Getting Started in Computer Science

Computer Science Department
School of Computing
College of Engineering and Computing
http://cs.gmu.edu/

Access these slides via the QR code
Agenda

- Finding Information
- Policies to Know
- The BS-CS and BS-ACS Degrees
- What do I register for?

Find these slides and materials at:

- [https://cs.gmu.edu/](https://cs.gmu.edu/) → Current Students → Undergraduates → Getting Started in CS at GMU
- [https://cs.gmu.edu/current-students/undergraduates/getting-started-in-cs-at-gmu/](https://cs.gmu.edu/current-students/undergraduates/getting-started-in-cs-at-gmu/)
Department Info

Contacts

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<tbody>
<tr>
<td>Undergraduate CS office</td>
<td>Buchanan D215</td>
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<tr>
<td>Graduate CS Office</td>
<td>ENGR 4300</td>
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<tr>
<td>advising appointments</td>
<td>Weekdays:</td>
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<tr>
<td>(physical and virtual)</td>
<td>10am-12pm</td>
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<td></td>
<td>1p-4pm</td>
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<tr>
<td>contact email:</td>
<td><a href="mailto:csug@gmu.edu">csug@gmu.edu</a></td>
</tr>
<tr>
<td>contact phone:</td>
<td>703-993-1530</td>
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People

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<tr>
<td>Chair:</td>
<td>Dr. David Rosenblum</td>
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<tr>
<td>Undergraduate Associate Chairs:</td>
<td>Dr. Elizabeth White</td>
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<td></td>
<td>Dr. Mark Snyder</td>
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<td>Undergraduate Advisors:</td>
<td>Joshua Fletcher</td>
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<td></td>
<td>Linda Sheridan</td>
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<td></td>
<td>Vernell Wilks</td>
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<td>Kristi Morrow</td>
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College of Engineering and Computing (CEC)

Computer Science

- Information Sciences and Technology
- Statistics
- Bioengineering
- Civil & Environmental Engineering
- Electrical and Computer Engineering
- Mechanical Engineering
- Systems Engineering & Operations Research
- Cyber Security Engineering
Quick Facts

• BS-CS is ABET-accredited
  [https://www.abet.org](https://www.abet.org)
• daytime CS classes
  • vast majority are face-to-face

Sites to know

password.gmu.edu – create your GMU username (netID)
[cs.gmu.edu](https://cs.gmu.edu) - CS website.
  • read through current students/undergraduates section
[patriotweb.gmu.edu](https://patriotweb.gmu.edu)
  • unofficial transcript: Student records → Unofficial transcript
  • Patriot Scheduler – search classes and register
  • DegreeWorks – see live mapping of your degree progress
[catalog.gmu.edu](https://catalog.gmu.edu) – course/degree details; all academic policies; catalog requirements

Examples

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<tbody>
<tr>
<td>email</td>
<td><a href="mailto:gmason76@gmu.edu">gmason76@gmu.edu</a></td>
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<tr>
<td>netID</td>
<td>gmason76</td>
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<tr>
<td>G#</td>
<td>G01234567</td>
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Policies to Know
Catalog Years

• The catalog is published yearly.
  • you meet all requirements for your catalog year: 2023-2024
  • Your catalog requirements don't change when we update later catalogs.

• Degree Planner – paper copy of your requirements. (on CS website)

• DegreeWorks – live mapping of your degree progress
  • Great for "What if?" scenarios. https://patriotweb.gmu.edu/

• Online Catalog – https://catalog.gmu.edu
  • all official catalog text, including your entire degree requirements
  • course info/prerequisites
  • all department/school/university policies
Prerequisites

• Each class has hardcoded prerequisites – courses that must be successfully completed before you can take the course

• Need **C or better** to meet the prerequisite
More Prerequisites
Grading Policies

• **C or better** needed for all prerequisites
• **one C-/D grade** is allowed towards CS major
  • *(can't be a prerequisite for another course though – those all must be C or greater)*
• **Repeats**: third and final (successful) attempt required in next semester, or you're terminated from CEC
• **Selective Withdrawal**: three times as undergraduate, you may drop by mid-semester from class (grade of W)
• **Honor Code**: you pledged not to lie, cheat, steal, or plagiarize in all academic matters. [oai.gmu.edu](https://oai.gmu.edu)
  • It is strictly enforced! [https://oai.gmu.edu/full-honor-code-document/](https://oai.gmu.edu/full-honor-code-document/)
Study Elsewhere Constraints

• Once you begin at GMU, your transferrable coursework is complete. You cannot take more courses elsewhere and transfer them in later.

• Example: if you take extra courses at NVCC and ask to transfer them in, the answer will be "no".

• To request an exception to this policy, ahead of time, you need to fill out a Study Elsewhere request form.

  • Some denied reasonings:
    • any attempts (including W) at the course at GMU
    • already have 60+ transferred credits
    • financial hardship
    • online version of a natural science with lab
    • also offered at GMU and open seats
More Programs

Minors

- Separate course sequence from major.
- Must have 8 unique credits (not used towards major)
- We offer the **Software Engineering Minor** (16 credit hours)

Accelerated Masters

- Use four graduate-level courses towards both BS and MS degrees (double-counted)
- Apply after earning 60 credits, with good GMU GPA
- Effectively a five-year BS+MS program
BS Computer Science Degree
BS CS Degree (120 credits)

- General Education (24cr)
- CS Core (35cr)
- Mathematics and Statistics (20cr)
- Natural Sciences (12cr)
- CS Senior electives (15cr)
- CS Related electives (6cr)
- General electives (8cr)
General Education (24cr)

- COMM 101 – oral communication
- ENGH 100/101 – composition
- ENGH 302N – advanced composition
  - *Natural Science sections only!*

- Mason Core
  - One course from each list:
    - Arts
    - Global Understanding
    - Literature
    - Social and Behavioral Science
    - Global History (HIST 125)

- *Search lists of Mason Core courses on catalog.gmu.edu*

- *All other general education requirements are covered by CS/SoC requirements.*
CS Core Courses (35cr)

- **Ethics**+ CS 110, 306
  - Essentials of CS, Synthesis of Ethics/Law for the Computing Professional

- **Programming** CS 112, 211, 310
  - Introduction to Programming; Object-Oriented Programming; Data Structures
    - New! CS 108 + CS 109 is a two-course replacement for CS 112.

- **Systems** CS 262, 367, 471
  - Intro to Low-level Programming; Computer Systems and Programming; Operating Systems

- **Software Engineering** CS 321

- **Theory** CS 330, 483
  - Formal Methods & Models, Analysis of Algorithms
Math/Statistics (20cr)

- Calculus I — MATH 113  *(or 123+124)*
- Calculus II — MATH 114
- Calculus III — MATH 213
- Discrete Math — MATH 125
- Linear Algebra — MATH 203
- Prob/Stat — STAT 344

**Math overrides contact:**
[camaya@gmu.edu](mailto:camaya@gmu.edu)

*(more info on overrides at the end of this talk)*
Natural Science Requirements (12cr)

Stronger requirements by CS than General Education.

- **Required:** lecture/lab sequence in one field, plus 4cr more
  - Some are one 4cr course combo, others are a separate lecture(3cr) and lab(1cr)
  - Last 4cr: *different-subject lab science from Mason Core, or use your sequence as prereqs.*
  - Example: sequence of BIOL 102(4) & 103(3)/105(1), and PHYS 160(3)/161(1) == 12cr.

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<th>Field</th>
<th>First</th>
<th>Second</th>
<th>Third</th>
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<tbody>
<tr>
<td>Biology</td>
<td>102</td>
<td>103/105</td>
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<tr>
<td>Chemistry</td>
<td>211/213</td>
<td>212/214</td>
<td>313/315</td>
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<td></td>
<td>(or 314/218)</td>
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<tr>
<td>Geology</td>
<td>101/103</td>
<td>102/104</td>
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<tr>
<td>Physics</td>
<td>160/161</td>
<td>260/261</td>
<td>262/263</td>
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CS Senior Electives (15cr)

• your chance to specialize your degree!
• five of the following, including at least one of 455/468/475/487

CS 425 – Game Programming I
CS 440 – Language Processors and Programming Environments
CS 450 – Database Concepts
CS 451 – Computer Graphics
CS 452 – Virtual Reality
CS 455 – Computer Communications and Networking
CS 463 – Comparative Programming Languages
CS 468 – Secure Programming and Systems
CS 465 – Computer Systems Architecture
CS 469 – Security Engineering
CS 475 – Concurrent and Distributed Systems
CS 477 – Mobile Application Development
CS 478 – Natural Language Processing
CS 480 – Introduction to Artificial Intelligence
CS 482 – Computer Vision
CS 484 – Data Mining
CS 485 – Autonomous Robotics
CS 487 – Introduction to Cryptography
CS 490 – Design Exhibition
CS 491 – Industry-Sponsored Senior Design Project (3 cr. – only)
CS 499 – Special Topics in Computer Science*
MATH 446 – Numerical Analysis I (equiv. to OR 481)
CS Related Electives (6cr)

- STAT 354
- SYST 371, 470
- PHIL 371, 376
- ENGH 388
- OR 335, 441, 442
- ECE 301, 231/232, 350, 446, 447, 511
- SWE ≥300
- MATH > 300
- CS > 300
- E.g. 419, 432, 437, 443
- Except 351
- More CS-senior electives

General Electives (8cr)

- Can't count remedial math (e.g. MATH 105) or some MLSC courses
- May count up to 3cr of RECR
- University requires 120 credits total to graduate; no exceptions
BS Applied Computer Science

- Concentrations: SWE, CGDS, GINF, BMGT, BMKT, TCHP
  - *Please declare your concentration during this orientation.*
- Students take foundation/core courses in CS and in the concentration area.

- All concentrations share the same common foundation/core:
  - CS 110/306
  - CS 112/211/310
  - CS 262/367/471
  - CS 321
  - CS 330/483
  - MATH 113/114/125/203, STAT 344 (or other stat course) *(no calc III)*
  - ACS Elective: one additional course CS≥400 *(except CS 498)*
ACS Concentrations

• Concentration in **Computer Game Design (CGDS)**
  • Foundation: GAME 230, CS 306, CS 325, CS 351; AVT 104; STAT 344
  • Core: CS 425, 426, 451; AVT 382, 383
  • One approved elective related to game design
  • PHYS 160/161, one additional lab science course

• Concentration in **Software Engineering (SWE)**
  • Foundation: STAT 344; CS 306
  • Core: SWE 205, 301, 401; SWE 419, SWE 437
  • Five courses chosen from:
    - CS 450, 455, 463, 465, 468, 475, 477, 491; SWE 432, 443
  • ENGH 388 & one of the following:
    - (PSYC 333, COMM 320, COMM 335)

• Concentration in **Geoinformatics (GINF)**
  • Foundation: CS 306, GGS 102, 103, 110, 300; STAT 250
  • Core: GGS 310, 311, 366, 379
  • four courses from GGS 354, 411, 416, 422, 426, 429, 462, 463, 470
ACS Concentrations

• Concentration in **Business Management (BMGT)**
  • Foundation: STAT 250; CS 306; BUS 100; PSYC 100; MGMT 303; MKTG 303
  • Core: MGMT 313, 321, 451, 453
  • three courses chosen from MGMT 300-499

• Concentration in **Business Marketing (BMKT)**
  • Foundation: STAT 250; CS 306; BUS 100; PSYC 100; MGMT 303; MKTG 303
  • Core: MKTG 312, 351, 471
  • four courses chosen from MKTG >300

• Concentration in **Technology Policy (TCHP)**
  • Foundation: GOVT 101/103, 134, 150, 300
  • Core: GOVT 352, 363, 366/7/8, 426, 460, GOVT490/CS306
  • four courses chosen from GOVT 304, 312, 318, 351, 369, 400, 414, 435, 444, 446, 461, 462, 464, 480
Transferrable Credits

- Only **college-level approved coursework** is transferrable
- **AP/IB scores** with sufficient scores
- **specific courses from specific places** have been approved for specific courses here at GMU
- All listed online (search for "GMU transfer credit")
  - [https://www2.gmu.edu/admissions-aid/how-apply/transfer/transfer-credit-policy](https://www2.gmu.edu/admissions-aid/how-apply/transfer/transfer-credit-policy)
- **Remember: once starting courses at GMU, GMU students cannot take coursework elsewhere for GMU credit (without PRIOR permission).**
  - As an example, you cannot take coursework at NVCC for GMU credit even if it's equivalent.

Getting Credits

- **Send scores/official transcript** to GMU after grades posted.
- GMU receives scores, processes manually – then they should show up on your transcript. (patriotweb → student records → unofficial transcript)
- **appeal elective credit** as specific course: send syllabus, coursework samples, etc. to relevant department. Rarely approved with only a syllabus.
When/How to Request Overrides

**When:** you plan on **immediately** taking a course that needs to use your transfer credits as a prerequisite, but they aren't yet in the system.

**How:** email the relevant department with a printed-to-pdf copy of your unofficial transcript/scores, requesting the override.

- Use your **GMU email**, including G#, e.g. **G01234567**
- Attach **PDF of unofficial scores** (with your name and score visible)
- You must re-attempt registration after the override is approved

**Computer Science**  **csug@gmu.edu**
**Mathematics**  **camaya@gmu.edu**
**Others**  **<email the department>**
What do I register for?
What do I register for? (Freshmen)

Recommendation: only four courses.

Are you calculus-ready? (Math Placement Test score or credit for MATH 113/123)

- Take four courses:
  - CS 110
  - CS 112
  - MATH 113 (or MATH 123 or MATH 124)
  - Gen-Ed (e.g. approved Mason Core Literature course, COMM 100/101)

Not calculus ready yet?

- CS 108 (covers first half of CS 112)
- CS 110
- proscribed next Math course (105, 123)
- Gen-Ed (e.g. approved Mason Core Literature course, COMM 100/101)
What do I register for? (Transfers)

Each transfer's starting point is different! Here are guidelines. Four courses recommended.

- **CS 110** (*needed first semester, everyone*)
- next programming course (e.g. 112, 211, 262 and/or 310)
- next math course (e.g. MATH 113, 114, 213, 125)
- next natural science or gen-ed
- ENGH 302N (Natural Science sections only)
- CS-Related courses (PHIL 376, ENGH 388, more math, SWE courses)

- **Goal:** finish CS 310, 330, 367 to open up prerequisite chains
Getting Help

• If you have concerns about meeting the prerequisites for a class, contact the CS Department.

• If you are in need of assistance before the semester starts, contact the CS Department Office staff.
  • We offer appointments every workday. (10am-12pm, 1pm-4pm)
  https://go.gmu.edu/cs-ug-advising

• Email: csug@gmu.edu
  • Contact us by email – for questions, sending forms, requesting CS course overrides
  • Only send from your Mason email account (@gmu.edu)
  • Always include your G number on all correspondence (e.g. G01234567)
  • Attach print-to-pdf webpage showing your relevant scores, e.g. A.P., transcript, etc. (needs to show your name on it too, of course!)
Break Through Tech
Mission Statement

Break Through Tech works at the intersection of academia and industry to propel more women and underrepresented communities into technology education and careers.

*Our goal is to achieve gender equality in tech.*
Key Drivers

3 C’s Framework

Curricular Innovation and Academic Pathways
Recruit non-traditional computer science students who may have limited or negative experiences with -- or perceptions of -- computer science and tech fields, and address policy barriers that restrict their access to relevant majors.

Improve the inclusive teaching practices of introductory computer science courses, through intervention and collaboration with faculty, staff, and other key academic department stakeholders.

Career Access
Focus on the career development of students underrepresented in tech careers, providing connections from students’ studies to real-world applications and in-depth exposure and access to tech careers.

Community Building
Support students who may not feel that they belong in tech by building opportunities that promote peer relationships, student leadership, and connections to networks of professional women in tech.
Foundational programs for early college years

**Summer/Winter GUILD**

Inspire more women to take an introductory computing course and consider major or minoring in computer science or related majors

- Paid 1-2 week workshop **designed for incoming students and underclassmen to “widen the funnel”**
- Hands-on experience with coding, digital product development, and technology creation through the lens of a “real world challenge”

**SPRINTERNSHIPS®**

Give students a resume credential that makes them more competitive when applying for summer internships and provides employers a chance to engage with a diverse talent pipeline.

- **Paid, three-week, mini-internship** during an academic recess for first and second year undergraduate students
- Working in teams of five, ‘Sprinterns®’ are immersed in their host site’s business and culture, complete a challenge project, and build their industry network and knowledge.

More Sprinternships and Guilds to come!
(Sprinternship apps open August)

Sign up for the listserv: [https://forms.office.com/r/truFhm7FKP](https://forms.office.com/r/truFhm7FKP)
What Happens Next

- Activate your Mason ID/password
- Take the Math Placement Test if needed [https://math.gmu.edu/placement_test](https://math.gmu.edu/placement_test)
- Use PatriotWeb/PatriotScheduler to plan your semester
- Register on PatriotWeb (part of orientation schedule)
  - Registration Guide: [https://registrar.gmu.edu/topics/registration-guide/](https://registrar.gmu.edu/topics/registration-guide/)
  - Adding to a waitlist: [https://registrar.gmu.edu/students/patriot-web-tutorials/interactive-demo-adding-yourself-to-waitlists/](https://registrar.gmu.edu/students/patriot-web-tutorials/interactive-demo-adding-yourself-to-waitlists/)

Getting Help

**Advising**

csug@gmu.edu

Buchanan D215  
10am-12pm. 1-4pm weekdays

[https://go.gmu.edu/cs-ug-advising](https://go.gmu.edu/cs-ug-advising)

Override requests for CS courses.  
(use @gmu.edu account, G#)

Things to Read/Explore

CS website: cs.gmu.edu

Current Students → Undergraduates

Unofficial Transcript (on Patriotweb)

Catalog: BS CS policies
More Useful Orientation Links

These slides: (or via QR code to the right →)

Math Placement Test & Override Request:
[science.gmu.edu/academics/departments-units/mathematical-sciences/mathematical-sciences-testing-center](science.gmu.edu/academics/departments-units/mathematical-sciences/mathematical-sciences-testing-center)

Info about AP Scores:
[www2.gmu.edu/admissions-aid/apply-now/how-apply/transfer/transfer-credit-policy#exams](www2.gmu.edu/admissions-aid/apply-now/how-apply/transfer/transfer-credit-policy#exams)

George Mason Course Catalog: [catalog.gmu.edu](catalog.gmu.edu)

How to Register for Classes:

Adding yourself to a Waitlist:
- [https://registrar.gmu.edu/students/patriot-web-tutorials/interactive-demo-adding-yourself-to-waitlists/](https://registrar.gmu.edu/students/patriot-web-tutorials/interactive-demo-adding-yourself-to-waitlists/)