Getting Started in Computer Science

Freshmen Students

Department of Computer Science

http://cs.gmu.edu/

Volgenau School of Engineering
Agenda

PLEASE SIGN IN !!

• Department information
• General information
• Program information
  • The BS CS Degree Program
  • The BS ACS Degree Program
• What do I register for? **Patriot Scheduler**
• Questions?
Department Info

- The CS Department office is located in the Nguyen Engineering (ENGR) Building, Room 4300
  - Department Chair: Dr. Sanjeev Setia
  - Associate Chair: Dr. Pearl Wang and Dr. Jan Allbeck—oversees the undergraduate programs
  - CS Undergraduate Advisor: Ms. Kara Smith
  - There are over 50 full time Faculty in the Department and their offices are located on the 4th and 5th floors of the ENGR building
- We’re part of the Volgenau School of Engineering (VSE) which contains the following Departments:
  - **Computer Science**
  - Bioengineering
  - Civil & Environmental Engineering
  - Electrical and Computer Engineering
  - Information Sciences and Technology
  - Mechanical Engineering
  - Statistics
  - Systems Engineering & Operations Research

Mooney: Researching reputation system for Skyrim-like game.

NO ONLINE OR NIGHT CLASSES!!!
General Information

- Activate your Mason ID and password at password.gmu.edu
  - All information to/from you and Mason is sent to your Mason email
- The CS Department website is cs.gmu.edu
  - It contains Student FAQs, contact information for faculty, course syllabi, jobs and student organization information
- The Mason Registration system is called PatriotWeb: patriotweb.gmu.edu
  - Use this website to register for classes
  - Using Patriot Scheduler will make registering much easier
  - Use this website to check your degree progress (DegreeWorks)
  - Use this website to check your advanced placement or transfer credit
- The Mason Catalog is online: catalog.gmu.edu
  - Check it frequently for reference to your degree requirements
• The Mason Transfer Admissions website is: admissions.gmu.edu/transfer
  • Check it for AP/IB and Transfer equivalencies: http://admissions.gmu.edu/transfer/transferCreditSearch.asp

• George Mason University has an Honor Code !!!
  • Make sure you understand what your responsibilities are.
  • Go to the Mason Honor Code website:
    • oai.gmu.edu

• The Computer Science Department also has an Honor Code for Programming Projects.
  • It is strictly enforced!
Undergraduate Degree Programs

• We offer two undergraduate BS degrees:
  • BS Computer Science (BS CS)
  • BS Applied Computer Science (BS ACS)

• Both degrees require a minimum of 120 credit hours = 4 years full-time

• Other program options:
  • Software Engineering Minor (16 credit hours)
  • BS/Accelerated MS options (144 credit hours)
Course Policies

- Course designations at Mason:
  - 100 level courses are typically for freshmen
  - 200 level courses are typically for sophomores
  - 300 level courses are typically for juniors
  - 400 level courses are typically for seniors

- Courses must be taken in sequence
  - Almost every course has a prerequisite chain
  - Prerequisites are enforced by the registration system

- You must earn a C or better in a CS or MATH class in order to take the follow-on course

- Courses offered by the department may only be taken a most three times; failure to pass a required Math or CS course after three attempts results in termination from the major
▪ **Selective Withdrawal:**

Every GMU undergrad is allowed three selective withdrawals where you can to drop a course after the drop date (but before the selective withdrawal deadline) - use these wisely!

▪ **One C-/D rule:**

Computer science majors are permitted to use one “C-” or “D” grade within Major coursework toward graduation, as long as that course is not a prerequisite for another class.
BS CS Educational Objectives

• The BS CS program is accredited by Computing Accreditation Commission of ABET (www.abet.org)

• The objectives of the BS CS degree are to provide our graduates with
  
  • A foundation for successful careers in industry:
    – graduates will have a broad understanding of the fundamental concepts, methodologies and tools, and applications of computer science.

  • A foundation for graduate study:
    – graduates of the program will have the academic preparation for successful completion of rigorous graduate programs.

  • Professional preparation:
    – graduates will have effective written and oral communication skills, and be able to work collaboratively in a professional and ethical manner.
The BS CS Curriculum

- Mason Core requirements (24 credits)
  - *Foundation*: English composition courses
  - Communications 100 - Public Speaking (3 credits)
  - *Core*: Literature, Western Civ., Social & Behavioral Sciences, Global Understanding, Fine Arts

- Major requirements (88 credits)
  - Required CS courses (35 credits)
  - Mathematics and Engineering courses (20 credits)
  - CS-Senior elective courses (15 credits)
  - CS-Related elective courses (6 credits)
  - Natural Sciences (12 credits)

- General Electives (8 credits)
  - Note: Remedial math classes do not count towards graduation
Major Requirements (CS Core)

• CS 110
  • Essentials of Computer Science

• CS 306
  • Synthesis of Ethics & Law for the Computing Professional

• CS 112, 211, 310
  • Introduction to Programming; Object-Oriented Programming; Data Structures

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

• CS 321
  • Software Engineering

• CS 330, 483
  • Formal Methods & Models, Analysis of Algorithms
Five CS-Senior electives:

- **CS 455 or 468 or 475**
- Four additional courses chosen from

  - CS 425 - Game Programming I
  - CS 440 - Language Processors and Programming Environments
  - CS 450 - Database Concepts
  - CS 451 - Computer Graphics
  - **CS 455 - Computer Communications and Networking**
  - CS 463 - Comparative Programming Languages
  - **CS 468 - Secure Programming and Systems**
  - CS 469 - Security Engineering
  - CS 471 - Operating Systems
  - **CS 475 - Concurrent and Distributed Systems**
  - CS 477 - Mobile Application Development
  - CS 480 - Introduction to Artificial Intelligence
  - CS 482 - Computer Vision
  - CS 484 - Data Mining
  - CS 485 - Autonomous Robotics
  - CS 490 - Design Exhibition
  - CS 491 – Industry-Sponsored Senior Design Project (3 credits only)
  - CS 499 - Special Topics in Computer Science*
  - MATH 446 - Numerical Analysis I or OR 481 - Numerical Methods in Engineering
Course Prerequisite Chains

2017-18
Prerequisite Structure for CS Department Courses
[C or better needed for all prerequisites]

Satisfaction of the prerequisites for MATH 113

CS 112
CS 211
CS 310
CS 262
CS 110
CS 330
CS 367
MATH 113
MATH 125
CS 325
CS 351
CS 306
Junior Standing, COMM 100, ENGH 302
Major Requirements (Math & ECE)

- MATH 113, 114, 213
  - Calculus I, II, III
- MATH 125, 203, STAT 344
  - Discrete Math,
  - Linear Algebra
  - Prob/Stat for Engineers
Major Requirements (continued)

- **Natural Science:**
  12 credits that must include a two-semester laboratory sequence chosen from:
  - BIOL 103 (4), 104 (4)
  - CHEM 211 (3)/213 (1), 212 (3)/214 (1)
  - GEOL 101 (4), 102 (4)
  - PHYS 160 (3)/161 (1), 260 (3)/261 (1)

- **CS Related elective courses**
  - Two courses selected from an approved list of ECE, OR, PHIL, STAT, SWE, SYST, MATH, or CS courses (see catalog)
BS Applied CS Degree

• BS Applied Computer Science
  • Created for students who want to work in one of the many disciplines that require advanced computing techniques.
  • Concentrations: game design and software engineering
  • Students take foundation and core CS courses along with foundation and core courses in the concentration area.
BS ACS Degree Requirements

• All concentrations share the same common **foundation** requirements as the BS CS:
  
  • CS 110 (Essentials of Computer Science)
  • CS 112 (Introduction to Computer Programming)
  • CS 211 (Object-Oriented Programming)
  • MATH 113, MATH 114, MATH 125, MATH 203, STAT 344
     Calculus I, II, Discrete Mathematics, Linear Algebra, Prob & Stat for Engineers

• All concentrations share the same common **core** requirements as the BS CS:
  
  • CS 262 (Intro to Low-Level Programming)
  • CS 306 (Law and Ethics for the Computing Professional)
  • CS 310 (Data Structures) / CS 330 (Formal Methods and Models)
  • CS 367 (Computer Systems & Programming)
  • CS 321 (Software Engineering)
  • CS 471 (Operating Systems)
  • CS 483 (Analysis of Algorithms)

• All concentrations must include one additional CS course numbered above 400
Concentration Requirements

• Concentration in Computer Game Design*
  • Foundation: GAME 230, 306, 325, 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*
  • Foundation: STAT 344; CS 306
  • Core: SWE 205, 301, 401; CS 332, SWE 437
  • Five courses chosen from:
    CS 450, 455, 463, 465, 468, 475; SWE 432, 443
  • ENGL 388 & one of the following:
    (PSYC 333, COMM 320, COMM 335)

*Not all concentration courses are offered every semester
What Do I Register For?

• If your Math Placement Score qualifies you for MATH 113 (Calculus I), then you should sign up for
  • CS 110 (Essentials of Computer Science)
  • CS 112 (Introduction to Computer Science)
  • MATH 113 (Calculus I)
  • Mason Core classes (See the Sample Schedule handouts)
  • Classes needed for your ACS concentration (See the Sample Schedules handouts) if you are ACS major

• If your score does not qualify you for MATH 113, then
  • CS 110 (Essentials of Computer Science)
  • You should register for MATH 105 (Pre-Calculus) or MATH 104 (Trig & Transcendental Functions) or MATH 123 (Calculus with Algebra/Trig Part A) as appropriate
  • You should register for courses that satisfy the Mason Core requirements (see the Sample Schedule handout for students who start with Math 104 or 105)
  • Next semester, if you have earned a C or better in MATH 104/105/123 or passed the Placement Test, you should register for
    • CS 112
    • MATH 113
    • ...
Freshman FAQs

• What should I do if I had AP or IB coursework in High School?
  • Depending on your score,
    • You might receive Mason credit for CS 112 if you took the AP Computer Science exam
    • You might receive Mason credit for MATH 113 if you took the AP Math exams
    • Check the admissions.gmu.edu/transfer website for score equivalencies
  • Make sure Mason has evidence that you received AP or IB credit or you will not be able to register for follow on courses
Mason Core

• How do I select Mason Core courses?

• The catalog has a list of courses for each category: e.g. Fine Arts, Social & Behavioral Sciences, Literature, etc.

• Consult the online Mason catalog under *Mason Core* here:
  • [catalog.gmu.edu](http://catalog.gmu.edu)
  • It lists the courses that qualify for each of the Core categories
Getting Help

• After classes begin, you will be assigned a CS Faculty Advisor. We will email you to let you know who your Faculty Advisor is.

• 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 are open 9 – 5pm every day.
  • Email: csug@gmu.edu
What Happens Next?

- Activate your Mason ID and password
- Take the Math Placement Test
- Use PatriotWeb to determine the day/times for the classes that you want to take
- Register on PatriotWeb.
  - Go to the registration site at the time and location listed for Orientation.
- Use Patriot Scheduler
- Any questions?