

# **Instructional Program Review 2019/20 UPDATE**

**Computer and Information Sciences**

**Created on: 09/12/2019 06:57:00 AM PST  
Last Modified: 02/09/2020 01:56:43 PM PST**

# Table of Contents

|  |           |
|--|-----------|
| <b>General Information</b>                             | <b>1</b>  |
| <b>2019/20 Instructional Program Review</b>            | <b>2</b>  |
| Submission Information and Updates (REQUIRED)          | 2         |
| Outcomes and Assessment (REQUIRED)                     | 5         |
| Program Analysis for Equity and Excellence (REQUIRED)  | 5         |
| Program Goals (REQUIRED)                               | 5         |
| Action Plans for Goals (REQUIRED)                      | 7         |
| Goal Status Report (REQUIRED)                          | 12        |
| <b>Request Forms</b>                                   | <b>20</b> |
| Classified Position, BARC and Faculty Position Request | 20        |
| <b>Reviewers</b>                                       | <b>21</b> |
| Liaison's Review                                       | 21        |
| Manager's Review                                       | 21        |
| <b>Appendix</b>  | <b>22</b> |

## **General Information (Instructional Program Review 2019/20 UPDATE)**

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## 2019/20 Instructional Program Review

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### SUBMISSION INFORMATION AND UPDATES (REQUIRED)

#### Section A:

- Name of Lead Writer: Tasha Frankie and Duane Wesley
- Name of Liaison: Bruce Naschak
- Department Chair: Duane Wesley
- Name of Manager/Service Area Supervisor: Danene Brown
- Is this a CTE program? (State Yes or No): Yes

#### Section B:

- 

Faculty: no change

- 

Staff: no change

- 

Mission: no change

- 

Curriculum:

- 

New courses taught 2019-2020 AY:

- 

CISC 179 (Python Programming)

- 

Courses to be offered soon:

- 

CISC 152 (Introduction to the Linux Operating System)

- 

CISC 201 (Advanced C++ Programming)

-

## CISC 205 (Object Oriented Programming Using C++)

- ADT was approved, will begin offering in Fall 2020. Also will be teaching 3 new courses as part of the ADT:
  - CISC 191 (Intermediate Java Programming)
  - CISC 211 (Computer Organization and Assembly Language)
  - CISC 246 (Discrete Mathematics for Computer Science)

- We are working with Microsoft to update CISC 193 (Microsoft C# Software Engineering 1) and begin development of a follow on course that integrates C# and the Unity Game Engine.

- We are actively collaborating with the Multimedia Department to help support the creation of their ADT. This includes having some CISC faculty teaching some MULT courses.

- Strengths:

- Began Peer Mentoring for CISC 190 (Java Programming). At least a handful of struggling students are now on track to pass the course because of Peer Mentoring.
- Mesa hosted the Empower Conference for middle school students, to encourage them to enter the STEM pipeline. We plan to make this an annual event.
-

Mesa Robotics Organization is collaborating with the Mesa Computer Science Club to develop and document new projects that will eventually become workshops for future club members, and may be integrated into appropriate CISC courses.

- Challenges:

- Students who are not Calculus-ready when they enter Mesa cannot complete the ADT in 2 years because of Math prerequisites. Specifically, CISC 246 requires MATH 245, which requires calculus. It would be helpful if there were a way to accelerate students through the required math prerequisites (MATH 150 and 151 are required for the ADT as well).
- Some of our students lack the necessary computing resources at home to be successful in the courses they are taking. Although there are computers available in the STEM Center, not all students taking CISC courses are STEM majors, and so many do not feel as though they can utilize the STEM Center. It would be helpful to have a dedicated collaborative study space within the BT building where students can access computing resources, find tutoring or peer mentoring, and work on group projects with classmates.
- Faculty do not have administrative privileges on their office Windows computers. Faculty also do not have access to the Mac OS X platform on work-supplied computers. This lack of administrative access, and lack of access to an entire operating system, makes it difficult to adequately support online and on campus students with computer setup. Students who have not correctly installed programs on their personal computers are not likely to succeed in a course; this is especially true for online students.
- Faculty who wish to support online students through Zoom office hours must use their own equipment, as the office computers are not equipped with a microphone, webcam, or speakers.
- Mesa is a C-STEM affiliate, which affords our participating students a boost on transfer applications to UC schools. We need to have more faculty trained to support the UC Davis C-STEM program. Training requires travel and conference funding. Additionally, we need to purchase Linkbot and related hardware to support the program, as well as software licences. The C-STEM program supports our teaching efforts related to C++, microcontroller, embedded and internet of things (IoT) systems programming, and also assists us in outreach to local K-12 teachers.
-

Our ability to develop new programs and courses is hampered by the slowness of the curriculum development process. While the current process may be appropriate for other disciplines, in our discipline, new technology is created and implemented in 6 months, so a 1-2 year curriculum development period is prohibitively slow and keeps us from being able to offer current, relevant, and employable skills to our students.

## OUTCOMES AND ASSESSMENT (REQUIRED)

**Form:** 2019/20 Program Review Outcomes and Assessment Section (See appendix)

## PROGRAM ANALYSIS FOR EQUITY AND EXCELLENCE (REQUIRED)

**Form:** 2019/20 Program Review Instructional Program Analysis Section (See appendix)

## PROGRAM GOALS (REQUIRED)

### 2018/19 CISC Goals

#### **Collaborate with local industry / four year schools / local K-12 schools**

Work with industry subject matter experts and boards to collaborate, build, and share content of rapidly changing fields such as robotics, cyber security, and data science including big data and analytics.

#### **Mapping**

**CA- Mesa College Strategic Directions and Goals:** Strategic Goal 1.1, Strategic Goal 1.2, Strategic Goal 1.3, Strategic Goal 1.5, Strategic Goal 1.6, Strategic Goal 2.1, Strategic Goal 2.2, Strategic Goal 2.3, Strategic Goal 2.4, Strategic Goal 3.1, Strategic Goal 3.2, Strategic Goal 3.3, Strategic Goal 4.1, Strategic Goal 4.2, Strategic Goal 5.2, Strategic Goal 6.2, Strategic Goal 6.3,

**CTE 2018/19:** Perkins Core Indicator Activity 1, Perkins Core Indicator Activity 2, Perkins Core Indicator Activity 3, Perkins Core Indicator Activity 5, Perkins Core Indicator Activity 6, Perkins Permissive Use 10.1, Perkins Permissive Use 10.10, Perkins Permissive Use 10.11, Perkins Permissive Use 10.12, Perkins Permissive Use 10.13, Perkins Permissive Use 10.15, Perkins Permissive Use 10.16, Perkins Permissive Use 10.2, Perkins Permissive Use 10.3, Perkins Permissive Use 10.4, Perkins Permissive Use 10.5, Perkins Permissive Use 10.6, Perkins Permissive Use 10.8, Perkins Permissive Use 10.9, Perkins Requirement 2, Perkins Requirement 4, Perkins Requirement 5, Perkins Requirement 1, Perkins Requirement 3, Perkins Requirement 7, Perkins Requirement 8, Perkins Requirement 9, Strong Workforce Recommendation 1, Strong Workforce Recommendation 10, Strong Workforce Recommendation 11, Strong Workforce Recommendation 15, Strong Workforce Recommendation 2, Strong Workforce Recommendation 3, Strong Workforce Recommendation 7, Strong Workforce Recommendation 9,

**Institutional Learning Outcomes 2016/17:** Communication, Critical Thinking, Global Consciousness, Information Literacy, Professional & Ethical Behavior

#### **Faculty Training to ensure that faculty are current with technology and education.**

We need to train our faculty by sending them to conferences and workshops. These events should include, but are

not limited to, education, health information sciences, software development, cybersecurity, and robotics.

### Mapping

**CA- Mesa College Strategic Directions and Goals:** Strategic Goal 1.1, Strategic Goal 1.2, Strategic Goal 1.4, Strategic Goal 1.5, Strategic Goal 1.6, Strategic Goal 2.1, Strategic Goal 2.2, Strategic Goal 2.3, Strategic Goal 4.1, Strategic Goal 4.2, Strategic Goal 5.1, Strategic Goal 5.2, Strategic Goal 6.1, Strategic Goal 6.2, Strategic Goal 6.3,

**CTE 2018/19:** Perkins Core Indicator Activity 1, Perkins Core Indicator Activity 2, Perkins Core Indicator Activity 3, Perkins Permissive Use 10.12, Perkins Permissive Use 10.13, Perkins Permissive Use 10.8, Perkins Requirement 4, Perkins Requirement 5, Perkins Requirement 1, Perkins Requirement 3, Perkins Requirement 7, Perkins Requirement 8, Perkins Requirement 9, Strong Workforce Recommendation 1, Strong Workforce Recommendation 11, Strong Workforce Recommendation 15, Strong Workforce Recommendation 7, Strong Workforce Recommendation 9,

**Institutional Learning Outcomes 2016/17:** Critical Thinking, Information Literacy

### **Integrate robotics and microcontrollers with our curriculum as fully as sensible and possible.**

We need to purchase and maintain active Ch software licenses in order to support our programming courses. We also need to purchase robotic and microcontroller equipment and software to support the development of a microcontroller curriculum, Mesa Robotics Organization, and outreach to local high schools.

### Mapping

**CA- Mesa College Strategic Directions and Goals:** Strategic Goal 1.1, Strategic Goal 1.2, Strategic Goal 1.3, Strategic Goal 1.4, Strategic Goal 1.5, Strategic Goal 1.6, Strategic Goal 2.2, Strategic Goal 3.1, Strategic Goal 3.2, Strategic Goal 3.3, Strategic Goal 4.1, Strategic Goal 4.2, Strategic Goal 5.1, Strategic Goal 5.2,

**CTE 2018/19:** Perkins Core Indicator Activity 1, Perkins Core Indicator Activity 2, Perkins Core Indicator Activity 3, Perkins Core Indicator Activity 4, Perkins Core Indicator Activity 5, Perkins Core Indicator Activity 6, Perkins Permissive Use 10.12, Perkins Permissive Use 10.13, Perkins Permissive Use 10.20, Perkins Requirement 2, Perkins Requirement 4, Perkins Requirement 1, Perkins Requirement 3, Perkins Requirement 7, Strong Workforce Recommendation 10, Strong Workforce Recommendation 11, Strong Workforce Recommendation 2, Strong Workforce Recommendation 7,

**Institutional Learning Outcomes 2016/17:** Communication, Critical Thinking, Global Consciousness, Information Literacy, Professional & Ethical Behavior

### **Increase the success rates of our online/hybrid courses**

Our online/hybrid courses have a lower success rate than our on campus classes. We need to effectively share online teaching strategies and also help students to understand that online courses are as rigorous and require as much time as on campus courses.



## Mapping

**CA- Mesa College Strategic Directions and Goals:** Strategic Goal 1.1, Strategic Goal 1.2, Strategic Goal 1.3, Strategic Goal 1.4, Strategic Goal 1.5, Strategic Goal 1.6, Strategic Goal 2.3, Strategic Goal 4.1, Strategic Goal 4.2, Strategic Goal 5.1, Strategic Goal 5.2, Strategic Goal 6.2,

**CTE 2018/19:** Perkins Core Indicator Activity 1, Perkins Core Indicator Activity 2, Perkins Core Indicator Activity 3, Perkins Permissive Use 10.12, Perkins Permissive Use 10.4, Perkins Permissive Use 10.9, Perkins Requirement 4, Perkins Requirement 1, Perkins Requirement 6, Perkins Requirement 7, Perkins Requirement 9, Strong Workforce Recommendation 11, Strong Workforce Recommendation 15, Strong Workforce Recommendation 2, Strong Workforce Recommendation 9,

**Institutional Learning Outcomes 2016/17:** Communication, Critical Thinking, Global Consciousness, Information Literacy, Professional & Ethical Behavior

## Develop a 4-year degree in game programming (collaborate with MULT)

We would like to develop a 4-year degree in game programming, in conjunction with the Multimedia department. We understand that the success of this goal is largely dependent upon approval by the state chancellors office.

## Mapping

**CA- Mesa College Strategic Directions and Goals:** Strategic Goal 1.1, Strategic Goal 1.2, Strategic Goal 1.3, Strategic Goal 1.4, Strategic Goal 1.5, Strategic Goal 1.6, Strategic Goal 2.1, Strategic Goal 2.2, Strategic Goal 2.4, Strategic Goal 3.1, Strategic Goal 3.2, Strategic Goal 3.3, Strategic Goal 4.1, Strategic Goal 4.2, Strategic Goal 5.1, Strategic Goal 5.2,

**CTE 2018/19:** Perkins Core Indicator Activity 1, Perkins Core Indicator Activity 2, Perkins Core Indicator Activity 3, Perkins Core Indicator Activity 5, Perkins Core Indicator Activity 6, Perkins Permissive Use 10.1, Perkins Permissive Use 10.10, Perkins Permissive Use 10.11, Perkins Permissive Use 10.12, Perkins Permissive Use 10.13, Perkins Permissive Use 10.16, Perkins Permissive Use 10.17, Perkins Permissive Use 10.19, Perkins Permissive Use 10.2, Perkins Permissive Use 10.20, Perkins Permissive Use 10.3, Perkins Permissive Use 10.4, Perkins Permissive Use 10.5, Perkins Permissive Use 10.6, Perkins Permissive Use 10.7, Perkins Permissive Use 10.8, Perkins Permissive Use 10.9, Perkins Requirement 2, Perkins Requirement 4, Perkins Requirement 5, Perkins Requirement 1, Perkins Requirement 3, Perkins Requirement 6, Perkins Requirement 7, Perkins Requirement 8, Perkins Requirement 9, Strong Workforce Recommendation 1, Strong Workforce Recommendation 11, Strong Workforce Recommendation 15, Strong Workforce Recommendation 2, Strong Workforce Recommendation 3,

**Institutional Learning Outcomes 2016/17:** Communication, Critical Thinking, Global Consciousness, Information Literacy, Professional & Ethical Behavior

## ACTION PLANS FOR GOALS (REQUIRED)

### Actions

#### 2018/19 CISC Goals

Goal

**Goal: Collaborate with local industry / four year schools / local K-12 schools**

Work with industry subject matter experts and boards to collaborate, build, and share content of rapidly changing fields

such as robotics, cyber security, and data science including big data and analytics.

**Action:** Host a yearly conference for middle school students (Empower)

|   |  |
|---|--|
| <b>Describe the actions needed to achieve this objective:</b>   | Work with SDUSD and SDCCD to organize and coordinate event logistics.  |
| <b>Who will be responsible for overseeing the completion of this objective:</b>   | Select CISC and other Mesa faculty.<br>SDUSD and SDCCD personnel.  |
| <b>Provide a timeline for the actions:</b>  | The conference will be hosted yearly in October. Planning begins in the Spring term.   |
| <b>Describe the assessment plan you will use to know if the objective was achieved and effective:</b>   | Students are surveyed about their experiences at the end of the conference. We hope to see increased enrollment in CISC in 6-8 years.  |
| <b>List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel &amp; Conference, Software, Facilities, Classified Staff, Faculty, Other):</b> | Robots (e.g. Linkbots, Nao robot)<br>ChIDE licenses<br>Raspberry Pis<br>Arduinos<br>Ongoing Professional Development for CISC faculty (Travel and Conference)<br>Computer Labs with up-to-date hardware and software |

**Action:** Professional Development via Conferences

|   |   |
|---|---|
| <b>Describe the actions needed to achieve this objective:</b>   | We need funding to send CISC faculty to professional conferences, where they have the opportunity to interact with industry professionals and faculty at other colleges and universities. |
| <b>Who will be responsible for overseeing the completion of this objective:</b>   | CISC faculty, assuming that funds are available.  |
| <b>Provide a timeline for the actions:</b>  | Ongoing.  |
| <b>Describe the assessment plan you will use to know if the objective was achieved and effective:</b>   | Faculty will introduce new teaching practices and technologies to their classes and to the curriculum.  |
| <b>List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel &amp; Conference, Software, Facilities, Classified Staff, Faculty, Other):</b> | Travel & Conference funds are needed.   |

**Action: Update C# Course - Collaborate with Microsoft**

|   |   |
|---|---|
| <b>Describe the actions needed to achieve this objective:</b>   | Collaborate with Microsoft to update C# course and ensure that it supports current industry needs.  |
| <b>Who will be responsible for overseeing the completion of this objective:</b>   | Duane Wesley  |
| <b>Provide a timeline for the actions:</b>  | Collaboration is beginning now, and will be ongoing. The course development process may take 2+ years due to campus and district curriculum review processes. |
| <b>Describe the assessment plan you will use to know if the objective was achieved and effective:</b>   | Updated course and/or new course is approved and offered.   |
| <b>List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel &amp; Conference, Software, Facilities, Classified Staff, Faculty, Other):</b> | Updated computer hardware and software in classrooms, Windows OS. Faculty professional development (Travel & Conference).                                     |

**Goal: Faculty Training to ensure that faculty are current with technology and education.**

We need to train our faculty by sending them to conferences and workshops. These events should include, but are not limited to, education, health information sciences, software development, cybersecurity, and robotics.

**Action: Get funding for conference and travel/send faculty to conferences**

|   |   |
|---|---|
| <b>Describe the actions needed to achieve this objective:</b>   | Put in BARC requests, Perkins requests.               |
| <b>Who will be responsible for overseeing the completion of this objective:</b>   | Tasha Frankie, Duane Wesley                           |
| <b>Provide a timeline for the actions:</b>  | Yearly.   |
| <b>Describe the assessment plan you will use to know if the objective was achieved and effective:</b>   | We receive necessary money for conference and travel. |
| <b>List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel &amp; Conference, Software, Facilities, Classified Staff, Faculty, Other):</b> | Travel & Conference funding.                          |

**Conference, Software, Facilities, Classified Staff, Faculty, Other):**

**Goal: Integrate robotics and microcontrollers with our curriculum as fully as sensible and possible.**

We need to purchase and maintain active Ch software licenses in order to support our programming courses. We also need to purchase robotic and microcontroller equipment and software to support the development of a microcontroller curriculum, Mesa Robotics Organization, and outreach to local high schools.

**Action: Professional Development for Faculty**

|   |  |
|---|--|
| <b>Describe the actions needed to achieve this objective:</b>   | Faculty need training to be able to use new/updated equipment and software.        |
| <b>Who will be responsible for overseeing the completion of this objective:</b>   | CISC faculty.  |
| <b>Provide a timeline for the actions:</b>  | Ongoing; technology changes rapidly.   |
| <b>Describe the assessment plan you will use to know if the objective was achieved and effective:</b>   | Faculty will continue to utilize updated technology and robotics in the classroom. |
| <b>List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel &amp; Conference, Software, Facilities, Classified Staff, Faculty, Other):</b> | Travel & Conference funding.   |

**Action: Purchase new ChIDE software licenses and Linkbot robots and accessories**

|   |   |
|---|---|
| <b>Describe the actions needed to achieve this objective:</b>   | Obtain funding through BARC requests, Perkins, and/or Strong Workforce.                 |
| <b>Who will be responsible for overseeing the completion of this objective:</b>                       | Duane Wesley and Tasha Frankie  |
| <b>Provide a timeline for the actions:</b>  | These resources need to be updated on a recurring basis.                                |
| <b>Describe the assessment plan you will use to know if the objective was achieved and effective:</b> | We will receive funding and be able to purchase items necessary to support our program. |
| <b>List resources needed to</b>   | ChIDE software licenses and Linkbot robots and accessories.                             |

achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):

**Goal: Increase the success rates of our online/hybrid courses**

Our online/hybrid courses have a lower success rate than our on campus classes. We need to effectively share online teaching strategies and also help students to understand that online courses are as rigorous and require as much time as on campus courses.

**Action: Develop, Assess, and Integrate appropriate curriculum resources**

|   |   |
|---|---|
| <b>Describe the actions needed to achieve this objective:</b>   | Coordinated work among faculty.<br>Attend conferences to discover more resources and their pedagogical value. |
| <b>Who will be responsible for overseeing the completion of this objective:</b>   | CISC faculty  |
| <b>Provide a timeline for the actions:</b>  | ongoing   |
| <b>Describe the assessment plan you will use to know if the objective was achieved and effective:</b>   | Success rates for online courses will improve.  |
| <b>List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel &amp; Conference, Software, Facilities, Classified Staff, Faculty, Other):</b> | Travel & Conference funding.  |

**Action: Professional Development for Faculty**

|   |  |
|---|--|
| <b>Describe the actions needed to achieve this objective:</b>                   | Faculty can complete @ONE courses to improve their online teaching skills. |
| <b>Who will be responsible for overseeing the completion of this objective:</b> | CISC faculty.  |
| <b>Provide a timeline for the actions:</b>                                      | Ongoing.   |
| <b>Describe the assessment</b>  | Success rates of online courses will improve, for all demographics.        |

**plan you will use to know if the objective was achieved and effective:**

**List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):**

Travel & Conference, funding for faculty to take training in online teaching.

**GOAL STATUS REPORT (REQUIRED)**

**Action Statuses**

**2018/19 CISC Goals**

Goal

**Goal: Collaborate with local industry / four year schools / local K-12 schools**

Work with industry subject matter experts and boards to collaborate, build, and share content of rapidly changing fields such as robotics, cyber security, and data science including big data and analytics.

**Action:** Host a yearly conference for middle school students (Empower)

**Describe the actions needed to achieve this objective:**

Work with SDUSD and SDCCD to organize and coordinate event logistics.

**Who will be responsible for overseeing the completion of this objective:**

Select CISC and other Mesa faculty.  
SDUSD and SDCCD personnel.

**Provide a timeline for the actions:**

The conference will be hosted yearly in October. Planning begins in the Spring term.

**Describe the assessment plan you will use to know if the objective was achieved and effective:**

Students are surveyed about their experiences at the end of the conference. We hope to see increased enrollment in CISC in 6-8 years.

**List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):**

Robots (e.g. Linkbots, Nao robot)  
ChIDE licenses  
Raspberry Pis  
Arduinos  
Ongoing Professional Development for CISC faculty (Travel and Conference)  
Computer Labs with up-to-date hardware and software

Status for Host a yearly conference for middle school students (Empower)

**Current Status:** In Progress

**If the Current Status was marked Completed, what was the impact of the completed objective on your program:** We just completed the first conference, and are preparing for the next cycle.

**If the Current Status was not marked Completed, what are the implications and next steps:** This is an ongoing cycle, and will never be complete.

**Action:** Professional Development via Conferences

**Describe the actions needed to achieve this objective:** We need funding to send CISC faculty to professional conferences, where they have the opportunity to interact with industry professionals and faculty at other colleges and universities.

**Who will be responsible for overseeing the completion of this objective:** CISC faculty, assuming that funds are available.

**Provide a timeline for the actions:** Ongoing.

**Describe the assessment plan you will use to know if the objective was achieved and effective:** Faculty will introduce new teaching practices and technologies to their classes and to the curriculum.

**List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):** Travel & Conference funds are needed.

Status for Professional Development via Conferences

**Current Status:** Not started

**If the Current Status was marked Completed, what was the impact of the completed objective on your program:**

**If the Current Status was not marked Completed,** We need more funding in order to send all faculty to conferences for ongoing

**what are the implications and next steps:** professional development.

**Action:** Update C# Course - Collaborate with Microsoft

**Describe the actions needed to achieve this objective:** Collaborate with Microsoft to update C# course and ensure that it supports current industry needs.

**Who will be responsible for overseeing the completion of this objective:** Duane Wesley

**Provide a timeline for the actions:** Collaboration is beginning now, and will be ongoing. The course development process may take 2+ years due to campus and district curriculum review processes.

**Describe the assessment plan you will use to know if the objective was achieved and effective:** Updated course and/or new course is approved and offered.

**List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):** Updated computer hardware and software in classrooms, Windows OS. Faculty professional development (Travel & Conference).

**Status for Update C# Course - Collaborate with Microsoft**

**Current Status:** Not started

**If the Current Status was marked Completed, what was the impact of the completed objective on your program:**

**If the Current Status was not marked Completed, what are the implications and next steps:** We have a meeting set up with Microsoft representatives to begin our collaboration.

**Goal: Faculty Training to ensure that faculty are current with technology and education.**

We need to train our faculty by sending them to conferences and workshops. These events should include, but are not limited to, education, health information sciences, software development, cybersecurity, and robotics.



**Action:** Get funding for conference and travel/send faculty to conferences

|   |   |
|---|---|
| <b>Describe the actions needed to achieve this objective:</b>   | Put in BARC requests, Perkins requests.               |
| <b>Who will be responsible for overseeing the completion of this objective:</b>   | Tasha Frankie, Duane Wesley                           |
| <b>Provide a timeline for the actions:</b>  | Yearly.   |
| <b>Describe the assessment plan you will use to know if the objective was achieved and effective:</b>   | We receive necessary money for conference and travel. |
| <b>List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel &amp; Conference, Software, Facilities, Classified Staff, Faculty, Other):</b> | Travel & Conference funding.                          |

Status for Get funding for conference and travel/send faculty to conferences

|  |   |
|--|---|
| <b>Current Status:</b>   | Not started   |
| <b>If the Current Status was marked Completed, what was the impact of the completed objective on your program:</b> |   |
| <b>If the Current Status was not marked Completed, what are the implications and next steps:</b>                   | We need to put in BARC and Perkins requests for travel funds. |

**Goal: Integrate robotics and microcontrollers with our curriculum as fully as sensible and possible.**

We need to purchase and maintain active Ch software licenses in order to support our programming courses. We also need to purchase robotic and microcontroller equipment and software to support the development of a microcontroller curriculum, Mesa Robotics Organization, and outreach to local high schools.

**Action:** Professional Development for Faculty

|   |   |
|---|---|
| <b>Describe the actions needed to achieve this objective:</b> | Faculty need training to be able to use new/updated equipment and software. |
|---|---|

|   |  |
|---|--|
| <b>Who will be responsible for overseeing the completion of this objective:</b>   | CISC faculty.  |
| <b>Provide a timeline for the actions:</b>  | Ongoing; technology changes rapidly.   |
| <b>Describe the assessment plan you will use to know if the objective was achieved and effective:</b>   | Faculty will continue to utilize updated technology and robotics in the classroom. |
| <b>List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel &amp; Conference, Software, Facilities, Classified Staff, Faculty, Other):</b> | Travel & Conference funding.   |

#### Status for Professional Development for Faculty

|  |   |
|--|---|
| <b>Current Status:</b>   | Not started   |
| <b>If the Current Status was marked Completed, what was the impact of the completed objective on your program:</b> |   |
| <b>If the Current Status was not marked Completed, what are the implications and next steps:</b>                   | We need funding to send faculty to professional development workshops for training. We are requesting funding through BARC and Perkins. |

#### Action: Purchase new ChIDE software licenses and Linkbot robots and accessories

|   |   |
|---|---|
| <b>Describe the actions needed to achieve this objective:</b>   | Obtain funding through BARC requests, Perkins, and/or Strong Workforce.                 |
| <b>Who will be responsible for overseeing the completion of this objective:</b>                       | Duane Wesley and Tasha Frankie  |
| <b>Provide a timeline for the actions:</b>  | These resources need to be updated on a recurring basis.                                |
| <b>Describe the assessment plan you will use to know if the objective was achieved and effective:</b> | We will receive funding and be able to purchase items necessary to support our program. |
| <b>List resources needed to achieve this objective and</b>  | ChIDE software licenses and Linkbot robots and accessories.                             |

**associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):**

Status for Purchase new ChIDE software licenses and Linkbot robots and accessories

**Current Status:** Not started

**If the Current Status was marked Completed, what was the impact of the completed objective on your program:**

**If the Current Status was not marked Completed, what are the implications and next steps:**

We need funding to purchase these items. We are requesting funding through BARC and Perkins.

**Goal: Increase the success rates of our online/hybrid courses**

Our online/hybrid courses have a lower success rate than our on campus classes. We need to effectively share online teaching strategies and also help students to understand that online courses are as rigorous and require as much time as on campus courses.

**Action:** Develop, Assess, and Integrate appropriate curriculum resources

**Describe the actions needed to achieve this objective:**

Coordinated work among faculty.  
Attend conferences to discover more resources and their pedagogical value.

**Who will be responsible for overseeing the completion of this objective:**

CISC faculty

**Provide a timeline for the actions:**

ongoing

**Describe the assessment plan you will use to know if the objective was achieved and effective:**

Success rates for online courses will improve.

**List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software,**

Travel & Conference funding.

**Facilities, Classified Staff,  
Faculty, Other):**

Status for Develop, Assess, and Integrate appropriate curriculum resources

**Current Status:** Not started

**If the Current Status was marked Completed, what was the impact of the completed objective on your program:**

**If the Current Status was not marked Completed, what are the implications and next steps:**

We need funding to send faculty to conferences and workshops. We are requesting funding through BARC and Perkins.

**Action: Professional Development for Faculty**

**Describe the actions needed to achieve this objective:** Faculty can complete @ONE courses to improve their online teaching skills.

**Who will be responsible for overseeing the completion of this objective:** CISC faculty.

**Provide a timeline for the actions:** Ongoing.

**Describe the assessment plan you will use to know if the objective was achieved and effective:** Success rates of online courses will improve, for all demographics.

**List resources needed to achieve this objective and associated costs (Supplies, Equipment, Computer Equipment, Travel & Conference, Software, Facilities, Classified Staff, Faculty, Other):** Travel & Conference, funding for faculty to take training in online teaching.

Status for Professional Development for Faculty

**Current Status:** Not started

**If the Current Status was marked Completed, what was the impact of the completed objective on**

**your program:**

**If the Current Status was not marked Completed, what are the implications and next steps:**

We are requesting funding through BARC and Strong Workforce to be able to enroll/register faculty in courses/conferences to improve online teaching.

## Request Forms

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### CLASSIFIED POSITION, BARC AND FACULTY POSITION REQUEST

## Reviewers

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### LIAISON'S REVIEW

**Form:** Instructional Program Liaison's Review 2019/20 UPDATE

### MANAGER'S REVIEW

**Form:** Instructional Program Manager's Review 2019/20 UPDATE

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# Appendix

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- A. **2019/20 Program Review Outcomes and Assessment Section** (Form)
  - B. **2019/20 Program Review Instructional Program Analysis Section** (Form)
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# Form: "2019/20 Program Review Outcomes and Assessment Section"

**Created with :** Taskstream

**Participating Area:** Computer and Information Sciences

## **(REQUIRED) Program name**

Computer & Information Sciences

## **(REQUIRED) Are you on target with your assessment schedule?**

Yes. We are currently meeting all of our program outcomes of technological awareness, critical thinking, and communication. However, these can always be improved, and we are constantly looking for ways to enhance instruction, increase student success, and maximize our positive impact upon our community and the world. The technology that we teach has a tremendous amplification effect on individuals, society, and ecosystems, so we take the impact our work very seriously.

## **(REQUIRED) What have your assessments revealed about your courses/programs/service area/school/division/office?**

70% of our students succeed in learning and becoming adept with the logic and processing skills that are at the core of our CISC discipline. However, we are a growing department, and while our students are doing well within the range of courses that we are offering, we need to develop more courses to address additional areas of our discipline. Also, our field is constantly changing, so we need to continually update our courses to reflect the most current knowledge and best practices.

## **(REQUIRED) Based on your assessments, what resource needs have you identified?**

To facilitate the update and expansion of our program, we need microcomputer, microcontroller, and robotics resources, such as Raspberry PIs, Arduinos, Linkbots, etc., and associated accessories.

We instruction support hardware and software, such as iClicker kits, Ch licenses for student and instructor systems, network servers for hosting virtualization environments, cybersecurity scaffolding, gaming and virtual-reality systems, and emerging, networked based curriculum hosting and collaboration platforms.

To keep pace with the new developments in our discipline, we need travel and conference funds to ensure that our faculty can confer with our peers in academia and industry, and complete the training necessary for us to remain viable as discipline experts.

**Please provide any other comments.**

None.

# Form: "2019/20 Program Review Instructional Program Analysis Section"

Created with : Taskstream

Participating Area: Computer and Information Sciences

## Program Name

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**(REQUIRED) Type your program name.**

Computer & Information Sciences

**Part A: In this section, please analyze your program in terms of course success metric. Start by disaggregating the available data by race, gender, and any other parameters of interest to your program and answer the following questions.**

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**(REQUIRED) A1. What patterns do you notice with regard to equity in course success at the program level by race/ethnicity?**

You may also conduct analysis by course and/or by modality.

Equity Gap: When a group of students who share a common characteristic (e.g. race/ethnicity) have lower access and/or outcome rates than their peers. The size of the equity gap along with the size of the group determine whether that gap is significant. Larger groups should, statistically, have smaller gaps and therefore when gaps are present (even small ones) they may be significant. Smaller groups will see wider variation in outcomes, therefore gaps should be seen consistently over time and/or reviewed by looking at multiple years in aggregate to determine if they are significant.

Success rate (%) vs. year by demographic, all CISC courses

|                                       | 2014-15  | 2015-16  | 2016-17  | 2017-18  | 2018-19  |
|---------------------------------------|----------|----------|----------|----------|----------|
| Overall (all groups, n = 2256 - 2790) | 62       | 61       | 63       | 63       | 60       |
| African American (n = 132-155)        | 51 (-11) | 43 (-18) | 52 (-11) | 53 (-10) | 45 (-15) |
| Latinx (n = 628-810)                  | 60 (-2)  | 53 (-8)  | 56 (-7)  | 55 (-8)  | 56 (-4)  |
| Asian (n = 388-472)                   | 70 (+8)  | 70 (+9)  | 71 (+8)  | 75 (+12) | 66 (+6)  |
| Filipino (n = 122-158)                | 68 (+6)  | 54 (-5)  | 63 (0)   | 66 (+3)  | 58 (-2)  |
| White (n = 724-967)                   | 62 (0)   | 67 (+6)  | 69 (+6)  | 65 (+2)  | 65 (+5)  |
| Male (all ethnicities, n = 1510-1934) | 61 (-1)  | 60 (+1)  | 65 (+2)  | 62 (-1)  | 59 (-1)  |

|                                       |        |        |        |        |        |
|---------------------------------------|--------|--------|--------|--------|--------|
| Female (all ethnicities, n = 746-856) | 64 (2) | 62 (1) | 60 (3) | 64 (1) | 64 (4) |
|---------------------------------------|--------|--------|--------|--------|--------|

\* no data available for unreported gender or American Indian

Our overall course success rates for all groups have largely stayed flat over the past 5 years. There is an equity gap for African American and Latinx students; Asian and White students typically perform near or better than average. We are pleased to see comparable success rates between men and women, although we would like to see an increase in the number of women enrolled in CISC courses.

**(REQUIRED) A2. Do these patterns persist over time (e.g., look at the last five years)? Describe if equity gaps are increasing, decreasing, or staying the same?**

The success rate patterns have persisted over the past five years, with some variation in the gap occurring for African American and Filipino students. We suspect the relatively large variation in the equity gap for these groups is due to the low number of students in the group (e.g. < 5 students cause most of the variation).

**(REQUIRED) A3. What factors may have influenced these results? What are your most significant findings?**

At the industry level, non-White, non-Asian, and non-male groups are underrepresented. We wonder if students who are already questioning whether CISC is an appropriate field of study based on their demographic identities are simply giving up when courses are challenging. We also wonder if the small number of students enrolled in CISC courses who identify as African American feel isolated because they are noticeably the only African American students in their classes. Although CISC faculty make efforts to be inclusive of all students, there may still be cultural competency issues that make it difficult for faculty to connect to students, and for students to see the faculty as role models.

**(REQUIRED) A4. How have you/might you alter practices to increase student success and reduce equity gaps?**

We have started a Peer Mentoring program to help support students in CISC 190. We would like to expand this program to other courses as well, and also increase the level of student support (e.g. tutoring, mentorship) for our courses that is available outside the classroom.

Additionally, we are working with a community engagement organization, Treobytes, to help reach students earlier in the STEM pipeline to offer guidance, mentorship, and employment opportunities.

We continue to send faculty to professional development that includes topics such as equity and cultural competency as well as pedagogical techniques that are proven to improve success rates.

**(REQUIRED) A5. How does your program contribute to the College's identity of being a Hispanic Serving Institution?**

We host a successful CISC Friday Speaker Series, in which we have monthly speakers from industry give a talk. Our speakers represent a variety of demographics, including Latinx.

Additionally, we sent several faculty and a Latinx student to the ACM Richard Tapia Celebration of Diversity in Computing Conference, where the student was able to interact with Latinx computing professionals, and our faculty learned more about how to serve the needs of diverse students

**(REQUIRED) A6. Have you identified resource needs? If yes, please list.**

We need to continue providing professional development for our faculty, both in keeping up to date with the latest computing technologies and in learning new teaching strategies to improve success rates for all students. Improving online teaching is especially important, as our online courses have a 55% success rate (over the past 5 years), compared to on campus courses having a 71% success rate.

We need more hands-on hardware equipment, such as Raspberry Pis, Arduinos, Linkbots and Linkbot accessories, other robotic equipment, and Vive/virtual reality systems. These devices assist students in visualizing fundamental programming concepts taught in our courses, and also serve as examples of the many applications of software development.

In our discussions with our CISC Friday Speakers (in particular speakers from Microsoft), we have heard that the reason they continued with Computer Science as a major was because of the sense of community that they experienced in their schools via a shared study space in a computer lab. We would like to help our students develop a similar supportive learning community of peers, and need a space within the BT building to help establish a focal point for the community.

**(REQUIRED) A7. Do any of your program goals address these implications or needs? If not, please develop a new goal that addresses your findings and subsequent reflection.**

Yes, one of our goals is to increase the success rates of our online/hybrid courses.

**Part B: In this section, look at the area of focus you identified in last year's program review and answer the following questions.**

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**(REQUIRED) B1. How have you developed this focus? Are you seeing any results? What are your next steps?**

- ADT: complete the approval process and start offering the degree, and courses needed to support the degree
  - The ADT is approved, and will be offered starting Fall 2020.
- Increase enrollment, retention, and success, especially in online courses
  - It has been difficult to assess our goal to increase enrollment, because the entire campus has been affected by historically low enrollment due to the strong economy. However, we are actively outreaching to middle school students through the Empower conference and are utilizing our connections to local high school computer science teachers to promote Mesa as a college option.
- Cybersecurity: creation of curriculum and degree/certificate
  - We plan to offer CISC 152 (Introduction to the Linux Operating System), which will serve as a preparatory course for the Cybersecurity track. We are also actively planning the Cybersecurity curriculum and degree/certificate, and are hoping to create an entire Cybersecurity program.

- Curriculum and certificate review, especially in updating how courses we offer fit into programs we offer
  - We have been actively updating courses on the 2-year review cycle to ensure that they meet current technology standards.