

Welcome to the

# Computer Science Major Data Science Emphasis

in the College of Physical and Mathematical Sciences

## College Advisement Center

Website: <https://science.byu.edu/advisement>  
Email: [science.math.advisement@byu.edu](mailto:science.math.advisement@byu.edu)  
Phone: 801-422-2674  
Office: N-181 ESC

## Computer Science Department

Website: [cs.byu.edu](http://cs.byu.edu)  
Email: [csoffice@cs.byu.edu](mailto:csoffice@cs.byu.edu)  
Phone: 801-422-3027  
Office: 3361 TMCB



## Undergraduate Department Advisor – Lynnette Nelson

Email: [lnelson@cs.byu.edu](mailto:lnelson@cs.byu.edu)  
Phone: 801-422-9439  
Office: 2250 TMCB

## Internship Coordinator – Dennis Ng (International Students only)

Email: [ng@compsci.byu.edu](mailto:ng@compsci.byu.edu)  
Phone: 801-422-2835  
Office: 3322 TMCB

## University Career Services – Lane Muranaka

Website: [careers.byu.edu](http://careers.byu.edu) (Handshake--see flyer in packet)  
Email: [lane\\_muranaka@byu.edu](mailto: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](http://stemalliance.byu.edu)

## Clubs

**ACM** – Kimball Germane, [kimball@cs.byu.edu](mailto:kimball@cs.byu.edu), and visit [acm.byu.edu](http://acm.byu.edu) to join and learn more

**AI**— Porter Jenkins, [pjenkins@cs.byu.edu](mailto:pjenkins@cs.byu.edu)

**Developers Club** – Kimball Germane, [kimball@cs.byu.edu](mailto:kimball@cs.byu.edu), and visit [dev.byu.edu](http://dev.byu.edu) to join and learn more

**BYU Competitive Programming Club**—Ryan Farrell (2216 TMCB), [farrell@cs.byu.edu](mailto:farrell@cs.byu.edu), 422-3222

**Gaming** – Seth Holladay (2220 TMCB), [seth\\_holladay@byu.edu](mailto:seth_holladay@byu.edu), 422-6490

**Linux Users Group** – Casey Deccio (3368 TMCB), [linuxclub.cs.byu.edu](http://linuxclub.cs.byu.edu), 422-5319

**Women in Computer Science** – Nancy Fulda - [nfulda@cs.byu](mailto:nfulda@cs.byu), and visit [wics.byu.edu](http://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](mailto:csoffice@cs.byu.edu)
  - Geological Sciences: S-389 ESC, 801-422-3918, [geology@byu.edu](mailto:geology@byu.edu)
  - Mathematics: 275 TMCB, 801-422-2061, [office@mathematics.byu.edu](mailto:office@mathematics.byu.edu)
  - Mathematics Education: 167 TMCB, 801-422-1735, [office@mathed.byu.edu](mailto:office@mathed.byu.edu)
  - Physics and Astronomy: N-283 ESC, 801-422-4361, [physics\\_office@byu.edu](mailto:physics_office@byu.edu)
  - Statistics: 2152 WVB, 801-422-4505, [statsec@stat.byu.edu](mailto: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](http://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: Data Science (693224) 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				Suggested Sequence of Courses		
<b>University Core Requirements:</b>				<b>FRESHMAN YEAR</b>		
<b>Requirements</b>	<b>#Classes</b>	<b>Hours</b>	<b>Classes</b>			
<b>Religion Cornerstones</b>				<b>1st Semester</b>		
Teachings and Doctrine of The Book of Mormon	1	2.0	REL A 275	C S 111	3.0	
Jesus Christ and the Everlasting Gospel	1	2.0	REL A 250	First Year Writing or American Heritage	3.0	
Foundations of the Restoration	1	2.0	REL C 225	MATH 112	4.0	
The Eternal Family	1	2.0	REL C 200	General education courses, university requirements, and/or general electives	3.0	
<b>The Individual and Society</b>				Religion Cornerstone course	2.0	
American Heritage	1-2	3-6.0	from approved list	<b>Total Hours</b>	<b>15.0</b>	
Global and Cultural Awareness	1	3.0	from approved list	<b>JUNIOR YEAR</b>		
<b>Skills</b>				<b>5th Semester</b>		
First Year Writing	1	3.0	from approved list	C S 312	3.0	
Advanced Written and Oral Communications	1	3.0	WRTG 316	C S 324	3.0	
Quantitative Reasoning	1	4.0	MATH 112* or 113*	STAT 330, Stat 220, or ECON 388	3.0	
Languages of Learning (Math or Language)	1	4.0	MATH 112* or 113*	Social Science	3.0	
<b>Arts, Letters, and Sciences</b>				Civilization 2	3.0	
Civilization 1	1	3.0	from approved list	<b>Total Hours</b>	<b>15.0</b>	
Civilization 2	1	3.0	from approved list	<b>6th Semester</b>		
Arts	1	3.0	from approved list	C S 472	3.0	
Letters	1	3.0	from approved list	C S 452	3.0	
Biological Science	1	3.0	from approved list	PHSCS 121	3.0	
Physical Science	1	3.0	from approved list	Elective	3.0	
Social Science	1	3.0	from approved list	Religion Elective	2.0	
<b>Core Enrichment: Electives</b>				<b>Total Hours</b>	<b>14.0</b>	
Religion Electives	3-4	6.0	from approved list	<b>SENIOR YEAR</b>		
Open Electives	Variable	Variable	personal choice	<b>7th Semester</b>		
<b>Graduation Requirements:</b>				<b>3rd Semester</b>		
Minimum residence hours required		30.0		C S 224	3.0	
Minimum hours needed to graduate		120.0		C S 236	3.0	
				Biological Science	3.0	
				STAT 121 or STAT 201 or MATH 431	3.0	
				Religion Cornerstone course	2.0	
				<b>Total Hours</b>	<b>14.0</b>	
				<b>4th Semester</b>		
				C S 240	4.0	
				Letters	3.0	
				Civilization 1	3.0	
				MATH 213	2.0	
				MATH 213	1.0	
				Religion Cornerstone course	2.0	
				<b>Total Hours</b>	<b>15.0</b>	
				<b>8th Semester</b>		
				C S 483 - DS Capstone 2 or C S elective		3.0
				C S Elective or DS elective		3.0
				C S Elective		3.0
				C S 404		3.0
				Global and Cultural Awareness		2.0
				Religion Elective		3.0
				<b>Total Hours</b>		<b>16.0</b>

## BS in Computer Science: Data Science (693224)

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

<b>Grades below C- are not allowed in major courses.</b>		STAT 251 - Introduction to Bayesian Statistics	3.0	C S 340 - Software Design	3.0
<b>REQUIREMENT 1</b> Complete 12 courses		STAT 340 - Probability and Inference 2	3.0	C S 345 - Operating Systems Design	3.0
C S 111 - Introduction to Computer Science	3.0	<b>REQUIREMENT 7</b> Complete 9.0 hours from the following course(s)		C S 355 - Interactive Graphics and Image Processing	3.0
C S 180 - Introduction to Data Science	3.0	<b>NOTE: C S 482/483, THE DATA SCIENCE CAPSTONE COURSES, ARE STRONGLY RECOMMENDED.</b>			
C S 224 - Introduction to Computer Systems	3.0	C S 252 - Introduction to Computational Theory	3.0	C S 356 - Designing the User Experience	3.0
C S 235 - Data Structures and Algorithms	3.0	C S 260 - Web Programming	3.0	C S 393 - Advanced Algorithms and Problem Solving	3.0
C S 236 - Discrete Structures	3.0	C S 329 - Testing, Analysis, and Verification	3.0	C S 401R - Topics in Computer Science	3.0v
C S 240 - Advanced Programming Concepts	4.0	C S 330 - Concepts of Programming Languages	3.0	<i>You may take up to 3 credit hours.</i>	
C S 312 - Algorithm Design and Analysis	3.0	C S 340 - Software Design	3.0	C S 412 - Linear Programming and Convex Optimization	3.0
C S 324 - Systems Programming	3.0	C S 345 - Operating Systems Design	3.0	C S 450 - Computer Vision	3.0
C S 404 - Ethics and Computers in Society	2.0	C S 355 - Interactive Graphics and Image Processing	3.0	C S 453 - Fundamentals of Information Retrieval	3.0
C S 452 - Database Modeling Concepts	3.0	C S 356 - Designing the User Experience	3.0	C S 455 - Computer Graphics	3.0
C S 472 - Introduction to Machine Learning	3.0	C S 393 - Advanced Algorithms and Problem Solving	3.0	C S 456 - Introduction to User Interface Software	3.0
C S 474 - Introduction to Deep Learning	3.0	C S 401R - Topics in Computer Science	3.0v	C S 460 - Computer Communications and Networking	3.0
<b>REQUIREMENT 2</b> Complete 4 courses		<i>You may take up to 3 credit hours.</i>			
MATH 112 - Calculus 1	4.0	C S 450 - Computer Vision	3.0	C S 462 - Large-Scale Distributed System Design	3.0
MATH 113 - Calculus 2	4.0	C S 453 - Fundamentals of Information Retrieval	3.0	C S 465 - Computer Security	3.0
PHSCS 121 - Introduction to Newtonian Mechanics	3.0	C S 455 - Computer Graphics	3.0	C S 470 - Introduction to Artificial Intelligence	3.0
*WRTG 316 - Technical Communication	3.0	C S 456 - Introduction to User Interface Software	3.0	C S 471 - Voice User Interfaces	3.0
<b>REQUIREMENT 3</b> Complete 1 option		C S 460 - Computer Communications and Networking	3.0	C S 482 - Data Science Capstone 1	3.0
<b>OPTION 3.1</b> Complete 1 course		C S 462 - Large-Scale Distributed System Design	3.0	C S 483 - Data Science Capstone 2	3.0
MATH 313 - (Not currently offered)		C S 465 - Computer Security	3.0	C S 486 - Verification and Validation	3.0
<b>OPTION 3.2</b> Complete 2 courses		C S 470 - Introduction to Artificial Intelligence	3.0	C S 497R - Undergraduate Research	3.0
MATH 213 - Elementary Linear Algebra	2.0	C S 471 - Voice User Interfaces	3.0	<i>You may take this course up to 1 time.</i>	
MATH 215 - Computational Linear Algebra	1.0	C S 482 - Data Science Capstone 1	3.0	C S 501R - Advanced Topics in Computer Science	3.0v
<b>REQUIREMENT 4</b> Complete 1 course		C S 483 - Data Science Capstone 2	3.0	<i>You may take up to 3 credit hours.</i>	
STAT 121 - Principles of Statistics	3.0	C S 486 - Verification and Validation	3.0	C S 513 - Robust Control	3.0
STAT 201 - Statistics for Engineers and Scientists	3.0	C S 497R - Undergraduate Research	3.0	C S 580 - Theory of Predictive Modeling	3.0
<b>REQUIREMENT 5</b> Complete 1 course		<i>You may take this course up to 1 time.</i>			
ECON 388 - Introduction to Econometrics	3.0	C S 501R - Advanced Topics in Computer Science	3.0v	ECON 378 - Statistics for Economists	3.0
STAT 220 - Statistical Modeling for Data Science	3.0	<i>You may take up to 3 credit hours.</i>			
STAT 330 - Statistical Modeling 2		C S 513 - Robust Control	3.0	ECON 388 - Introduction to Econometrics	3.0
<b>REQUIREMENT 6</b> Complete 3.0 hours from the following course(s)		C S 580 - Theory of Predictive Modeling	3.0	ECON 488 - (Not currently offered)	
<b>NOTE: COURSES TAKEN TO FULFILL REQUIREMENT 5 CANNOT DOUBLE COUNT HERE.</b>		<b>Note: Students can take C S 401R or C S 501R more than once.</b>			
C S 412 - Linear Programming and Convex Optimization	3.0	<b>Note: Total hours for C S 497R across all requirements cannot exceed 6.0.</b>			
ECON 378 - Statistics for Economists	3.0	<b>REQUIREMENT 8</b> Complete 3.0 hours from the following course(s)		<b>REQUIREMENT 9</b>	
ECON 388 - Introduction to Econometrics	3.0	<b>NOTE: COURSES TAKEN TO FULFILL REQUIREMENTS 5, 6, AND 7 CANNOT DOUBLE COUNT HERE.</b>		Complete Senior Exit Interview with the Computer Science department during last semester or term.	
ECON 398 - Applied Econometrics	3.0	C S 252 - Introduction to Computational Theory	3.0	<b>Note: Math 112, Math 113, Phscs 121, Engl 316, and C S 312 can be used to fill both General Education and program requirements. Advanced Writing and Oral Communication: Engl 316. Quantitative Reasoning: Math 112 or 113. Languages of Learning: Math 112 or 113. Physical Science: C S 312 or Phscs 121.</b>	
ECON 588 - Advanced Econometrics	3.0	C S 260 - Web Programming	3.0		
LING 581 - Natural Language Processing	3.0	C S 329 - Testing, Analysis, and Verification	3.0		
MATH 314 - Calculus of Several Variables	3.0	C S 330 - Concepts of Programming Languages	3.0		
MATH 413 - Advanced Linear Algebra	3.0				
STAT 240 - Probability and Inference 1	3.0				

## **BS in Computer Science: Data Science (693224)**

### **2022-2023 Program Requirements Cont...**

#### **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

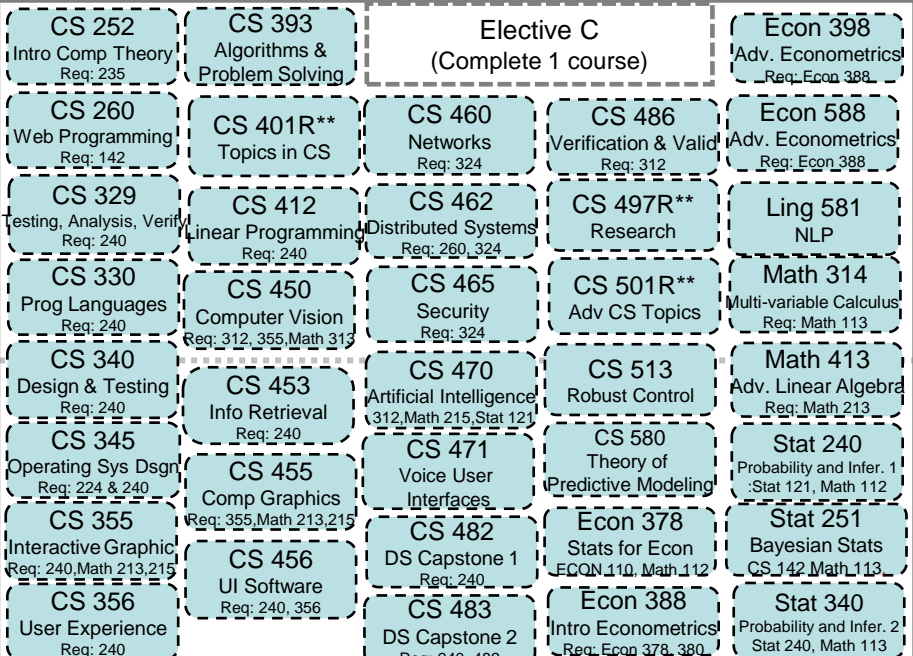
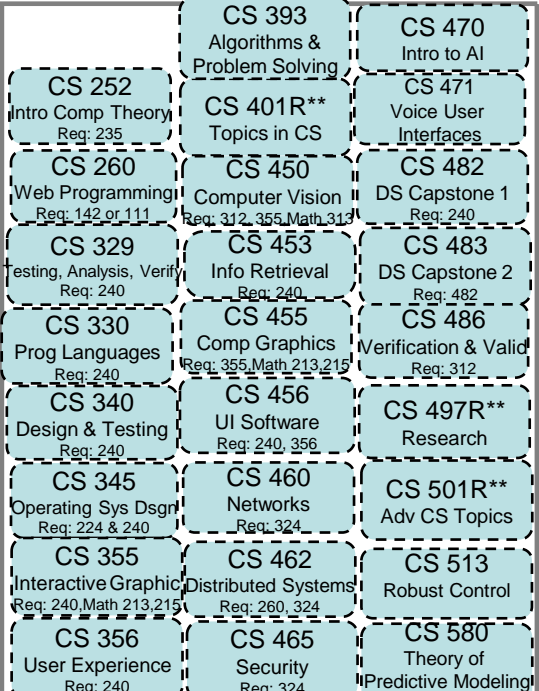
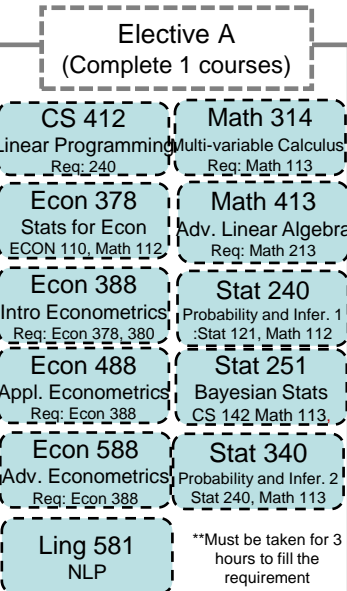
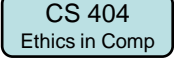
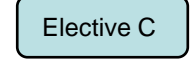
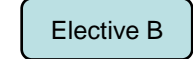
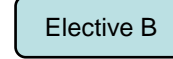
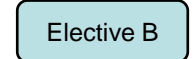
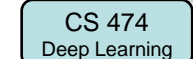
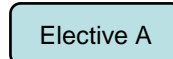
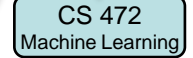
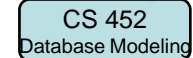
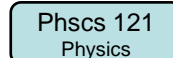
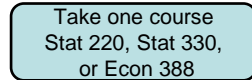
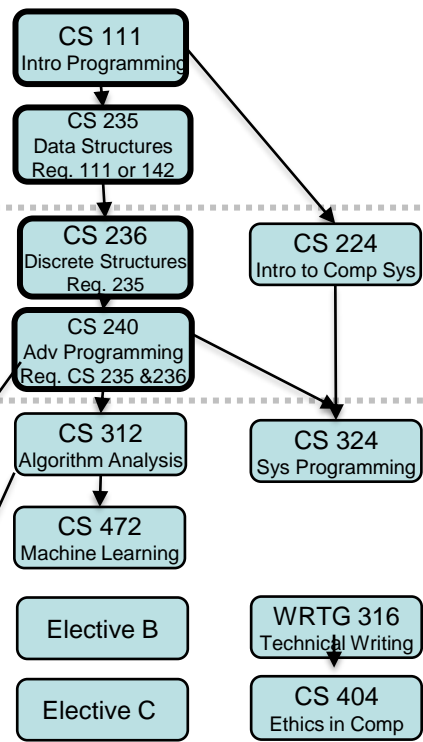
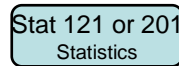
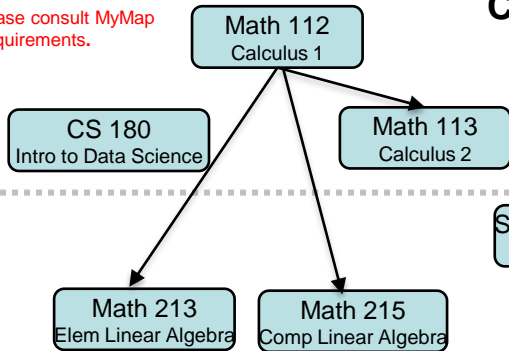
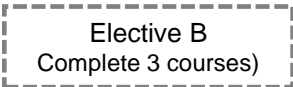
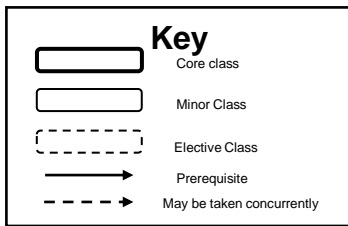
# Data Science Emphasis

## Fall 2022 Requirements

### Major (74 Hours)

- Grades below C- are not allowed in major courses.
- Complete the following courses: CS 111, 180, 224, 235, 236, 240, 312, 324, 404, 452, 472, 474
- Complete the following supporting courses: WRTG 316, Math 112, 113, 213, 215, and PHSCS 121
- Complete one of the following: Stat 121 or Stat 201
- Complete one of the following: Stat 220, STAT 330 or Econ388
- Complete a total of 5 elective courses from the follow 3 groups:

- 1 course **must** be from the following courses: Stat 240, Stat 340, Stat 251, Econ 378, CS 412, Econ 388, Econ 398, Econ 588, Ling 581, Math 314, Math 413
  - 3 courses **must** be from the following courses: CS 252, 260, 329, 330, 340, 345, 355, 356, 393, 401R\*\*, 450, 453, 455, 456, 460, 462, 465, 470, 471, 482, 483, 486, 497R\*\*, 501R\*\* 513, 580
  - 1 additional course from a list that includes all classes from elective A and B.
- If a class is taken in A or B, it may not double count in C.
  - Students are strongly encouraged to take the DS capstone courses (CS 482 and 483) (if CS 401R, 497R, or 501R is chosen, it must be taken for three credit hours)



## 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](https://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 your 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

### 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](mailto: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



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!

# 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/>*