Appendix A: TEMPLATE FOR ANNUAL PROGRAM REPORT REVIEW *(See preceding document for detailed descriptions for each section)*

ANNUAL PROGRAM REPORT

College	College of Science
Department	Computer Science
Program	M.S. Computer Science
Reporting for Academic Year	2020-2021
Last 5-Year Review	2017-2018
Next 5-Year Review	2022-2023
Department Chair	Levent Ertaul
Author of Review	Leann Christianson
Date Submitted	10/1/2021

I. SELF-STUDY *(suggested length of 1-2 pages)*

A. Five-Year Review Planning Goals

Present your planning goals from your last 5-year plan.

From our last 5-year review, the department has identified goals as given below – note these are for both the graduate and undergraduate Computer Science degree.

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Curriculum:

i. Implement semester-based courses as defined by transformed syllabi.
ii. Assess semester-based courses and use data to continually improve courses.
iii. Evaluate assessment mechanisms themselves to provide opportunity to improve mechanisms.
iv. Regularly re-visit choice of programming languages and platforms used in introductory programming classes based on effectiveness shown by assessment data.
v. Regularly evaluate possibility of seeking accreditation from Accreditation Board for Engineering and Technology (ABET), which provides accreditation for Computer Science programs.
vi. Add new courses to address new fields or changes in existing fields in B.S. and M.S. degrees. vii) Increase the number of sections of introductory courses taught by tenured or tenure-track faculty. viii) Continue to increase lab elements and other participatory elements of classes.
vii. Offer more on-line or hybrid courses to allow students more flexible schedules.

viii. Continue to offer new service courses in computing to other university departments.
ix. Offer GE course in computing.

Students:

i. Provide ongoing support for students who are continuing through the semester conversion
ii. Find funding or substitute for undergraduate advising role. iii) Improve student experience and B.S. graduation rate.
iii. Reduce time to graduation for B.S. Students, both native CSUEB students and transfer students.
iv. Implement mechanisms to make student research projects available to student population. Use same mechanisms for internship experiences, peer advice, and references.
v. Work with AACE to increase recruiting on campus, both for graduates and students seeking internships.
vi. Develop mechanisms for handling growth in undergraduate program and right-size graduate program to fit department resources.

Faculty:

i. Recruit new faculty to reduce reliance on lecturers and to provide opportunities to offer classes and research support in areas of current Computer Science areas of development.
ii. Encourage professional development.
iii. Develop department by-laws.
iv. Develop department leadership. iv) Address workload of faculty, specifically four course per semester teaching load.
v. Address support for faculty supervision of student research.

Resources:

i. Facilities for department faculty offices, teaching labs, research labs, including co-locating office space to provide opportunities for faculty to work together more easily.
ii. Improve relationship with ITS (Instructional Technology Services) to support teaching and research needs.
iii. Upgrade labs and environments used for class assignments, student research.
iv. Address funding for readers, TAs, and travel to academic conferences.
v. Address need for library resources, specifically to support graduate courses.
vi. Continue to develop Industry Advisory Board

B. Progress Toward Five-Year Review Planning Goals

Report on your progress toward achievement of the 5-Year Plan. Include discussion of problems reaching each goal, revised goals, and any new initiatives taken with respect to each goal.

Curriculum

The MS Computer Science program was restructured for semesters and continues to offer both a computer science and a networking concentration. Both concentrations share five (15 units) of required courses with the remaining 15 units being electives and a capstone experience. The computer science concentration is by far the most popular among students.

New courses that have been added to the curriculum as electives at the graduate level include Internet of Things, Parallel Computing, Natural Language Processing, Machine Learning, Information Coding and Cryptography, and Digital Signal Processing.

The pandemic forced all courses online in either asynchronous, synchronous, or hybrid modes during Fall 2020. During Spring 2021, we offered some graduate courses on-ground to comply with ICE regulations for F1 students. We will continue to offer courses in on-ground and hybrid formats to support our graduate students and to comply with WASC and immigration regulations.

The MS Computer Science program offers three choices for a capstone experience: comprehensive exams, project, or thesis. The project option allows students to work with faculty in a proof-of-concept project that can be completed within a semester. This capstone option is growing in popularity with the students.

Assessment quizzes maintained and distributed through Blackboard were developed to assess each required graduate course.

New equipment to support Advanced Computer Networking, Network Security, Cybersecurity, Parallel Processing, IoT and Machine Learning has been acquired with the help of A2E2 funds.

Curriculum sections v, viii, and ix apply to the BS Computer Science degree so please see that report for progress in those areas.

Students

Most graduate students who began the MS Computer Science program under the quarter system have successfully graduated. The graduate coordinator, Dr. Christianson, continues to advise interested applicants and current graduate students. Despite the pandemic, enrollment has remained consistent with previous

years and is currently growing. Statistics available from Pioneer Insights are from Fall 2016 to Fall 2020. Data shows there is a moderate increase to 164 students. This number continues to grow for Fall 2021. See figure 1

The graduate program Sections ii-iii address the undergraduate program in Computer Science so please see that report for progress in these areas.

Section iv addresses mechanisms to allow student research projects to be available to the student population. Previously under quarters, our program's capstone experience included comprehensive exams or thesis. As the thesis option generally took students longer to finish and thus graduate, fewer students opted for the thesis. To increase student and faculty research collaborations during semester conversion, we added a third option of capstone project. Interest in this option has increased each semester. During the last academic year, 17 capstone projects were completed. Students gave zoom presentation of their work to faculty and students at the end of the semester. A shared google drive is used to archive capstone projects making them available to other interested students. Students are also encouraged to archive their capstone projects with the CSUEB library.

Despite the pandemic, students continued to find internship experiences at Amazon, Ehealth, Genentech, HP, and Paypal to name a few. Students complete a report on their experiences which is shared with other students so that they can learn about internships and companies recruiting our students. Our department works with AACE to facilitate and advertise recruiting events. Companies that have offered virtual events in the past year include: Capital One, Google, Twitter, Zoom, and Trimble.

Section vi growth of the program: we continue to review our admission criteria (GRE scores and prerequisite courses) as well as acceptance rates to keep enrollment manageable and to provide the necessary number of course offerings each semester.

Faculty

Both the Computer Science graduate and undergraduate programs are quite large and since our last 5 year review, we have seen some retirements. In order to offer the number of course sections needed by both our programs, we continually rely on lecturer support. We currently have 13 tenure track faculty members and 14 lecturers. For multiple years we have had two faculty searches that resulted in zero to one hire. Conditions negatively affecting our ability to recruit faculty include faculty workload, salary, and cost of living in the Bay area. Since our last

5-year review, however, we have successfully hired Drs. Ruan, Derakshandeh, Daneshyari and in spring 2021 Dr. Li.

Section ii:
Despite a challenging year, faculty have been active in their professional development. In total there were 18 publications by faculty in the department. Several faculty members were awarded grants from NSF and LBNL. Faculty also participated in conferences and variety of technical presentations and talks sponsored by IEEE, SPI, SIGCSE, ACM and others. Also attended were campus recruiting and training events led by CISCO, QUEST, NDG, Microsoft, and Google Cloud.

The final draft of our Departmental bylaws was approved in August 2021.

Part iv of our faculty 5 year plan addressed faculty workload under semesters. The Chair of our department, Dr. Ertaul, has been attentive with scheduling allowing faculty to teach multiple sections of required courses and providing assigned time, when possible, to faculty who are completing research projects with students.

C. Program Changes and Needs

Report on changes and emerging needs not already discussed above. Include any changes related to SB1440, significant events which have occurred or are imminent, program demand projections, notable changes in resources, retirements/new hires, curricular changes, honors received, etc., and their implications for attaining program goals. Organize your discussion using the following subheadings.

Overview:
Curriculum:
Students:
Faculty:
Staff:
Resources: *(facilities, space, equipment, etc.)*
Assessment:
Other: *(e.g., major program modifications)*

Overview:

With our new curriculum and new elective courses, we feel that we are addressing student needs and training them appropriately to be industry leaders. With both a large graduate (164) and undergraduate program (763), we continue to struggle with finding faculty and lecturers to teach the number of sections needed to support our programs. Our Chair, Dr. Ertaul has been conducting “town hall” meetings to assess student concerns and expectations so that the department can address them appropriately. Resources such as funds for faculty research and travel, teaching assistants, and a dedicated information technician continue to be important issues for the department.

Curriculum:

The graduate curriculum under semesters was changed to require 5 courses in the areas of Algorithms, Complexity, Web, Operating Systems, and Cyber security. In the past most students took comprehensive exams as their capstone experience with a small percentage writing a thesis. The new capstone project option is gaining popularity with students. The project provides a research experience that can be completed within a semester time frame. Students following the project option are required to write a paper, produced software, and give an oral presentation. Drs. Varickson and Ruan have offered new graduate courses in their related fields, and we hope that Dr. Li will be able to offer a new class in natural language programming in the coming year. A new Computer Networks (Cisco) and Network Security (CNNS) lab has been created in VBT 218 with specialized equipment to support our Advanced Networking and Network Security and Cybersecurity classes. An Extended Reality (XR), AI and Machine Learning lab funded by A2E2 is also being designed planned for the coming year. A new Parallel Computing course (CS 607) was offered for the first time this past year.

Students:

As mentioned, we had 164 graduate students enrolled in Fall 2020. Most students are international students from India and China. The pandemic forced many embassies to close making access to student visas difficult. Many of our Fall 2020 stayed in their home countries and faced challenging time zone differences when taking courses. Many of our admitted students deferred to Spring 2021. In Fall 2020, we experienced a small reduction in student enrollment, but had increased enrollment in Spring 2021. We are continuing to see an increase in interest in our graduate program. In Fall 2020 we offered 18 graduate course sections in Spring we had 16 sections. To accommodate immigration policies, we needed to ensure that our international students were able to take one on-ground course during the Spring 2021 semester. Luckily staff and faculty were willing to come to campus to teach. We continue to struggle with an insufficient number of faculty and staff to lead the number of course sections needed to support both the graduate and undergraduate student populations. Finally, we would like to build stronger ties with industry to provide internships for students as well as scholarships to ease student's debt. To support this, we have re-activated our industry board.

Faculty: as of spring 2021

Name	**Time Base**
Brown, Kevin	1.0
Christianson, Leann	1.0
Daneshyari, Moayed	1.0
Derakshandeh, Zahra	1.0
Erickson, Varick	1.0

Ertaul, Levent	1.0
Hongmin Li * new hire 2021	1.0
Grewe, Lynne	1.0
Johnson, Matt	1.0
Roophavar, Farzan	1.0
Xiaojun, Ruan	1.0
Yang, David	1.0
Zhong, Fay	1.0
TOTAL FTEF	13.0

We currently have 13 tenure track faculty members and approximately 14 lecturers. Dr. Fay Zhong was on sabbatical leave during the 2020-2021 year. Recruitment continues to be an issue for our department due to sections needed to support our large graduate and undergraduate programs which total 925 students. In Fall 2021 our department offered 63 undergraduate sections of which 53 were taught by lecturers or FERP faculty. Graduate sections in Fall 2020 numbered 18 with 5 taught by lecturers with PhD credentials. In Spring 2021 we offered 64 undergraduate sections and labs of which 41 were taught by lecturers or FERP faculty. Spring 2021 graduate sections numbered 16 with 8 taught by lecturers with PhD credentials or FERP faculty. We were able to hire Dr. Hongmin Li in Spring 2021. Her expertise is Natural Language processing, and she is the first in our department with that specialty. We are currently searching for two new tenure track faculty for the 2021-2022 academic year. Salary disparities between academic and industry positions, the high cost of living in the Bay area, and workload continue to be the reason faculty applicants reject tenure track positions offered by our department. In Spring 2021 the David Valdovinos and Stephanie Carr Computer Science Faculty Excellence Award was given to one of our faculty members, Dr. Moayed Daneshyari.

Staff:

Ms. Janet Snyder and Ms. Stephanie Wiley are our department support staff. Ms. Wiley as our office assistant maintaining scheduling and the budget. Ms. Snyder works with both the Computer Science and Math graduate programs and performs undergraduate advising. Both Ms. Wiley and Ms. Snyder normally have student support workers to help with their duties, however we were unable to hire any student support over the last year. Ms. Snyder had to take on application processing (finding transcripts and test scores and preparing this information for the graduate coordinator. As there were x application over the academic year, this was a large increase in workload. Our department would like the ability to hire a student worker to help with this process. Computer Science has one technology support person, Mr. Brian Campbell, who is shared with the College of Science. A dedicated technology person would be preferred

as computer science has multiple labs and specialized equipment, and Mr. Campbell is overscheduled with his duties helping other College of Science faculty and staff.

Resources: *(facilities, space, equipment, etc.)*

Computer Science is a lab science and lab experiences enhance student learning. Two new labs were recently created in VBT 218. Cisco networking academy for Computer Networks, Network Security, Cyber security, Advanced Computer Networks and IoT laboratories. These labs are up and running currently. Drs. Zhong, Ruan and Li were awarded an A2E2 grant in which funds will be used to implement an Extended Reality lab, however, space has not yet been allocated to the department for this lab.

To facilitate these labs the Computer Science department in needs of a dedicated Information Technology administrator. Our current administrator is shared with the faculty and programs of the College of Science.

Other resources that would benefit the department include travel funds for research conferences and presentations, funds for student activities such as clubs and hackathons, funds for teaching assistants and graders, and funds for research equipment, software, and classroom needs.

Assessment:

Semester conversion allowed the department to standardize and organize assessment practices. We are on our way to better address the assessment needs of the College and the University. Our assessment process is addressed below.

Other: *(e.g., major program modifications)*

New WASC rules require any program in which a course is taught in the on-line modality will need to apply for online program approval. We are moving forward with this change and will also update all course modalities to allow for on-ground and hybrid options. We are updating the catalog description for two courses, Advanced Algorithms (CS 601) and Machine Learning (CS 667). In addition, we will no longer be cross listing Machine Learning with Math. Finally, we are adding a new graduate course in Cryptography.

II. <u>SUMMARY OF ASSESSMENT</u> *(suggested length of 1-2 pages)*

A. Program Learning Outcomes (PLO)

List all your PLO in this box. Indicate for each PLO its alignment with one or more institutional learning outcomes (ILO). For example: "PLO 1. Apply advanced computer science theory to computation problems (ILO 2 & 6)."
Program Learning Outcome(S) Assessed. *List the PLO(s) assessed. Provide a*

brief background on your program's history of assessing the PLO(s) (e.g., annually, first time, part of other assessments, etc.)

PLO1 Apply knowledge of mathematics and computational theory to analyze problems in computer science and assess and determine the resources and requirements needed for their solution.
ILO1: Quantitative Reasoning
ILO2: Communication
Class Assessed: CS 611 Theory of Computation – 2018-2019

PLO2 Design, develop, and evaluate a computer-based system, process, component, or program to meet desired needs.
ILO1: Quantitative Reasoning; ILO4: Collaboration
Class Assessed: CS 651 Web Development 2019-2020

PLO3 Classify and explain the mechanisms, components
and architecture of computing systems.
ILO1: Quantitative Reasoning
Class Assessed: CS 621 Operating System – 2020-2021

PLO4 Employ current techniques, skills, and tools
necessary for computing practice and justify the need for continuing professional development.
ILO1: Quantitative Reasoning
Class Assessed: CS 601 Advanced Algorithms - 20201-2022

PLO5 Discuss professional, ethical, legal, and security
issues and responsibilities, and the impact of computing on individuals, organizations, and society.
ILO1: Quantitative Reasoning
ILO2: Communication
Class Assessed: CS 601 Advanced Algorithms - 2021-2022

PLO6 Function successfully on teams to accomplish a
common goal and explain computer science concepts effectively in written and oral form.

ILO1: Quantitative Reasoning

ILO2: Written Communication

Class Assessed: CS 671 Cybersecurity 2022-2023

We assess the Computer Science program in five courses that are required for all students. We assess these courses each semester and have a 5 year plan for assessing the ILOs that are associated with a particular course each year. As part of semester conversion standard summative assessments were created for each course. The assessment includes multiple-choice questions that students complete at the end of the course. The assessments are deployed through Blackboard. A score of 60% proficiency was chosen to indicate that a student has met expectations for a particular PLO.

B. Summary of Assessment Process

Summarize your assessment process briefly using the following sub-headings

Instrument(s): *(include if new or old instrument, how developed, description of content)*
Sampling Procedure:
Sample Characteristics:
Data Collection: *(include when, who, and how collected)*
Data Analysis:

Instrument(s):

We assess the Computer Science program in five courses that are required for all students. These include CS 601 Advanced Algorithms, CS 611 Theory of Computation, CS 621 Operating Systems Design, CS 651 Web Systems, and CS 671 Cybersecurity. We assess these courses each semester and have a 5-year plan for assessing the ILOs that are associated with a particular course each year. Summative assessments include multiple-choice questions that students complete at the end of the course. The assessments are deployed through Blackboard. A score of 60% proficiency was chosen to indicate that a student has met expectations for a particular PLO. Elective courses are not assessed.

Sampling Procedure:

Each assessment has 10 questions. Scores range from 0 – 100.
Each professor is responsible for gathering the assessment results and uploading the results to a shared department Google assessment drive. Faculty have had some issues

with the process, and we were able to gather statistics for 3/5 required courses this past year.

Results gathered in the academic 2020-2021 year are for the following courses:

CS 601 Advanced Algorithms, PLO4
CS 611 Theory of Computation, PLO1
CS 621 Advanced Operating Systems, PLO3

Sample Characteristics:

CS 601 Advanced Algorithms, PLO4 -- Min 60 Max 100 Average 85
CS 611 Theory of Computation, PLO1 -- Min 80 Max 100 Average 88
CS 621 Advanced Operating Systems, PLO3 -- Min 50 Max 100 Average 87

Data Collection: *(include when, who, and how collected)*

Data was collected during the last two weeks of the Fall 2020 and Spring 2021 semester through Blackboard assessment and analysis tools

Data Analysis:

Instructors are asked to evaluate the results of their assessments and to consider adjustments to their lecture topics when a specific PLO or content area is flagged through the assessment as challenging for students. The assessment coordinator also evaluates assessment results and shares them with the graduate committee for areas of concern, curricular adjustments, and general comments.

During the 2020-2021 academic year oral communication was assessed at the ILO level. We do not have a course that maps to this ILO.

C. Summary of Assessment Results

Summarize your assessment results briefly using the following sub-headings.

Main Findings:
Recommendations for Program Improvement: *(changes in course content, course sequence, student advising)*
Next Step(s) for Closing the Loop: *(recommendations to address findings, how & when)*
Other Reflections:

Main Findings:

The assessment scores are in the 80th percentile which is well above the 60% chosen for proficiency. We are happy to see our students are mastering the concepts aligned with our program learning outcomes in these important required courses.

Recommendations for Program Improvement: *(changes in course content, course sequence, student advising)*

Currently, we do not see a need to change course content, sequence or advising.

Next Step(s) for Closing the Loop: *(recommendations to address findings, how & when)*

Our results were positive and show that students are learning content aligned with our PLOs in the classes assessed this academic year.

Other Reflections:

Our findings will be disseminated to the department graduate committee and then to the department at large. Working to ensure faculty and lecturers remember to complete the assessment process and upload results remains a challenge. We are looking for an easier more automatic way to retrieve and post results.

D. Assessment Plans for Next Year

Summarize your assessment plans for the next year, including the PLO(s) you plan to assess, any revisions to the program assessment plan presented in your last five-year plan self-study, and any other relevant information.

Based on our department's five-year assessment plan, our emphasis next year will be on PLO4 which is addressed in CS 601 Advanced Algorithms. We will not be assessing an ILO in the next year as the university is not assessing ILO quantitative reasoning in 2021-2022.

III. <u>DISCUSSION OF PROGRAM DATA & RESOURCE REQUESTS</u> *(suggested length of 2 pages)*

Each program should provide a one-page discussion of the program data available through University Dashboard. This discussion should include an analysis of trends and areas of concern. Programs should also include in this discussion requests for additional resources including space and tenure- track hires. Resource requests must be supported by reference to University Dashboard data.

Requests for tenure-track hires should indicate the area and rank that the program is requesting to hire. If a program is not requesting resources in that year, indicate that no resources are requested.

A. Discussion of Trends & Reflections Notable Trends;
Summarize and discuss any notable trends occurring in your program over the past 3-5 years based on program statistics (1-2 paragraphs). You may include 1-2 pages of supplemental information as appendices to this report (e.g., graphs and tables).

In Fall 2020 the Computer Science graduate program (164 students) ranked 5th in terms of largest graduate program at CSUEB behind Business Admin, Business Analytics, Teacher Credential, and Health care. (See Table 1). We have seen an increase from 515 applications in Fall 2020 to 823 applications for Fall 2021. We anticipate that there is demand following the pandemic and that interest will continue to increase. Students are primarily attracted to our program based on CSUEB's proximity to Silicon Valley which offers the opportunity for internships and hiring opportunities. See Table 2 for enrollment trends. The majority of students are female (61%) and identify as international (80%) or Asian (13%). See Tables 3 and 4.

Reflections on Trends and Program Statistics:
Provide your reflections on the trends discussed above and statistics and supplemental information presented in this report.

B. Request for Resources *(suggested length of 1 page)*

1. Request for Tenure-Track Hires: provide evidence from trends provided

   The Computer Science Department had 13 faculty and 14 lecturers in the 2020-2021 academic year. One faculty member finished FERP and one is on FERP. We regularly use two faculty members from the Engineering Department each semester to help staff our Computer Architecture courses.

   In Fall 2021 the Computer Science department offered 58 undergraduate course sections and 6 labs. Of these course sections 23 were taught by tenure track faculty. Therefore 64% of classes were taught by lecturers or FERP faculty. Graduate sections in Fall 2020 numbered 18 with 8 (44%) taught by lecturers with PhD credentials or FERP faculty. In Spring 2021 we had a similar situation with 61 undergraduate sections of which 41 were taught by lecturers or FERP for 64%. Spring 2021 graduate sections numbered 15 with 9 taught by lecturers with PhD credentials or FERP faculty (50%). It is imperative that we recruit more tenure track faculty to meet program and student needs.

2. Request for Other Resources

Computer Science needs office space for our new faculty hires. We have one new faculty member hired in Spring 2021 and are searching for two more in the next academic year. We have new funding for an extended reality lab and will need space to place the equipment. Funds to hire student helpers for our staff are necessary. Resources that would benefit the department include funds for teaching assistants and

graders, funds for research equipment, software, and classroom needs.
In addition, funds to support professional development activities for both students and faculty such as research conferences, presentations, clubs, and hackathons would be are needed.

Table 1

Graduate Overview | By College & Major | Drill Down

Graduate Enrollment by College and Program: All

		Fall 2016	Fall 2017	Fall 2018	Fall 2019	Fall 2020
CBE	Accountancy	41	37	30	46	60
	Business Administration	387	340	299	297	304
	Business Analytics	91	154	148	172	169
	Economics	31	32	38	25	21
	Total	550	563	515	540	554
CEAS	Counseling	106	106	93	99	123
	Curriculum and Instruction					23
	Early Childhood Education				14	14
	Education	93	80	43	43	
	Education - OTL	35	40	38	38	24
	Educational Leadership	116	116	117	91	125
	Educational Leadership Ed.D.	61	62	53	51	48
	Educational Technology			22	49	47
	eLearning					39
	Hospitality & Tourism	31	29	25	25	21
	Kinesiology	28	22	19	15	17
	Reading and Literacy					48
	Special Education	35	36	29	17	113
	Teacher Credential Program	301	294	283	321	378
	Total	806	785	722	763	1,020
CLASS	Anthropology	4				
	Communication	22	25	15	13	13
	English	46	44	25	7	
	Geography	4	2			
	Health Care Administration	218	267	215	248	239
	History	23	18	17	24	28
	Multimedia	17	17	19	14	18
	Music	21	17	11	16	15
	Public Administration	219	159	157	151	123
	Social Work	213	184	150	151	137
	Speech Language Pathology	122	112	103	94	86
	Teaching English to Speakers of Other Languages			4	11	11
	Total	909	845	716	729	670
CSCI	Biological Sciences	29	34	36	35	45
	Biostatistics	23	22	22	21	23
	Chemistry	23	21	20	19	25
	Computer Networks	29	13	3	1	
	Computer Science	211	216	153	156	164
	Construction Management	64	43	49	56	48
	Engineering Management	70	60	40	25	30

College
(All
CBE
CEA
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UNI

Funding
(All)
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CSCI	Biological Sciences	29	34	36	35	45
	Biostatistics	23	22	22	21	23
	Chemistry	23	21	20	19	25
	Computer Networks	29	13	3	1	
	Computer Science	211	216	153	156	164
	Construction Management	64	43	49	56	48
	Engineering Management	70	60	40	25	30

	Environmental Geosciences	11	12	11	15	15
	Mathematics	45	52	43	31	28
	Nursing (RN-to-Nursing Degree)			14	39	49
	Statistics	87	92	123	87	73
	Total	592	565	514	485	500
UNI	Interdisciplinary Studies/Special Major	1				
	Total	1				
TOTAL		2,858	2,758	2,467	2,517	2,744

Table 2 - Enrollment

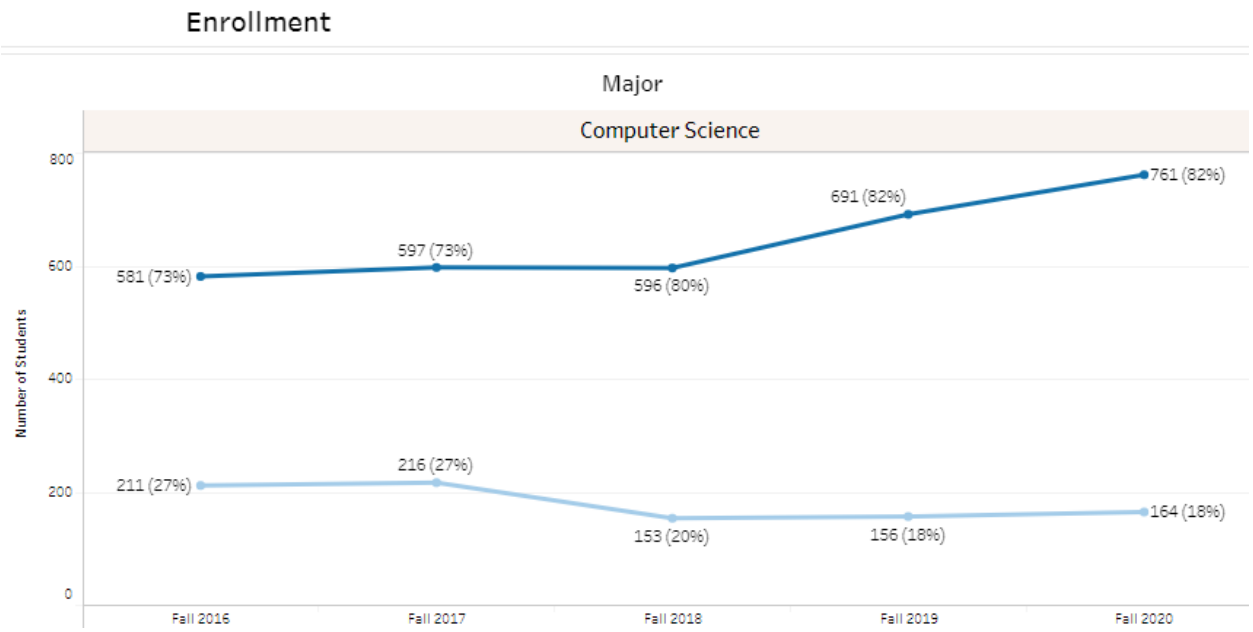

Table 3 Sex

Computer Science: Sex		Fall 2016		Fall 2017		Fall 2018		Fall 2019		Fall 2020	
		n	%	n	%	n	%	n	%	n	%
Graduate	Female	100	47%	102	47%	74	48%	80	51%	100	61%
	Male	111	53%	114	53%	79	52%	76	49%	64	39%
	Total	211	100%	216	100%	153	100%	156	100%	164	100%
Grand Total		211	100%	216	100%	153	100%	156	100%	164	100%

Table 3 Race

Computer Science: Race/Ethnicity		Fall 2016		Fall 2017		Fall 2018		Fall 2019		Fall 2020	
		n	%	n	%	n	%	n	%	n	%
Graduate	Asian	18	9%	14	6%	17	11%	15	10%	22	13%
	Black	1	0%								
	Hawaiian/PI					1	1%	1	1%	1	1%
	International	180	85%	188	87%	127	83%	129	83%	131	80%
	Latinx			2	1%	1	1%	1	1%	3	2%
	Multirace	1	0%	2	1%	1	1%	1	1%	1	1%
	Unknown	3	1%	4	2%	2	1%	1	1%		
	White	8	4%	6	3%	4	3%	8	5%	6	4%
	Total	211	100%	216	100%	153	100%	156	100%	164	100%
Grand Total		211	100%	216	100%	153	100%	156	100%	164	100%

Appendix B: Checklist for CAPR liaison who reviews the APR and guiding checklist for author of the annual program report.

NOTE TO CAPR REVIEWER:
Read the Annual Program Review submitted by the program by visiting the Five-year Reviews and Annual Reports by Department page on the Academic Senate website. Find the CAPR document that pertains to the last five year review (e.g. 08-09 CAPR 42). Read this document and identify the main issues raised by CAPR with respect to the five-year plan and the goals set for this program in the intervening five years to the next program review. Report back on the program and the degree to which the Annual Report a) addresses the five year planning horizon as appropriate, and b) addresses the specific elements as parsed out below (questions 1-4).

CAPR liaisons: please check the Annual Program Review, and identify whether the following information is included in the submitted report:

1. Does the Annual Program Review have a self-study?
   Yes___*(support with evidence starting with recommendations from last 5 year review, program learning outcomes, assessment strategies and results)*
   No___*(provide rationale for not including a self-study)*

2. Does the Annual Program Review record progress with departmental planning and review? Does it describe progress toward the program's defined goals, any problems reaching its goals, any revisions to goals, and any new initiatives taken with respect to goals?
   Yes___*(support with evidence)*
   No___*(support with rationale for not reporting in this section)*

3. Does the Annual Program Review detail progress on fulfilling programmatic needs? Does it record significant events which have occurred or are imminent, such as changes to resources, retirements, new hires, curricular changes, honors received, online programs, loss of faculty, changes in enrollment, etc.?
   Yes___*(support with evidence)*
   No___*(support with rationale for not reporting in this section)*

4. Does the Annual Program Review have a summary of assessment results and ensuing or necessary revisions?
   Yes___*(support with evidence)*
   No___*(support with rationale for not reporting in this section)*

5. Program learning outcome(s) (PLO) was/ were assessed:

Yes___*(support with evidence)*
No___*(support with rationale for not reporting in this section)*

6. Assessment instrument(s) was/ were used to measure this PLO and clearly indicated:
   Yes___*(support with evidence)*
   No___*(support with rationale for not reporting in this section)*

7. Participants/ courses were sampled to assess this PLO and clearly indicated:
   Yes___*(support with evidence)*
   No___*(support with rationale for not reporting in this section)*

8. Assessment results were obtained, highlighting important findings from the data collected:
   Yes___*(support with evidence)*
   No___*(support with rationale for not reporting in this section)*

9. Assessment results were (or will be) used as well as any revisions to the assessment process are clearly indicated:
   Yes___*(support with evidence)*
   No___*(support with rationale for not reporting in this section)*

10. Annual Program Review contains a reflection upon progress made and changes with respect to the program learning outcomes assessment plan that is reported on in the five-year review self-study.
    Yes___*(support with evidence)*
    No___*(support with rationale for not reporting in this section)*

11. Annual Program Review includes information about any associated minor(s).
    Yes___*(support with evidence)*
    No___*(support with rationale for not reporting in this section)*

12. Annual Program Review includes a discussion of program data?
    Yes___*(support with evidence)*
    No___*(support with rationale for not reporting in this section)*

13. Annual Program Review includes a request for additional resources including tenure-track hiring requests with support from program data. (Note: for programs submitting a 5-Year Academic Review in the same academic year, this is the only section required to be submitted by October 1st).
    Yes___*(support with evidence)*
    No___*(support with rationale for not reporting in this section)*