



Instructional Annual Program Review and Planning Update Form Fall 2023

BACKGROUND:

Program review is an integral part of the campus planning process. As programs and areas monitor their progress on the current comprehensive four-year program review, changes in need and scope can be expected. This Annual PR Update form is designed to outline and request modifications to the current program review that occur between comprehensive four-year review cycles, as needed.

Examples of a requested change include new information such as action plans, outcomes modifications, personnel changes, technology needs, and capital expenditures requirements. As programs and areas monitor their progress on the previous comprehensive four-year program review, the form provides the basis to suggest a change in plans and processes to improve student success and institutional effectiveness.

DIRECTIONS:

This form shall be completed annually by **all** programs.

- Instructional programs must submit their Annual Program Review Update form to their dean by 5pm on Monday, November 27, 2023.
- Deans will forward the completed form to the Program Review and Planning Committee Chairs by 5pm on Monday, December 4, 2023.
- Questions or concerns?
 - Committee contacts:
 - Co-chairs Mary Bogan (mbogan@fullcoll.edu) and Bridget Kominek (bkominek@fullcoll.edu)
 - Division representatives on the [Program Review and Planning Committee](#)
 - [Office of Institutional Effectiveness](#)

SUBMISSION:

Program: Computer Information Systems Division: Business & CIS Date: 11/27/23

We have reviewed our most recent self-study and **have not identified** any significant changes that necessitate resource requests for the upcoming academic year. (*Complete part 1 only*)

We have reviewed our most recent self-study and **have identified** significant changes that necessitate additional resource requests, which are attached in our submission. (*Complete parts 1 and 2*)

Principal Author Signature: *Anna Carlin* Printed Name: Anna Carlin Date: 11/27/23

Dean Signature: *Carlos Ayon* Printed Name: Carlos Ayon Date: 12/1/2023

Part 1: Review of Data

Institution Set Standards (ISS)

1. Use the data provided by the Office of Institutional Effectiveness (OIE) to review your course completion and success rates and provide a comparison to the Institution Set Standards for course completion and success rates.

Based on the data below, both the CIS and CISG programs overall meet or exceeds the Institution Set Standards for both course completion and success rates. However, there are individual classes in the CIS and CISG program that are well below standard that will be reviewed and compared to those courses that exceed the Institutional Set Standards for completion and success by reviewing:

- Course Materials - Ensure that course materials represent diverse perspectives, cultures, and voices. Include readings, case studies, and examples that resonate with underrepresented groups.
- Inclusive Teaching Practices - Implement teaching strategies that foster inclusivity, such as group discussions, collaborative projects, and active learning.
- Feedback and Assessment - Collect feedback from underrepresented students regularly to understand their experiences in the course. And, use diverse assessment methods that cater to different learning styles and backgrounds.
- Community Engagement and Partnerships - Engage guest speakers or professionals from diverse backgrounds to provide real-world perspectives.
- Continuous Improvement - Regularly assess and adapt teaching methods based on student feedback and outcomes.



Instructional Program Review Annual Update Data AY 2022/2023

Change View

- Overall
 Disaggregated

Program

Computer Information Systems

Completion Set Standard	Completion Aspirational Goal	Success Set Standard	Success Aspirational Goal
74.1%	86.7%	62.0%	78.3%

Course Success and Completion by Program

Subject	Enrollments	Avg. Success	Success Standard	Avg. Completion	Completion Standard
CISG	272	65.1%	+	88.2%	++
CIS	1,956	64.6%	+	81.2%	+

Course Success and Completion by Course

Course	Enrollments	Avg. Success	Success Standard	Avg. Completion	Completion Standard
CIS 120 F	16	31.3%	Below Standard	56.3%	Below Standard
CISG 160 F	14	35.7%	Below Standard	57.1%	Below Standard
CIS 221 F	13	61.5%	Below Standard	61.5%	Below Standard
CIS 154 F	35	51.4%	Below Standard	62.9%	Below Standard
CISG 185 F	9	66.7%	+	66.7%	Below Standard
CIS 103 F	71	56.3%	Below Standard	69.0%	Below Standard
CIS 104 F	10	60.0%	Below Standard	70.0%	Below Standard
CIS 153 F	14	64.3%	+	71.4%	Below Standard
CIS 230 F	19	73.7%	+	73.7%	Below Standard
CIS 223 F	23	52.2%	Below Standard	73.9%	Below Standard
CIS 180 F	118	73.7%	+	77.1%	+
CIS 226 F	88	76.1%	+	77.3%	+
CIS 109 F	79	59.5%	Below Standard	78.5%	+
CIS 142 F	20	60.0%	Below Standard	80.0%	+
CIS 168 F	20	75.0%	+	80.0%	+
CIS 228 F	5	80.0%	++	80.0%	+
CIS 290 F	25	72.0%	+	80.0%	+
CIS 111 F	346	58.7%	Below Standard	80.6%	+
CIS 152 F	64	78.1%	+	81.3%	+
CIS 183 F	23	69.6%	+	82.6%	+
CIS 106 F	52	65.4%	+	82.7%	+
CIS 100 F	409	59.7%	Below Standard	83.4%	+
CIS 160 F	68	76.5%	+	83.8%	+
CIS 217 F	27	77.8%	+	85.2%	+
CISG 110 F	75	66.7%	+	85.3%	+
CIS 201 F	232	66.4%	+	85.3%	+
CIS 165 F	43	69.8%	+	86.0%	+
CIS 222 F	16	87.5%	++	87.5%	++
CIS 181 F	21	33.3%	Below Standard	90.5%	++
CIS 171 F	11	63.6%	+	90.9%	++
CISG 101 F	22	63.6%	+	90.9%	++
CISG 100 F	152	67.1%	+	93.4%	++
CIS 166 F	42	76.2%	+	95.2%	++
CIS 107 F	46	80.4%	++	95.7%	++

2. If your program meets or exceeds the standard for completion and success, to what do you attribute your success? If your program does not meet this standard, please examine the possible reasons, and note any actions that should be taken, if appropriate.

The CIS program overall exceeded the institutional standard set for success and completion. Reasons for this could be attributed to:

- Flexible scheduling of times and instructional modes – daytime, evenings, online, hybrid,

- and on-campus
- Offering a variety of CIS discipline certificates
 - Initiate Instructional Success Team review of high-enrollment courses CIS 100 and CIS 111
 - Improved tutoring support for CIS general classes
 - Improved tutoring support for CIS programming classes
 - Toward the end of the semester, Instructors review of the curriculum and suggested next courses
 - CISG course assessments are short answers rather than multiple choice questions
 - Live recording of notes for in-class lectures to be posted online
 - Remote lab environments for conducting homework assignments
 - Student contact – use Discord or other social media to enable students to communicate with each other
 - Weekly programming exercises conducted in class

Institutional Student Learning Outcomes (ISLOs)--Global Awareness ISLO.

1. Describe your program's participation in assessment of Institutional Student Learning Outcomes (ISLO's). Specifically, how does your CSLO attainment, for the courses that are mapped to the Global Awareness ISLO, compare to Fullerton College's ISLO attainment? (After August 15, you will be able to access PDF copies of your program's ISLO data here: [ISS ISLO Documents](#). The folder will also include instructions to access Tableau dashboards with the same information. Please reach out to your SLOA representative if you have questions.)

When reviewing the CIS Department's overall ISLO attainment, we Meet Expectations over 95% and Does Not Meet Expectation anywhere from 3.9% to 4.44%.

For the Global Awareness ISLO, the CIS Department Meets Expectation was 96.10%.

Overall by ISLO for Department: Business Div. » Computer Information Systems Dept.

	Greatly exceeds expectations.		Exceeds expectations		Meets expectations		Does not meet expectations but developing		Does not meet expectations	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Communicate clearly and appropriately for a variety of purposes and audiences.	0	0.00%	0	0.00%	653	96.03%	0	0.00%	27	3.97%
Analyze and synthesize data/information in a variety of forms (numerical, textual, graphic) for the purpose of interpretation, problem-solving, and decision-making.	0	0.00%	0	0.00%	653	96.03%	0	0.00%	27	3.97%
Analyze the interconnectedness of racial, cultural, political, social, economic, and environmental issues from multiple perspectives and recognize the individual agency and collective responsibility necessary for positively influencing those systems.	0	0.00%	0	0.00%	493	96.10%	0	0.00%	20	3.90%
Interpret, appreciate, and create artistic forms of knowledge and expression.	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Articulate personal values and goals as well as explain the skills, mindsets, and behaviors necessary to achieve well-being and professional success.	0	0.00%	0	0.00%	688	95.56%	0	0.00%	32	4.44%

2. Does the SLO data show significant achievement gaps among demographic groups in your program? If so, where are the gaps and what steps can your program take to shrink them? If not, to what do you attribute your success in minimizing the achievement gap?

Completion Set Standard	Completion Aspirational Goal	Success Set Standard	Success Aspirational Goal
74.1%	86.7%	62.0%	78.3%

Course Success and Completion by Program

Subject	Race/Ethn	Enrollments	Avg. Success	Success Standard	Avg. Completion	Completion Standard
CISG	Asian	56	71.4%	+	85.7%	+
	Black/African ..	6	33.3%	Below Standard	83.3%	+
	Hispanic	106	61.3%	Below Standard	91.5%	++
	Native American	1	0.0%	Below Standard	100.0%	++
	Two or More	22	59.1%	Below Standard	86.4%	+
	Unknown/Decli..	12	50.0%	Below Standard	83.3%	+
	White	69	73.9%	+	87.0%	++
CIS	Asian	286	75.5%	+	87.8%	++
	Black/African ..	72	45.8%	Below Standard	80.6%	+
	Filipino	15	80.0%	++	86.7%	+
	Hispanic	976	62.5%	+	78.6%	+
	Native American	4	50.0%	Below Standard	50.0%	Below Standard
	Pacific Islander	5	80.0%	++	100.0%	++
	Two or More	204	64.7%	+	79.4%	+
	Unknown/Decli..	64	51.6%	Below Standard	76.6%	+
	White	330	67.0%	+	85.5%	+

While the overall completion and success for both the CIS and CISG program comprised of 2593 students have been stellar, based on the table to the left we have been unsuccessful in some Races/Ethnicities. The CIS program Completion Rate for four Native Americans consisted of two students being unsuccessful when taking CIS 111 and CIS 217. Regarding CIS Success rates, 72 Black/African American students averaged 45.8%, 4 Native American consisted of 2 students taking CIS 111 and CIS 217 (similar note regarding CIS completion rate) averaged 50%, and 64 Unknown/Declined to State students averaged 51.6%.

A detailed review of the Black/African American and Unknown student categories Success Rates was performed at the course level, and the following was found:

Course	Black/African American		Unknown/Declined to State	
	Number	%	Number	%
CIS 100	19	31.60%	19	42.10%
CIS 103	5	80%	6	33.33%
CIS 104	2	50%	0	N/A
CIS 107	0	N/A	1	100%
CIS 109	2	100%	2	0%
CIS 111	19	31.60%	6	50%
CIS 142	0	N/A	1	0%
CIS 152	0	N/A	2	50%
CIS 153	1	0%	2	100%
CIS 154	0	N/A	3	0%
CIS 160	1	0%	0	N/A
CIS 165	1	100%	2	100%
CIS 166	0	N/A	2	100%
CIS 168	0	N/A	2	100%
CIS 171	1	100%	0	N/A
CIS 180	5	60%	2	100%

CIS 181	1	0%	1	0%
CIS 201	7	57.10%	9	77.87%
CIS 217	0	N/A	1	0.00%
CIS 221	1	100%	0	N/A
CIS 223	1	0%	1	0%
CIS 226	1	0%	2	0%
CIS 230	1	100%	0	N/A
CISG 100	4	25%	4	50%
CISG 101	2	50%	1	0%
CISG 110	0	N/A	6	50%
CISG 185	0	N/A	1	100%

For the Black/African American and Unknown student categories, the CIS courses that need more in-depth focus on success and completion rates are CIS 100, CIS 111, CIS 201, CISG 100, and CISG101. Except for CIS 201, please note that these courses are typically taken by first semester/year college students who may not understand the amount of time required to successfully complete the course. CIS 201 is the first programming course in the CIS curriculum that is challenging and requires a significant amount of time outside of the classroom to be successful. Programming is much like learning to play a musical instrument, students need to practice, practice, and practice.

Part 2: Additional Resource Request Reasoning and Support

For each separate resource request, complete steps A, B, and C.

The CIS department has several requests, in no order of importance:

- Full time Faculty
- Emerging Technology Lab
- Gaming Program Support
- Drone Program Support
- Instructional Support-1
- Emergency Safety
- Instructional Support-2

Full time Faculty

Step A: Briefly describe the request.

Three additional full time faculty positions to support Programming, Gaming, Cybersecurity, Web Design and Development, Cloud (new), Data Analytics (new), Artificial Intelligence, Robotics, and Autonomous Device Programming curriculum. The CIS Department ranked 4th college-wide in the issuance of 87 certificates and 3rd in Fall 2022.

Step B: Answer the following questions:

1. Is it imperative that this resource request be processed now rather than during the next comprehensive program review? Why?

It is imperative that we do it now to continue the growth of the CIS department in light of rapid technological changes, we need additional full time faculty positions.

2. How will this additional resource allocation specifically enhance your program's services, activities, processes, etc. to continue or improve student learning and achievement?
- Is the resource request personnel-related? If so, please provide evidence to justify the requested positions such as retirements, program growth or curricular demands, full-time/adjunct ratios, etc.

A. The CIS department subsists with **4.5 full-time faculty** following a reduction of **45%** (almost half!) from 2018 due to retirements. **Currently, two full-time faculty members in the department are retirement age. It's possible that, within the coming five years, retirements within the CIS department may lead to a potential reduction in the count of full-time faculty to just one or one and a half, to accommodate CIS, CISG, and the new CYBR program.**

B. For every full-time faculty member, there will be 3 adjuncts. Full time faculty are absolutely critical in order to not only teach course and develop curriculum but help create and guide new programs. Because technology in this area is changing so quickly, new programs and revisions to existing programs must be done on a regular basis. Adjunct Faculty cannot be expected to perform these tasks and full-time Faculty that are required to teach a full overload schedule in order to maintain the CIS department, do not have the time to create and revision programs. In addition, a significant amount of time is spent posting the job opening, marketing the job opening, selecting candidates to interview, interviewing them (2 rounds), and selecting candidates. While the candidates are being onboarded, the department coordinator begins working with them on preparing for their class, orienting them to FC policies and procedures, etc. The time spent on the recruitment, care, and maintenance of adjuncts is often overlooked.

C. The data provided is for the whole CIS department but does not reflect the challenges of the multiple career paths with varied skills built upon the programming foundation. The CIS programs **cannot** hire adjuncts to teach and consequently may not be able to offer all the required classes necessary for students to complete their degrees and certificates. We have 11 adjunct instructors of which 3 are only available for online instruction due to their day jobs and their location. Compounding all of this, it is difficult to attract and retain adjunct instructors in such a high-demand/high-paying field of CIS. We hired three adjuncts this semester and one quit the first week due to the lack of access to FC online resources and the time needed to prepare adequately for the class. A second adjunct instructor has declined to handle administrative tasks related to teaching a course (such as teacher evaluation). Both adjuncts are experts in their respective fields and stated that their full-time job projects demanded a substantial amount of their time, making it challenging to dedicate ample attention to their teaching commitments. The remaining adjunct teaches at another community college and has teaching experience in the community college environment.

D. Our National Center of Academic Excellence in Cyber Defense (NCAE-CD) designation from the NSA and DHS requires an annual report of the Cybersecurity program which includes the retention and recruitment of experienced faculty to develop and teach cybersecurity courses. Upon renewal in 2027, we could risk losing our NCAE-CD designation if qualified faculty cannot support the program.

E. Based on input from our industry advisory committee meetings, programming skills are foundational to careers in cybersecurity, cloud computing, and data analytics.

F. In accordance with the data from the Bureau of Labor Statistics, the anticipated national average employment shift from 2022 to 2032 stands at 2.8%. However, the CIS occupations listed below surpass this national employment change by a significant margin, projecting remarkable median annual earnings of \$110,993.

Bureau of Labor Statistics Fastest Growing Occupations 2022 and projected 2032 https://www.bls.gov/emp/tables/fastest-growing-occupations.htm						
2021 National Employment Matrix title	Employment, 2022 (in thousands)	Employment, 2032 (in thousands)	Employment change, 2022-32 (in thousands)	Percent employment change, 2022-32	Compared to Projected National Average Employment Change (2.8%)	Median annual wage, 2022
Software and web developers, programmers, and testers (Summary)	2,159.4	2,628.6	469.2	21.7%	7.75x	\$114,190
Software developers	1,594.5	2,004.9	410.4	25.7%	9.2x	\$127,260
Information security analysts	168.9	222.2	53.2	31.5%	11.25x	\$112,000
Network and computer systems administrators	339.9	348.2	8.3	2.5%	1.12x	\$90,520
Total, all occupations	4,262.700	5,203,900	941,200	18%	6.4x	\$110,992.50 AVG

Nearly the entire globe is either connected or quickly seeking ways to increase connections. CIS offers many different benefits, such as:

- **Cybersecurity:** Developers build the solutions we need to keep our online interactions safe from threat actors. Mastery of different programming languages and attack techniques helps students launch their careers in this high-demand field. Nationally there are over 663,000 open positions in cybersecurity, of which, over 69,000 are in California, and over 22,000 are in our local areas of Los Angeles, Long Beach, and Anaheim (cyberseek.org).
- **Data science and artificial intelligence:** This field is projected to grow 35.2% (more than 12 times the national average) by 2032 and needs software engineers to build environments suitable for processing and visualizing the data necessary to train models for data science and machine learning projects.
- **Web development and design:** Designers leverage computer programming skills to build online experiences in fields like eCommerce or entertainment. This field is expected to grow 33.5% (almost 12 times the national average) by 2032.
- **Gaming:** Creating games requires visual and interactive content to support, enhance, entertain and/or market products or services. With the evolution of augmented and virtual reality, programming and networking are heavily relied upon.

In summary, programming, networking, and cybersecurity are integrated into every facet of our lives, encompassing everything from the banking application on your phone to platforms like YouTube. Proficiency in programming is beneficial for job hunting, even for individuals not inclined towards technology-focused careers. It cultivates essential 21st-century transferable skills such as problem-solving and critical thinking, highly valued by employers. With automation on the rise, the demand for skilled professionals to develop and troubleshoot these tools remains crucial.

3. How will this additional resource allocation help you serve the college mission or strategic initiatives, and/or your program's goals for improvement, as stated in your last program review?

The college mission statement (as published on the college web site) is: "Fullerton College advances

student learning and achievement by developing flexible pathways for students from our diverse communities who seek educational and career growth, certificates, associate degrees, and transfer. We foster a supportive and inclusive environment for students to be successful learners, responsible leaders, and engaged community members.”

The College Learning core value is: “Growth – We create an environment where personal and professional growth is expected, supported, and rewarded for all members of our community. Intellectual Curiosity – We encourage each other to ask questions that drive further inquiry, research, and experimentation. Excellence – We hold ourselves accountable to high standards.”

The growth of the student needs to be supported by the growth of the learning tools, which in this case are the computers used to instruct. Career preparation is one of the missions of both the college and the community college system in California. This can be accomplished with equipment that matches current industry standards and the expectation of the students.

Step C: Complete this chart with details of the request:

Type of Resource	Requested Dollar Amount	Potential Funding Source It is only necessary to list potential funding forces if you are aware of specific grants/program funds appropriate to the request, such as Strong Workforce.
Personnel	3 Full time faculty	District Budget
Facilities		
Equipment		
Supplies		
Computer Hardware		
Computer Software		
Training		
Other		
Total Requested Amount:	To be determined	

Notes: None

Emerging Technology Lab

Step A: Briefly describe the request.

Four technicians and ongoing training, hardware and software to maintain the Emerging Technologies Lab in 523.

Step B: Answer the following questions:

1. Is it imperative that this resource request be processed now rather than during the next comprehensive program review? Why?

The Emerging Technology Lab request is a strategic investment that directly impacts the quality of education in our cybersecurity program and enhances student engagement. It improves the learning environment, provides crucial support to students, and ensures that the program stays current and effective in preparing students for the challenges of the rapidly evolving field of cybersecurity.

2. How will this additional resource allocation specifically enhance your program’s services, activities, processes, etc. to continue or improve student learning and achievement?
 - a. Is the resource request personnel-related? If so, please provide evidence to justify the requested positions such as retirements, program growth or curricular demands, full-time/adjunct ratios, etc.

Increased Hands-On Learning Experiences for Students is of vital importance to student engagement and on the job skills training. Additionally cyber “student” laboratory technicians can facilitate more hands-on learning experiences for increased student engagement. This is crucial in fields like cybersecurity, where practical skills are essential. With more technicians, students can engage in real-world simulations, exercises, and experiments, deepening their understanding of cyber concepts. Cyber laboratories require regular maintenance and updates to ensure all equipment and software are functioning optimally. Additional technicians can take on these responsibilities, ensuring that the lab infrastructure remains reliable and up to date, creating a seamless learning environment for students.

This resource request is not personnel related and is a program that provides students with an opportunity to gain valuable work experience as Professional Experts that will lead to them finding more permanent employment opportunities due to hands on experience and research that they conduct on their own. This is not a program for Adjunct Faculty or full-time FC classified personnel.

3. How will this additional resource allocation help you serve the college mission or strategic initiatives, and/or your program’s goals for improvement, as stated in your last program review?

Cybersecurity is a rapidly evolving field, and staying current with the latest technologies is crucial. Additional technicians can dedicate time to research and implement the latest tools and technologies into the curriculum. This ensures that students are exposed to cutting-edge practices, preparing them for the dynamic nature of the cybersecurity landscape. More technicians can facilitate more enhanced collaborative projects and activities among students. Group work is an essential component of many cybersecurity tasks, and having adequate support enables students to work effectively in teams, fostering collaborative skills and preparing them for real-world scenarios. Additional cyber laboratory technician resources is a strategic investment that directly impacts the quality of education in a cybersecurity program.

This will also meet the college mission statement of providing environments supporting student outcomes and enhancing student learning.

Step C: Complete this chart with details of the request:

Type of Resource	Requested Dollar Amount	Potential Funding Source It is only necessary to list potential funding forces if you are aware of specific grants/program funds appropriate to the request, such as Strong Workforce.
Personnel	\$66,000	
Facilities	\$10,000	
Equipment	\$25,000	

Supplies	\$15,000	
Computer Hardware	\$25,000	
Computer Software	\$40,000	
Training	\$10,000	
Other	\$80,000	
Total Requested Amount:	\$271,000	

Notes: None

Gaming Program Support

Step A: Briefly describe the request.

The Gaming program is successful in program completion and success (above the college average). As software and computer games change, upgrading hardware has become more important. The upgraded desktops will allow game design and game programming classes to be taught with current game engine software.

Step B: Answer the following questions:

1. Is it imperative that this resource request be processed now rather than during the next comprehensive program review? Why?

The Gaming program is successful in program completion and success (above the college average). As software and computer games change, upgrading hardware has become more important. The upgraded desktops will allow game design and game programming classes to be taught with current game engine software.

One of the most popular game engines is Unreal Engine version 5.0. The improvement in graphics that this program is capable of requires modern hardware.

Many modern games use a feature called Ray Tracing. The following image is not a photograph but is generated by a modern game engine (Unreal) using a technology called Ray Tracing. This calculates the path light takes from a source as it bounces off objects and casts shadows. The goal is to render images as realistic as possible.

The cup on the left uses ray tracing single bounce and the cup on the right using multiple ray tracing bounce. While a static image is easy to render using ray tracing, games that render such scenes in animation at 60 to 120 frames per second require a powerful game engine and powerful hardware. Modern hardware is required to develop such ray-traced games in addition to other features increasingly common to modern video games.



Without modern computing hardware, classes that teach features found in modern game engines cannot be offered. The rapid pace of development in the area of game engine technology impacts the ability to teach classes using modern game engines without suitable hardware. This will affect student enrollment, success, and completion rates. Since the game engine software is free, the bottleneck is the hardware. This hardware needs to be acquired as soon as possible.

The CIS department has been involved in providing classes at middle schools in Buena Park. In addition, there is significant interest in dual enrollment classes at various high schools. To sustain ongoing dual enrollment programs and enable the CIS department to maintain its support for current computer game technology, approval of these resources is essential before the upcoming program review cycle.

2. How will this additional resource allocation specifically enhance your program's services, activities, processes, etc. to continue or improve student learning and achievement?
 - a. Is the resource request personnel-related? If so, please provide evidence to justify the requested positions such as retirements, program growth or curricular demands, full-time/adjunct ratios, etc.

Modern games use current version of the major Game Engines. These include Unreal, Unity, Godot, and other game engines. In order to test and view the output from these game engines, the computers must be able to run modern video games. Some of the defining features of modern video games include a modern Graphics Processing Unit (GPU) and a modern Central Processing Unit (CPU). The current standard for these two features are:

GPU = Nvidia Graphics Cards – 30x or 40x series
CPU = Intel 12 or 13th generation with 32/64 GB of memory

In addition to regular computer games, the growing popularity of Virtual Reality (VR) games requires this level of hardware.

Improved hardware will enhance the following classes by allowing the game engine curriculum to be presented with current game engine software:

CISG 105 Intro Augmented Virt Reality – requires Unity and Unreal
CISG 112 Foundations of Game Engine Programming – requires Unity, Unreal, and Godot
CISG 110 Introduction to Game Programming – requires Godot
CISG 160 C#/Unity for Game Programming – requires Unity
CISG 165 C++/Unreal Engine for Game Programming – requires Unreal Engine

The upgraded hardware will support the curriculum for Unreal and Unity game engines at level 5.x. Students can learn modern game engine software on current generation hardware. This will make them more competitive in the job market and make the certificates in the Computer Gaming

program more relevant. The modern hardware will also make it easier to recruit students to the program.

3. How will this additional resource allocation help you serve the college mission or strategic initiatives, and/or your program’s goals for improvement, as stated in your last program review?

The college mission statement (as published on the college web site) is: “Fullerton College advances student learning and achievement by developing flexible pathways for students from our diverse communities who seek educational and career growth, certificates, associate degrees, and transfer. We foster a supportive and inclusive environment for students to be successful learners, responsible leaders, and engaged community members.”

The College Learning core value is: “Growth – We create an environment where personal and professional growth is expected, supported, and rewarded for all members of our community. Intellectual Curiosity – We encourage each other to ask questions that drive further inquiry, research, and experimentation. Excellence – We hold ourselves accountable to high standards.”

The growth of the student needs to be supported by the growth of the learning tools, which in this case are the computers used to instruct. Career preparation is one of the missions of both the college and the community college system in California. This can be accomplished with equipment that matches current industry standards and the expectation of the students.

Step C: Complete this chart with details of the request:

Type of Resource	Requested Dollar Amount	Potential Funding Source It is only necessary to list potential funding forces if you are aware of specific grants/program funds appropriate to the request, such as Strong Workforce.
Personnel		
Facilities		
Equipment		
Supplies		
Computer Hardware	\$154,500	Program Review
Computer Software		
Training	\$5,000	Program Review
Other		
Total Requested Amount:	\$159,500	

Notes: Need upgrades for the following programs - Gaming/Drone/AI/Data Analytics

- a. MSI Trident X2 Gaming Desktop,
- b. Intel Core i9-13900KF – Processing (CPU)
- c. RTX 4090 – Video (GPU)

- d. 64GB (32GB*2) - Memory
- e. 2TB SSD, - Solid state storage
- f. Wi-Fi 6E+BT, - Upgraded wifi
 - i. \$4900 x 30 = \$147,000 – Runs current game engine software
- g. HP M24fwa FHD Monitor – \$250 * 30 = \$7500 – needed to display modern 4K and HDR level game graphics

Drone Program Support

Step A: Briefly describe the request.

The Computer Information System department is currently working as part of the proposed Drone/Automatous Device program, which is planned as a bachelor's level program offered at Fullerton College. This will likely be a cross-divisional program offering classes in areas such as Geology, Radio/TV, Journalism, Geography, Theater, Art, Real Estate, Marketing, etc. Drone technology touches a wide area and many of the programs at Fullerton College can benefit from and can create curriculum for Drones and automatous devices.

One aspect of this program includes programming Drone/Automatous devices. These programming classes will be taught in the Computer Information Systems department and will require software and hardware in order to offer the classes.

Step B: Answer the following questions:

1. Is it imperative that this resource request be processed now rather than during the next comprehensive program review? Why?

Because a bachelor's level program is being developed at Fullerton College, it is important that these Drone resources are approved prior to the next program review cycle. The reason is that the Drone program requires a set of CIS courses that teach Drone programming, Drone design, and Drone mapping (configuring Drones to fly specific patterns). These classes will be taught at both the lower and upper division levels within the bachelor's program. To develop the curriculum required for this program, the CIS department needs the equipment.

In addition to supporting the bachelor's level Drone program, this equipment is needed to support the dual enrollment programs being developed with local high schools. There is significant interest in dual enrollment Drone courses and, since some high schools have Drone programs, the dual enrollment links make sense. Once the Fullerton College bachelor's program is in operation, these dual enrollment classes provide a pipeline of students to the bachelor's program and provide an opportunity for high school students to transition to Fullerton College and obtain a bachelor's degree.

2. How will this additional resource allocation specifically enhance your program's services, activities, processes, etc. to continue or improve student learning and achievement?
 - a. Is the resource request personnel-related? If so, please provide evidence to justify the requested positions such as retirements, program growth or curricular demands, full-time/adjunct ratios, etc.

For this curriculum to be developed, the set of drone hardware and software that students will use as part of the class must be established. The capabilities of the drones and/or automatous must be part of the curriculum development. If the program has smaller and less capable drones, then the curriculum must be adjusted to reflect this limitation. If the program has access to professional quality drone technology, then the curriculum created in various divisions can be adjusted to reflect this hardware capability.

3. How will this additional resource allocation help you serve the college mission or strategic initiatives, and/or your program's goals for improvement, as stated in your last program review?

Drone makers have their own drone programming and development software platforms. The leading

drone company is DJI (www.dji.com). All of the requested hardware is from this company and the drone development software (which is free) is also from this company. Giving students access to modern drone hardware from the leading drone maker will enhance their ability to get jobs in this area. Most companies are likely using drones from DJI and a familiarity with the drone software and the drone hardware from this company is critical.

The Drone/Automatous device program is new and is being developed as a Baccalaureate level program taught at Fullerton College.

The college mission statement (as published on the college web site) is:

Fullerton College advances student learning and achievement by developing flexible pathways for students from our diverse communities who seek educational and career growth, certificates, associate degrees, and transfer. We foster a supportive and inclusive environment for students to be successful learners, responsible leaders, and engaged community members.

This resource request will clearly meet the mission of the college to help students with their career growth. Without the ability of students to engage in hands-on operation of Drones/Automatous devices, the mission of supporting student growth and career advancement would be difficult.

Step C: Complete this chart with details of the request:

Type of Resource	Requested Dollar Amount	Potential Funding Source It is only necessary to list potential funding forces if you are aware of specific grants/program funds appropriate to the request, such as Strong Workforce.
Personnel		
Facilities		
Equipment	\$109,480	Program Review
Supplies		
Computer Hardware		
Computer Software		
Training	\$10,000	Program Review
Other		
Total Requested Amount:	\$119,480	

Notes:

Drone Needs:

- a. DJI Mini 4 Pro Fly More Combo (DJI RC 2) - \$1,099 x 20 = \$21,980 – these drones can be flown without getting a special FAA license. These will allow the students to start learning Drone programming without getting the FAA license
- b. DJI Mavic 3 Pro -- \$3200 x 20 = \$64,000 – these are professional level drones that do require an FAA license
- c. DJI Goggles Integra Motion Combo -- \$650 x 20 = \$13,000 – these are VR goggles that allow students to control a drone
- d. DJI RC -- \$350 x 30 = \$10,500 – these are upgraded hand-held remote control devices to manually control drones.

Instructional Support - 1

Step A: Briefly describe the request.

Portable HiFlex Carts for classes using a HiFlex (combine zoom with in-class presentations) modality. These carts are designed to be portable but to contain all of the necessary components to teach a HiFlex class. This includes lights, video capture, cameras, and other elements. In combination with the touch screen (which can be mounted in the classroom) the carts can connect through the demo stations. This allows the instructor to present an in-person lecture while at the same time streaming video and audio through a zoom on-line session.

Step B: Answer the following questions:

1. Is it imperative that this resource request be processed now rather than during the next comprehensive program review? Why?

Student enrollment and engagement are currently top priorities for the campus and for the District. Since the Covid shutdowns many students, as well as Faculty, have shifted to online and hybrid classes. Providing online zoom classes with a real-time connection to the classroom will benefit students. With the restructuring of Title V rules on degrees, creating combined Zoom and in-class sections should take top priority.

In addition to supporting student learning and success, creating more combined Zoom and in-class sections will ensure that our online sections meet the accreditation standards of regular and meaningful student contact as well as student-to-student interaction. (Students on zoom can interact with on-campus students during these HyFlex sessions.)

2. How will this additional resource allocation specifically enhance your program's services, activities, processes, etc. to continue or improve student learning and achievement?
 - a. Is the resource request personnel-related? If so, please provide evidence to justify the requested positions such as retirements, program growth or curricular demands, full-time/adjunct ratios, etc.

Many online classes are taught with limited or no access to real-time interactive sessions. Many of the CIS courses are complex and require much more student to instructor and student to student interaction. With the ability to engage with online students through Zoom while presenting material and answering both in-class and online questions, will greatly enhance our classes. In addition, the ability to move a HiFlex cart from room to room means that instructors that wish to use this instructional modality are not limited to special HiFlex room. All of the required equipment is on the cart.

3. How will this additional resource allocation help you serve the college mission or strategic initiatives, and/or your program's goals for improvement, as stated in your last program review?

The HiFlex carts will meet the goals from our last program review to enhance our online classes. It will allow for more classes that currently do not offer online sections to extend the material traditionally taught on-campus to online classes. This will capture more students that wish to take classes and will

improve the outcomes of our current online classes.

This will also meet the college mission statement of providing environments supporting student outcomes and enhancing student learning.

Step C: Complete this chart with details of the request:

Type of Resource	Requested Dollar Amount	Potential Funding Source It is only necessary to list potential funding forces if you are aware of specific grants/program funds appropriate to the request, such as Strong Workforce.
Personnel		
Facilities		
Equipment	\$34,763.44	
Supplies		
Computer Hardware		
Computer Software		
Training		
Other		
Total Requested Amount:	\$34,763.44	College or District Funds

Notes:

Description	Product Code	Quantity	Unit Price	Total Price
Canon EOS M50 Mark II Mirrorless Camera with 15-45mm and 55-200mm Lenses and Webcam Starter Kit (Black)	CAEM5022LKWS	4	1,018.00	4,072.00
Sony a6400 Mirrorless Camera with 55-210mm Lens Kit	SOA6400B55LK	2	1,148.00	2,296.00
Insta360 Link UHD 4K AI Webcam	INCINSTBJA	4	265.56	1,062.24
Sony AC Adapter for Select Sony Cameras	SOACPW20	2	90.70	181.40

Impact Double Ball Joint Head with Camera Platform Kit	IMCC131K	7	37.00	259.00
JOBY BallHead 3K PRO (Black/Charcoal/Red)	JOJB01568	4	45.32	181.28
Impact 20" Pivot Arm with Camera Platform Kit	IMBHE115PK	4	79.50	318.00
Tether Tools TetherPro Micro-HDMI to HDMI Cable with Ethernet (Black, 15')	TEH2D15BLK	3	36.89	110.87
Tether Tools TetherPro Micro-HDMI to HDMI Cable with Ethernet (Orange, 15')	TEH2D15ORG	4	36.89	147.56
Pearstone USB 2.0 Type A Male to Micro Type B Male Cable (Black) - 6' (1.8 m)	PECUAMUMBM6Q	4	5.19	20.76
Tether Tools TetherPro USB 2.0 A Male to Micro-B 5-Pin Cable (15', Orange)	TECU5430ORG	4	27.66	110.64
Pearstone USB-C 3.1 to USB-A Charge & Sync Cable (3')	PEUSB313CMA3	4	11.19	44.76
ZILR Hyper-Thin High-Speed Micro-HDMI to HDMI Cable with Ethernet (3.3')	ZI8KP60MC33	5	14.89	74.45
Kramer High-Speed HDMI 2.0 Cable (10')	KRCHMHM10	7	14.80	103.60
Elgato Cam Link 4K (Standard Packaging)	ELCL4KGCD	4	129.99	519.96
RGBlink mini-pro Dual-Channel 4K Video Switcher	RGMINIPRO	4	364.85	1,459.40
Elgato Stream Deck Mini	ELSTRMDKMINI	4	68.95	275.80

Xcellon 10-Port Powered USB 3.0 Slim Aluminum Hub with 3 Dual Data/Charging Ports	XCSH107H3HC2	4	55.59	222.36
RODE VideoMicro Ultracompact Camera-Mount Shotgun Microphone	ROVIDEOMICRO	4	42.00	168.00
Kofax (Nuance) HS-GEN-C Stereo Communication Headset with Dragon USB Adapter	KO29K61A3301	3	32.81	98.43
HyperX Cloud II Wired Gaming Headset (Black & Gunmetal)	HY4P5L9AA	3	81.04	243.12
Pearstone 3.5mm Stereo Male to Female Extension Cable (Black, 10')	PEMMSB110B	4	3.69	14.76
512 AUDIO 512-BBA Microphone Boom Arm	51512BBA	4	49.74	198.96
Oben MBH-11 Dual-Action Mini Ball Head with Arca-Style Quick Release Plate	OBMBH11	5	29.90	149.50
amaran COB 60x Video Light	AMAPA0225A10 Now Replced with AMAPA0020A20	4	162.00	648.00
Aputure Lantern Softbox (2.2')	APLANTERN	4	74.50	298.00
Kupo High Roller Stand (14')	KUKS300112	4	245.00	980.00
Impact 40" Extension Grip Arm (Silver)	IMKCP240	7	22.35	156.45
Impact 6" End Jaw Vise Grip	IMME106	5	30.95	154.75
Impact Grip Head for Lights and Accessories - 2.5" Diameter (Chrome)	IMKCP200	12	13.50	162.00
Impact Double-Ended Spigot	IMCA100	7	5.19	36.33

Impact Double-Ended Spigot with 5/8" Stud and 1/4"-20 Threads	IMSRP114	7	5.90	41.30
Impact Super Clamp with Ratchet Handle	IMCC106R	12	14.85	178.20
Furman SS-6B-PRO 6-Outlet Surge Protector (15')	FUSS6BPRO	5	42.27	211.35
Mount-It! Full Motion Monitor Truss/Pole Mount - Vesa 75x75 to 100x100 mm/32" Screen	MOI391	5	26.15	130.75
ASUS VS228H-P 21.5" LED-Backlit Widescreen Computer Display	ASVS228HP	4	132.75	531.00
CyberPower GC201 Extension Cord (6")	CYGC201	12	2.20	26.40
Impact Filled Saddle Sandbag (15 lb, Black)	IMSBFB15	11	16.45	180.95
BenQ RP7503 75" Class 4K UHD Educational Touchscreen LED Display	BERP7503	4	3,449.00	13,796.00
Kanto Living MTMA100PL Height-Adjustable Mobile TV Cart with Adjustable Shelf for 60-100" TVs	KAMTMA100PL	4	659.99	2,639.96
Pearstone DisplayPort 1.2a Cable with Latches (15')	PEDPDD1215	4	12.45	49.80
Pearstone USB 3.0 Type A Male Type B Male Cable - 15'	PEUSB3AB15	4	7.46	29.84
StarTech Active USB 3.0 Type-A Male to Type-B Male Cable (30')	STUSB3SAB10M	2	108.42	216.84
Kramer VGA Male to	KRCMGMGM25	4	43.19	172.76

VGA Male Cable (25')				
Kramer Flexible High-Speed HDMI Cable with Ethernet (Gray, 25')	KRCMHM25	4	43.50	174.00
Pelican Vault V300 Large Case with Lid Foam and Dividers (Black)	PEV300LLDB	5	88.99	444.95
On-Stage LSB-6500 Stand Bag	ONLSB6500	4	62.75	251.00
MultiCart RocknRoller R12STEALTH 8-in-1 All-Terrain Equipment Cart	MUR12STEALTH	4	229.99	919.96
Total			9,189.95	34,763.44

Emergency Safety

Step A: Briefly describe the request.

Install phones for emergency announcements in Rooms 520 and 522.

Step B: Answer the following questions:

1. Is it imperative that this resource request be processed now rather than during the next comprehensive program review? Why?

This is a safety issue. The Clery Act requires institutions to alert their campuses by issuing a Timely Warning if a Clery-specific poses a serious or ongoing threat to the campus community. Clery crimes include may homicide, aggravated assault, sexual assault, weapons law violations, among other crimes. The act also requires institutions to issue emergency notifications when an emergency, threatening the health and safety of the campus community, occurs on campus. Emergencies can range from a chemical spill in the science lab to an unexpected tornado to an active shooter. Using the backup of mass email/text/voicemail notification is not always effective as faculty and students may have silenced their phones during class and are not reading emails.

2. How will this additional resource allocation specifically enhance your program’s services, activities, processes, etc. to continue or improve student learning and achievement?
 - a. Is the resource request personnel-related? If so, please provide evidence to justify the requested positions such as retirements, program growth or curricular demands, full-time/adjunct ratios, etc.

Not applicable.

3. How will this additional resource allocation help you serve the college mission or strategic initiatives, and/or your program’s goals for improvement, as stated in your last program review?

This will also meet the college mission statement of providing environments supporting personnel safety and ensure compliance with the Clery Act.

Step C: Complete this chart with details of the request:

Type of Resource	Requested Dollar Amount	Potential Funding Source It is only necessary to list potential funding forces if you are aware of specific grants/program funds appropriate to the request, such as Strong Workforce.
Personnel		
Facilities		
Equipment	To be determined	General Budget
Supplies		
Computer Hardware		
Computer Software		
Training		
Other		
Total Requested Amount:	TBD	

Notes: None

Instructional Support - 2

Step A: Briefly describe the request.

Glass marker wall for Room 514 for multiple-format presentations. It would allow the projection of materials such as PPT while allowing the Instructor to make notations on the project material projected on the wall. All notations and displayed materials can be saved and shared with students.

Step B: Answer the following questions:

1. Is it imperative that this resource request be processed now rather than during the next comprehensive program review? Why?

Student enrollment and engagement are currently top priorities for the campus and for the district. Room 514 is limited, in that there is only room for a screen projector and about 1 foot of white board on either side. This confines the available area for visual aids and interactive writing surfaces within the room's dimensions.

2. How will this additional resource allocation specifically enhance your program's services, activities, processes, etc. to continue or improve student learning and achievement?
 - a. Is the resource request personnel-related? If so, please provide evidence to justify the requested positions such as retirements, program growth or curricular demands, full-time/adjunct ratios, etc.

This additional resource will empower our program to offer a more comprehensive, personalized, and innovative educational experience. They will not only sustain our current standards but elevate them to better meet the diverse needs of our students and enhance their overall learning and achievement.

3. How will this additional resource allocation help you serve the college mission or strategic initiatives, and/or your program’s goals for improvement, as stated in your last program review?

This will meet the college mission statement of providing environments supporting student outcomes and enhancing student learning.

Step C: Complete this chart with details of the request:

Type of Resource	Requested Dollar Amount	Potential Funding Source It is only necessary to list potential funding forces if you are aware of specific grants/program funds appropriate to the request, such as Strong Workforce.
Personnel		
Facilities		
Equipment	\$20,066.36	
Supplies		
Computer Hardware		
Computer Software		
Training		
Other		
Total Requested Amount:	\$20,066.36	College or District Funds

Notes:

METEOR EDUCATION

Glass Marker Wall

Meteor Education, LLC
 690 NE 23rd Avenue
 Gainesville, FL 32609
 www.meteoreducation.com

Prepared For:
 North Orange County Community College District
 1830 W Romneya Dr
 Anaheim, CA 92801

Site:
 Fullerton College
 321 Chapman Ave
 Fullerton, CA 92832

Quote ID	Terms	Quote Contact	Site Contact
94202-03 10/26/2023 D.D.	Net 30 Days Prices Good Through 11/25/2023	Emily Alessandri / cell: (559) 908-3696 / ealessandri@meteoreducation.com	Brian Roach / (714) 992-7209 / broach@fullcoll.edu

Claridge Inc. OMNIA/Region 4 - Zone 4 Installed R191810			Discount: Net%	Install: NET	Shipping and Handling: NET
Item No.	Qty	Model Number	List Price	Your Price	Ext. Price
1	1	C-MGMW-830 MOD Description: MAGNETIC GLASS MARKER WALL, SECTION MODIFIED * 1/4" Ultraclear tempered glass * Brilliant White coating * Steel Backer * 1190 Trim top and bottom (shipped loose) * Clear plastic T-Bar * Polished edged * Cut outs included ** Includes C-1191-8 GLASS MW TRIM * 8'-0" length * 1/4 Face ** Includes C-1191-17 GLASS MW TRIM * 17'-0" length * 1/4 Face	\$23,152.00	\$13,428.16	\$13,428.16
Claridge Inc.					\$13,428.16
			TOTALS		
			Product:		\$13,428.16
			Install:		\$4,630.00
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			[PFI] Sales Tax at 7.750000%:		\$1,443.29
			Total:		\$20,066.36