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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<tr>
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<tr>
<td>Undergraduate CS office</td>
<td>Buchanan D215</td>
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<tr>
<td><strong>Graduate CS Office</strong></td>
<td><strong>ENGR 4300</strong></td>
</tr>
<tr>
<td>advising appointments (physical and virtual)</td>
<td>Weekdays: 10am-12pm, 1p-4pm</td>
</tr>
<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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<tbody>
<tr>
<td>Chair:</td>
<td>Dr. David Rosenblum</td>
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<tr>
<td>Undergraduate Associate Chairs:</td>
<td>Dr. Elizabeth White, Dr. Mark Snyder</td>
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<tr>
<td>Undergraduate Advisors:</td>
<td>Joshua Fletcher, Linda Sheridan, Vernell Wilks, 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

• CS classes are daytime
  • vast majority are face-to-face

Sites to know

password.gmu.edu – create your GMU username (netID)

CS.gmu.edu - CS website.
  • read through current students/undergraduates section

patriotweb.gmu.edu
  • unofficial transcript: Student records → Unofficial transcript
  • Patriot Scheduler – search classes and register
  • DegreeWorks – see live mapping of your degree progress

Examples

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<td>email</td>
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catalog.gmu.edu – course/degree details; all academic policies; catalog requirements
Policies to Know
Policies to Know

• The catalog is published yearly.
  • you meet all requirements for your catalog year: 2024-2025
  • 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

• FERPA rights – adult students control their own academic records.
  • Access can be explicitly given to parents (and others) if desired. Advisors can't discuss records with anyone you unless you give access.
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

Legend:
- Prerequisite
- Math/Stat Prerequisite
- Required Course
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
  - It is strictly enforced! 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 reasons it could be denied:
    • any attempts (including W) at the course at GMU
    • already have 60+ transferred credits
    • financial hardship as the stated reason to request
    • taking an online version of a natural science with lab
    • course is also offered at GMU and open seats (if you live locally)
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)

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

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

- Additional Mason Core
  - One course from each list:
    - Arts
    - Global Contexts
    - Literature
    - Social and Behavioral Science
    - Global History (HIST 125)
  - *Search lists of Mason Core courses on catalog.gmu.edu*

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

- **Ethics+** CS 110, 405
  - Essentials of CS, Synthesis of Ethics/Law for the Computing Professional

- **Programming** CS 112, 211, 310
  - Introduction to Programming; Object-Oriented Programming; Data Structures
    - *Alternative: 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:**
fill out their online request form. *(more info on overrides at the end of this talk)*

- [https://science.gmu.edu/academics/departments-units/mathematical-sciences/majors-and-minors/course-override-request](https://science.gmu.edu/academics/departments-units/mathematical-sciences/majors-and-minors/course-override-request)
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 uses your sequence as prereq.*
  - *Example: sequence of BIOL 102(4) & 103(3)/105(1), and PHYS 160(3)/161(1) == 12cr.*

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<th>Second</th>
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<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 (or 314/218)</td>
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<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 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 (6cr max)
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 (e.g. 419, 432, 437, 443)
- MATH > 300 (except 351)
- CS > 300 (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

- Twelve Concentrations:
  - Business: (BMGT), (BMKT)
  - Computer Game Design: (CGDS)
  - Geoinformatics (GINF)
  - Intelligence Analysis (IACN), (IAKR), (IAME), (IARU)
  - Linguistics (LING)
  - Mechanical Engineering (ME)
  - Software Engineering (SWE)
  - Technology Policy (TCHP)

- **ACS students, please declare your concentration after this orientation.**

- Students take foundation/core courses in CS and in the concentration area.

- All concentrations share the same common foundation/core:
  - CS 110/112/211/262/310/321/330/367/483
  - MATH 113/114/125/203 (no calc III)
ACS Concentrations

- Concentration in **Computer Game Design (CGDS)**
  - Foundation: GAME 230, CS 405, CS 325, CS 351; AVT 104; STAT 344
  - Core: CS 425, 426, 451, 471, one CS >400; 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 405
  - 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 405, GGS 102, 103, 110, 300; STAT 250
  - Core: CS 471, one CS >400; GGS 310, 311, 366, 379
  - GINF Related: 12cr in: GGS 354, 411, 416, 422, 426, 429, 462, 463, 470
ACS Concentrations

• Concentration in **Business Management (BMGT)**
  - Foundation: STAT 250; CS 405; BUS 100; PSYC 100; MGMT 303; MKTG 303
  - Core: MGMT 313, 321, 451, 453, CS 471, one CS >400
  - three courses chosen from MGMT 300-499

• Concentration in **Business Marketing (BMKT)**
  - Foundation: STAT 250; CS 405; BUS 100; PSYC 100; MGMT 303; MKTG 303
  - Core: MKTG 312, 351, 471, CS 471, one CS >400
  - four courses chosen from MKTG >300

• Concentration in **Technology Policy (TCHP)**
  - Foundation: GOVT (101|103), 134, 150, 300
  - Core: CS 405, one CS >400, GOVT 352, 363, 366|367|368, 426, 460, GOVT492
  - TCHP Related: 12cr: GOVT 304, 312, 318, 351, 369, 400, 414, 435, 444, 446, 461, 462, 464, 480
ACS Concentrations

- **Concentration in Intelligence Analysis: Chinese Studies (IACN), Korean Studies (IAKR), Middle Eastern Studies (IAME), Russian Studies (IARU)**
  - Foundation: STAT 250; CS 405; BUS 100; PSYC 100; MGMT 303; MKTG 303
  - CS Related work (9-10cr)
  - Language work (12cr)
  - Intelligence Analysis (9cr)
  - [Region] Studies (12cr)

- **Concentration in Linguistics (LING)**
  - Foundation: LING 300, 405, STAT 344, CS 405
  - Core: (LING 331|333), (335|337), 338, 471, CS 478, (CS440|480|484|499|SYST469)
  - (LING 441|451|453), three from (LING 316, 322, 323, 336, 443, 441, 451, 453, 496)

- **Concentration in Mechanical Engineering (ME)**
  - Foundation: CHEM 211/213, MATH 213, 214, PHYS 160/161
  - Core: ME 211, 212, 221, 231, 313, 322, 323, 443, 444
  - CS Related: two from (CS 451, 452, 471, 482, 485)
  - ME Related: two from (ME 445, 447, 499)
Technology Policy

- how technology can create politics, and how political processes shape technology
- international treaties and the role of the UN in addressing technological change
- relationship between scientific achievement and geopolitical power
- legal, economic, political, and moral perspectives in examining the worlds of data and computation

Learn more
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://www.gmu.edu/transfer/credits](https://www.gmu.edu/transfer/credits)

- **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 do I need to request an override?:** only if you plan on immediately taking a course that needs to use your pending transfer credits as a prerequisite, but they aren't yet in the system.

- **How:** contact the course's 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      **via online form (you can google "GMU math override")**
  [https://science.gmu.edu/academics/departments-units/mathematical-sciences/majors-and-minors/course-override-request](https://science.gmu.edu/academics/departments-units/mathematical-sciences/majors-and-minors/course-override-request)
- Others           **<email the department>**
What do I register for?
What do I register for? (Freshmen)

Recommendation: only four courses.

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

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

**Not calculus ready yet?**

- CS 110
- CS 108 *(covers first half of CS 112)*
- proscribed next Math course (e.g. 105, 123)
- Mason Core *(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, 203, STAT 344)
- next natural science or mason core
- 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 Academic Advisors.

  • 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!)
What Happens Next

• 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
  • [patriotweb.gmu.edu → Student Services → Registration](https://patriotweb.gmu.edu)
• 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

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[csug@gmu.edu](mailto: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

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

George Mason Course Catalog: catalog.gmu.edu

How to Register for Classes:
  • video: https://registrar.gmu.edu/wp-content/uploads/8E519658-EC8A-4DE5-ADA7-515A28693764-.mp4

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