How did COVID-19 affect our academics and co-op?
What were the most challenging terms for us?
How did SYDE help us discover our interests?
What are we doing after graduation?
How did we change in the past five years?
How were our relationships with each other?
foreword

Systems Design Engineering (SYDE) is a five-year undergraduate engineering program at the University of Waterloo (UW). It is unique in its interdisciplinary nature, with students gaining a foundation in areas across engineering disciplines. The program’s focus on design thinking equips students to solve complex challenges in a range of areas.

Since 2017, each SYDE graduating class has published a detailed survey capturing students’ experiences throughout the program. This document extends previous class surveys and aims to tell the story of SYDE ‘21. We spent eight terms together in school (2.5 were online due to the COVID pandemic) and six terms around the world for co-op. We hope that through this survey you are able to gain some insight on the SYDE experience for the class of ‘21.
This survey was run by SYDE ‘21 students, independent of the University of Waterloo or Systems Design Engineering Faculty. Responses were collected in May 2021, meaning that some data presented may no longer be accurate. 76 of 96 students (79%) of students in our graduating class responded to the survey. All questions were optional.

In the survey, we refer to the eight school terms as 1A, 1B, 2A, 2B... 4B, with the number indicating the year of study and A or B indicating the first or second term. Each co-op term is referred to by the previous school term, e.g. the co-op term following our first school term is “1A co-op”.

For questions involving monetary values, we asked respondents to convert USD values to CAD using a conversion rate of 1 USD = 1.21 CAD.
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What were people like in high school?

What extracurricular did people do?

What final average did we have in high school?
We’re a well-rounded group!

96% of the class did extracurriculars in high school, ranging from sports to music to debate.

- 89% did multiple extracurriculars, the average number being 3.35
- Less than half the class worked in high school
We saw ourselves in a diverse range of industries

Almost half the class had no idea what they wanted to do before coming into SYDE, and that’s okay!

Co-op and the classes definitely helped me figure out what I wanted to do ‘cus I feel like Systems gives us so many different types of classes that we take that I was like “oh wow, I’m actually interested in hardware” or “oh, this design course was super cool.”

- Haley G.
Over 35% of students also applied to math programs

Nearly 80% of us applied for at least one other STEM field. Business was the most common non-STEM field followed by humanities.

0% of SYDEs applied to clown school. Professor Kofman would be disappointed 😢
About 14% of us considered a gap year

But for the majority of the class, university was the only option considered.
Nearly 1/3 of the class was in AP or IB programs

55% of the class was in an accelerated program.
We were all try-hards

The minimum entrance average was 85%, the maximum was 100%, and the median was 94%.
We considered other ENG and CS programs

Mechatronics engineering, computer science, and software engineering were the top three other programs considered.
How many of us funded our own university degree?

What background did our parents have?

What are our political leanings?

demographics
Our class was diverse in gender and in ethnicity

Our class has a higher ratio of women to men than many other engineering programs. The gender split was also more equal than SYDE '17 (27% female), SYDE '18 (36% female) and SYDE '19 (38% female) (data for SYDE '20 was not available).

We also come from a variety of ethnic backgrounds:
- 40.8% White
- 34.2% East Asian
- 25.0% South Asian
- 2.6% Black
- 1.3% Middle Eastern
- 1.3% Southeast Asian
- 3.6% Other
(Students who selected multiple ethnicities were counted once in each group)

The class was similar in age. Nearly all of us were born between 1995 and 1999, with the majority (73.6%) born in 1998.
The majority of people grew up in near Toronto

Most of us did not travel far to attend Waterloo. Only 10.5% of us were from outside of Ontario, and 10.5% from outside of Canada. This is lower that the proportion of international undergraduate students at UW as a whole (22%).
Most of us are second-generation immigrants

Were either of your parents born in North America? (n=76)

- Yes: 35.5%
- No: 64.5%
We followed in our parents’ footsteps

- 95% of the class has at least one parent with a post-secondary degree
- More than half the class have parents with a master’s or doctoral degree
- 68.4% of students have at least one parent who worked in STEM

Parents have a huge role in shaping what education paths we take, trust and are aware of.

I narrowed [programs] down to computer science or engineering. ‘Cus my dad’s an engineer and my mom codes, so they’re very much involved in the software world. And that’s kind of all I knew at the time.

– Charmaine W.
We were typically in the upper-middle class

The majority of the class had parents who made more than the median Canadian household income of $70,000 in 2016.
A little under 10% of the class funded university by themselves

Tuition (including fees) over our five years at Waterloo amounted to $68,183 for domestic students.

Around 1/5 had university fully funded and around 2/5 had > two thirds of their tuition funded.

This makes sense considering most of our class comes from upper-middle class families.
Did your parents pay for more than 2/3 of your university tuition?

- Combined household income >$200k (n=15)
  - Yes: 73%
  - No: 27%

- Combined household income <$200k (n=58)
  - Yes: 78%
  - No: 22%
Trudaddy reigns supreme

When asked to categorize their political leaning, the results were:
- Left – 27.6%
- Centre-left – 39.5%
- Centre – 23.7%
- Centre-right – 2.6%
- Right – 2.6%
42.1% of our class believe in God or a Higher Power (n=76)
What were the averages across terms?

Which term was most stressful?

Which courses do we recommend?
The class average across terms was 79.90%.

The lowest term average was 3A (median of 75.7%) and the highest was 4B (median of 86.3%). Higher averages in fourth year were likely due to online school and more flexible course selection. Grades trended down and then back up.
Program averages by group

Men in SYDE had slightly higher averages than women (average of 80.6% across terms for men vs 79.3% for women). Of the three most represented ethnicities, East Asians had the highest average (80.8% across terms).

Cumulative average by gender

Cumulative average by ethnicity
Summer terms (3A, 1B) seem to be our favourite

I love summer terms just 'cus I feel like we're a lot happier and there's a lot more things to do! Uptown, going to food festivals or concerts in the summer, going on picnics and walks. It's a good time.

– Charmaine W.

Upper-years organized rafting trips for each class on stream every summer.
We rated 2B as our most stressful term

Notoriously known as the most difficult term in SYDE “2B or not 2B”.

The least stressful terms were in 4A and 4B, perhaps due to remote learning.

Students were asked to rate their stress level from 1 to 5 with:
- 1 being “No stress” and
- 5 being “Very stressful”
But we don’t look *that* stressed in our 2B class pic

Check out our colour coordination!
Our average attendance for lectures declined over terms

There was a sharp decrease from 3B to 4A, possibly due to the transition to online classes.
We’ve got a wide spread of favourite profs

Igor Ivkovic (34.2%), Carolyn MacGregor (18.4%) and Hamid Tizhoosh (10.5%) came out on top.

We’ve had Professor Borland for four courses and Birkett and Speziale for three courses, which were the most out of all professors.
15 people in our class studied abroad

- Singapore (7)
  - National University of Singapore (4)
  - Nanyang Technological University (2)
  - Singapore University of Technology and Design (1)
- Sweden (4)
  - Lund University
- Finland (1)
  - Tampere University
- Netherlands (1)
  - Delft University of Technology
- Japan (1)
  - Tottori University
- Australia (1)
  - Queensland University of Technology
Out of the 15 students who went on exchange, 6/15 said it was their **favourite** school term, 13/15 of them **left early** due to COVID-19, and all of them **recommend** it to others!

Replies to “Why do you recommend exchange to others?”

- Make lifelong friends, travel, and maybe even survive the start of a pandemic together!
- Singapore had arcades and playing DDR and essentially Japanese exclusive arcade games was a blast
- Easier workload, you get to meet many students from around the world, amazing opportunity to travel
- Trying things that are outside of your comfort zone. This was probably the only term where I really had fun and didn’t spend the majority of my time focusing on school! Highly recommend :)!
- New culture, new people, experience what university education is like in another country (and outside of Waterloo)
Design was useful and enjoyable for most of us

How useful were the design courses?
1 = Will not not use any of the knowledge
5 = Can see applying lots of the knowledge in the future

How enjoyable were the design courses?
1 = Really did not enjoy
5 = Enjoyed very much
SYDE 223 & 162 were the most useful courses

SYDE 223: Data Structures and Algorithms and SYDE 162: Human Factors in Design might be the top two because those courses taught us foundations for work done in computer science and product/design fields.

There are probably very few courses that I use in my co-ops. But the design courses were definitely useful and that is not a focus in other engineering streams.

Even in software, you have an idea of why you’re doing things and being able to contribute to conversations with more value.

- Rishi I.

What was the most useful course of the degree?

1. SYDE 223 – Data Structures and Algorithms
2. SYDE 162 – Human Factors in Design
3. SYDE 348 – User Centered Design Methods
4. SYDE 361 – Systems Design Methods 1
5. SYDE 121 – Digital Computation
6. SYDE 372 – Cooperative and Adaptive Algorithms
7. SYDE 252 – Linear Systems and Signals
8. SYDE 161 – Introduction to Design
9. SYDE 362 – Systems Design Methods 2
10. SYDE 212 – Probability and Statistics
ECON and MSCI were popular Complementary Studies Electives

Our class explored a total of 49 departments to take CSEs from!

In terms of Technical Electives (TEs), we mostly stuck with SYDE, ECE and MSCI electives. Our top 10 faculties for TEs were:

1. SYDE
2. MSCI
3. ECE
4. MATH
5. SCI
6. STAT
7. INTEG
8. CIVE
9. CS
10. Other engineering

Which departments did our class take Complementary Studies Electives from?
We highly recommend Music 140 & 246

Out of all the non-SYDE courses recommended by our respondents (40 in total), MUSIC 140 & 246 were the only ones above 10%.

What non-SYDE course would you most recommend?

1. MUSIC 140 – Popular Music and Culture
2. MUSIC 246 – Soundtracks Music in Film
3. PLAN 100 – The Evolution of Planning
4. PACS 315 – Engineering and Peace
5. ECON 101 – Intro to Microeconomics
6. ECE 457A – Cooperative and Adaptive Algorithms
7. LS 283 – Business Law
8. ECE 406 – Algorithm Design and Analysis
9. CLAS 104 – Classical Mythology
10. PSYCH 101 – Introductory Psychology
Most of us were proud of our FYDP projects

Compared to SYDE 2019, 6% more students did a multidisciplinary project, but 7% less students plan on continuing FYDP.

- Will you continue working on your FYDP after graduation? (n=76)
  - No (84.2%)
  - Maybe (13.2%)
  - Yes (2.6%)

- FYDP SYDE-only or multidisciplinary? (n=74)
  - SYDE-only (83.8%)
  - Multidisciplinary (16.2%)

- Are you proud of your completed FYDP? (n=76)
  - Yes (48.7%)
  - Somewhat (36.8%)
  - No (14.5%)
Sustainability was the most popular FYDP problem space

I'm genuinely impressed by our class projects, especially in COVID. I know people in our class are crazy smart, but I don't think that it really hits you until you see someone make something.

- Sitara V.
**Academic Integrity?**

Most of us cheated in some way during our degree. Maybe this contributed to the majority of our class graduating without any failed courses!

- 77.6% failed 0 courses
- 13.1% failed 1 course
- 5.3% failed 2 courses
- 2.6% failed 3 courses
- 1.3% failed 7 courses
Over 70% of us didn’t complete any options

Although most of the class chose not to add an option to their degree, a few of us completed a Management Science, AI, or Biomechanics option. There are many others available to Waterloo engineering students, however most students prefer the flexibility of choosing all of their electives.
Over 90% of our class completed our degree together

Although five years is the standard length of our degree, having a few classmates join and leave our cohort each term was normal.
86.7% of us would pick SYDE again if we went back in time

The unique blend of systems modeling and design courses helped us stand out from other disciplines when tackling engineering problems.

The tight-knit community made us feel welcomed and helped us make it through the tough courses and co-op grinds.

I think a lot of people walk away only feeling like they’re going to be using the design skills. Whereas the system skills are so applicable and gives such a good starting point for any other engineering discipline.

– Reno N.

I think what separates Systems from a lot of other programs is the community within. In choosing Systems, you’re not just choosing the academics, you’re not just choosing the program, but you’re choosing the community and the close-knit group of people that comes with it.

– Matthew W.

What Systems actually prepared me to do is leaps and bounds above what your average engineering student is able to do, and I am so thankful for that.

– Emma S.

What makes SYDE a great program?
How did we find online school?

Where did we live during online school?

How did the pandemic affect our mental health?
Online school was easier but less enjoyable

Not seeing as many classmates made the experience a lot tougher. Studying was more self-guided with the reduction of in-person lectures and tests.

"Online School is More Enjoyable than In-Person School"

"Online School is Easier than In-Person School"
People lived in Waterloo despite taking online classes

Some reasons for people living in Waterloo:
- Signed a lease before online school was announced and didn’t want it to go to waste (or find a sublet)
- Wanted to live with friends during online school and Waterloo was an easy location to pick
The class skewed toward following COVID guidelines

5 = Strict social distancing
1 = Regular close interactions with groups outside of household
The pandemic made us feel worse

How has the pandemic affected your mental health? (n=76)
- My mental health is worse: 50%
- My mental health is the same: 36.8%
- My mental health is better: 13.2%

How do you feel your job prospects have changed as a result of the pandemic? (n=76)
- I feel worse about my job prospects: 52.6%
- I feel the same about my job prospects: 46.1%
- I feel better about my job prospects: 1.3%
How has the pandemic affected you?

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I feel like I am languishing and the inability to be spontaneous has affected my productivity and overall happiness.

Feeling lonely because of not seeing friends, but my social anxiety is better because there's no society

Lost dream co-op job

I feel like I have gotten worse at social interactions. I have more anxiety.

I feel so alive.

It felt like it made school easier because there was a higher focus on projects instead of cramming for things. Which actually felt better than constant quizzes and tests.

3B Co-op offer rescinded

So Bored... done nothing... feel very unproductive overall.

I feel as though I'm not good at maintaining relationships from a distance, and as such, I feel like I have lost touch with quite a few friends since the beginning of the pandemic.

I feel like I have improved in my mental health. I have more depression due to what seemed like time speeding up and staying stagnant.

I haven't seen many friends since December 2019, so I'm really missing seeing them.

Mentally, it was rough being stuck in one place and not being able to go outside and hang out with people especially in our last years in school. Graduation felt like a waste because we just ended randomly but I appreciated the grad ball and black tie event.

It took away all of the potential lifelong memories that would have been made throughout under grad.

It's tragic we have no way of celebrating with friends after 5 years here.

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I think the "highs" of life are lower now and so my average state is just lower in general.

I feel like I am languishing and the inability to be spontaneous has affected my productivity and overall happiness.

Isolation for an extrovert sucks

Feeling lonely because of not seeing friends, but my social anxiety is better because there's no society
How has the pandemic affected you?

Page 2 of 2

- More depressed and anxious

- Relationship issues exacerbated by the pandemic and a difficult time sharing emotions makes for a tough pandemic

- I haven't seen many friends since December 2019, so I'm really missing seeing them.

- As fucked up as it sounds, the pandemic has been great for me. I have been able to travel and pursue opportunities I would not have been able to had school been in-person in 4A and 4B.

- Mentally, it was rough being stuck in one place and not being able to go outside and hang out with people especially in our last years in school. Graduation felt like a waste because we just ended randomly but I appreciated the grad ball and black tie event.

- my mental health has suffered a bit from the lack of in-person interactions

- It took away all of the potential lifelong memories that would have been made throughout undergrad. It's tragic we have no way of celebrating with friends after 5 years here.

- I feel more alone and without things to do, often pondering my existence

- Became very isolated and developed depression due to what seemed like time speeding up and staying stagnant

- It's tragic we have now way of celebrating with friends after 5 years here.

- As fucked up as it sounds, the pandemic has been great for me. I have been able to travel and pursue opportunities I would not have been able to had school been in-person in 4A and 4B.

- I feel more alone and without things to do, often pondering my existence

- Relationship issues exacerbated by the pandemic and a difficult time sharing emotions makes for a tough pandemic

- I haven't seen many friends since December 2019, so I'm really missing seeing them.
Where did people find their co-op jobs?

What was the gender pay gap in our class?

How much did we make across the co-op terms?
WaterlooWorks does work

About 80% of students found their co-op position from WaterlooWorks (the UW job search platform) each term.

This dropped to ~50% of students during 3B, likely due to a decrease of postings on WaterlooWorks during the onset of COVID-19.
Software engineering, product management, and design dominate

The ‘Other’ category was likely bigger in the earlier terms because many students worked in QA and IT, which don’t fall under any of the listed categories.

Between 2A and 2B people started to shift from software development to product management.
Software, finance, and hardware were the biggest industries

Students transitioned into the software industry as terms progressed.
Canada’s braindrain in action

The number of people working in the United States steadily increased each term.
The gender pay gap was reversed for our class

Salaries increased as more students worked for US companies and took on more advanced roles. Some students received US salaries converted to Canadian dollars for the 3B remote term.
What were our friendships like during university?

Which drugs did we experiment with?

How many of us dated within our program?

lifestyle
Most of us are in relationships 😍

Are you currently in a relationship? (n=74)
- Yes: 59.5%
- No: 40.5%

If yes, do you think you’ll be with them forever? (n=44)
- Yes: 75%
- No: 25%
65% of the class hadn’t had sex before university. Now, 25% of the class continues to abstain.
About 30% of us participated in “SYDE-cest”

SYDE-cest (noun): the act of dating someone else in SYDE.
Alcohol consumption hardly changed. Stoners doubled.

Consumption of marijuana might have been affected by the legalization in 2018. The usage of many hard drugs also increased by double or more.
Keeping in touch with other classes

There's a trend for keeping in touch with 1-2 upper years and >3 lower years. Maybe due to mentorship; one older student mentors multiple younger students.
We’re besties

96% of us have at least one best friend in SYDE. For 35% of us, our 5 closest friends were all made during SYDE.

One thing that I want to emphasize is the friendships I gained from SYDE. A lot of the people that I met in Systems I want to keep communicating with. Even the people who I don’t talk to as often anymore. All of my close friends at this point in my life are from Systems. And I think it’s because of all the things we went through.

Tiffany S.
Shawarma is a favourite for more than 20% of us

Shawarma Plus, iPota to and Lazeez account for ~20% of the class’s favourite restaurants in the plaza.
The class got a little more fit during university

Perhaps people realized the importance of doing physical activity in managing a healthy student life.

...or maybe we realized we needed something to counter all the bubble tea and Lazeez 😏
How did our earning potential change?

How did our self-image change with school?

Are we more attractive now than before?

transitions
5 years made us smarter, prettier, and more in tune with ourselves

Meanwhile, our sense of morals, work ethic, and teamwork didn’t change much.

Self-perceived ratings: 1 (below the class average) to 5 (above the class average).
We understand our own personalities better, how we work best, and the importance of a social circle.

Replies to “How did you change over university?”

- Worked, cried, laughed with a lot of people throughout my undergrad. Couldn’t have done it without the people I met throughout my undergrad :)

- I learn best by doing. For example, every time I studied for a calculus test by looking at theorems, I would fail, but every time I studied by attempting to solve problems, I would do really well. I learned that I would not be where I am today without the help of my peers.

- I am someone who likes structure, love spending my time mentoring others and that I found a group of supportive friends.
What are our career plans post-graduation?

How many of us are leaving Canada?

How are our finances after school?
Post-grad plans

Unsurprisingly, the majority of us (63) are diving into the workforce. Five of us are continuing some sort of education.

For those going back to school immediately:
- 2 are going back to the University of Waterloo
- 1 is going to UC Berkeley
- 1 is going to the University of Toronto
- 1 is going to the Massachusetts Institute of Technology

As for returning to school, the class is split into three groups:
- 34.2% plan on never going back to school,
- 34.2% isn't sure if they ever will,
- 31.6% are interested in programs such as Masters, MBA, PhD, Professional School and Teachers College.

What are your plans within 1 year of graduation?

- Work: 90%
- Continuing education: 70%
- Time off: 20%
- Not sure: 10%
- Entrepreneurship: 0%
50% of people who found a job are going back to one of their co-op companies

Do you have a full-time job secured? (n=61)
- Yes: 73%
- No: 27%

Are you going back to a past co-op company? (n=52)
- Yes: 50%
- No: 50%
21 people are leaving Canada

Out of those, 90% of them plan to return to Canada at some point.

Not shown on the map:
- 1 person is moving to Vancouver, BC
- 1 person is moving to Hamilton, ON
- 1 person is moving to London, UK

Darker dots represent more people.
Most of us are techies

Despite us only having only 2 mandatory software courses, half of those who had secured a job last May planned to do software development.

Software was also the most common job industry (40 students), followed by Consulting (5 students), then Healthcare/Biotech (3 students), then Construction (1 student). 2 people did not categorize their industry.
Not all of us want to be software developers in tech

Although software development is by far the most common job area, not all students wanted to pursue a traditional tech job.

Different paths include:
- Other roles in the technology industry such as product management or product design
- Applying software skills to engineering contexts such as environmental agencies
- Academia and research

Students often mentioned the struggle of “breaking the mold”—deviating from what most of their peers were doing took bravery and self-reflection after realizing it wasn’t for them.

Some of their stories

- The upper-years I admired worked in tech. But that’s ultimately not where my interest lies. I got sucked into a narrative that’s what success is in Systems.
  
  - Emma S. Masters of Transportation at MIT

- I started feeling like software was tedious. I wanted to try for product management but I had a fear of failing. I ultimately ended up getting into PM and I’m happy I took the risk.
  
  - Rishi I. Product Manager at Datadog

- The job I’m doing right now uses software to tackle electric power systems problems. It’s an overlap between the software development skills I learned on co-op and our engineering systems education. Software and traditional engineering don’t have to be mutually exclusive fields.

  - Reno N. Software Developer at Opus One
Those working in the US are getting paid 2x as much as those working in Canada

The median base salary for jobs in the US is $150,625 CAD; for Canadian jobs it is $75,000 CAD.
More than 1/3 of our class saved over $40k

- The most anyone saved was $180k
- Four students saved over $100k
- The median was $30k

Students who had had more of their tuition paid by their family had more in savings. On average, students who had:
- 0% of tuition paid by parents had $14,988 in savings
- 1–33% of tuition paid by parents had $32,033 in savings
- 34–66% of tuition paid by parents had $38,265 in savings
- 67–99% of tuition paid by parents had $37,000 in savings
- 100% of tuition paid by parents had $68,909 in savings

How much do you have in savings? (CAD)

- More than $40k
- $30k–$40k
- $20k–$30k
- $10k–$20k
- $5k–$10k
- $0–$5k
- 0–5%
- 5–10%
- 10–15%
- 15–20%
- 20–25%
- 25–30%
- 30–35%
- 35%
>50% of our class is graduating debt-free!

Students who were graduating with debt were asked how long they thought it would take to pay it off:
- 41% said <1 year
- 35% said 1–2 years
- 3% said 5–10 years
- 6% said >10 years
- 15% said they didn’t know
Most people expect to stay in touch with a small circle of friends.

This isn't too surprising considering that about a third of us said our 5 closest friends are in our class, and we learned about how important a close social circle is to us.
end.

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