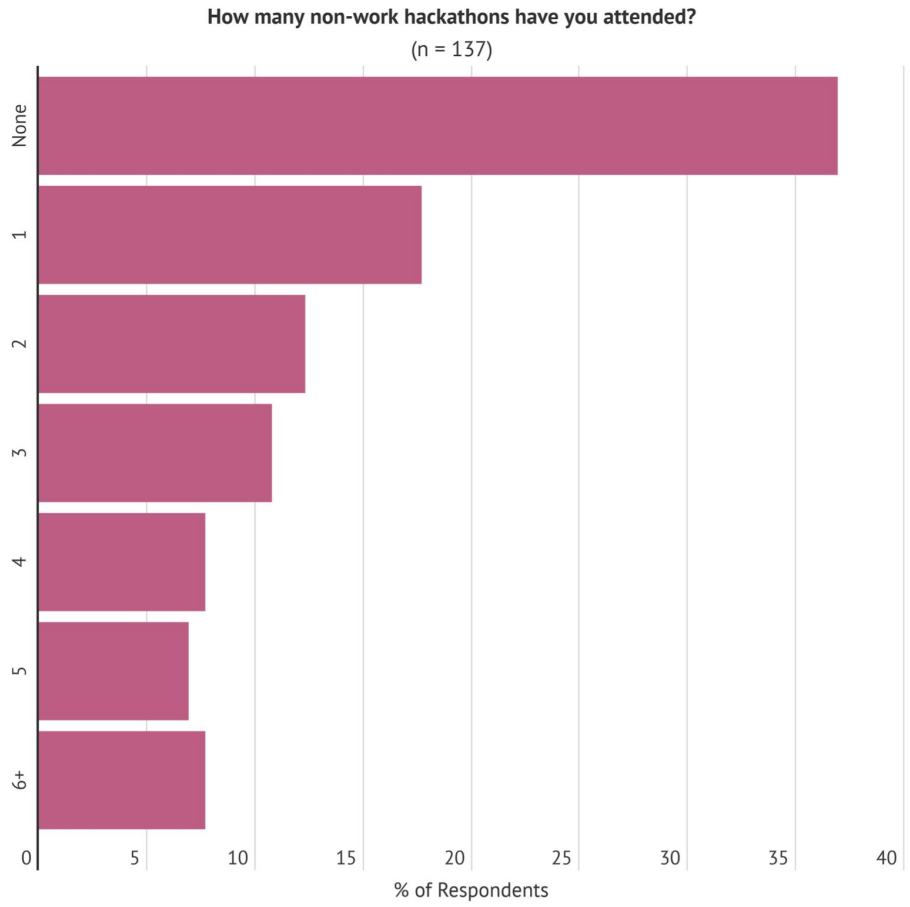
Investing

With the rise of “free” trading platforms, investing has become popular among the cohort with mobile platforms such as **Wealthsimple Trade** and **Robinhood** being popular.



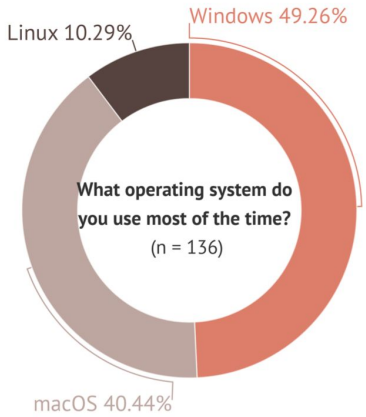
Hackathons

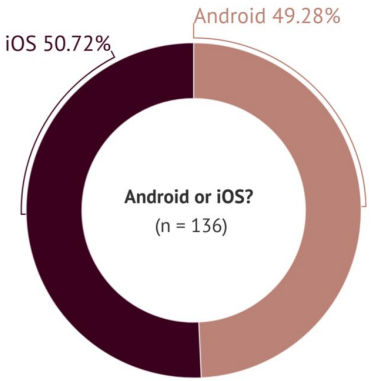
A majority of respondents attended at least one hackathon, among them, **34%** say that they have won a prize/award at a hackathon.



Preferred Operating Systems

Windows was the most popular operating system on computers, while iOS narrowly edged out Android for phones.





Favourite Programming Language

The runaway favourite programming language was **Python**. **C++, Java, JavaScript,** and **C** round up the top 5.

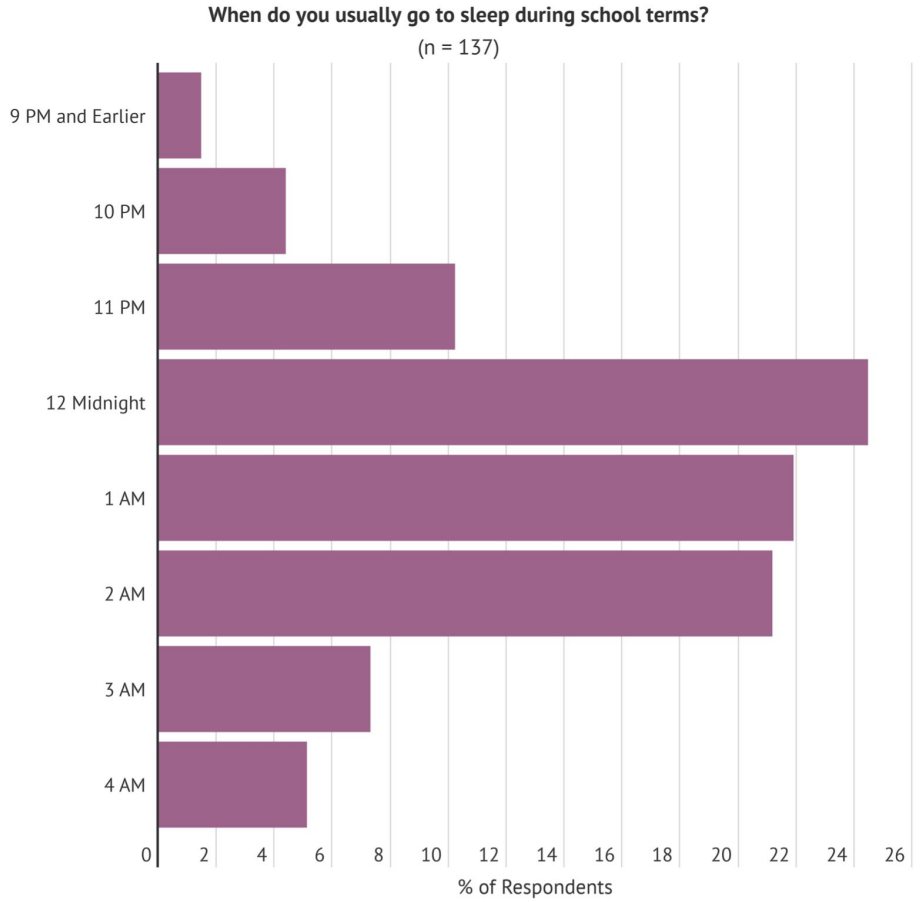
One respondent made it very explicit that their favourite programming language was "*not Rust*" (perhaps traumatized from ECE 459).

Favourite Code Editor

VSCode was the runaway favourite, while vim was more popular than emacs, for those who care.

Sleep Schedules

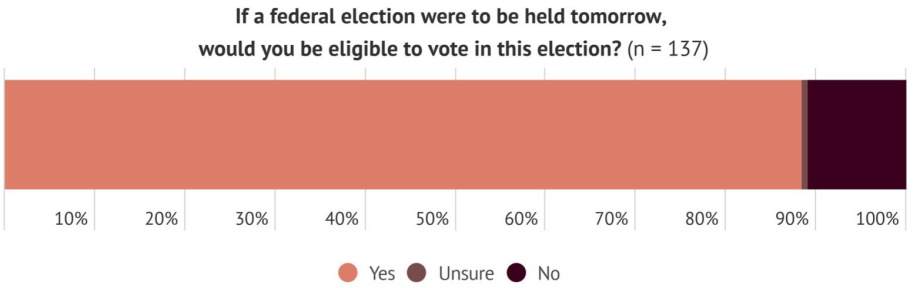
Most students slept before 2 AM, with the latest being 4 AM.

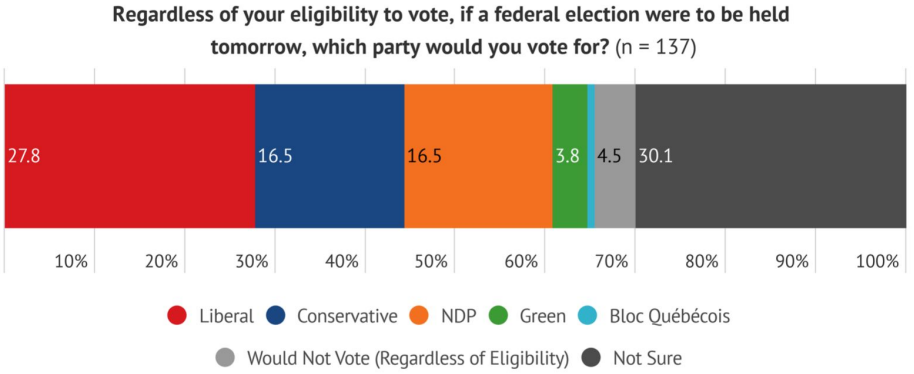


Voting

Most respondents said that they would be eligible to vote should a federal election occur tomorrow.

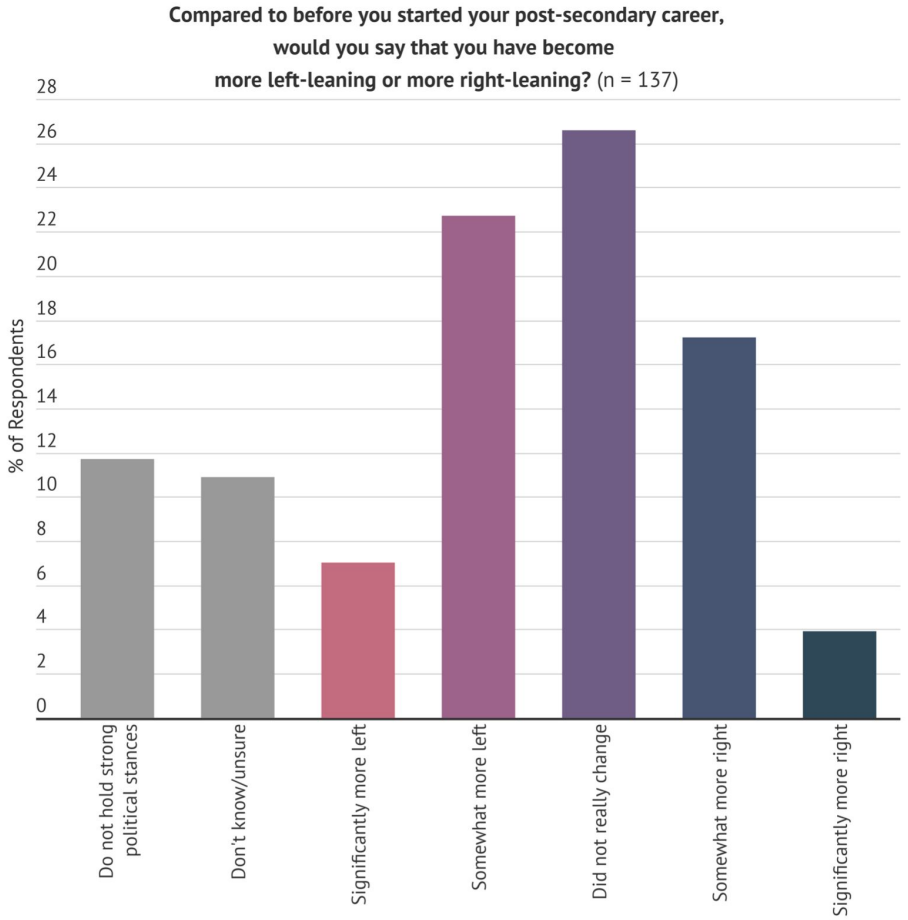
Among respondents, the “Not Sure Who to Vote For” party would win a plurality, followed by the Liberals, then with the Conservative and NDP in a tie for third.





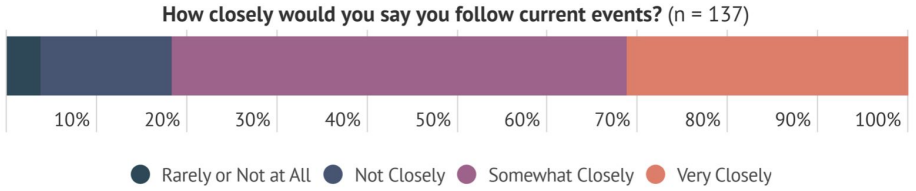
Political Shifts

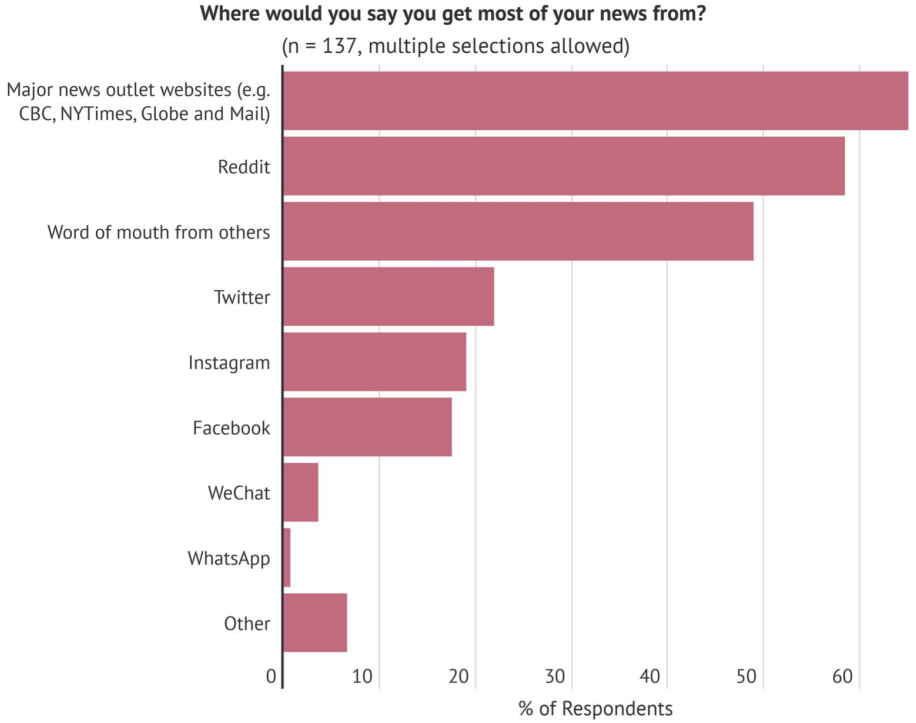
Altogether, only **slightly more than half (50.8%)** of respondents indicated that their political views changed at all compared to before they started their post-secondary career.



Current Events

Most respondents follow current events closely, with major news outlet websites and Reddit being popular sources of news.





Miscellaneous uh... “Activities of Interest”

With the complexity of the US Tax Code, it probably isn’t too crazy to imagine someone inadvertently committing tax fraud.

61% Have gone to a nightclub

21.5% Have gone to class while drunk or high

11.9% Admitted to drinking/taking an edible in class

5.9% Admitted to taking a test or exam while drunk/high

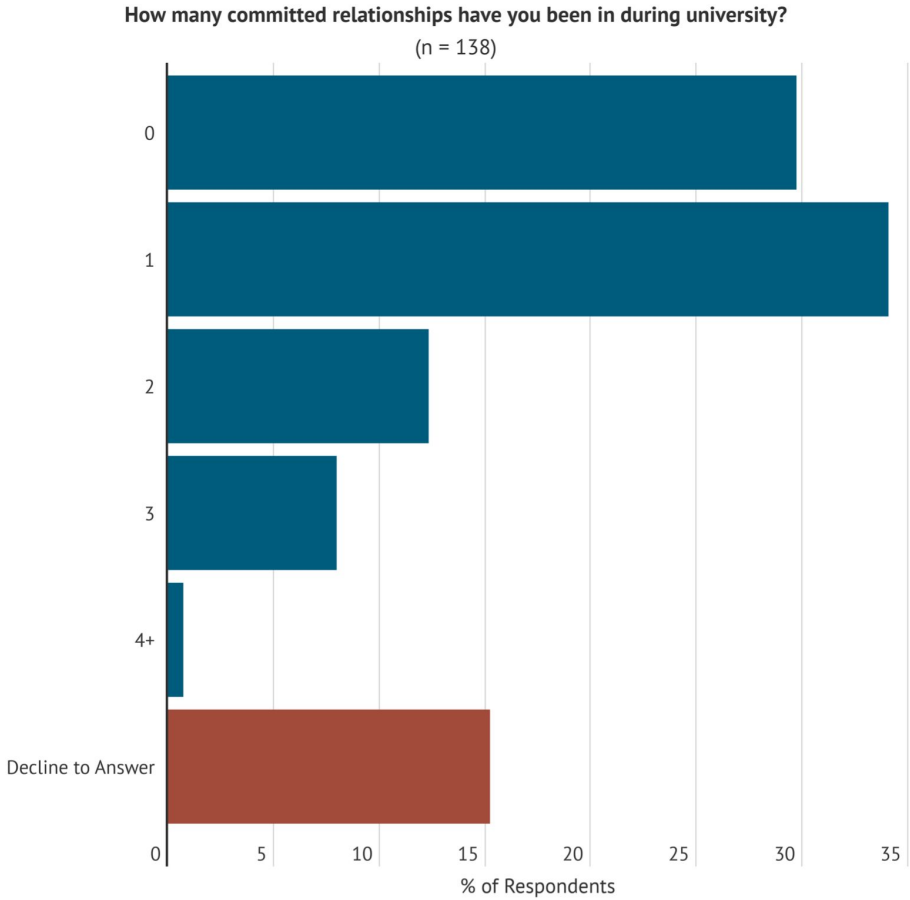
4.5% Committed (or may have committed) tax fraud

1.5% Have been arrested before

1.5% Had to go to the hospital due to alcohol/drug intake

Number of Relationships during University

55% of respondents said that they were in at least one committed relationship over their university years.

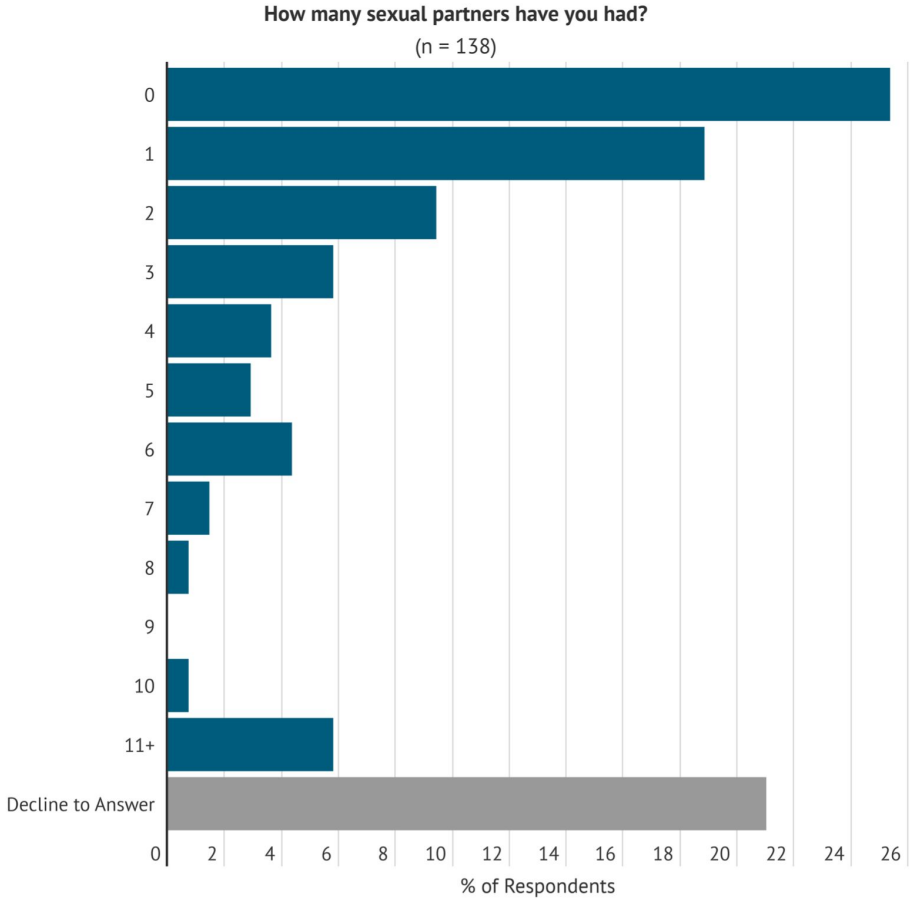


Dating within the Class

Fun (?) fact: the number of respondents who said that they dated another ECE 2021 student is not an even number.

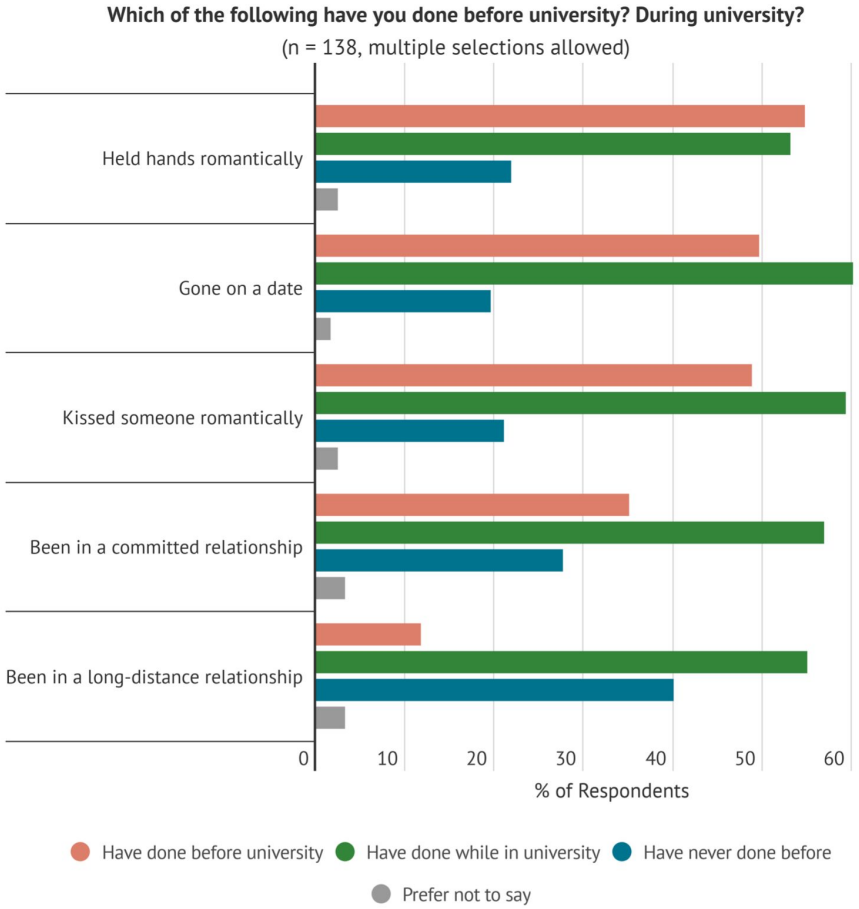
Number of “Partners”

Due to popular demand (and the fact that this question is also asked in other Class Profiles), we reluctantly asked the ECE cohort as well...



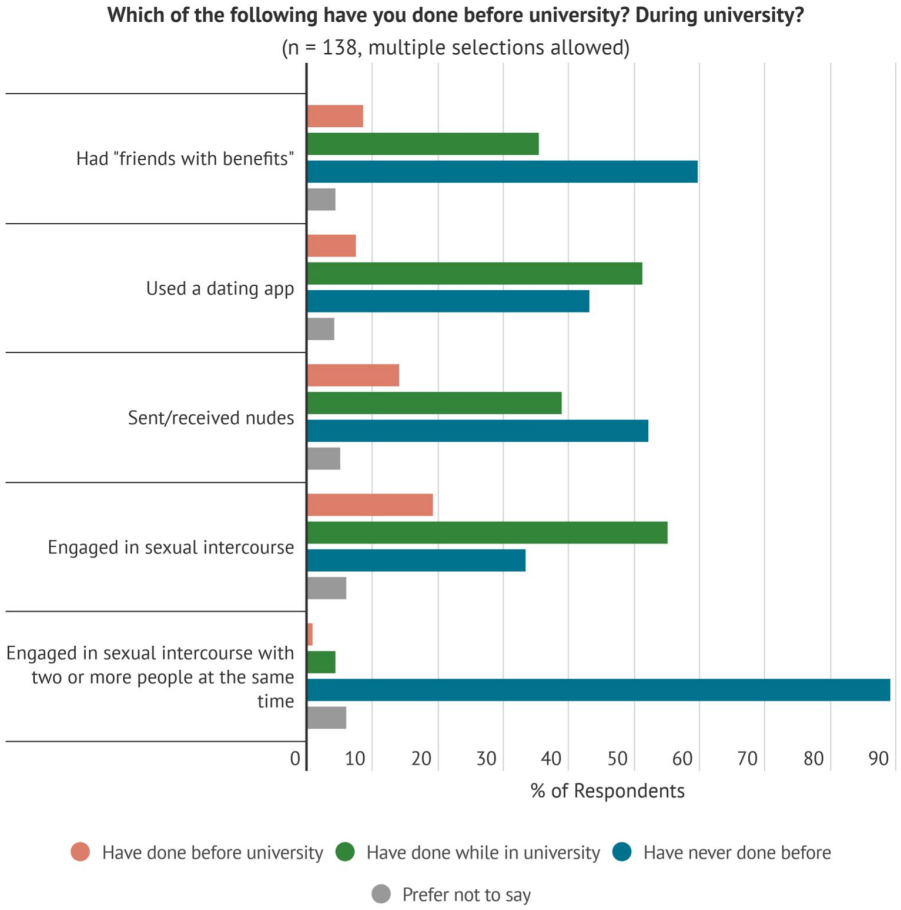
Intimacy (1/2)

Again, due to popular demand...

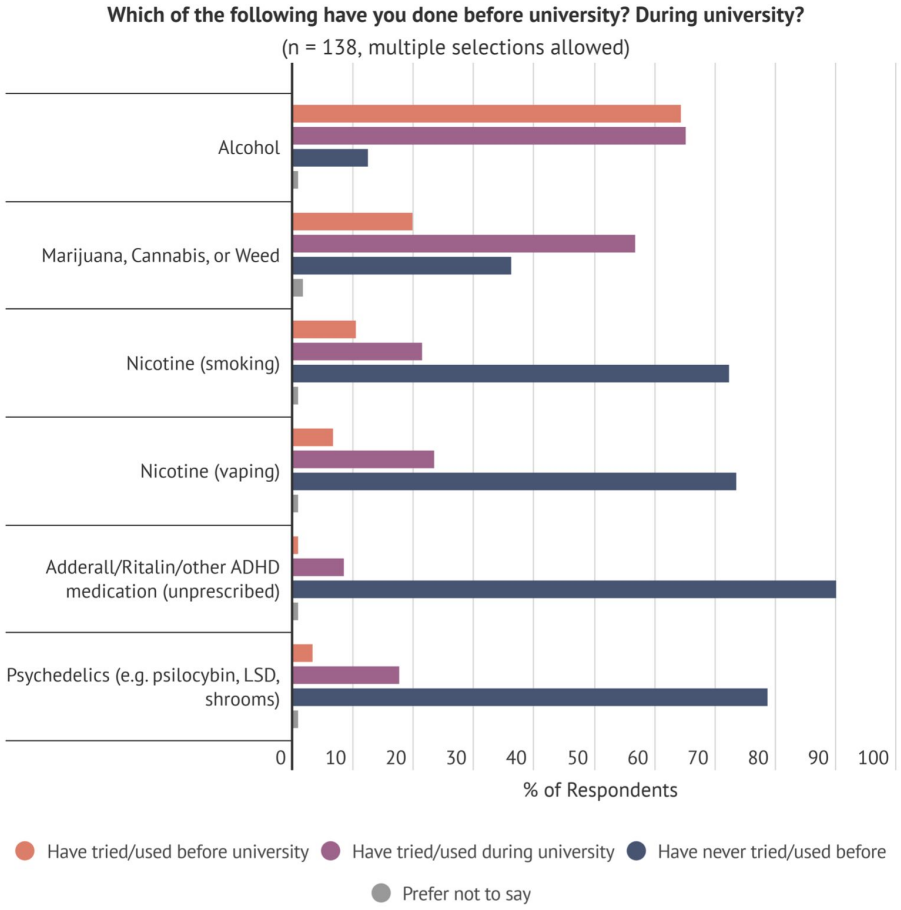


Intimacy (2/2)

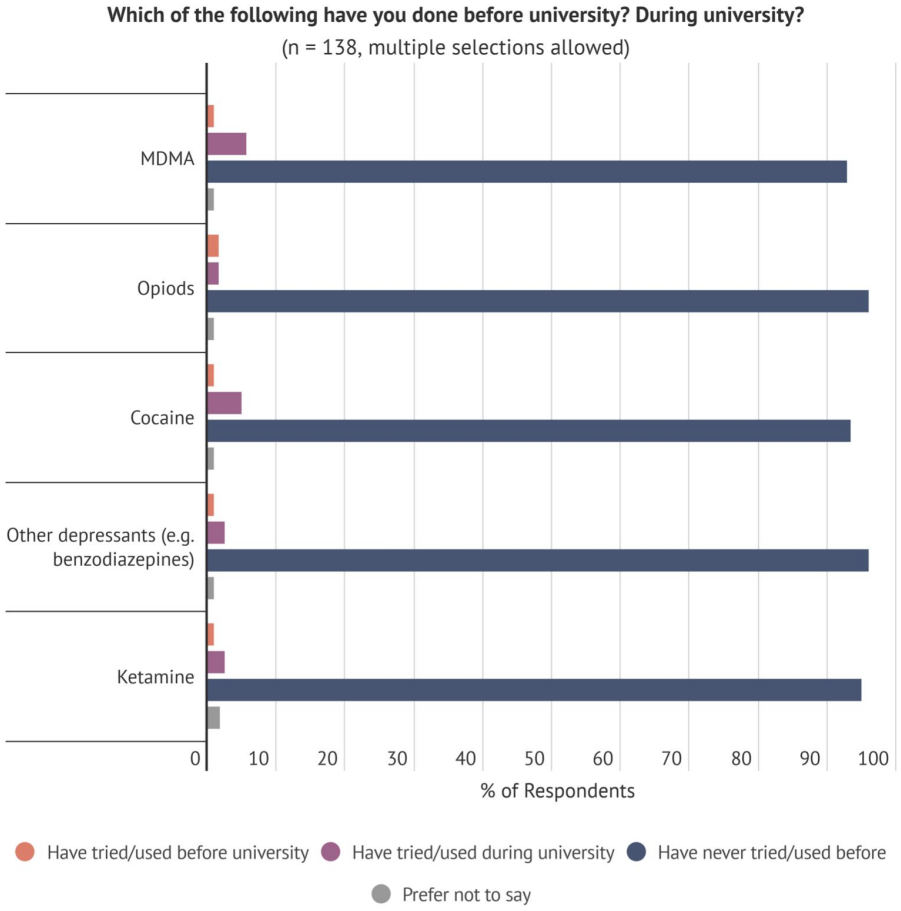
Uh... as long as it's legal and consensual I guess...



Drug and Substance Use (1/2)



Drug and Substance Use (2/2)



Concluding Remarks

Memoir Questions and Concluding Remarks

Thank you for reading the inaugural ECE Class Profile, we hope you enjoyed reading it as much as we did creating it.

Unfortunately, the effect of the pandemic is clearly visible in terms of pay, employment, future plans, and mental health among the ECE 2021 class. Nevertheless, **92%** of respondents are optimistic about the future of their job field, while **54%** are interested in attending an in-person reunion once the pandemic is over.

As a reminder, this Class Profile project is **entirely student-led and not endorsed or affiliated** by the University of Waterloo or the Department of Electrical and Computer Engineering. This is not meant to be a scientific study and results may not necessarily extrapolate to the entire class.

At the end of the Class Profile Survey, we asked everyone some long-form questions.

“Share a story, happy or sad, from your time in ECE”
“What is something you regret over your time at Waterloo?”
“Give a piece of advice to your fellow ECE 2021 grads”

We have chosen a few responses to highlight to conclude this Class Profile.

“Share a Story, happy or sad, from your time in ECE”

Moved out of Waterloo in 3B unknowing that it would be my last time there as a student

Finishing a final exam at 9PM, then going home and studying for my next exam at 9AM that I haven’t started studying for yet. I didn’t sleep that night. I passed both courses somehow.

Started with a very low GPA (around 60s), but I improved a lot and even made the Dean’s Honour List in 4A

Thought I was the s**t and got wrecked and humbled immediately by ECE 106 with Saini

ECE 140 - Failed. ECE 240 - Failed. The happiness came when I went back, retook the courses and excelled in both of them.

When Professor Dabbagh used to say “Just close your eyes and choose” to us in ECE 140. I still use that phrase to this day.

I remember the end of the chem exam in 1A. It was such an intense feeling of freedom after so long of studying and stress. I didn’t even care if it went good or bad, I was just so happy to be done. I remember walking back to res with friends and screaming into the air as we passed DC. It was like nothing had felt so good.

I watched so many friends that I made each term not to make it to the next terms or simply drop out

“What is something you regret over your time at Waterloo?”

Not stopping and enjoying the present moment.

Not appreciating the time to hangout with everyone before COVID.

Being stuck in Waterloo during winter terms

Wasting time by going to class because that is traditionally what people did to get good grades

Not getting to know others in my cohort. I think stream 8 just stuck to their own sub-groups I feel like I missed my chance at getting to know some amazing people

Not keeping my Bitcoin

Staying in EE. I was so scared of switching into CE because I didn’t think I’d be a good enough programmer. I thought that even though I hated circuits at least I could do them. Boy was that a mistake…

Lack of participation in extracurriculars and just generally not making the most of my time there

Not getting more involved

Not meeting more people

In summary, no one graduates wishing they had studied more!

“Give a piece of advice to your fellow ECE 2021 grads”

Find something like the light at the end of a long dark tunnel, whether that light be finally getting a dog, financial independence, or lifelong fulfillment and hang on to that hope. We will make it there, take care

It’s easy to lose track of the progress you’ve made climbing the mountain that is life. Don’t forget to look down and enjoy the view

Remember the humans your work affects. Do things to help society, some things may be fun or neat but can harm people

Don’t doubt yourself! You are braver than you believe, stronger than you seem, and smarter than you think!

Do what makes you happy, not what is seen as being “successful” in the ECE bubble

Move on from your mistakes and failures, and grow from them. I failed 1A in 2015 and never thought I would make it to 4B and graduating now. Strive to become a better person, and know that there is more to life than just an engineering job. Enjoy it and pursue things you’re passionate about

Try not to get stuck in a bubble and be open to meeting new people

Don’t be afraid to try. Everyone learns along the way

Be kind. Be compassionate. Forgive others so you can heal

“Give a piece of advice to your fellow ECE 2021 grads”

You are all beautiful souls, I love you all

Don’t let your hard work getting devalued stop you from being nice to other people

It’s okay to progress slowly

Wear a mask, and stay safe, so one day, I can touch The Tool

Don’t catch COVID like my dumbass

If you need to take some time to figure out who you are, that’s okay. Some people will grow up faster than others. All you need to remember is that today you are a better person than you were yesterday.

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Further thanks to authors of past Class Profiles, especially **William Lo** (SE'20), **Stephanie Carras** (SYDE'20), and **Earvin Tio** (SYDE'20), for providing guidance and advice on how to conduct this project.

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[2] Aboriginal Population Profile, 2016 Census. Statistics Canada.
http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/abpopprof/index.cfm?Lang=E

[3] Table 11-10-0012-01 Distribution of total income by census family type and age of older partner, parent or individual. Statistics Canada.
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[4] W. Bishop, Chances for Admission for Fall 2021. The Road to Engineering.
https://theroadtoengineering.com/2020/09/30/chances-of-admission-for-fall-2021/

[5] Table 11-10-0239-01 Income of individuals by age group, sex and income source, Canada, provinces and selected census metropolitan areas. Statistics Canada https://doi.org/10.25318/1110023901-eng

Other Class Profiles

If you are the author of a Waterloo Engineering Class Profile that is not listed, please feel free to contact the authors to have yours added to the list.

Systems Design 2017
Systems Design 2018
Systems Design 2019
Systems Design 2020 (report no longer online, Reddit discussion linked)

Software Engineering 2018
Software Engineering 2020

Biomedical Engineering 2019
Biomedical Engineering 2020

Mechatronics Engineering 2020

Management Engineering 2020

Colophon

The font used in this report was PT Sans. (Titles: Bold 24 pt. Body: 12 pt., Small Text: 10 pt.). Verdana was used in box plots when PT Sans was not available.

The graphs were made with matplotlib (boxplots) and Infogram (all other graphs). This report was made with Google Slides.

The Class Profile Survey was conducted with Typeform Premium, and questions were split across three surveys: Demographics, Academics and Co-op, and Personal/Lifestyle questions. This was to ensure that survey responses could not be linked between the surveys. The ECE Exit Survey was conducted by the ECE Department with Qualtrics. The Class Profile Survey was conducted from March 12 - April 15. The ECE Exit Survey was conducted March 3 - March 31.