McGill | School of Computer Science

Computer Science Program Orientation

CS Undergraduate Student Affairs Coordinators

Liette Chin liette.chin@mcgill.ca

Teresa (Tess) Pian teresa.pian@mcgill.ca

June 2023

McGill | School of Computer Science

CS Program Organization

- A common set of **Core courses** (for all Majors, Minors, and Joint programs), covering basic programming, algorithms, and math.
- A set of **Complementary courses** to choose from, which give flexibility to *specialize*.
  - Graphics, databases, AI, networks, and more!
- Beyond core and complementary courses, **Elective courses** – electives can be taken in (almost) any department.
  - You can take more CS courses, general interest courses, all kinds of things.

First CS Course at McGill

1

- **If you have a lot of experience programming**, or have taken programming classes before, take COMP 250
- **If you have never programmed before or have minimal experience**, take COMP 202 (or COMP 204 or COMP 208)

NOTE: COMP 202/204/208 cannot be taken for credit after you have taken COMP 250. *You can NOT take COMP 202 and COMP 250 at the same time* (and you cannot get credit for both if you do it).

COMP 202/204/208
Which one is right for me?

- All of them cover roughly the same material, using **Python**.
- **COMP 202**: can be taken by any student at McGill
  - Only requires CEGEP level (or equivalent) math – Calc 1&2, Linear Algebra
  - It is a Complementary course in the U0 Freshman Program.
- **COMP 204**: can be taken by students with a background in life sciences
  - BIOL 112 is a prerequisite, and you have to be comfortable with the basics of cell biology and genetics.
- **COMP 208**: part of several B.Eng. and some B.Sc. programs in the physical sciences
  - MATH 141 ‘Calculus 2’ (or equivalent) is a prerequisite and MATH 133 ‘Linear Algebra and Geometry’ is a co-requisite.

What courses should I take in first year?

Depends on if you were admitted as a <u>U0</u> or <u>U1</u> student

<u>U0</u>

You are coming from **high school**
with no advanced credits (or less than 30 credits)
You start with the ***Freshman Program***

<u>U1</u>

You have advanced credits from **CEGEP/ IB /AP**
You go straight into your Major program

First, a word about workload

- **1 credit in a course translates to about 3 hours of work per week**
  - 3 credit course = average workload of 9 hours a week (including class time)
  - So 5 courses with 3 credits each means 45 hours of work per week!
  - It is perfectly normal to take 4 courses (about 36 hours per week) to have time for extra-curriculars, clubs, etc.
- Not all courses are the same **difficulty** – a higher course number does not necessarily mean the course is more difficult, just that it requires more background
- Many CS courses involve programming assignments or projects, which can be **time consuming**
- **Overall, be aware of your limits and don't overload and overwork yourself in a semester.** You need time to live!

Second, a word about ‘vision’

- If you **know what you want to do after you graduate McGill** (it’s ok if you don’t know for sure yet!), then:
  - Look at the 400-level & 500-level courses you would like to take, and work backwards looking at *prerequisite* 200-level & 300-level courses
  - You will see a path emerge for the courses you should take to get there!

U0: Freshman Program (Arts and Science)

- The **Freshman Program** is a **30 credit program** you must complete *before* you can take classes for the Major you want
  - You *have to* take 30 credits from a specific list of Freshman courses
  - Requirements differ depending on which 'Group' you were admitted in

    Science Freshman courses - Arts Freshman courses

- If you want to study CS or Software Eng in your second year, make sure you take these Freshman courses in U0:

  COMP 202 *Foundations of Programming* (3 credits)** /**COMP 204**/**COMP 208**

  **Even if you have experience programming, we recommend taking COMP 202 in U0

  MATH 133 *Linear Algebra* (3 credits)

  MATH 140 *Calculus 1* (3 credits)

  MATH 141 *Calculus 2* (4 credits)

NOTE: these reccomended courses only add up to 13 credits – you still need to take 17 credits of other Freshman courses to complete the 30 credits total required

U1: No or Minimal Prior Programming

Only applicable if you are starting as a U1 student or did not take COMP 202 in U0

- FALL: **COMP 202/ 204/ 208** + two **MATH** courses + electives (like classes for a Minor)

- WINTER: **COMP 250** + **COMP 206** + one or two **MATH** courses + electives

MATH courses to take in U1 (either semester):

MATH 240, MATH 222, MATH 223

U1: Prior Programming Experience

- FALL: **COMP 250** + **COMP 206** + **MATH 240** + electives and/or another MATH course

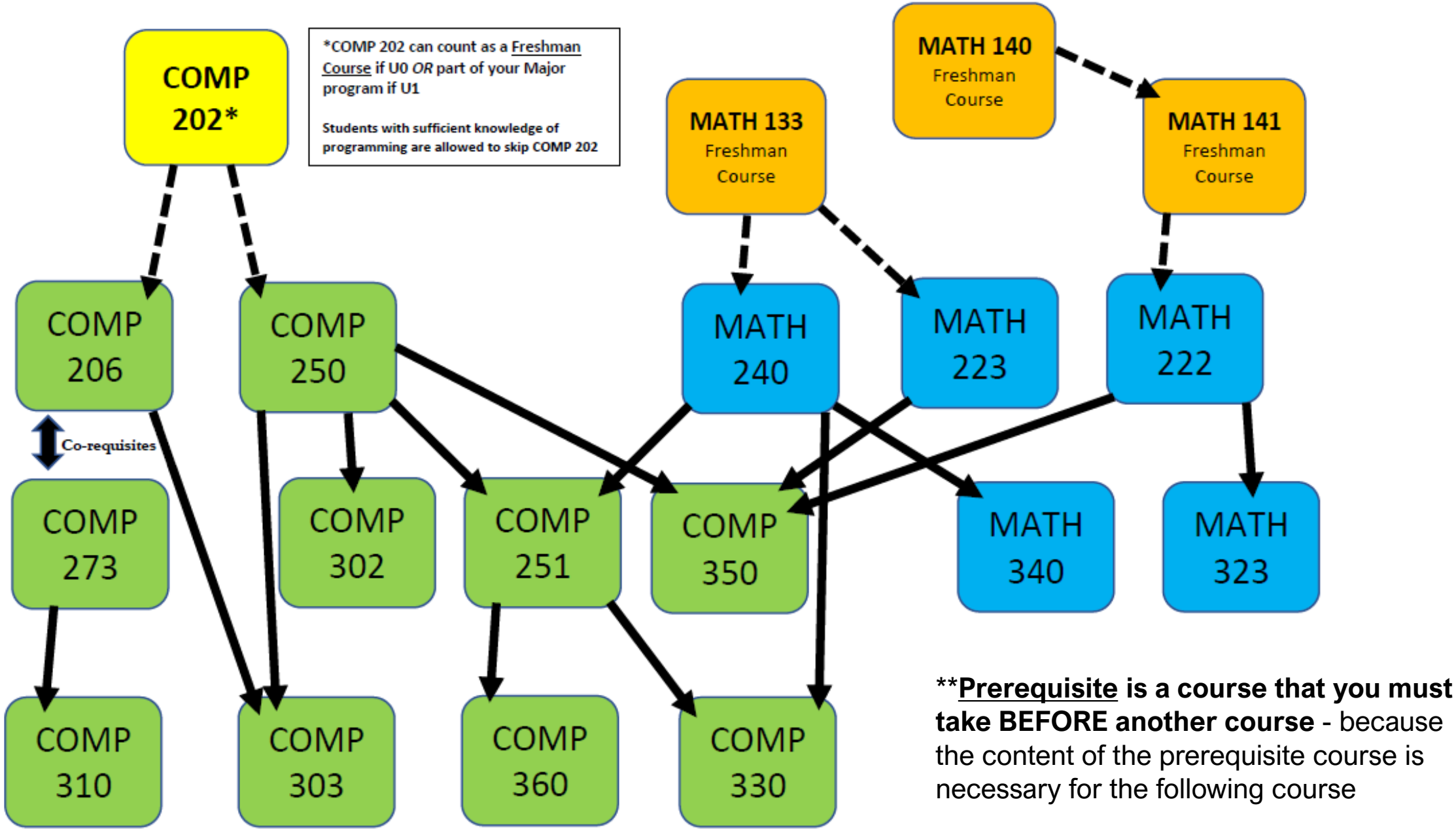
  you must take MATH 240 ***before* COMP 251 – no exceptions

- WINTER: **COMP 251** + **COMP 273** + one or two **MATH** courses + electives

MATH courses for U1:

MATH 240, MATH 222, MATH 223

Understanding *prerequisites* for core Computer Science classes



__Prerequisite__ is a course that you must take BEFORE another course - because the content of the prerequisite course is necessary for the following course

Registering for Courses

- **Once registration starts, you can add courses for *both* Fall and Winter semesters**
- You have until the end of the **Add/Drop period** (second week of classes) to register for whatever courses you want
  - Add/drop deadline for Fall courses is in September - Add/drop deadline for Winter courses is in January
- If the class you want to register for is **full**, **sign up for the waitlist** if there is one
  - Minerva will notify you when a spot opens and you are at the top of the waitlist. Waitlist how-to: https://www.mcgill.ca/students/courses/add/waitlisting
- Always check **Minerva for the most accurate course information**, like times, locations, prerequisites, open spots
  - VSB is a good tool for figuring out your overall schedule, but it's not always accurate
- If you have *course registration issues*, email **Teresa (Tess) Pian** teresa.pian@mcgill.ca

CS Programs & Degree Options

Major vs. Honours vs. Liberal (Science)

- **Computer Science** or **Software Engineering Major** (63 credits)
- **CS Honours** (75 credits)
  - Honours courses have a few different required courses, a research project, and require more CS credits
  - GPA must always be 3.0 or above
- **CS Liberal Program** (45 credits)
  - **Liberal Program in Software Engineering** (49 credits)

- Details of all program requirements are on the CS website, and you can select your program directly on Minerva!

Joint Programs

- **Interested in doing two Majors?** Computer Science offers specific joint programs:
  - **CS & Biology** (74 credits)
  - **Mathematics & CS** (72 credits)
  - **Statistics & CS** (72 credits)
  - **Physics & CS** (66 credits)
- Joint programs require less credits than two separate majors, but still have the *same core courses* for each major.

CS Minor

- Want just a little bit of CS in your degree? Do a **CS Minor**
  - 24 credits for Science, 18 credits for Arts
- Use the **CS Minor Form** to declare and plan your Minor
  - To get the relevant Minor Form for your degree, email Liette Chin (Liette.chin@mcgill.ca) with your student ID number, current degree, and faculty
  - Send the **PDF** with your course selections to the Minor Advisor for approval, email minor-advisor@cs.mcgill.ca
  - See the whole procedure here: https://www.cs.mcgill.ca/undergrad/specializations/minor/
- You can select your Minor on Minerva, but you **should declare the Minor at the beginning of U2 or earlier**

Major Concentration CS or SE (Arts)

For students in a Bachelor of Arts:

- **Major Con. in Computer Science** or **Software Engineering** (36 credits
  - The **same core courses** as the Bachelor of Science CS and Software Engineering programs, just with less required credits

- Add on the **Supplementary Minor Concentration in CS** (18 credits) for a more robust program and more complementary course credits
  - Major Concentration in CS (36 credits) + Supplementary Minor in CS (18 credits) = **54 CS credits total** - *almost equivalent to a CS Major*


Diversify your Degree

Internships

- Internships are **paid positions related to your field of study**
  - Many students choose to do internships to get real-world work experience!
  - They can be done after you finish U1
- **Industrial Practicum** – 4 month internship
- **Internship Year in Science (IYS)** – 8, 12, or 16 months
- More info:
  - For B.Sc. students ifso.science@mcgill.ca
  - For B.A. students https://www.mcgill.ca/arts-internships/

Research Opportunities

- **Research courses** are available in the Fall, Winter, or Summer (COMP 396, COMP 400 etc.)
  - Under the supervision of a professor, you work on a project and summarize your findings at the end
  - You receive credits and a mark on your transcript
- **Summer research awards**
  - Similar to research courses, but you get $ instead of credits
  - NSERC USRA for all students, SURA for Science students, and ARIA for Arts students
- **Part-time research for $, or volunteering** in Fall, Winter, or Summer
  - You could have your own project, or could help in a professor's existing lab

Career Advice

- Check out the **Career and Placement Centre (CAPS)** for Computer Science and Software Engineering jobs
  - Special events organized with companies, like the **Tech Fair** twice a year (September and January)
  - **CV and interview advice** offered
- Job and internship postings on https://caps.myfuture.mcgill.ca/
- On-campus jobs available through the **work-study office**
- Great events by McWics and CSUS!

McGill | School of Computer Science

Important Things to Know

Take Care of Yourself!

Your mental and physical health are more important than school

- The **Student Wellness Hub** is your one-stop-shop for health and wellness services, health promotion activities, and more https://www.mcgill.ca/wellness-hub/

- They have extensive program and **support offerings,** Self-Help tools, and an **off-campus Health and Wellness Resource Map**
- Workshops on time management, mindfulness meditation, research skills, effective studying… whatever you need

Questions? Concerns? Ask an Advisor

- Don’t be afraid to reach out to an academic advisor if you have any questions about your program requirements or degree progression – they’re here to help!
- **Advisors with the Faculty of Science (SOUSA)** – for general questions and about the Freshman Program: https://www.mcgill.ca/science/undergraduate/advice/sousa
- **CS Advisors:** https://www.cs.mcgill.ca/undergrad/program/advising/
  - **General questions**: contact Teresa (Tess) Pian teresa.pian@mcgill.ca
  - Questions about **COMP 202 and COMP 250, or U0:** email Prof. David Becerra david.becerra@mcgill.ca
  - Questions about **U1 and U2:** email Prof. Joseph Vybihal jvybihal@cs.mcgill.ca
  - For a **Degree Audit** (to see if you are fulfilling your program requirements): contact Liette Chin liette.chin@mcgill.ca

Email Etiquette

- Don’t be afraid to reach out to professors or staff, but do it properly so that you get the best result!
  - Use your **McGill email**
  - Always include your **McGill Student ID Number**
  - **Be polite and professional** – Hello Prof. LastName, Dear Mr./Ms. LastName
  - **Be concise** – ask your questions and be direct about what you need, don’t send a super long email with every single detail (if we need to know more, we will ask!)
    - When emailing about a specific course, put that course code in the subject line.
  - **Be patient** – do not send multiple emails or re-send emails, we respond as soon as we can! There are over 4,000 students taking CS courses, that’s a lot of questions and concerns to answer.
    - Follow-up only if you don’t receive a response after over a week.
- More tips: https://www.mcgill.ca/onboardingcentral/files/onboardingcentral/student_email_etiquette_tips.pdf

Library Resources

- Course reserves = your textbooks! mcgill.on.worldcat.org/courseReserves/landing
- **You can access the whole library catalog online at** www.mcgill.ca/library/
  - Schulich Library of Physical Sciences is closed, but you can find all the same resources at the Humanities and Social Sciences Library
- Not just books! The McGill Library has many useful resources for you
  - Printing
  - Workshops (on research skills, citations, writing papers etc…)
  - Book a study room or a space to Zoom
- Jennifer Zhao (Jennifer.zhao@mcgill.ca) is the Library Liaison for CS and ECE. She can help you:
  - Use the library's collections, services, and spaces
  - Search for research literature
  - Manage and cite references
  - Manage research data
  - And more!
- Find all Library service and open hours here: https://mcgill.ca/x/ovn

Computer Science Undergraduate Society

For students & by students!

https://mcgill-csus.ca/

They have amazing information and resources for:

- Help desk & free peer tutoring
- Mental health support and resources
- Sustainability
- Equity
- Research opportunities
- Internships
- Industry mentorship

CSUS is a great way to get involved and meet other CS students

- First year council positions!
- Weekly study nights
- Hackathons
- Connections to other CS student clubs!

McGill | School of Computer Science