Welcome to the

Computer Science Major
Software Engineering Emphasis

in the College of Physical and Mathematical Sciences

College Advisement Center
- Website: https://science.byu.edu/advisement
- Email: science.math.advisement@byu.edu
- Phone: 801-422-2674
- Office: N-181 ESC

Computer Science Department
- Website: cs.byu.edu
- Email: csoffice@cs.byu.edu
- Phone: 801-422-3027
- Office: 3361 TMCB

Undergraduate Department Advisor – Lynnette Nelson
- Email: lnelson@cs.byu.edu
- Phone: 801-422-9439
- Office: 2250 TMCB

Internship Coordinator – Dennis Ng (International Students only)
- Email: ng@compsci.byu.edu
- Phone: 801-422-2835
- Office: 3322 TMCB

University Career Services – Lane Muranaka
- Website: careers.byu.edu (Handshake--see flyer in packet)
- Email: lane_muranaka@byu.edu
- Phone: 801-422-9360, or 801-422-2674 (schedule appointment)
- Office: N221-J ESC

STEM Alliance--Connect with STEM employers, mentors, and clubs: stemalliance.byu.edu

Clubs

ACM – Kimball Germane, kimball@cs.byu.edu, and visit acm.byu.edu to join and learn more
AI— Porter Jenkins, pjenkins@cs.byu.edu
Developers Club – Kimball Germane, kimball@cs.byu.edu, and visit dev.byu.edu to join and learn more
BYU Competitive Programming Club—Ryan Farrell (2216 TMCB), farrell@cs.byu.edu, 422-3222
Gaming – Seth Holladay (2220 TMCB), seth_holladay@byu.edu, 422-6490
Linux Users Group – Casey Deccio (3368 TMCB), linuxclub.cs.byu.edu, 422-5319
Women in Computer Science – Nancy Fulda - nfulda@cs.byu, and visit wics.byu.edu to join and learn more

Things to Know

Resources for Graduation Planning

- Flow Charts and Major Academic Plans (MAPs) can be found here: https://science.byu.edu/advisement/flowcharts.
- Academic advisors in N-181 ESC will help you understand course sequencing and help you plan classes to efficiently fill requirements. They can also help you with study skills and initial career exploration as well as connecting you with correct resources.
- Plan and register from your plan on MyMAP. Your academic advisor can help you understand how to best utilize this resource.
- Evaluate your current program. Periodically major programs are updated. An academic advisor would be happy to review the differences between the programs with you to help you determine what would be best for you.
- Consider meeting with a faculty advisor in your department. Contact info is found on first page of this packet.

Tutoring Resources and Research

- Volunteer peer tutors are available through Y Serve if you need help with a class. Also, if you excel in a subject, consider serving your fellow students by becoming a tutor. Find out more here: https://tutoring.byu.edu/.
- Many departments provide TA Tutorial Labs and research opportunities. Check your department for details:
  - Chemistry and Biochemistry: C-100 BNSN, 801-422-3667, https://www.chem.byu.edu/
  - Computer Science: 3361 TMCB, 801-422-3027, csoffice@cs.byu.edu
  - Geological Sciences: S-389 ESC, 801-422-3918, geology@byu.edu
  - Mathematics: 275 TMCB, 801-422-2061, office@mathematics.byu.edu
  - Mathematics Education: 167 TMCB, 801-422-1735, office@mathed.byu.edu
  - Physics and Astronomy: N-283 ESC, 801-422-4361, physics_office@byu.edu
  - Statistics: 2152 WVB, 801-422-4505, statsec@stat.byu.edu

Prepare Early for a Career

- Check out University Career Services in 2590 WSC and at https://ucs.byu.edu/.
- Consider doing an internship.
  - Attend the STEM and Career Fairs held in fall and winter semesters.
  - Talk to your department about internship opportunities.
  - Use LinkedIn and Handshake (see flyer in this packet) to connect with alumni and apply for jobs/internships. BYU Connect is another great resource for networking (connect.byu.edu).
  - Talk with the college Career Director who can help you search for internships as well as assist you with many other career related strategies (see first page of this packet).
- Consider taking StDev 317 (Career Strategies) your junior year.
- Consider taking either Chem 502, CS 502, Geol 502, Math 502, PHSCS 502, or STAT 502 (1-credit Job Search Class). Class is held for 1 hour per week for eight non-consecutive weeks throughout the semester.

BS in Computer Science: Software Engineering (693225) MAP Sheet

Physical and Mathematical Sciences, Computer Science

For students entering the degree program during the 2022-2023 curricular year.

University Core and Graduation Requirements

University Core Requirements:

Requirements	#Classes	Hours	Classes
Religion Cornerstones			
Teachings and Doctrine of The Book of Mormon	1	2.0	REL A 275
Jesus Christ and the Everlasting Gospel	1	2.0	REL A 250
Foundations of the Restoration	1	2.0	REL C 225
The Eternal Family	1	2.0	REL C 200
The Individual and Society			
American Heritage	1-2	3-6.0	from approved list
Global and Cultural Awareness	1	3.0	from approved list
Skills			
First Year Writing	1	3.0	from approved list
Advanced Written and Oral Communications	1	3.0	WRTG 316
Quantitative Reasoning	1	4.0	MATH 112* or 113*
Languages of Learning (Math or Language)	1	4.0	MATH 112* or 113*
Arts, Letters, and Sciences			
Civilization 1	1	3.0	from approved list
Civilization 2	1	3.0	from approved list
Arts	1	3.0	from approved list
Letters	1	3.0	from approved list
Biological Science	1	3.0	from approved list
Physical Science	1	3.0	from approved list
Social Science	1	3.0	from approved list
Core Enrichment: Electives			
Religion Electives	3-4	6.0	from approved list
Open Electives	Variable	Variable	personal choice

Graduation Requirements:

Minimum residence hours required	30.0
Minimum hours needed to graduate	120.0

Suggested Sequence of Courses

FRESHMAN YEAR

1st Semester

C S 111	3.0
First-year Writing or American Heritage	3.0
MATH 112	4.0
Religion Cornerstone course	2.0
General education, university requirements, and/or general electives	3.0
Total Hours	**15.0**

2nd Semester

C S 202	1.0
C S 235	3.0
PHSCS 121	3.0
First-year Writing or American Heritage	3.0
MATH 113	4.0
Religion Cornerstone course	2.0
Total Hours	**16.0**

SOPHOMORE YEAR

3rd Semester

C S 203	1.0
C S 224	3.0
C S 236	3.0
Biological Science	3.0
Civilization 1	3.0
Religion Cornerstone course	2.0
Total Hours	**15.0**

4th Semester

C S 240	4.0
C S 260 or other C S elective	3.0
MATH 213	2.0
MATH 215	1.0
Civilization 2	3.0
Religion Cornerstone course	2.0
Total Hours	**15.0**

JUNIOR YEAR

5th Semester

C S 204	1.0
C S 312	3.0
C S 324	3.0
Social Science	3.0
STAT 121 or STAT 201	3.0
Religion Elective	2.0
Total Hours	**15.0**

6th Semester

C S 329	3.0
C S 340	3.0
C S 452	3.0
Letters	3.0
Religion Elective	2.0
Total Hours	**14.0**

SENIOR YEAR

7th Semester

C S 480	3.0
C S Elective	3.0
WRTG 316	3.0
Arts	3.0
Religion Elective	2.0
General education, university requirements, and/or general electives	2.0
Total Hours	**16.0**

8th Semester

C S 481	3.0
C S Elective	3.0
C S Elective	3.0
C S 404	2.0
Global and Cultural Awareness	3.0
Total Hours	**14.0**

BS in Computer Science: Software Engineering (693225)

2022-2023 Program Requirements (74 - 76 Credit Hours)

Grades below C- are not allowed in major courses.

REQUIREMENT 1 Complete 16 courses

CORE COURSES:

C S 111 - Introduction to Computer Science	3.0
C S 202 - Software Engineering Lab 1	1.0
C S 203 - Software Engineering Lab 2	1.0
C S 204 - Software Engineering Lab 3	1.0
C S 224 - Introduction to Computer Systems	3.0
C S 235 - Data Structures and Algorithms	3.0
C S 236 - Discrete Structures	3.0
C S 240 - Advanced Programming Concepts	4.0
C S 312 - Algorithm Design and Analysis	3.0
C S 324 - Systems Programming	3.0
C S 329 - Testing, Analysis, and Verification	3.0
C S 340 - Software Design	3.0
C S 404 - Ethics and Computers in Society	2.0
C S 452 - Database Modeling Concepts	3.0
C S 480 - Software Engineering Capstone 1	3.0
C S 481 - Software Engineering Capstone 2	3.0

REQUIREMENT 2 Complete 4 courses

SUPPORTING COURSES:

MATH 112 - Calculus 1	4.0
MATH 113 - Calculus 2	4.0
PHSCS 121 - Introduction to Newtonian Mechanics	3.0
*WRTG 316 - Technical Communication	3.0

REQUIREMENT 3 Complete 1 option

OPTION 3.1 Complete 1 course

MATH 313 - (Not currently offered)

OPTION 3.2 Complete 2 courses

MATH 213 - Elementary Linear Algebra	2.0
MATH 215 - Computational Linear Algebra	1.0

REQUIREMENT 4 Complete 1 course

STAT 121 - Principles of Statistics	3.0
STAT 201 - Statistics for Engineers and Scientists	3.0

REQUIREMENT 5 Complete 2 courses

C S 260 - Web Programming	3.0
C S 330 - Concepts of Programming Languages	3.0
C S 345 - Operating Systems Design	3.0
C S 356 - Designing the User Experience	3.0
C S 453 - Fundamentals of Information Retrieval	3.0
C S 456 - Introduction to User Interface Software	3.0
C S 460 - Computer Communications and Networking	3.0
C S 462 - Large-Scale Distributed System Design	3.0
C S 465 - Computer Security	3.0
C S 486 - Verification and Validation	3.0

REQUIREMENT 6 Complete 2 courses

COURSES WILL NOT DOUBLE COUNT BETWEEN REQUIREMENT 5 AND REQUIREMENT 6.

C S 252 - Introduction to Computational Theory	3.0
C S 260 - Web Programming	3.0
C S 330 - Concepts of Programming Languages	3.0
C S 345 - Operating Systems Design	3.0
C S 355 - Interactive Graphics and Image Processing	3.0
C S 356 - Designing the User Experience	3.0
C S 393 - Advanced Algorithms and Problem Solving	3.0
C S 401R - Topics in Computer Science	3.0v
You may take up to 3 credit hours.	
C S 405 - Creating and Managing a Software Business	3.0
C S 412 - Linear Programming and Convex Optimization	3.0
C S 450 - Computer Vision	3.0
C S 453 - Fundamentals of Information Retrieval	3.0
C S 455 - Computer Graphics	3.0
C S 456 - Introduction to User Interface Software	3.0
C S 460 - Computer Communications and Networking	3.0
C S 462 - Large-Scale Distributed System Design	3.0
C S 465 - Computer Security	3.0
C S 470 - Introduction to Artificial Intelligence	3.0
C S 471 - Voice User Interfaces	3.0
C S 472 - Introduction to Machine Learning	3.0
C S 474 - Introduction to Deep Learning	3.0
C S 486 - Verification and Validation	3.0
C S 493R - Computing Competitions	3.0
You may take up to 3 credit hours.	
C S 497R - Undergraduate Research	3.0
You may take up to 6 credit hours.	
C S 498R - Undergraduate Special Projects	3.0v
You may take up to 3 credit hours.	
C S 501R - Advanced Topics in Computer Science	3.0v
You may take up to 3 credit hours.	
C S 513 - Robust Control	3.0
C S 580 - Theory of Predictive Modeling	3.0
EC EN 424 - Computer Systems	4.0
EC EN 425 - Real-Time Operating Systems	4.0
IT&C 567 - Cybersecurity and Penetration Testing	3.0
MATH 411 - Numerical Methods	3.0
MATH 431 - Probability Theory	3.0
MATH 485 - Mathematical Cryptography	3.0

Note: If C S 493R, C S 498R, or C S 501R is chosen, it must be taken for 3 credit hours.

REQUIREMENT 7

Complete Senior Exit interview with the C S department during last semester or term.

Note: Math 112, Math 113, Phscs 121, WRTG 316, and C S 312 can be used to fill both General Education and program requirements. Advanced Writing and Oral Communication: WRTG 316. Quantitative Reasoning: Math 112 or 113. Languages of Learning: Math 112 or 113. Physical Science: C S 312 or Phscs 121.

MAP DISCLAIMER

While every reasonable effort is made to ensure accuracy, there are some student populations that could have exceptions to listed requirements. Please refer to the university catalog and your college advisement center/department for complete guidelines.

DEPARTMENT INFORMATION

Computer Science Department
Brigham Young University
3361 Talmage Building
Provo, UT 84602
Telephone: (801) 422-3027

ADVISEMENT CENTER INFORMATION

Physical and Mathematical Sciences College Advisement Center
Brigham Young University
N-181 ESC
Provo, UT 84602
Telephone: (801) 422-2674

BYU Computer Science Major

Software Engineering Emphasis

Fall 2022 Requirements

Major (74-76 Hours)

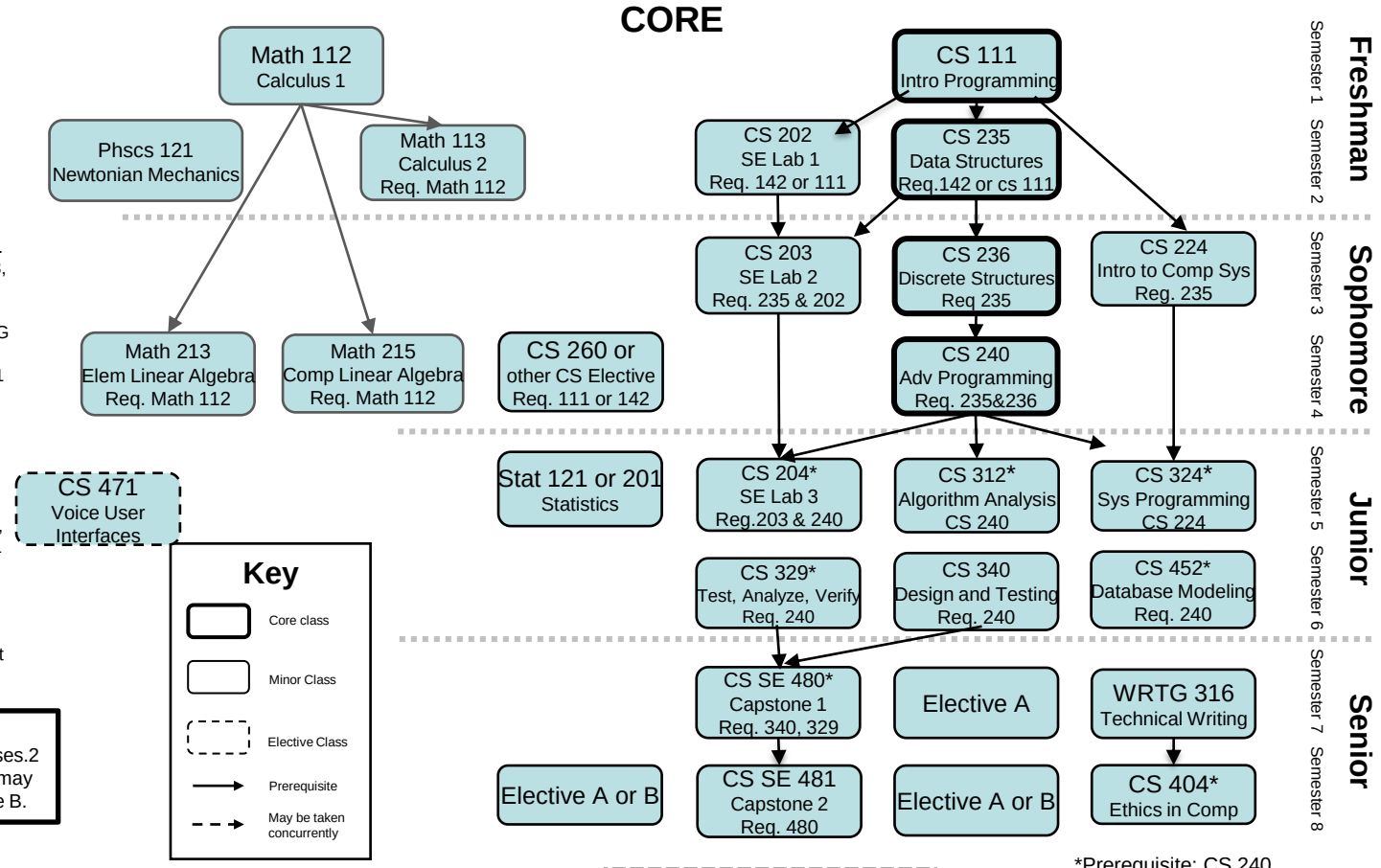
1. Grades below C- are not allowed in major courses.
2. Complete the following courses: CS 111, 202, 203, 204, 224, 235, 236, 240, 312, 324, 329, 340, 404, 452, 480, 481
3. Complete the following supporting courses: WRTG 316, Math 112,113, 213, 215, and Phscs 121
4. Complete one of the following: Stat 121 or Stat 201
5. Complete a total of 4 elective courses from the follow two groups:
   a. 2 courses **must** be from the following courses: CS 260, 330, 345, 356, 453, 456, 460, 462, 465, 486
   b. 2 courses from the following courses: CS 252, 260, 330, 345, 355, 356,393, 401R**, 405, 412, 450, 453, 455, 456, 460, 462, 465, 470,471 472, 474, 486 493R**, 497R**, 498R**, 501R**, 513, 580, EC EN 424, EC EN 425, IT&C 567, MATH 411, Math 431, MATH 485

(If CS 401R, 493R, 497R, 498R, or 501R is chosen, it must be taken for three credit hours)

Elective Information:
Students must complete a total of 4 elective courses.2 from Elective A and 2 from Elective B. Courses may not double count for both Elective A and Elective B.

Guide only— please consult MyMap for full requirements.

Courses will not double count between requirements A and B



*Prerequisite: CS 240

Elective A (Choose 2 courses)

- CS 260 Web Programming — Req: 142 or 111
- CS 456 UI Software — Req: 240, 356
- CS 330 Prog Languages — Req: 240
- CS 460 Networks — Req: 324
- CS 345 Operating Sys Dsgn — Req: 224 & 240
- CS 462 Distributed Systems — Req: 260, 324
- CS 356 User Experience — Req: 240
- CS 465 Security — Req: 324
- CS 453 Info Retrieval — Req: 240
- CS 486 Verification & Valid — Req: 312

Elective B (Choose 2 courses)

- CS 252 Intro Comp Theory — Req: 235
- CS 356 User Experience — Req: 240
- CS 450 Computer Vision — Req: 312, 355,Math 313
- CS 462 Distributed Systems — Req: 260, 324
- CS 474 Deep Learning — 312,Math 213, 215
- CS 501R** Adv CS Topics
- EC EN 425 Real Time Op Sys — Req: EC EN 323 & 330
- CS 260 Web Programming — Req: 142
- CS 393 Algorithms & Problem Solving
- CS 453 Info Retrieval — Req: 240
- CS 465 Security — Req: 324
- CS 486 Verification & Valid — Req: 312
- CS 513 Robust Control — Req: Math 213, 215
- MATH 411 Numerical Methods — Req: MATH 334
- CS 330 Prog Languages — Req: 240
- CS 401R** Topics in CS
- CS 455 Comp Graphics — Req: 355,Math 213,215
- CS 470 Artificial Intelligence — 312,Math 215,Stat 121
- CS 493R** Comp. Competition — Req: 240
- CS 580 Theory of Predictive Modeling
- MATH 431 Probability Theory — Req: Math 213
- CS 345 Operating Sys Dsgn — Req: 224 & 240
- CS 405 Software Business — Req: 240 & Engl 316
- CS 456 UI Software — Req: 240, 356
- CS 471 Voice User Interfaces
- CS 497R** Research
- IT&C 567 Security Testing — Req: CS 465 or IT 366
- MATH 485 Cryptography — Req: MATH 213
- CS 355 Interactive Graphic — Req: 240,Math 213,215
- CS 412 Convex Optimization — Req: 240
- CS 460 Networks — Req: 324
- CS 472 Machine Learning — 312,Math 215,Stat 121
- CS 498R** Special Projects — Req: 240
- EC EN 424 Computer Systems — Req: EC EN 323 & 330

**Must be taken for 3 hours to fill the requirement

Handshake: BYU's Online Job Board

handshake

BYU's own job board. Employers who want to hire BYU graduates or offer internships to current students post job openings to this website and students apply. Just like LinkedIn, employers can view student profiles and students can network as they apply for jobs and internships

Login to handshake.byu.edu >>> BYU Net ID

*you do not need to create an account, just sign in with you BYU information

HOW TO MAKE THE MOST OUT OF HANDSHAKE:

1. COMPLETE YOUR PROFILE

- Upload your resume and it will auto-fill in your profile
- Completed profiles tailor your Handshake experience
- Information from your transcript is already uploaded
- Fill in the Summary/Bio section
- Fill in yor past jobs and experiences, including all the bullet points you use on your resume
- Add a professional headshot and background photo

Remember: every word in your profile will be searchable by students and employers

employers are

5X MORE LIKELY

to view a profile that has at least one job/skill/organization

2. APPLY FOR JOBS

- Search for job titles, employers, or skills
- Apply for interesting jobs that meet your skill set

3. RESEARCH COMPANIES

- Under the "Jobs" Tab there is an "Employers" Tab
- Search for keywords or locations to find companies that are the right fit for you
- Plan to attend their info sessions on BYU Campus, connect with them at Career Fairs, or set up informational interviews to learn more

Remember: when looking at companies or jobs, Handshake will tell you what other BYU students have worked there. Use this resource to network and discover more information!

4. EXPLORE FELLOW STUDENTS

- "Students" tab
- Search for fellow BYU students to view their profiles and job positions (Facebook stalking... "networking")

5. ATTEND EVENTS

- The "Events" tab will be your key to attending info sessions, interviews, and Career Fairs
- The "Calendar" tab under "Events" will show you what events are coming soon
- Make sure to save events you are interested in or RSVP so you do not forget to attend
- Spread the word to your friends on social media

6. DOWNLOAD HANDSHAKE APP

- Search: "Handshake" not "Handshake Career Services"
- Input your BYU e-mail address: netID@byu.edu (it will forward emails to the e-mail you have on file with BYU)
- Handshake will send you a link via e-mail to enable your account in the app
- Navigate the app to perform all the functions of the website that have been previously mentioned

7. VISIT THE CAREER STUDIO

- Freshen up your resume, cover letter, or LinkedIn
- Receive networking help
- Practice interviewing with a mock interview
- Meet with a full-time Career Counselor in your field

8. GET A JOB, RING THE BELL

- Once you're hired, stop by the Career Studio to ring our Victory Bell and get a picture for the Victory Board

Possible Careers
with a Computer Science major

(Not a comprehensive list)

Animation Tool Developer
Applications developer
Artificial intelligence engineer
Bioinformatics developer
Business intelligence analyst
Cloud-related jobs – devops engineer, cloud engineer, virtualization engineer, web serviced engineer
Computational and information scientist
Computer programmer
Computer systems analyst
Cyber Security Analyst
Data scientist
Database manager
Embedded Systems Programmer
Multimedia programmer
Network Engineer
Network Architect
Professor*
Research Scientist
Robotics software engineer
Security Engineer
Security Architect
Software Test Engineer
Software Development Manager
Software Engineer
Systems Engineer
UI/UX Engineer
UI/UX Researcher
Video game developer and designer
Web designer
Web programmer

*Usually requires a graduate degree

More information is available at the Counseling and Career Center and from CareerOneStop: http://www.careeronestop.org/