



Department of Computer Science 2022 Assessment Report

MISSION STATEMENT

We use computation and train others in its use to improve understanding and solve problems for the betterment of society.

- Revised March, 2021

DEPARTMENT ALIGNMENT WITH PRIORITIES FOR ACTION

Departmental Objectives

1. We prepare students to make principled and effective use of computation by emphasizing (PFA 4)
 - a. the social context in which computing occurs, and (PFA 2, 4)
 - b. developing the ability to design, implement, and test computer-based systems to meet desired needs. (PFA 3)
2. Our students will
 - a. experience career success, (PFA 1, 3, 5)
 - b. work well in teams, and (PFA 3,5)
 - c. recognize the need for continuous professional development (PFA 3,5).

- Revised March, 2021

See appendix 1 for a table detailing our department's alignment with the university's priorities for action.

STUDENT LEARNING OUTCOMES and MEASUREMENT TOOLS

Our student learning outcomes come to us from the accreditation board for engineering and technology (ABET), which we were accredited by until 2018. We did not renew because the cost of accreditation was becoming too high both in terms of administrative overhead and direct payments to ABET. We still believe that these are appropriate outcomes for computer science students that must enter an intellectually demanding and ethically confusing workplace.

We carried on using the measurement tools listed below, and in the manner they are applied through 2020. Due to COVID and high faculty turnover in the department (lost 3 of 6 tenure track faculty in a 12 month period) we have been remiss in application of many of our measurement tools. In particular

- **Faculty course assessment reports.** These standardized forms encourage instructors to focus on the results of critical, in class assignments and assess progress. No FCARs were done in this reporting period.
- **Capstone class.** This class is project based and allows students to apply everything learned in our curriculum. As such several key summative assessments occur in the class. In this reporting period the class convened once, in 2021.
- Our **exit survey** is used to gauge student opinion of our program and determine job placement. One exit survey was done in 2021 - the results appear in Appendix 2.

- We have an **advisory board** that draws from private and public organizations that have employed our students. We convene annually, face-to-face, and collect input from them on curriculum and the skills expected for new employees. The advisory board was not convened in this reporting period.

Student Learning Outcomes	Faculty Course Assessment Reports (FCAR)	Capstone Class	Exit Survey	Advisory Board
1. Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.	X			
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.	X	X	X	X
3. Communicate effectively in a variety of professional contexts.	X	X	X	X
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.	X		X	
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.	X	X	X	
6. Apply computer science theory and software development fundamentals to produce computing-based solutions.	X			X

RESULTS and MODIFICATIONS

Student Learning Outcomes results	Modifications made to enhance learning
<p>Exit Survey Question 2.6 suggests we could do a better job of preparing our students for a job search because a majority of respondents (7/17) indicate our performance is just good. Question 5.5 shows that 12/17 or likely or extremely likely to recommend our program to others.</p> <p>Maps to Learning Outcomes 4 and 5.</p>	<p>We have started having Cheryl Minnick, Director of Career Success come into our careers class (CSCI 106), and have made her services known to a wider segment of our student population by discussing it in class. We have also done a better job of promoting and supporting student internships with students posting the results of internships on the department walls, and achieving 14 internships in this review period. Self reported satisfaction with internships (Exit Survey Q4.2) is high, with 3/9 students saying it was excellent.</p>
<p>Exit Survey Question 5.3 indicates that 12/17 students thought our course content was very good or excellent.</p> <p>Maps to Learning Outcomes 1,2, and 6.</p>	<p>We seek to retain our excellent staff by stressing the flexibility of the job, the positive social interactions with the department, and the positive nature of the place we are in.</p>
<p>Exit Survey Question 5.4 suggests personal issues are the greatest impediment to completion of a computer science degree.</p> <p>Maps to Learning Outcome 5.</p>	<p>We have named a social coordinator for the program and endeavor to have at least three social events per semester. Examples of the events we have include: nature walks, cross country skiing, board game night, department open houses, potlucks and picnics, coding challenges, and bowling. These have had a qualitative impact on student cohesion and resilience.</p>
<p>The events of Fall 2021, which led to the resignation of Rob Smith and Oliver Serang are well documented in the press and certainly should be considered 'data' by the department. At its core, there were a couple of faculty that were not putting the interests of our students first. Or second, third, or even fourth. This was a major failing of the department.</p> <p>Maps to Learning Outcomes 1-6.</p>	<ol style="list-style-type: none"> 1. We conducted a survey to gauge student opinion of the department's engagement with issues related to diversity, equity, and inclusion (results in Appendix 3). The throughlines of the free responses suggest that we need to do a better job of hiring new faculty. 2. In reaction to the survey results and other stimuli we hired a consultant to come in and lead us in the development of a CS Department Community Principals document (appearing in Appendix 4). 3. We have revised our hiring process to help prevent future hires of this sort by defining our culture in a clear uncompromising way, based on the documented community principles.

FUTURE PLANS FOR CONTINUED ASSESSMENT

Going forward, we need to return to the fundamental measurement tools of our assessment process and develop new metrics to replace others. The advisory board has been very helpful and needs to be convened in the coming assessment period. Now that we have three concentrations for our degree, some of the assessment methods appearing in the Capstone course and exit survey are going to have to make their way into the courses unique to each of the three concentrations (see appendix 5, curriculum map). The faculty course assessment reports have not been helpful and are a burden. We will seek to replace them with some sort of standardized questions/exams to measure our student's performance relative to their peers in other CS programs. These will form the bulk of the assessments found in the curriculum map. We have our program review in the Fall of 2023 and look forward to that feedback.

This has been a difficult review period for University of Montana’s Computer Science program. However, due to the support of the administration for two replacements and two new hires, we look forward to documenting our progress in 2023-24 assessment report..

APPENDICES

1. Computer Science Department’s Alignment Priorities for Action

Priority for Action	Computer Science Department’s Alignment
1. Place student success at the center of all we do.	We are committed to the career success of our students (Department Objective 2a) and have robust career placement, internship, and student research programs. Faculty secure external funding to ensure the majority of these experiences are paid.
2. Drive excellence and innovation in teaching, learning, and research.	Our curriculum is highly adaptable to student’s abilities and features a number of strong, interdisciplinary offerings that draw students from across campus. These interdisciplinary offerings are currently a focus for the department because they provide computational proficiency to a larger portion of our campus community, solidify our enrollments, and introduce our students to different ways of thinking about problems by putting them in contact with non-CS majors. The interdisciplinary courses are: Machine Learning, Data Visualization, Simulation Modeling, Sports Analytics, and Internet of Things. We are also proud to offer an introductory sequence that stretches challenging curriculum across three instead of two semesters. This go-slow approach has allowed us to maintain a higher level of expectations for our students, while simultaneously providing basic training to non-majors. This aligns with Departmental Objective 1a which encourages us to see the applications of computing technology.
3. Embody the principle of “Mission First, People Always”.	<p>Since the last departmental assessment we have overhauled our curriculum. The objectives of the curriculum overhaul are tightly aligned with the principle of people always:</p> <ol style="list-style-type: none"> 1. ensure the curricula is directly responsive to current workforce demands; 2. boost student retention and engagement by providing more routes to completion via three distinct concentrations; 3. prepare every graduate to excel in the areas of problem-solving, adaptability, communication, critical thinking, collaboration, creativity, and ethical reasoning; and 4. engage students with interdisciplinary education. <p>Our new curriculum aligns with all aspects of Departmental Objective 2.</p>
4. Partner with place.	Many of our externally funded research programs are specific to the aims of Montana. For example, Yolanda Reimer has a large grant from the Gianforte

	<p>Family Foundation to develop highschool computer science curriculum and train teachers in its application. Jesse Johnson has a \$4 million dollar NSF grant to study and improve the management of natural resources (snow melt water and timber) in Montana using drone acquired data and machine learning. Other examples include funds to study the spread of wildfire and fire severity in the Pacific Northwest. Undergraduate and graduate students from the CS program are heavily engaged with these local research and education activities. These efforts align well with Departmental Objective 1 and especially 1a.</p>
<p>5. Proudly tell the UM story</p>	<p>At the time of our last placement survey, 100% of our graduating class had achieved employment in the field of computer science and had a mean annual starting salary of \$67,000. We are proud to contribute to Montana's economy with well prepared computing professionals and this aligns well with Departmental Objective 2.</p>

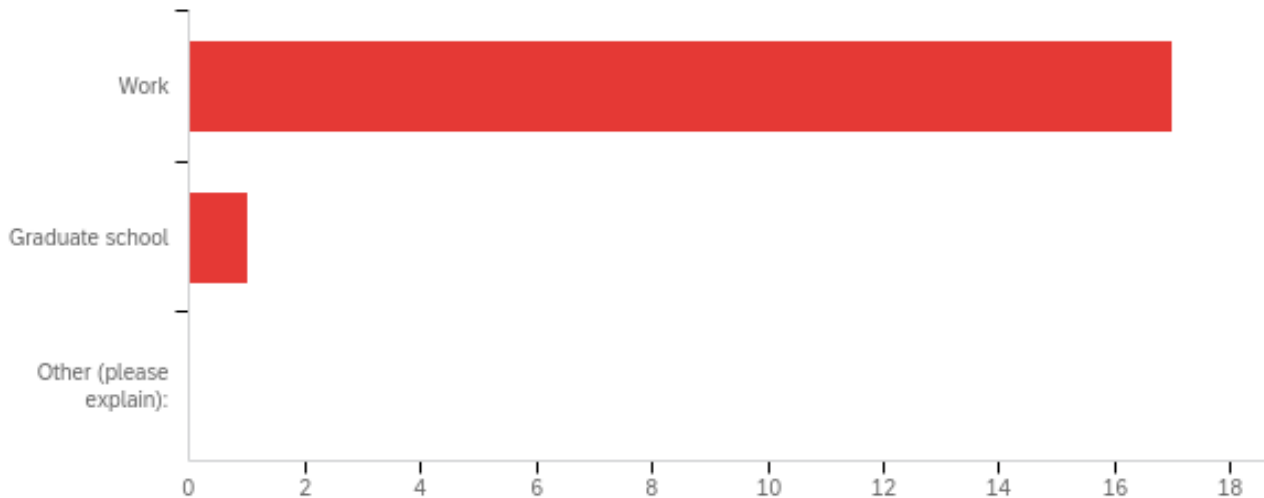
2. Exit Survey from Capstone Students, Conducted Spring, 2021

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CS exit survey -- Spring 2021

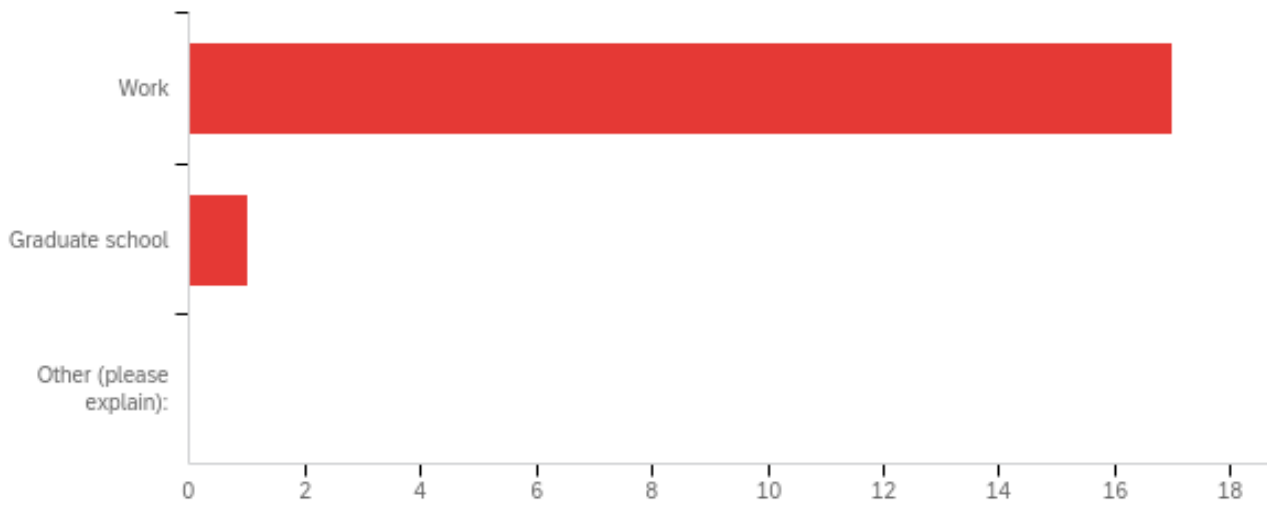
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Q1.2 - What is your current career plan (check all that apply):



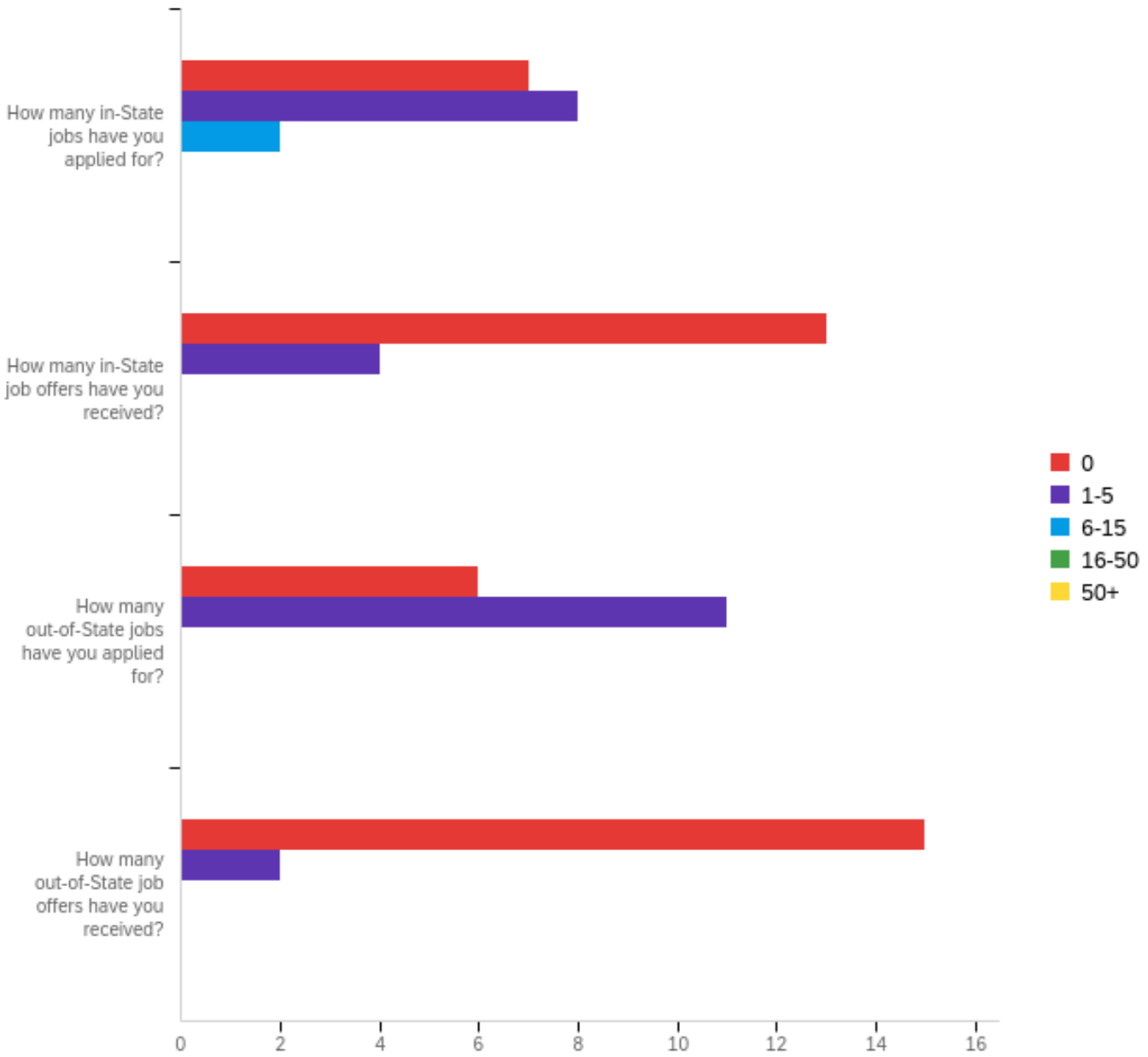
	Answer	%	Count
-	Work	94.44%	17
!	Graduate school	5.56%	1
}	Other (please explain):	0.00%	0
	Total	100%	18

Q2_3_TEXT - Other (please explain):

Other (please explain): - Text

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Q2.1 - Employment Opportunities



Question	How many in-State jobs have you applied for?	How many in-State job offers have you received?	How many out-of-State jobs have you applied for?	How many out-of-State job offers have you received?	Total
0	17.07%	31.71%	13	14.63%	41
1-5	32.00%	16.00%	4	44.00%	25
6-15	100.00%	0.00%	0	0.00%	2
16-50	0.00%	0.00%	0	0.00%	0
50+	0.00%	0.00%	0	0.00%	0

Q2.3 - What will your position be (e.g., programmer, software engineer, etc.)?

What will your position be (e.g., programmer, software engineer, etc.)?

Embedded Systems Engineer, Mobile Application Developer

Implementation Consultant

Managing all ticketing operations and system data (helping use data to target groups for marketing purposes and better our processes)

Programmer.

Software Developer

Software Implementation Consultant

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Q2.4 - What is your starting salary?

40-59K

40-59K

60-79K

80-99K

80-99K

less than 40K

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Q2.5 - How aligned with computer science is the job you are taking? (i.e., will it utilize CS skills and knowledge)

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Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
How aligned with computer science is the job you are taking? (i.e., will it utilize CS skills and knowledge)	2.00	3.00	2.67	0.47	0.22	6

Answer	%	Count
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	Not at all	0.00%	0
	Somewhat	33.33%	2
	Entirely	66.67%	4
	Total	100%	6

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Q2.6 - How well did our program prepare you for your job search?

	Answer	%	Count
	Poor	0.00%	0
	Fair	29.41%	5
	Good	41.18%	7
	Very good	23.53%	4
	Excellent	5.88%	1
	Total	100%	17

Page Break

Q2.7 - Do you believe that the career you will begin is the one you prepared for while studying at UM?

	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
	Do you believe that the career you will begin is the one you prepared for while studying at UM?	2.00	3.00	2.29	0.46	0.21	17

	Answer	%	Count
	Not at all	0.00%	0
	Somewhat	70.59%	12
	Entirely	29.41%	5
	Total	100%	17

Page Break

Q3.1 - Graduate School

Question	How many graduate programs did you apply to?		How many graduate programs were you accepted by?	Total
0	50.00%	1	50.00%	2
1-3	0.00%	0	0.00%	0
4-8	0.00%	0	0.00%	0
9+	0.00%	0	0.00%	0

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Q3.2 - If you will be attending graduate school, which is it and where is it located?

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Q3.3 - Will you be a Master's candidate, or a PhD candidate?

Answer	%	Count
Master	0.00%	0
Phd	0.00%	0
Other (please explain)	0.00%	0
Total		0

Page Break

Q3.4 - What will you be studying in graduate school?

What will you be studying in graduate school?

Page Break

Q3.5 - How well do you believe our program prepared you for graduate school?

Answer	%	Count
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	Poor	0.00%	0
	Fair	0.00%	0
	Good	0.00%	0
	Very good	0.00%	0
	Not sure	0.00%	0
	Excellent	0.00%	0
	Total		0

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Q4.1 - How many internships did you participate in during your time in our program?

	Answer	%	Count
	0	47.06%	8
	1	29.41%	5
	2	17.65%	3
	3+	5.88%	1
	Total	100%	17

Page Break

Q4.2 - How valuable was your internship experience?

	Answer	%	Count
	Poor	0.00%	0
	Fair	0.00%	0
	Good	55.56%	5
	Very good	11.11%	1
	Excellent	33.33%	3
	Total	100%	9

Page Break

Q4.3 - Who (e.g., what companies) were your internships with? (list all)

Who (e.g., what companies) were your internships with? (list all)

AST enterprises, Prime Labs

Institute for Tourism and Recreation Research

MG Security

Missoula PaddleHeads

Spectral Fusion Designs at The University of Montana.

The institute of Tourism and Recreation Research, KPCN, Montana Space Grant Consortium

JM Esports both times

Page Break

Q4.4 - Did you participate in any Undergraduate Research while in our program?

	Answer	%	Count
	Yes	23.53%	4
	No	76.47%	13
	Total	100%	17

Page Break

Q4.5 - How valuable was your Undergraduate Research experience?

	Answer	%	Count
	Poor	0.00%	0
	Fair	0.00%	0
	Good	50.00%	2
	Very good	0.00%	0
	Excellent	50.00%	2
	Total	100%	4

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Q5.1 - Did you receive a pell grant while at UM?

	Answer	%	Count
	Yes	58.82%	10
	No	41.18%	7
	Total	100%	17

Page Break

Q5.2 - What is your GPA?

What is your GPA?

1.5

1.87

about 2.9 I think.

1.9

1.9

1.94

1.something

1.2

1.44

1.45

1.5

1.51

1.6

1.62

1.73

1.75

1.97

Page Break

Q5.3 - Please rate the following aspects of the CS program:

Question	Poor	Fair	Good	Very good	Excellent	Total
Value of course content	0.00% 0	0.00% 0	29.41% 5	64.71% 11	5.88% 1	17

Variety of courses that interest you	5.88%	1	11.76%	2	41.18%	7	29.41%	5	11.76%	2	17
Facilities and Resources	0.00%	0	35.29%	6	23.53%	4	23.53%	4	17.65%	3	17
Faculty / Instructors	0.00%	0	5.88%	1	17.65%	3	47.06%	8	29.41%	5	17
Advising	0.00%	0	29.41%	5	29.41%	5	35.29%	6	5.88%	1	17
Peers	0.00%	0	0.00%	0	29.41%	5	23.53%	4	47.06%	8	17
Overall workload	5.88%	1	11.76%	2	41.18%	7	23.53%	4	17.65%	3	17
Research opportunities	6.25%	1	12.50%	2	56.25%	9	18.75%	3	6.25%	1	16
Internship opportunities	11.76%	2	17.65%	3	47.06%	8	17.65%	3	5.88%	1	17

Page Break

Q5.4 - What were the biggest obstacles to completing your degree? (check all that apply)

Answer	%	Count
Challenging classes	25.81%	8
Reconciling class schedules	22.58%	7
Financial stress	12.90%	4
Personal issues	29.03%	9
Other	9.68%	3
Total	100%	31

Q5.4_5_TEXT - Other

Other - Text

azy/Incompetent Group Members

remote instruction

required classes only being offered every other semester.

Page Break

Q5.5 - How likely are you to recommend the CS program at UM to a friend or colleague?

	Answer	%	Count
	Extremely unlikely	0.00%	0
	Unlikely	0.00%	0
.0	Neutral	29.41%	5
.1	Likely	58.82%	10
.2	Extremely likely	11.76%	2
	Total	100%	17

Page Break

Q5.6 - Please provide additional comments that you have.

Please provide additional comments that you have.

Capstone class was great. It was difficult and at time overwhelming but I feel that it has helped prepare me for a career in computer science. It was definitely the most beneficial class that I've taken. I like that it focuses on soft skills considering that in CS many students are introverted.

CS classes which actively use a laptop during class should really be held in rooms with easily available outlets for charging your laptop. Or at least run some extension cords. A laptop battery only lasts so long. I didn't get a chance to take a networking class here, but I didn't really see any offered during my time. I think networking is a very important topic to include in a computer-related program. It would have also been nice to be offered more variety or courses available.

I feel like I was being tugged in different directions throughout the years studying, as in learning what seemed like the basics of a handful of different programming languages without being challenged too much, without having to explore or create things of our own. What I did like about all these different languages learned is there was a good time at the beginning of the class spent on learning and teaching about setting up at least basic environments where we can do the basic programs. My only suggestion to this is maybe having a actual project besides the capstone class where you get to see the different ways to deploy a big project in many different languages.

I have enjoyed the CS program and the recent changes to CS degree options seem like they will be even better at preparing students for their future careers.

Overall, the UM CS program has provided me with an absolute blast of a time and a beyond valuable education. Not only did I get to connect with awesome and brilliant instructors, but I came away with good friends from my peers as well. To be more constructive: when people interested in a CS education ask me about UM's program, I tell them that if they "play their cards right" when picking and choosing courses, they will get an excellent education. (I feel that I have done just that.) The reason for stance is that I know, partly from experience and mostly from conversations with my peers, that there is a discrepancy between course quality depending on instructor. I think that the differences that cause these discrepancies wind up being due to one of the following: lack of knowledge/experience in course subject matter, or poor course structure.

The instructors were very hit or miss, with the department losing by far its best instructor (Michael Cassens) and with him the most interesting classes during my time in the program. I greatly appreciate the new Software Engineering track that has been added, and wish it existed much sooner as I prefer practical courses that more align with the job market over abstract theoretical ones. I would highly suggest the program work with the Media Arts department to allow for CS students to take some of their upper division development courses in topics such as: Mobile, VR/AR, and Game Development. These fields are dominated by CS professionals in the actual marketplace, so we should be able to offer them for credit.

The program did a great job at covering the fundamentals for object oriented languages. However, as the classes transitioned from language learning to theoretical practice, it was easy to get rusty in terms of working with actual code. I never had the chance to take the new class, but it is great that students now have access to a course that is devoted to understanding the commandline and using github, which are valuable skills to have developed as well as having an understanding of object based languages and algorithm design.

There needs to be more clarity right out of the gate when it comes to required classes and in which order they come in. There should also be some classes dedicated to career searching, interview process, professional environments, etc. The variety of classes were sufficient and the complexity and learning curve of the program is acceptable for a professional career after college.

3. Results of CS Inclusion Survey

CS Inclusion survey

November 23rd 2021, 8:13 pm MST

Q14 - Please add any other comments related to diversity, equity and inclusion that you feel are relevant.

A decent amount of the teachers I've had have been very unapproachable. Felt like a sink or swim major.

Although a minority, I don't feel any different than anyone else.

As a female student in the CS department, I have had several interactions with male professors and adjuncts that were very negative and hostile. These interactions made me afraid to come to class or office hours, and afraid to ask questions or seek help. I wish that there had been more care taken during the hiring process to ensure that these individuals actually cared about teaching and their students, not just the prestige of the job. Anyone can be good at computer science, but it takes a special combination of skills, experience, and compassion to be a good instructor. I hope that going forward, all interviews with prospective faculty members will include questions about what they will do in their classrooms to promote diversity and equity, and address ethical and moral issues in the field. The thing that has kept me in the degree and the program has been the dedication of a few staff members toward involving and including everyone, no matter who they are. I think these individuals are the strength of the CS department, and I hope you will all listen to what they have to share. It takes careful planning to counter the trends of misogyny and hostility that are found in our industry, but it can be done through building a team of people who genuinely care about students and their success as human beings. Instructors are the role models for the next generation of programmers, entrepreneurs, managers, and CEOs: what students see as behaviors of a "successful computer scientist" are the ones they will try to emulate. I hope that they will learn that to be successful, they should be compassionate, inspiring, collaborative, and humble, as opposed to hostile, discriminatory, downputting, and

competitive. There are many good people out there with the skills to be a good instructor, and I hope you will all make an effort to find them.

because CS is such a broad field, some students tend to excel in certain classes, and gives those students an advantage over others. I've noticed professors in these classes favor those students.

DEI is very important. I think it would be most effective to utilize (perhaps fund if needed) existing resources that the University Possesses, and increase the interfacing between those resources and the CS Dept. That should help the teachers focus on academic success and a healthy environment for their students without adding as much additional work (as making it the duty of the CS Dept solely).

Following the situation with Rob Smith, I think the CS department responded appropriately. It was clear to me that other professors in the CS department are trust worthy sources to go to if any future conflict was to come up in the future of the department. But I do think following everything that has happened this semester the department needs to stay focused on how department decisions impact the students in negative and positive ways. I understand that Rob was still granted tenure despite knowledge of his blogs because although he had made his personal opinions, those opinions did not seem to be portrayed on students so logically, it posed no threat. But if students would have known about this blog at any point within Rob's time here at the University it would have angered students, this is the kind of impact that the CS department should have taken into consideration. A professor could have a wide set of skills in CS but if students are not comfortable with their instructors, it can sway students from the topic of CS and this factor needs to be taken into consideration. Future department decisions need to take into consideration the comfort of the students in the department not just the overall success of the department.

Honestly, I have had an amazing experience with 90% of the department save a couple specific individuals who personally, I felt didn't care about my effort or success. They are no longer involved in the curriculum and I think the department has an opportunity to better itself from those departures. I think ALL of the departures this semester can be a net positives. I do think that the diversity in our students is significantly homogenous, I would love to see a more diverse community of students.

I am frustrated with many classes being required but when I go to register for classes they are not available. I'm not referring to the classes that are spring/fall only.

I am happy to see some distancing from the Rob Smith issues the department has taken however it should not have taken so long to remove him. Also as a side note, I am a white male presenting person so my input in most of these are not the perspective the department needs to garner in order to understand inequity and inequality within the department. It's nice to see some sort of steps in the direction of making the department a more inclusive space

am not a computer science major, but am taking an introductory level class as required by my degree. My only experience within the department has been with Trish Duce and Sean McNulty who are both inclusive, kind, and knowledgeable.

do feel that I have been treated very well, and have had a lot of good opportunities and experiences. However, I come from a very privileged demographic, so my experiences may not be representative of the whole student body.

don't have any

don't really have any direct experience with these topics. For the most part teachers/staff/students have been welcoming or neutral. I never interacted with Rob Smith, so my experience might be atypical. It feels like the Computer Science department is closed off physically. A more open and central meeting area for advising and meeting teachers might be a good idea.

feel better knowing our CS department doesn't tolerate discrimination.

feel like there could be more things to help people get involved.

feel like UM as a whole is placing way too much emphasis on diversity, equity and inclusion. While I don't really want to drag politics into this, as a female student who is more conservative/libertarian leaning, I find myself becoming more and more isolated as we push ourselves past reasonable inclusivity. I don't care if somebody is gay or trans or black or white, but I'd rather it not be at the center of our education, and certainly not a focus of it. I think the CS department is intimidating, but I don't feel that way because I'm a woman and I don't think anyone has looked down on me because of it. I would rather be taught by a straight white man who is good at teaching than someone who was hired just because they are "woke" and maybe lousy at teaching. I think the beauty of STEM classes is that they are by nature, inclusive. Computer science is not a racist, sexist, homophobic, transphobic discipline, so I'm confused as to why the school (and not just UM, it's this way in many places) is treating it as such. While I don't agree with all of Rob's views, I do disagree with Rob being "cancelled" by students over them.

feel much more confident in my decision to pursue Computer Sciences now that I have seen the general response to the whole Rob Smith situation. I had some reservations about the field I was entering, but I feel very assured that I will be supported in the UofM CS department.

feel that the CS department has had a very one size fits all approach to education during my time here at UM. I am happy to see that more degree routes/concentration have been opened to future students and that hopefully there will be more room in the future for students to choose to study the fields of computer science that they want to pursue. Travis Wheeler specifically has stated in his classes that he teaches to the top 10% of students and that he doesn't have any interest in students that don't perform well. This same elitist sentiment has echoed throughout the department in my time here. The students that excel are praised and held up while the students that struggle are brushed to the wayside and left to fail out of the department. To further this point, there is a complete lack of attention towards mental health and well being in the department. Upon the publication of the Kaimin article about Rob Smith's blog being published, student counselors from the Theater department and other departments on campus immediately emailed their students with a list of resources for students that were triggered by the article or any of the posts. I did not receive a single email from either a counselor or our department chair addressing this issue. It is astonishing that there has not been a department wide letter sent out offering a list of resources to students and that all that we have been given is this survey. As a student I feel like I have no idea what is happening in my department. Additionally, as to the point of diversity within the department, I feel that there is a complete lack of course offerings for the diversity technology that is encompassed by computer science. At least half of the students that I have talked to about their reason for getting into CS respond by listing some kind of inspiration from video games but there is not a single course offering game design or anything related. This department needs more courses that appeal to a wider range of people.

feel the CS department is diverse and makes a decent effort to include all types of people.

feel the department is handling the current issue with Rob Smith well. Part of me wonders what underlying problems there are though, when another professor resigned, seemingly out of spite, right after this event. I nevertheless love this department and want to see it thrive for students who come after me.

have only taken one CS class and am unaware of the efforts being made to make a welcoming community. There is a CS professor on my committee and I have had nothing but positive and professional interactions with him. I also have had a great experience with the one class. I think the CS department is on the right track and I am impressed at the faculty's ability to talk about the sexism and other 'isms' that exist in the CS community.

really think that we should really try and create a nice space where CS students could come together and collaborate and help each other with things that they might have questions on or if they need help on projects.

took several classes taught by Rob Smith so many negative answers were regarding my experiences with him. I have always had positive experiences being taught by female professors in the Computer Science department. I have enjoyed LeetCode club since it gave me a way to get help from other students and professors outside of class, but it is really hard to get help outside of class for certain issues. There have been a lot of classes where I've fallen behind in the first week trying to figure out how my IDE works or for some other dumb reason where it has been discouraging to ask some of the professors for help with small things because it feels like I'm wasting their time and asking something I shouldn't need to ask. It would be really nice to have a lab where we could go with questions during the school week instead of having to try to figure it out alone. Also, just answering questions respectfully is really important. I have had quite a few instances with male professors where I've felt made fun of or unintelligent for asking any questions, which has made it so I rarely ask them at all anymore. Basically every professor that's acted like that resigned this year, but it is good to keep in mind. There have even been times this year where I've asked male professors for help and they've basically assumed I don't know anything about coding in my third year because I asked them a single question. It's really discouraging.

I'm aware that this school is known for its business school, but it would be nice to have any variety in the classes that are offered in the computer science field. Essentially every class seems as though it is oriented around the idea that every student who goes through the CS program is going to go out into the world and develop websites or apps. Personally, I would like to do something in the field of robotics and would greatly appreciate classes that delve into that more specifically rather than just offering generic machine learning and artificial intelligence classes that again contain undertones of being oriented around web/app design. TL;DR: Provide more diverse class options to CS students that offer more specificity in regards to different CS jobs that students may be interested in, i.e., robotics classes, video game design classes, etc.

I'm getting really nervous about this spring's course offerings. I think it would be beneficial to send students an announcement every now and then detailing current course plans, as well as progress on getting professors for the department.

I've been around the CS department for quite a while now, so I apologize if this is overly lengthy or there are any hard truths. As a bit of a disclaimer, I have always been interested in practical Software Engineering courses that teach the technologies and skills in use within the SE workforce. This view biases me away from more traditional Computer Science courses that focus on theory and the science behind it all, though knowing your data structures is still universally handy. A lack of course options has always plagued this department, but it has only ever seemed to worsen over the past four and half years. For myself, this problem was most noticeably felt when we lost Michael Cassens to the Media Arts department, which created a void of interesting electives in our program that was never really filled. Making this problem worse is that as our number of professors continues to erode, the professors that are departing tend to be the most approachable and engaged with student success, apart from one recently resigning individual. On a positive note, the move to add the Software Engineering track is a massive step in the right direction to address the problem of course options. However, the shortage of good professors to teach SE courses is greatly impacting the department, and we haven't seemed to make any progress over the past two to three years to resolve this professor shortage. What I have found most frustrating during my time in the CS department is that, in my mind, no solution to these problems has existed since they first appeared. Mobile, AR/VR, Game, Web Server, and Front-End Web Development courses are all presently taught at UM outside of our department, and if you were to ask professionals in the workplace, they could all easily be described as core fields of Software Engineering. As a school, it is not in UM's interest to have two competing programs struggling to teach the same courses, one due to a lack of students (Media Arts) and one due to a lack of professors (Computer Science). Of the five courses I mentioned, I have taken four with the Media Arts department at the personal cost of attending an additional semester at UM than I had initially planned since they were largely not for credit in our program. That being said, I have no regrets because these four courses are the cornerstone for my resume as they afforded me project-based work across a diverse number of technologies and platforms. I wish I had more to show for my CS coursework, but apart from the Capstone, most of my courses within the department are just class names on a transcript that do not have projects associated with them that showcase my actual skills. What I am obviously getting at is that we should be working with, not against, the Media Arts department. I don't pretend to know what happened that changed this view, but when we initially cooperated after losing Professor Cassens, it worked exceptionally well from my perspective. I would even go so far as to suggest the current state of affairs is an enormous missed opportunity. Our programmers should be placed on projects with their digital artists, as realistically, any good website, game, or app is built by a team of individuals from both disciplines working together. Individually, we are settling for, at best, half the picture of what the workforce will bring, and even that assumes we can find enough professors and students to teach the course at all. I hope my point of view is somewhat useful. I've enjoyed my time at UM, and many of the CS courses I have taken. I just think our program could do more to serve students, so choices like mine to jump around between programs aren't necessary.

I've felt the department has always been good at maintaining diversity, equity, and inclusion (and significantly better than some of the other departments I've had classes in). With the exclusion of Rob Smith, of whom I didn't have classes with until this year, I've found all the rest of the faculty in the CS department to be happy and willing to help anyone that needed help. I think at the moment it is key the CS department finds good faculty to replace those who have left, and figures out a way to keep them at the University. The CS department is expanding, and yet we've lost 3 CS professors/faculty. Without more faculty, the ability of the CS department to service and help CS students as a whole and in a way that is inclusive will be strained, and the already existing CS faculty will have additional stresses placed on them.

Make sure to do deep research on professors you hire next, and put a deep emphasis on hiring diverse teachers instead of middle aged white men.

Most/Any negative experiences came from problematic faculty which have already resigned

My first exposure to the CS department was Rob Smith. It made me question whether or not I had made the right choice in major. He provided very little assistance and the course work was not supported by his lectures. Thankfully I stayed in the program and was happy to find other professors who are much more supportive. Professor Duce specifically has been instrumental in motivating me to continue with the program. I believe that the school would benefit from hiring or training instructors to be open and accepting of the broad range of students that attend the university.

My limited experience in CS has been with Jesse Johnson and has been very positive. I feel supported in the class and included in course content, despite not being a CS major. However, the demographics are homogeneous and the recent events with Rob Smith are disturbing. The university as a whole needs to work harder to prevent things like this from happening. UM is not competing at the same level as other universities in the region and this culture must have something to do with it (a culture which is likely present in the office of the president as well...). Spend money to make money. Respect everybody.

N/A

None

Pretty much all my CS classes encourage discussion and inclusion, however I think some personalities in cs make this difficult

Some instructors feel unapproachable, and there really isn't a CS community here besides the CS classes. I have made some great friends who are knowledgeable and friendly, but overall I don't usually feel comfortable talking to members of the faculty, whether my advisor or my professors. It doesn't feel like I am involved, just involved in the sense that I have classes in CS. This is my first semester here after transferring and it doesn't feel welcoming and I feel like just another person going for a CS degree, rather than a unique person.

The school in general including the Computer science division is way too focused on race and sexuality and stupid things like that. We're all human there's no need to try to fit us all into categories like we're some animals. I'm here to get a degree bruh

The teachers (remaining) in the department seem committed to the students success and to soundly contributing to the department. Web App Design does a good job of collaboration through git, as well as teaching some other useful tools to build basic web apps. Careers in comp science is vastly better than I thought it would be. Prof Duce gets some really good speakers in there (LMG Security presentation - WOW). The structure in the CS-152 class was decent at best, but now is pretty good (though CONSIDERABLY improved). The latest 152 HW assignment was designed to grade only when the program was 100% complete, which made it more hard to evaluate, build and debug compared to other formats of coding in java. Leetcode club is one of the best things that this dept has in my opinion BECAUSE it is useful extracurricular. And involvement was really solid so far. Diversity is huge, and should be focused on for sure. I think that the U of M itself should be more committed to the growth and improvement of this program as well. Game-changing improvements: 1. Tutors, on a regular schedule 2. Discord channels in class, to encourage student collaboration 3. A computer lab area that students hang out at. It is odd to me that there is not an area where there is a group of CS students that hang out on campus regularly. 4. A linux server for students to use would be pretty dang cool too 5. A drone club 6. Other cool clubs and extracurriculars

There aren't enough minority students around for me to make any observations but I can say that I have seen a lot done to bring forth female students. And being older, I don't haven't felt any "age-ism" myself. I am think very highly of the way the CS professors behave towards their students.

There is a large gender gap in the computer science department that I feel is not addressed enough. I have heard from female students that they have experienced discrimination and have felt less than their male peers.

There's no massive issues given my limited experience. That doesn't mean we can't do better though.

This survey is extremely poorly done. I hope the analysis of it will be better.

Tutors would be a great help in the CS department for students that would like help.

While I absolutely adore several of the faculty that I have had in this department, there needs to be a much more meaningful and significant push to address some of the sexist and exclusivity sentiments found within the department. Additionally, it feels that there needs to be more transparency surrounding investigations within the department. The fact that the chair of the department and the tenure board knew about Rob Smith's blog and did nothing to inform the student body that they were taking classes from a racist, sexist, homophobic pedophile is deeply troubling. Personally, I feel like there also needs to be a push to educate many of the young men within the department, as there have been several times where I have felt looked down upon or lesser than, just because I am a woman. I should not have to prove myself to my peers any more than they do to me. This whole movement has to be more than optics and pageantry, there needs to be serious talks and vetting and a genuine movement towards change and improvement.

While I don't feel discriminated against, I feel that it's too much of a focus for the department, so much so that it's coming at the expense of the focus on learning and environmental learning. My experience here at UM for the CS degree has overall been quite negative (about 2 out of 10). The classes are mostly slide shows, personal research and reading out of a book (and then doing whatever problems that book has). All of which I can easily do myself without the help of others and without spending several thousand dollars every 6 months. I've only found 1 of the assignments in all of my classes in the CS department to be inspiring or interesting in any capacity. (This was theombie problem from Melissa's Java class, which was an interesting math/algorithm problem) Diversity, equity, and inclusion are fine and all, but in my opinion, the CS department has *much* more pressing problems when it comes to providing a valuable and engaging learning environment.

4. Our Community Principals Document

Members of the University of Montana Computer Science (UM CS) community – faculty, undergraduates, graduate, and staff – are dedicated to supporting and maintaining a scholarly community in which all share together in the common enterprise of learning. As a central aim, UM CS promotes intellectual inquiry through vigorous discourse, both oral and written. In becoming a part of UM CS, we accept the rights and responsibilities of membership in the University's academic and social community, and assume the responsibility to uphold the University's principles.

1. Respect for the Integrity of the Academic Process. The rights and responsibilities that accompany academic freedom are at the heart of the intellectual purposes of the University. Our conduct as community members should protect and promote the University's pursuit of its academic mission. We are all, therefore, expected to conduct ourselves with integrity in our learning, teaching and research, and in the ways in which we support those endeavors.

2. Individual Integrity. In order to ensure that the University can dedicate itself fully to its academic and educational vision, it is expected that an individual's personal integrity will be reflected not only in honest and responsible actions but also in a willingness to offer direction to others whose actions may be harmful to themselves or the community. The University expects that members of the UM CS community will be truthful and forthright. The University expects that community members will not engage in behavior that endangers their own sustained effectiveness or that has serious ramifications for their own safety, welfare, academic well-being or professional obligations, or for that of others.

3. Respect for the Freedoms and Privileges of Others. We strive for a sense of community in which the individual growth of all members is advanced through the cultivation of mutual respect, tolerance, and understanding. The University values and encourages individuality while also affirming the community dimensions of academic life. A socially responsible community provides a structure, within which, individual freedoms may flourish without threatening the privileges or freedoms of other individuals or groups. The University is committed to honest, open, and equitable engagement with racial, religious, gender, ethnic, sexual orientation, and other differences. The University seeks to promote an environment that in its diversity is integral to the academic, educational, and community purposes of the institution.

4. Respect for University Resources. All community members must respect the general resources and physical property of the University. Such resources are assets in which community members have a vested interest, as these resources specifically support the institutional mission.

This document was modeled after the document entitled ["Principles of the Brown University Community"](#).

All members of our community can act on our communities principles by working toward the following objectives.

1. **Respect for the Integrity of the Academic Process. Collectively, members of UM CS will:**
 - a. build community through shared purpose, academic integrity, a supportive work culture, and collective accountability.
 - b. deliver a Computer Science education at the level of rigor required for student success in the profession and for the betterment of society.
 - c. foster and reward productive collaboration between members of the Department, and the campus, scientific, and local communities.
 - d. carefully consider the ethical consequences of the expanding role of computation in our lives.
2. **Individual Integrity. Each of us in UM CS will work to:**
 - a. model the behavior suggested by the community principles stated in this document.
 - b. Assume good faith on the part of those you interact with.
 - c. make a concerted effort to thoughtfully engage with others in our community - faculty, students, and staff.
 - d. be available and approachable during established and well advertised hours.
 - e. always be tolerant of questions from others.
 - f. be a good role model by speaking out against behavior that is contrary to our community principles.
 - g. work to ensure that effort is rewarded by success.
 - h. actively listen and adapt accordingly.
3. **Respect for the Freedoms and Privileges of Others. Each of us in UM CS will work to:**
 - a. acknowledge that others come from different backgrounds and experience struggles different than our own, and therefore adapt accordingly and within reason.
 - b. support the inclusion of diverse perspectives in classroom and research environments.
 - c. foster an inclusive work environment.

In addition to the principles that unite us as a community, we have the following additional expectations for faculty members.

- Perform their duties in a professional manner that includes:
 - assuming good faith on the part of your colleagues and students;

- being an active participant in interactions with all community members – faculty, staff and students.
- searching for common ground when navigating disagreements.
- Demonstrate a willingness to accept and provide feedback on professional behavior including teaching pedagogy, research, and professional service.
- Develop and document a peer reviewed plan that engages students in meaningful ways both inside and outside the classroom.
- Support and help facilitate an inclusive, supportive, non-judgmental, diverse and collaborative work environment.
- Acknowledge collective accountability and responsibility for the Department by mentoring junior faculty; supporting and facilitating inclusive strategies; active involvement in seminars, faculty meetings, Department activities, etc.; participating in service activities as defined by the Department; and by supporting the Department within and outside the University structure.

5. Curriculum Map

UM Curriculum Mapping Template Computer Science Degree

Required Course (Name and Number)	Analyze requirements and identify solutions	Design, implement, and evaluate computer systems	Communicate effectively	Recognize legal and ethics issues	Work in teams	Apply theory and fundamentals
CSCI150: Intro. to Programming	I	I				
CSCI106: Careers in CS				I		
CSCI151-152: Interdisciplinary CS	D	D	I		I	
CSCI232: Int. Data Structures and Alg.	D	D/A			D	I

CSCI258: Web Application Development		D	D		D/M	D/M
CSCI332: Adv. Data Structures and Alg.	D/A	D				D/M
CSCI340: Database	D	D				M/A
CSCI315E: Ethics			M	M/A	M	
Upper Division Courses in Concentration *						
Software Eng: CSCI461,462: Capstone	M/A	M	M/A		M/A	M
Data Science: CSCI444: Data Visualization	M	M	M	D		
Algorithm Dev: CSCI361: Computer Architectures	D	D/A	D		D/A	D
KEY:						
I = Introduced						
D = Developed/reinforced, with opportunities to practice						
M = Mastery						
A = Assessment evidence collected						
* The computer science degree has three concentrations; Software Engineering, Data Science, and Algorithm Development. Required courses in each are listed below.						