



Sh*t I Wish I Knew

2020 Edition

University Program Information



CGPA

- What is CGPA?
 - Cumulative Grade Point Average
 - Calculated by taking the weighted average GPA of each of your courses
 - Can be broken down by year (annual CGPA)
 - Annual term: Summer to Winter
- Carleton uses a 12-point GPA system
 - See chart (right) for details
 - Grade points assigned intervallically
 - Highest possible grade point in a course: any grade $\geq 90\%$

Carleton University's Grade Point Scale:

Grade points for 1.0 credits	Grade Points for 0.5 credits	Percentage Equivalency
A+ = 12.0	A+ = 6.0	90-100%
A = 11.0	A = 5.5	85-89%
A- = 10.0	A- = 5.0	80-84%
B+ = 9.0	B+ = 4.5	77-79%
B = 8.0	B = 4.0	73-76%
B- = 7.0	B- = 3.5	70-72%
C+ = 6.0	C+ = 3.0	67-69%
C = 5.0	C = 2.5	63-66%
C- = 4.0	C- = 2.0	60-62%
D+ = 3.0	D+ = 1.5	57-59%
D = 2.0	D = 1.0	53-56%
D- = 1.0	D- = 0.5	50-52%
F = 0.0	F = 0.0	0-49%

1st-Year Courses

COMP 1405 - Intro to CS I: variable types, branching and looping structures, arrays, functions, sorting and searching (in Python)

COMP 1406 - Intro to CS II: object-oriented programming, basic data structures, recursion, efficiency, debugging (in Java)

COMP 1805 - Discrete Structures I: logic, proof techniques, set theory, graph theory, asymptotic analysis of algorithms

MATH 1007 - Calculus I: limits, derivatives and differentiation, max/min optimization, basic integrals (similar to Grade 12 Calculus)

MATH 1104 - Linear Algebra I: systems of linear equations, matrix algebra, vector spaces, eigenvalues, complex numbers

2nd-Year Courses

COMP 2401 - Intro to Systems Programming: memory management, pointers, process management (in C)

COMP 2402 - Abstract Data Structures: stacks, queues, lists, trees, graphs

COMP 2404 - Intro to Software Eng.: object-oriented software development (in C++)

COMP 2406 - Web Applications: HTML/CSS, JavaScript programming, database querying, web technologies

COMP 2804 - Discrete Structures II: counting, probability, recurrence relations, randomized algorithms

STAT 2507 - Intro to Stat Modelling I: random variables, probability distributions, distribution of sample mean, hypothesis testing

3rd-Year Courses

COMP 3000 - Operating Systems: Linux OS and file system, low-level C programming

COMP 3004 - Object-Oriented Software Eng: group project class, UML, computer ethics

COMP 3005 - Database Management Systems: ER modelling, SQL, relational algebra, normalization

COMP 3007 - Programming Paradigms: functional and logical programming (Haskell, Lisp/Scheme, Prolog)

COMP 3804 - Design and Analysis of Algorithms I: divide-and-conquer, dynamic programming, shortest path, NP-completeness

Importance of Grades

- Annual CGPA of 10.00 (A- average) required to renew entrance scholarship
- CGPA of 10.00 in first year required to qualify for DSRI
- Overall CGPA of 8.00 (B average) required to be in Co-op
- Some courses require a minimum grade in a prerequisite course
 - Minimum grade of C- in COMP 1406 required to register for COMP 2401, 2402, and 2406
 - Minimum grade of C- in COMP 1805 required to register for COMP 2804, 3005, and 3007



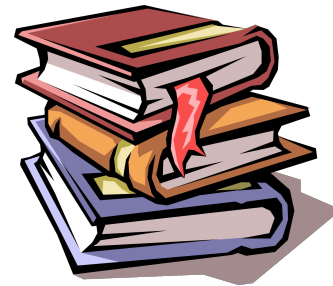
Free Electives vs. Breadth Electives

Free electives are courses that are:

- **Not** included in your **major**
- **Not** on the list of **prohibited courses**:
 - BUSI 2402, BUSI 3400, COMP 1001, COMP 1004, MATH 1009, MATH 1119, MATH/ECON 1401, MATH/ECON 1402
 - All courses in BIT, IMD, IRM, MPAD, NET, OSS, PLT and ITEC **except for the following**:
 - BIT 1000, BIT 1001, BIT 1100, BIT 1101, BIT 1200, BIT 1201, BIT 2000, BIT 2004, BIT 2005, BIT 2007, BIT 2100, BIT 2300

Breadth electives are courses that are:

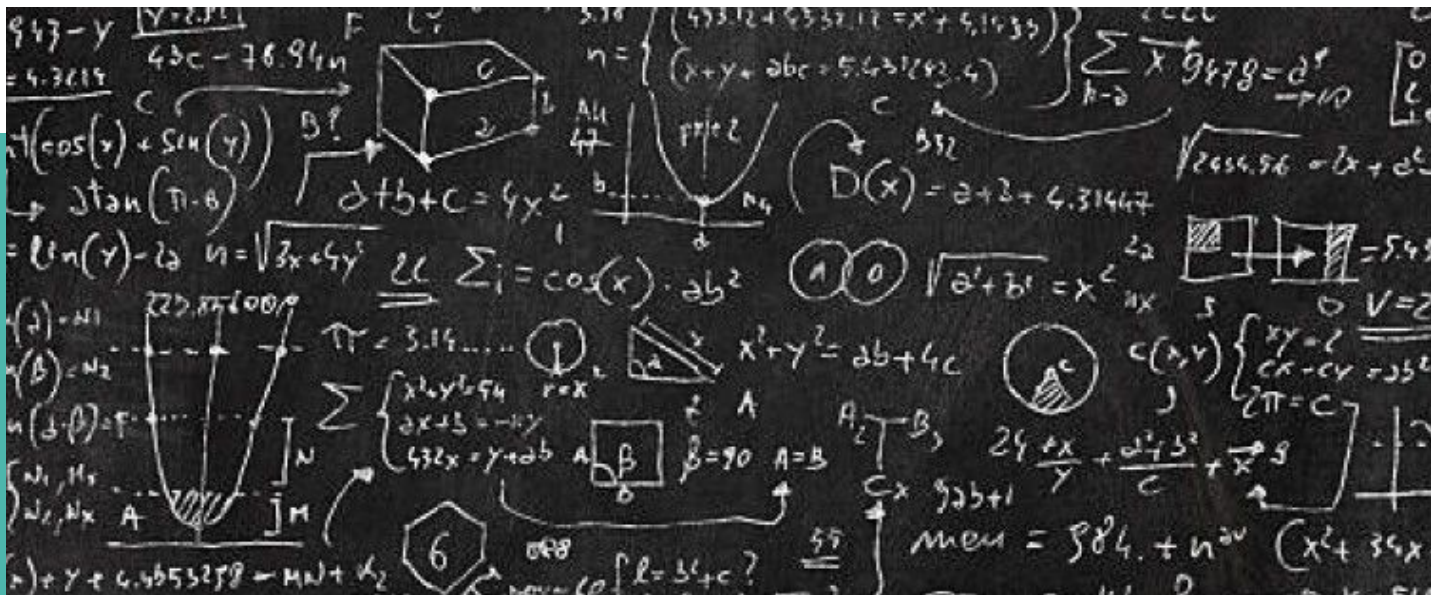
- **Not** included in your **major**
- **Not** on the list of **prohibited courses** (see list on the left)
- **Not** in any of the following:
 - School of Computer Science
 - School of Mathematics and Statistics
 - Faculty of Engineering and Design



Major vs. Honours vs. Streams

- Carleton offers a BCS Major as well as a BCS Honours degree
 - The Honours degree requires COMP 3804 and a project/thesis
 - The Honours degree has higher CGPA requirements to be in good standing/to graduate
 - Many universities require an Honours degree to get into graduate studies
- What is a stream?
 - A 2.0-credit concentration in a particular CS field, and a related Honours project/thesis
 - Gives priority access to certain optional COMP courses
 - Available streams: Algorithms, Management and Business Systems, Software Eng., Network Computing, Computer and Internet Security, Mobile Computing, Game Dev.
- Important notes:
 - You must be in the Honours program to have a stream
 - Streams are unique to the CS program at Carleton - may not be recognized at other institutions/in the workplace

Academic Advice



Time Management

- Start your assignments as early as possible
 - Even if you don't finish, you'll have something to hand in
 - You will be able to think about the assignment while you aren't working on it
- Schedule specific times for schoolwork/studying/free time
 - Separating work and play helps you increase productivity while working and enjoy yourself more during free time
- Use an agenda/calendar
 - Writing things down helps you to remember them
 - You will have an organized list of everything you need that you can refer back to
- Set reminders for important dates and deadlines
 - E.g. alarms, push notifications, sticky notes
 - You don't want to risk waking up late for a test, or missing an assignment deadline

Hofstadter's Law: It always takes longer than you expect, even when you take into account Hofstadter's Law.



Work Ethic

- Don't procrastinate
 - The sooner you do your work, the sooner you can fix the bugs in your code
- Treat school like a full-time job
 - (except you are being paid in knowledge and grades)
- Attend all lectures
 - And take your own notes, even if the prof posts their notes as well
 - The more classes you miss, the more likely it will be for you to fall behind
- Don't skip assignments!
 - Anything is better than 0%; every percent counts!
- Know when to stop
 - Burnout is real
 - Don't keep pushing yourself to the limit at the expense of your mental/physical health

Resources

- Learn to Google
 - If you run into a problem, chances are thousands of others have as well
- Consult your instructor and TAs
 - There is no shame in asking questions
 - They are there to help you learn
- Join a study group
 - Your peers can help hold you accountable for your schoolwork
 - Help and support each other (as long as you don't violate academic integrity)
- Make use of Carleton's resources
 - [Science Student Success Centre](#)
 - [Paul Menton Centre](#)
 - [Carleton Computer Science Society](#)
 - [MacOdrum Library](#)

Quick Intro to Research with MacOdrum

Why do you need to know this?

- Electives are a necessary part of your degree
 - ◆ 5.0 credits in breadth electives → 10 courses that are not COMP, STAT, or MATH
 - ◆ Categories
 - Culture and Communications
 - Humanities
 - Social Science
 - Science, Engineering, and Design
- Minors
 - ◆ Anything else you're passionate about?

Omni

- Main search engine MacOdrum offers
- Searches entire collection
- Pulls from different databases
 - ◆ JSTOR
 - ◆ Project MUSE
 - ◆ DOAJ
 - ◆ HathiTrust*

Subject Guides

- Curated resources by a Librarian
- Detailed guides include how-tos on writing and citation
- Quick guides offer a small sample of sources

Library Services

- Writing Services
 - ◆ Will help with all written assignments
- Off-campus database access
 - ◆ Search databases directly

Career Opportunities



Getting Started

- Make a resume even if you have no work experience or side projects
- Start applying now
 - You will start to learn how to market yourself
 - You will get used to rejection early on
- Go to info sessions to learn more about companies hiring from Carleton
- Apply even if you don't meet all the requirements
- Don't stress yourself out - you don't HAVE to get a job in first year

Internship Opportunities

- Dean's summer Research internship (DSRI)
 - Process starts december/january
 - You must find the placement by reaching out to profs
- Federal Student Work Experience Program (FSWEP)
 - Partially a lottery process
 - Internships
- First-year-specific internships exist (e.g. Google STEP Program)

Internships Vs Co-op

- Some job postings ask for you to be in a registered co-op program
- Coop through universities is often subsidized by the government
- Coop at Carleton University provides you with a job board
- Career Services Office available to all students - will provide resume reviews and mock interviews!
- It's not necessary to be in the coop program to get a great internship!
 - You can always apply externally
- But it is a lot more work to find jobs yourself - takes effort and commitment

Finding Jobs

- Keep an eye on the Careers page of the companies you're interested in!
- Indeed
- LinkedIn Jobs
- Networking Events
 - You can register for coop job fairs and networking events in first year
 - Net Night (1 per semester)
 - Career Fairs in University Center on campus
- Going to Hackathons, Tech Meetups

Resume Tips

- You can use MS Word or online resume builder templates
- A little bit of colour and style can make you stand out!
- Two columns is a popular style
- Verify your resume can be parsed (CTRL-F Test)
- Get all your friends and mentors to review your resume



- What do you put on your resume if you don't have any compsci work experience?
 - Projects!
 - Hackathons
 - Organizations you're involved in
 - Volunteer experience
 - Non - CS work experience
 - School/uni projects

Interview Tips

- Go to mock interview and technical interview workshops
 - Ask your friends to interview you!
- Confidence and friendliness goes a LONG way, smile!!!!
 - Culture fit is very important and companies are looking for positive, passionate candidates
- Research the company - culture, products, tech, etc.
- Ask questions!
 - Indicates interest and will make you more familiar with the company
 - Example question: "what's a typical day like as a developer on your team?"
- Own the things you don't know but emphasize how much you want to learn
- Dress up professionally (even helps you feel prepared for phone interviews)
- Practice technical interview problems on HackerRank and LeetCode and brush up on CS concepts
- Follow up with a thank-you email



Learning Outside the Classroom



Personal Projects

- Personal Projects
 - Can showcase your knowledge of certain skills
 - Languages, frameworks, paradigms, etc.
- They show you go beyond just doing classwork
- Group projects are good too!
 - Join hackathons to work on something exciting for a competition
 - Start a side project with your friends
 - Find project buddies @ CCSS Dev Club

Personal Projects

- Make something you're passionate about - a fun game, a digital planner, a website
- Remake something you use but optimized for you e.g. Notes App!
- Make something to help you learn something new e.g. mobile development
- Remake a school assignment and add more features such as a full GUI
- If you really can't think of anything... make a [resume website!](#)
- Look at projects you're inspired by on [Devpost!](#)

- Examples:
 - [First-year Project](#)
 - [Recent Project](#)



Github

- Having a [public portfolio](#) that shows your activity and interests is a big plus
- Free Github [Student Developer pack](#)



Self-Directed Learning

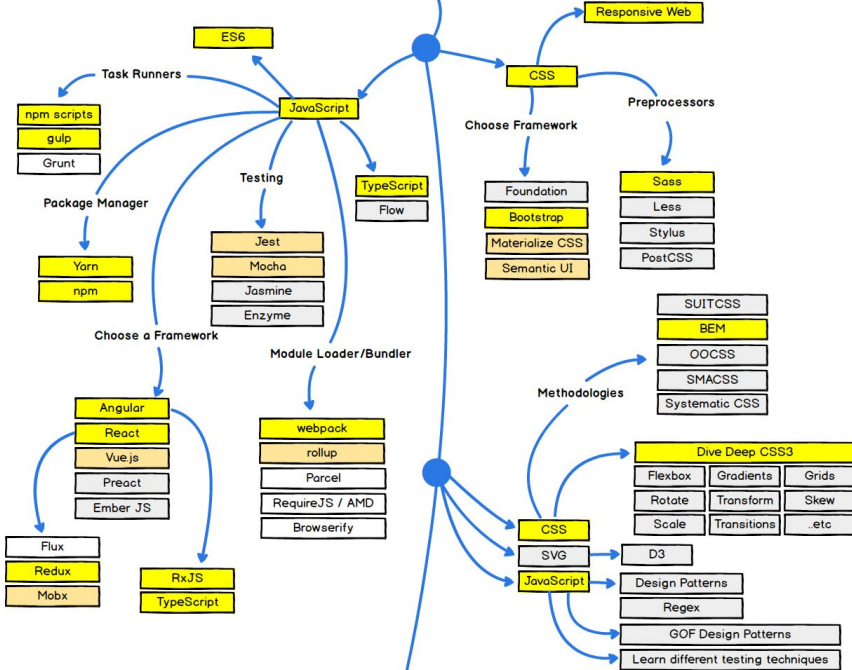
- Self Directed Learning Strategies
 - Absorb Context
 - Watch videos, read articles, or ask others to get a gain context
 - Context will help you make sense of new information
- Follow a [road map](#)
 - You can't just jump into something that requires other base knowledge
 - Understanding context helps you develop a road map

Front-end

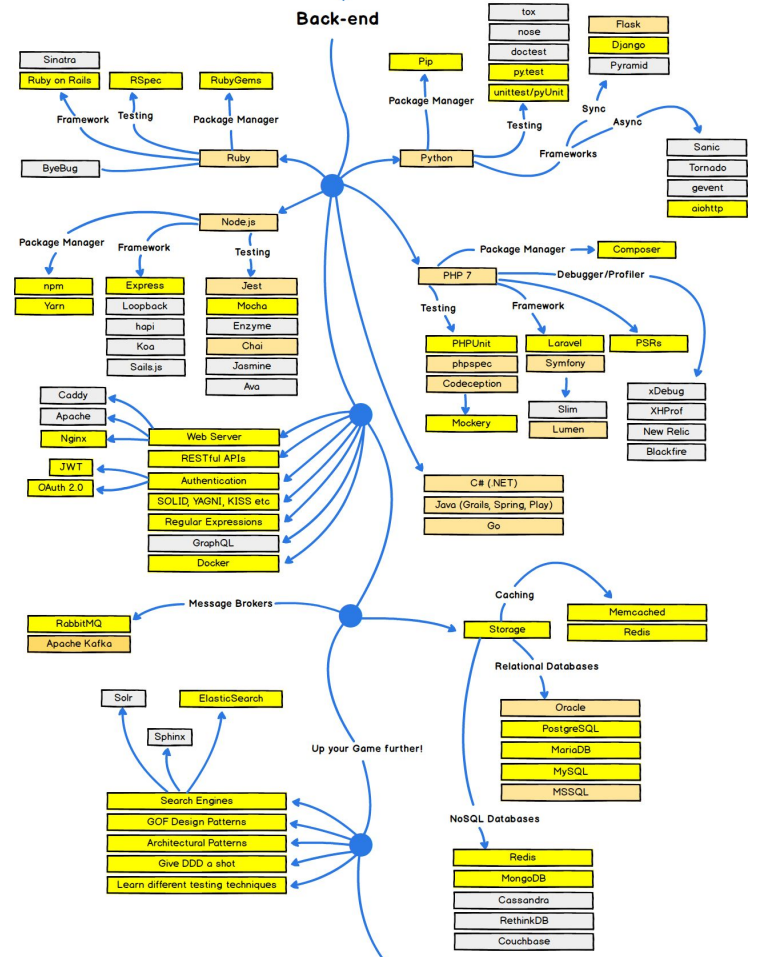
Learn the Basics

- HTML
- CSS
- JavaScript

Getting Deeper



Back-end



Self-Directed Learning

- Strategies for finding interests within CompSci
 - Look at positions and checkout the technical requirements
 - Research the technologies required to build something you would like to make
- No one knows everything... CS is vast
- Don't be discouraged by information overloads, everyone is gonna have a niche

Sources

<https://carleton.ca/academicadvising/cgpas/>

<https://carleton.ca/awards/scholarships/entrance-scholarships-for-new-students/>

<https://calendar.carleton.ca/undergrad/regulations/co-operativeeducation/>

<https://calendar.carleton.ca/undergrad/undergradprograms/computerscience/>

<https://carleton.ca/scs/current-students/undergraduate-students/help-selecting-courses/electives-and-prohibited-courses-2/>

<https://carleton.ca/scs/current-students/undergraduate-students/streams-and-programs/major-vs-honours-2/>

<https://science.carleton.ca/students/undergraduate-resources/deans-summer-research-internships/>

<https://www.canada.ca/en/public-service-commission/jobs/services/recruitment/students/federal-student-work-program.html>

<https://carleton.ca/career/>

<https://roadmap.sh/>