Helena College Academic Program Review

Year:	2022-23	Review:	Information Technology and Programming 2022-23	Author:	Steinwand, Bryon	Status:	Published

Section 1: Program Review

Credentials:

A.A.S. Software Dev., A.A.S. Net

Description:

We offer an AAS in Sofware Development and AS Computer Science transfer. Starting in the fall of 2023, we are planning to add a DevOps AAS and IT Help Desk CAS options.

Misson Statement:

The Helena College University of Montana Information Technology and Programming (IT and P) program is a two year program offering options in two different areas of technology: Software Development, and Computer Science AS Transfer. Curriculum of Software Development option area prepares students for employment within a wide range of information technology fields. Curriculum of Computer Science AS Transfer option prepares students to continue their education in Computer Science at a four year institution. Program curriculum develops a foundational knowledge in technology that students can build upon as their employment needs and opportunities change throughout their career.

Mission Alignment:

The AS in Computer Science aligns specifically with the MUS Computer Science Pathway. The courses present in the AAS in Software Development provide the pathway and tools necessary to feel confident in the subject matter and to find employment. Also, the program facilitates communication between students and those working in their fields by a using advisory group, internships, and project-based learning.

Additional Comments:

The network administration AAS option was put on moratorium and later discontinued due to lack of students entering the option.

Section 2: 5-Year Summary

Previous Recommendations:

#1: "CT faculty will use the new student course assessment system to map course student learning outcomes to degree outcomes and degree outcomes to College institutional competences."

Program faculty have continued to use the new course assessment system to map course student learning outcomes to degree outcomes and degree outcomes to College institutional competences.

#2: "CT faculty will use the new student course assessment system, when available, to document student outcome assessments for all CT courses."

Program faculty have continued to use the new course assessment system.

#3 "CT faculty will organize and participate in the CT Round Table Forum in the fall of 2018. CT faculty will organize and participate in the CT Round Table Forum each fall."

Round Table Forums were held in the Fall of 2018 and 2019. They have not been held again since COVID.

4 "CT faculty will organize and participate in the interview and resume day in the spring of 2019."

A interview and resume day was offered in the Spring of 2019. They have not been held again since COVID.

Annual Work Plans:

2018-19:
Two of Four goals were completed, and progress was made on other two goals.
Goal 1 was directly related to previous recommendation number 1.
Goal 2 was directly related to previous recommendation number 2.
Goal 3 was directly related to previous recommendation number 3.
Goal 4 was directly related to previous recommendation number 4.

2019-20:
One goal was completed, and progress was made on most goals. COVID did stop progress on one goal.
Goal 1 was directly related to previous recommendation number 1.
Goal 3 was directly related to previous recommendation number 3.
Goal 4 was directly related to previous recommendation number 4.

2020-21:
Four of Five goals completed when final plan was due. Last goal was completed one month later. Goal 2 was directly related to previous recommendation number 1.

2021-22:
Some progress was made on several goals. Given that a new faculty, Bill Hallinan, was hired, it makes sense to get input from Bill on the goals and initiatives.
Goal 4 was created due to work done related to previous recommendation number 4.

Successes/Strengths:

The program has fully participated in the course outcome mapping and assessment initiatives.
We were successful in hiring a new faculty member, Bill Hallinan.

Challenges:

Enrollment and retention have been problematic, especially with the Network Administration AAS option.

Section 3: Student Learning

Credential Learning Outcomes:

Network Administration AAS

1. Students will demonstrate the ability to install, configure, diagnose, repair and upgrade entry-level personal computers, software, and network fundamental components according to industry standards.
2. Plan, install, configure, and manage resources; connect and run applications; monitor, optimize and troubleshoot network software and hardware.
3. Determine the type of software or hardware necessary to complete an objective; understand the functions of different operating systems.
4. Implement, administer, and troubleshoot a server in a networked environment.
5. Apply the principles of modern microcomputer operating systems, network architecture, hardware architecture, and Subsystems to network, repair and manage operating systems.
6. Solve basic network design and application problems using knowledge of common network architectures and network software.

Software Development AAS

1. Students will demonstrate knowledge of programming concepts, logic, design and problem solving techniques.
2. Develop, deploy and test desktop, distributed, and web applications.
3. Write computer programs using fundamental software development skills.
4. Write computer programs using Object oriented programming features
5. Demonstrate critical thinking by applying appropriate data structures and Abstract Data Types (ADTs).
6. Analyze and design information systems and database applications solutions to achieve business/organizational goals.
7. Implement a designed solution to solve business IT problems using state-of-the-art programming techniques and applications software

Assessment:

Network Administration A.A.S.
We use the assessment system to assess courses. Over time more courses are being fully assessed. When using the assessment system initially, we noticed course outcomes that had issues or were not at the appropriate level. Use of the assessment system made us pay more attention to the course outcomes and how we assess them.
The other thing we learned was that we had difficulty mapping course outcomes of a new course to our credential outcomes. We knew that the course outcomes were valuable and appropriate, so this indicated to us that our credential outcomes needed to be updated.
I believe that program’s assessment activities sufficiently demonstrate students' achievement.

Software Development A.A.S.
We use the assessment system to assess courses. Over time more courses are being fully assessed. When using the assessment system initially, we noticed course outcomes that had issues or were not at the appropriate level. Use of the assessment system made us pay more attention to the course outcomes and how we assess them.
The other thing we learned was that we had difficulty mapping course outcomes of a new course, CSCI 194, to our credential outcomes. We knew that the course outcomes were valuable and appropriate, so this indicated to us that our credential outcomes needed to be updated. Assessment of courses taught by adjuncts was not always completed. The college has standardized how adjunct assessment is collected, so that should not be an issue moving forward.
We believe that program’s assessment activities sufficiently demonstrate students' achievement.

Curriculum/Assessment Changes:

Network Administration A.A.S.
Many of the curriculum changes for the Network Administration option were driven by changes to CISCO curriculum that was extensively utilized. A first year seminar was added to both options to better prepare students for the industry and assist students creating educational goals. With the decision to discontinue the Network Administration option, work began to determine an alternative option or options. For the future we are proposing two new credentials DevOps AAS and IT Help Desk CAS. The DevOps option required several new courses. The IT Help Desk option only required one new course. In some ways the new credentials can be viewed as a more modern approach to Network Administration in the age of Cloud Computing and DevOps processes and methodologies.

Software Development A.A.S.
For the Software Development AAS option curriculum, we tend to make extensive changes every few years. The changes are primarily driven by input from our advisory committee. The reason for curriculum changes is almost always either the addition or removal of some technical skill to tool. The most recent new courses for the Software Development option were to include Cloud Computing and Project Management.
In the last five years we have shifted from the majority of courses being offered in a hybrid format to the majority being offered in a remote or virtual blended format. The change was initially in response to COVID but we continued due to the additional flexibility if offered to students. We now only offer a course in a traditional face to face format when there is another section available in a remote friendly format.
We would say the most common way that the assessment system impacts curriculum is in allowing the faculty to enter planned changes that often include recommendations for changes to curriculum.
For the future we are proposing two new credentials DevOps AAS and IT Help Desk CAS. The DevOps option required several new courses. The IT Help Desk option only required one new course.

Section 4: Alignment with Community Needs

Community Partnerships:

The program partnered with East Helena High School (EHHS) with a Governor's Education Emergency Relief (GEAR) grant. Faculty worked with EHHS teacher to create curriculum for a new class.

The program also worked with Missoula College (MC) on a GEAR grant that was awarded to MC. Faculty developed new curriculum and participated in professional development paid for by the grant. We have continued to participate with MC and Montana Cyber Communities of Practice monthly meetings. We get access to two cyber ranges for use in courses.

We also partnered with Cyber Montana to offered Computer Science and Cyber Security Summer Camp for middle school students. We are applying to offer the camp again this summer.

We are planning free community class to let people try out programming. The class will be held a few times a year.

We have attempted to put together training for State of Montana employees in the ServiceNow platform. No firm plans currently but work continues.

Advisory Board:

Our curriculum changes are driven by input for the advisory board. Often the changes come out of ideas that faculty bring up with committee and other times the ideas come from the committee members.

Advisory Board Members:

Bob Finstad
Dept. of Revenue

Steven Zimmerman
Figure Technologies

Joel Norris
Dept. of Corrections

Caitlin Carroll
Fish, Wildlife and Parks

Kevin Sandoval
Helena Indian Alliance

Shaun Scott
Carroll College Faculty

Luke Muszkiewicz
Pinion

James Bell
Mphasis

Mike MurphyReferred by Denise Adamson, no response
Dept. of Administration

Mel Ewing
Chief Information Officer CIO for HC and UM Western

Section 5: Data Review

Enrollment/Annual Average FTE:

Network Administration A.A.S.
Regarding enrollment trends, the unduplicated annual enrollment by credential and program declined downwards and precipitated the retirement of the Network options. AY1718's count was 35 students declining to 10 in AY 2122. Retention dropped to zero in AY 1920 and AY 2122. The annual average FTE was below 5 in AY 2122. Regarding enrollment trends and what influenced the numbers: Students not as interested in computer hardware. Businesses and users are moving to virtualization of applications, services, and networks services in the cloud (less demand for hardware). Covid reduced in person/hands on classes. The professor for Network Services passed away in AY 2122.

Software Development A.A.S.
Over five years, the unduplicated annual enrollment varied by 2 to 3 students. The average 5-year retention rate is 33%. The 5-year annual average FTE was 21. Many programming and software students are non-degree or post-degree students who seek the skills to enter the job market. These students may be reflected in the FTE counts but would be reflected in the revenue/expense amounts.

Retention:

Network Administration A.A.S.
With the decision to retire the Network Administration program, and the loss of Network instructor, retention was expected to fall. Recent trend data show the expected enrollment of zero in Networking AAS option.

Software Development A.A.S.
The retention rate has dropped over a five year period. The rate started to drop pre-Covid, the during the Covid quarantine, and in the year after. The overall 5-year retention rate is 52%. An adjusted 5-year retention rate may be slightly higher if it included the Spring cohort for December graduations. Note in the Fall 2021 there were a number non-degree seeking students not reflected in the retention rate.

Degree/Certificate Production:

Network Administration A.A.S.
Networking ASS shows increase slight increase as a small number of program participants matriculated.

Software Development A.A.S.
Programming/Software AAS shows slight increase as a small number of program participants matriculated.

Market Analysis:

Network Administration A.A.S.
Job outlook for 2021 to 2031 averages 9% in Montana and 5% nationally. HC 5-year average job placement rate for both IT & P programs was 88%. The Network Administration Option has been discontinued. According to the Bureau of Labor and Statistics, the growth rate for Network Administration 3% (Slower than average).

Software Development A.A.S.
The growth rate for software development jobs remains strong. The data noted the Job outlook for 2021 to 2031 averages 16% in Montana and 15% nationally. For Helena College, specifically the 5-year average job placement rate for both IT & P programs was 88%, which is high. According to Bureau of Labor Statistics (3/2023) the job outlook for software developers is growing at 25% (Much faster than average). The median annual wage for software developers was $120,730 in May 2021.

Financial Impact per FTE:

Network Administration A.A.S.
The Networking AAS required an investment in current hardware. Because the growing diversity of networking hardware manufacturers, offering only a Cisco-based program was limiting. A working range of hardware devices from multiple manufacturers would have been expensive. The closure of the program reduces these hardware costs to zero.

The revenue from (IT & P) is based on the following: the five-year average enrollment is 20 FTE/year; the total 5-year average revenue is $364,487; the total 5-year average expenditures are $207,736. The 5-year revenue to expense ratio is 1.75. The 5-year average program expenditure per FTE is $6,225, which is 17% less than HC average. The cost per FTE is being reduced by closing the Networking option. Future expenditures will be directed towards the Software Development and DevOps programs. The program expenses will be limited to staff salaries and benefits and small costs for access to cloud-based infrastructure and staff training.

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Other Comments:

Network Administration A.A.S.
Preliminary training was done to help understand the source, limits, and uses of the data. Additional data that would be helpful is seeing data based on cohorts as well as time slicing by calendar vs academic year because this program has Spring cohorts.

Software Development A.A.S.
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Section 6: Resources

Faculty & Staff:

Name	Title	FTE	Years	Highest Education
Bryon Steinwand	Information Technology and Programming Instructor	1.00	21.00	Bachelors
Bill Hallinan	Information Technology and Programming Instructor	1.00	0.50	Masters

Professional Development:

Bryon Steinwand
UPDATE2 Guided Pathways Essential Practice Workshop Oct. 6th - Oct. 14th
AWS Cloud Foundations Certification June 2021
Introduction to Cybersecurity Tools & Cyber Attacks Online Webinar - Coursera Jun 2021

Bill Hallinan
2021 Received CISA (Certified Information System Auditor) from ISACA (https://www.isaca.org/)

Budget:

Program faculty was reduced from three to two as enrollment decreased. With the elimination of the Network Administration option the need for CISCO Academy fees and CISCO network equipment upgrades was also eliminated. CISCO equipment upgrades have historically been the largest non-personnel cost to the program.

Resource Needs:

Due to policy changes related to network security, the program is no longer able to run servers on campus to provide lab environments for students off campus. The new Cloud DevOps AAS option will require cloud computing lab environments for students. We would like to pivot our CISCO fee account for this purpose and restructure our course fees for continued funding.

To assure program success over the next 5 years and beyond, the continuity of program faculty should be considered as part of a long range plan. The success and reputation of the college depends on consistently meeting high expectations over time. For the programs longer term success, identify the key components, the risks present, and the strategies to mitigate in order to keep the same quality of program.

Section 7: Recommendations

Rec #	Title	Recommendation
1	Implement new options	Key Recommendation: Fully implement three new degree options and support certification. Rationale: Job market and best IT practices recognize the necessity of DevOps. DevOps is a combination of the terms development and operations, meant to represent a collaborative or shared approach to the tasks performed by a company's application development and IT operations teams. Success Target: The program grows from 20 to 50 students in 5 years with positive student response/reviews of program. Course content stays current with best industry practices/tools. Success Strategy: Get final approval for the degree options. Aggressively market them in the community and among partners. Success Resource: Community involvement, program marketing, and partnerships. Resp. Party: Information Technology and Programming APRC Response: There was some concern that increasing from 20 students to 50 in 5 years was too ambitious, given the declining number of high school grads and the decrease in the value of the degree as more ways to learn the skills become available. The committee was reassured that college presented an ideal environment for students who wouldn't succeed at more self-paced learning options and that a degree was still appealing to employers, as it demonstrated that students possessed both competency and work ethic. The growth is necessary to sustain the program and should be possible with successful development of the three new credentials in the works. Additionally, programs across the state that are similar to those in the works here show a high level of interest. Cabinet Feedback: . It seems very in line with current demand to add short-term, stackable certificates to get people working in this quickly. Both ServiceNow and Web Development seems like great options. Adding the accreditation in cybersecurity using the courses in our existing degree options also seems like a good value add to the program, and something we can promote to both students and employers to recognize the quality of the program. Working toward this accreditation is a good balance for us. It gives us an avenue to demonstrate, document, and advertise the training we provide in cybersecurity without the need to add a degree. We encourage the faculty to consider how they can promote to the “gamers” who are interested in this career field how the basics of programming they are learning can be used in the game development field. There is the potential to add content in Unity and work toward Unreal Engine.

2	Marketing and Recruitmentt	Key Recommendation: Develop and implement aggressive marketing, recruitment, and outreach. Rationale: Without targeted marketing, that creates the need and entices individuals to the program, the program may languish and fail. Success Target: 50 students are enrolled in the program in Fall 2025. Success Strategy: Regularly scheduled community outreach/events for IT instructors to meet with potential students. Strategies to bring high schools students into the program in a meaningful and sustainable way. Recruitment from a statewide inventory of MUS students to provide students with new opportunities and strategies to complete degrees. Visit board meetings, make asks for community leaders, etc. Identify value proposition of our program for employers and remote-work companies based in Montana. Make quarterly contact regarding how our program can add value to existing employees. Success Resource: Marketing campaign for CS that is targeted, active, and sustained over five years. Actively engaged community partnerships. Resp. Party: Information Technology and Programming APRC Response: The committee suggests more robust prior learning assessment (PLA) options be developed and promoted. Students may be reluctant to pursue a degree if they have already acquired some of the skills taught in the program, such as those who were self-taught, or those already in the industry wanting to advance their careers. A partnership with the HC Testing Center should be pursued. Cabinet Feedback: This is very good timing for this recommendation and this program review. This year the College has received two sources of funding to support recruitment efforts for this program: the Montana Futures at Work grant targeting high school students and Education Design Labs funding to promote the stackable short-term training pathways. There is a potential to receive even more funding through the OCHE and the sprint degree designation. We also encourage focusing on the AS transfer pathway as an opportunity to start in Helena and transfer to UM without leaving Helena. This has potential to appeal to a lot of people who don't want to leave this community.

3	Partnerships	Key Recommendation: Create partnerships with government, education, private industry, military and community organizations. Foster Service Learning projects for the community. Including statewide high schools in outreach. Rationale: We need understand the needs of our employers and have a relationship with them in order to provide a high quality experience for our students and show our partners the value of the program. Success Target: We have six active collaboration that bring value to our students and our partners. The activity and level of engagement is measured in frequency and duration of contact, e.g. once a year CS job fair. Success Strategy: Use existing funding sources to develop and implement a sustainable, documented, long-term system of maintaining and managing partner relationships. Success Resource: A contact manager to follow up to make sure contacts take place. Leverage existing HC contacts on behalf of CS program. If available, utilize the career services staff for regular outreach. If a career services staff is not available, program staff will need to arrange time to conduct regular outreach. Resp. Party: Information Technology and Programming APRC Response: There was some concern about using work study students to build and/or maintain relatonships, given the brief length of employed in this area. Faculty will reconsider this idea. The committeed suggested reaching out to military partners, as the program could offer a way for veterans to transition from military training to a civilian job. A possible partnership with the psychology department was suggested, in the form of a psychology of programming or brain/computer interface course. There may be an opportunity to have more people trained in using the new system-wide LMS or Ellucian Banner. Cabinet Feedback: Good reminder of the importance of our continued to connection to industry and other organizations to provide opportunities for students. We should continue to look for internship partners, as well as business and industry to be active on the advisory board. An opportunity for partnership may exist with the FIRST LEGO Robotic Association as young people involved in this activity have an interest in programming. It is encouraging to hear of renewed connection with Helena High School, and the Montana's Future at Work may open up more connections to schools.

Section 8: APRC Committee Proposed Determination & Rationale

APRC Proposed Determination:

Continue

APRC Rationale:

Continue as is with plans to grow the program.
Information technology and programming skills are increasingly in demand, though interest on the students' part in formal degree paths has been challening in the last few years. The programs plans to add at least three new degree/certificate options, along with heavy marketing and pursuit of new partnerships, are solid strategies for rebuilding the program.

APRC Additional Feedback:

Notes from the meeting:
• Networking has officially been terminated, but was included in the program review because it was active for most of the review period. Factors that led to the termination include:
o Focus on one vendor (CISCO) was limiting
o Loss of instructor
o Declining enrollment
o Much of network management has moved to the cloud
o Employment outlook is low

•Changes in curriculum are driven by industry and the advisory committee
o Computer science pathway fills a gap in transfer pathways system-wide
• Course formats were changed to primarily virtual blended format to provide flexibility in attendance. Instructors can easily identify students who are struggling with remote participation and encourage them to attend in person
• Faculty had explored a block schedule for the program, but determined that the high number of part time students made it difficult to implement. They have tried to condense course times to one time of day and fewer days per week, which has been helpful.
• The program currently has a common first term for all pathways, enabling students to get started in program and switch without acquiring too many extra credits
• Program faculty are interested in hearing from alumni about the value of their degree

Section 9: Dean's Cabinet Feedback

Dean's Cabinet Approval of APRC Determination:

Approve APRC Determination

Overall Cabinet Feedback:

The faculty in this department are to be commended for their hard work and commitment to reviewing and improving the program. They are both very involved in ongoing conversations on the best way to meet student needs, meet industry needs, and remain relevant in this everchanging industry.
The big concerns raised by the review are recruitment and retention of students. This year we will focus heavily on recruitment for this program (see below), but see reasons for this trend that need to be addressed through our offerings:
1.Many high school students with an interest go straight to the 4-year university.
2.Industry values skills achieved through short-term certifications for many jobs.
Student retention is low for several reasons:
1.Part-time students working in other fields stop-out and life makes it difficult for them to complete.
2.Adult students pursue the field, but realize they would be starting entry level in new career and have a difficult time leaving current employment (and pay) to make that new start.
3.Gamers are interested in programming as a career prospect but realize in first term that the program doesn't fit their goals.
We appreciate the efforts of the faculty in this department to work to meet students where they are. A good example of this is the review of changing to a block schedule. The move to hyflex modality is another good example of the willingness of the instructors to be very flexible to accommodate students.
We support all three recommendations made by the faculty.

Section 10: Final Determination for BOR Report

Final Determination for BOR Report:

Continue

Supporting Rationale:

The Information Technology & Programming program at Helena College has undergone significant change during the five-year review period. The program name was changed from Computer Technology in 2020 and the Programming AAS received a new name of Software Development. The AAS in Networking was placed in moratorium at the same time and eventually terminated in 2022.

Enrollment in the Software Development program has remained relatively steady, while retention and graduation rates have fluctuated quite a bit. Credential course completion rates compare with the college average. Program faculty have made efforts to improve retention and increase support for students. Faculty explored a block schedule but eventually determined it would be more challenging for the large number of part-time students in the program. Transitioning more courses to a hyflex modality has enabled more flexible attendance options for students, especially part-time students who may be working while attending school.

The program faces a number of external challenges. Despite transfer pathways in computer science from Helena College to MSU, UM, and MT Tech, many high school students with an interest in computer science choose to start at the four-year university. Although he skills covered in the program are highly valued by the industry, the college degree is not required, as it is possible to obtain short-term certifications in a variety of ways.

The program is currently exploring new offerings, including short-term stackable certificates in fields such as ServiceNow and web development. The program is also planning to add a degree in DevOps, which integrates development and operations functions of an IT department. The program is also considering pursing the accreditation for cybersecurity, rather than adding another credential offering to the many available around the state. The faculty will also pursue options for gamers interested in programming..

Marketing will be essential to promote the new and existing offerings in the program, as will partnerships with government, education, private industry, military, and community organizations. Not only will students have opportunities for work-based learning, but the partners may provide a valuable source of new students.

Attached Files

Attachment #	Attachment Title	Attachment URL
57	Data Summary	http://hc-curriculum.helenacollege.edu/ViewAttachment.aspx?id=57
58	CT Program Review	http://hc-curriculum.helenacollege.edu/ViewAttachment.aspx?id=58
59	Assess Matrix V1	http://hc-curriculum.helenacollege.edu/ViewAttachment.aspx?id=59
61	Assess Matrix V1	http://hc-curriculum.helenacollege.edu/ViewAttachment.aspx?id=61
62	ITP Curriculum Changes	http://hc-curriculum.helenacollege.edu/ViewAttachment.aspx?id=62
63	Annual Work Plan 5-Year Summary	http://hc-curriculum.helenacollege.edu/ViewAttachment.aspx?id=63
65	Assess Report	http://hc-curriculum.helenacollege.edu/ViewAttachment.aspx?id=65

Annual Work Plan 4-Year Summary ITP

Plan Developer	Year Code	Goal Number	Strategic Goal Objective	Goal Status	Action Item	Indicators	Mid-Year Update	Results	Future Actions
Steinwand, Bryon	2018-19	1	SG2.1	Ongoing	CT faculty will use the new student course assessment system to map course student learning outcomes to degree outcomes and degree outcomes to College	Mapping completed for some outcomes of every CT course. Area student learning outcome mapping report produced.	NULL	The assessment system was not ready in time to complete.	Work will begin over the summer to map course student learning outcomes to degree outcomes and degree outcomes to College institutional competences.
Steinwand, Bryon	2018-19	2	SG2.1	Ongoing	CT faculty will use the new student course assessment system, when available, to document student outcome assessments for all CT courses.	Course student learning outcome assessments completed for some outcomes of the majority of CT courses. Area student learning outcome	NULL	The assessment system was not ready in time to complete.	Work will begin over the summer to add learning assessments and assessment results for summer courses.
Steinwand, Bryon	2018-19	3	SG3.1	Completed	CT faculty will organize and participate in the CT Round Table Forum in the fall of 2018. Report on number of students	Event held and feedback from participants evaluated.	NULL	Event was held October 17th. Note sheets from each table was compiled and analyzed and reviewed in advisory	Positive feedback was received from event. We should hold the event again next year.
Steinwand, Bryon	2018-19	4	SG1.1	Completed	CT faculty will organize and participate in the interview and resume day in the spring of 2019.	Event held. Feedback from evaluators and students reviewed. Report on number of students and evaluators	NULL	Event held April 18th. We had fewer (2) students participate this year. We typically have between 4 and 8.	The the event again. Work to increase participation for future offerings.
Steinwand, Bryon	2019-20	1	SG2.1	Ongoing	CT faculty will use the new student course assessment system to map course student learning outcomes to degree outcomes and degree outcomes to College	Mapping completed for some outcomes of every CT course. Area student learning outcome mapping report produced.	NULL	The CT program is an early user of the new assessment system. 54% of CT courses have course outcome mapping to credential outcomes or institutional competencies.	We will continue to use the system and plan to achieve 100% coverage next academic year.
Steinwand, Bryon	2019-20	2	SG2.1	Ongoing	CT faculty will use the new student course assessment system, when available, to document student outcome assessments for all CT courses.	Course student learning outcome assessments completed for some outcomes of the majority of CT courses. Area student learning outcome	NULL	The CT program is an early user of the new assessment system. 37% of CT courses have planned outcome assessments created.	We will continue to use the system and plan to achieve 100% coverage next academic year.
Steinwand, Bryon	2019-20	3	SG2.1	Completed	The CT program experienced low retention of AAS students from the Fall 2018 cohort. CT AAS Retention and Completion data analysis will be conducted to identify problems. Changes to program will be identified once analysis is complete.	An analysis of current data on retention and completion. The planned changes to the program.	NULL	Added seminar as first semester / first year experience course to introduce students to the industry. Modified capstone course to be a required fourth term project course that would include portfolio creation and presentation. Part time students make up 38% of CT students. We chose not to move to block schedule to the negative impact on part time	CT AAS Retention and Completion data analysis will continue to be analyzed and additional changes planned.

Annual Work Plan 4-Year Summary ITP

Plan Developer	Year Code	Goal Number	Strategic Goal Objective	Goal Status	Action Item	Indicators	Mid-Year Update	Results	Future Actions
Steinwand, Bryon	2019-20	4	SG1.1	Deferred	CT faculty will organize and participate in the interview and resume day in the spring of 2019. If a college wide event is organized, CT will participate in	Event held. Feedback from evaluators and students reviewed. Report on number of students and evaluators attending.	NULL	Due to COVID 19 the event was not held.	Plan to hold the event again.
Steinwand, Bryon	2019-20	5	SG1.1	Completed	Explore integrating with the new MUS Computer Science pathway.	Results of analysis and or planned changes to AS option and related curriculum.	NULL	It was deemed to be too much of a risk to offer the new pathway with with a small cohort of current AS CT Programming students. It was decided that the current AS CT offerings should be withdrawn	Continue to explore options for implementing the MUS Computer Science or other pathways for our students.
Steinwand, Bryon	2020-21	1	SG2.2	Completed	CT faculty will use the student course assessment system to map course student learning outcomes to degree outcomes and degree outcomes to College institutional competences.	Mapping completed for some outcomes of every CT course. Area student learning outcome mapping report produced.	NULL	96% of courses have outcome mappings to credential outcomes. One course was not able to be mapped because none of the credential outcomes align with the course outcomes. This is likely an indicator that the credential	Update credential outcomes so that all courses can have some mapping of course outcomes to credential outcomes.
Steinwand, Bryon	2020-21	2	SG2.1	Completed	Participate in the two GEER's grants the the CT program is involved with. Assist East Helena HIgh School with new course curriculum development. Work with other participating colleges on course sharing initiatives, common curriculum development and expansion of Cyber Security and Cloud Computing curriculum into new or existing courses.	New IT or programming course or courses developed at East Helena High School with the assistance of Computer Technology Faculty. A list of courses that could be shared between participating campuses. Curriculum developed for new or existing courses in the Cyber Security and Cloud Computing topics.	NULL	Curriculum development with East Helena High is completed. Course sharing with Missoula College implemented for Spring semester. Students took the following courses from Missoula College: CSCI 215E Social and Ethics in CS, ITS 279 Cloud Systems. Missoula College students took the following courses from Helena College: ITS 224 Introduction to Linux. Two Missoula College courses were adopted for the Software Development AAS degree. Missoula College is	Continue to work with MUS colleges to expand the course sharing opportunities to better serve students.
Steinwand, Bryon	2020-21	3	SG3.1	In Progress	Partner with State government and community businesses on apprenticeship opportunities for Computer Technology	Agreements with several organizations to offer apprenticeships to Computer Technology students.	NULL	Several meeting held with state officials. Work ongoing.	Continue to work with state officials and industry representatives to expand apprenticeship opportunities.

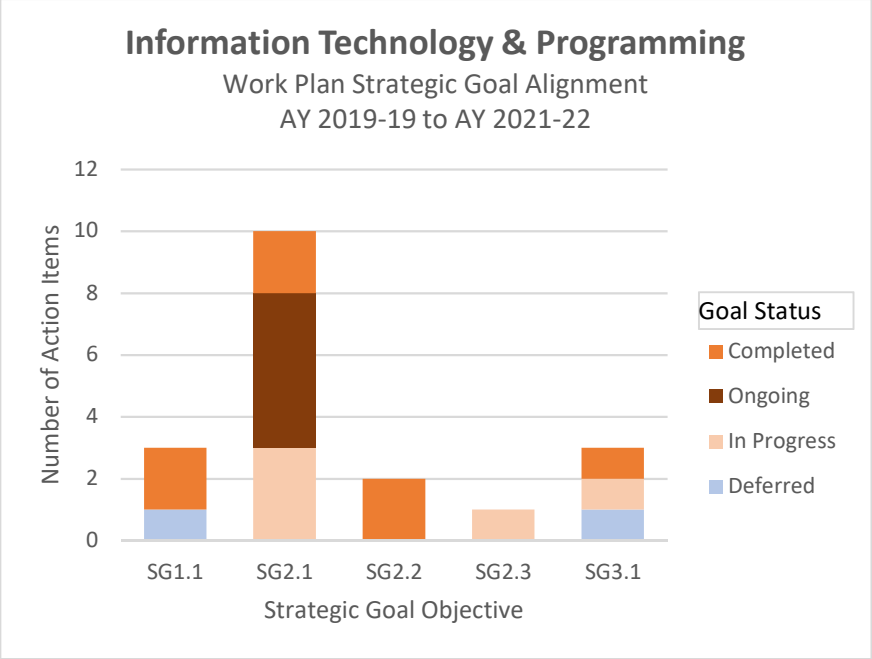
Annual Work Plan 4-Year Summary ITP

Plan Developer	Year Code	Goal Number	Strategic Goal Objective	Goal Status	Action Item	Indicators	Mid-Year Update	Results	Future Actions
Steinwand, Bryon	2020-21	4	SG2.1	In Progress	With the expansion of content into Cyber Security and Cloud Computing, additional faculty professional development will be necessary.	CT faculty will complete professional development in Cyber Security and or Cloud Computing topics. CT faculty will achieve at lease one industry certification in Cyber Security and or Cloud	NULL	Professional development on Cyber Security and Cloud Computing ongoing.	Bryon will be taking the Amazon AWS Certified Cloud Practitioner exam very soon. Bryon plans to then work on the COMPTIA Network+ certification after that. There may not be time before the
Steinwand, Bryon	2020-21	5	SG2.2	Completed	CT faculty will use the new student course assessment system, when available, to document student outcome assessments for all CT courses..	Course student learning outcome assessments completed for some outcomes of the majority of CT courses. Area student learning outcome assessment report produced.	NULL	For the 2020-21 academic year, 96% of sections, taught by full time faculty, had some outcomes assessed, 75% of courses were had all outcomes assessed, and 54% of courses	We will continue to use the assessment system into the future.
Steinwand, Bryon	2021-22	1	SG3.1	Deferred	Partner with State government and community businesses on apprenticeship opportunities for Information Technology and Programming students.	Agreements with several organizations to offer apprenticeships to Information Technology and Programming students.	No progress made yet.	No progress made.	No progress made. Will do next year.
Steinwand, Bryon	2021-22	2	SG2.1	Ongoing	With the expansion of content into Cyber Security and Cloud Computing, additional faculty professional development will be necessary.	IT and P faculty will complete professional development in Cyber Security and or Cloud Computing topics. IT and P faculty will achieve at lease one industry certification in Cyber Security and or Cloud	Progress made but not ready to test yet.	Bryon is attending the NICE Cyber Security Conference early June. Bryon is working on another Amazon AWS Cloud Computing Certification. Expect to test late summer or early fall.	There are several certifications so this will continue until all necessary certifications are achieved.
Steinwand, Bryon	2021-22	3	SG2.1	In Progress	The Network Administration AAS credential will not be continuing. We want to look for an alternative credential to offer. Currently considering Cyber Security AAS and Computer Science AS.	Research results on feasibility of options. If feasible option is found, plans developed for curriculum development, staffing and implementation.	Computer Science AS pathways created for MUS, MT Tech, and UM. Planning to develop new Cloud Devops AAS and IT Support CAS.	Currently working on new Cloud Devops AAS and IT Support CAS options and looking into No/Low Code option or training for current or future state employees. Will be meeting with Missoula College and Great Falls College faculty over the summer to discuss the Cloud Devops AAS	Create curriculum and finalize OCHE paperwork for new options.
Steinwand, Bryon	2021-22	4	SG2.3	In Progress	Credential outcomes need to be updated. We are unable to map some course outcomes to credential outcomes. We are also not able to map from credential outcomes to	New credential developed and submitted to ASCRC for approval. Outcome mapping completed for all courses once approval received.	No progress yet.	Draft of new credential outcomes created. We want to allow the new IT and P faculty to have input into the new outcomes. This will happen late summer or early fall.	Collaborate with new faculty member on draft credential outcomes. Submit new credential outcomes for ASCRC approval in the fall.

Annual Work Plan 4-Year Summary ITP

Plan Developer	Year Code	Goal Number	Strategic Goal Objective	Goal Status	Action Item	Indicators	Mid-Year Update	Results	Future Actions
Steinwand, Bryon	2021-22	5	SG2.1	In Progress	Research incorporating project-based learning in select courses. Determine what courses would benefit the most from project-based learning projects. Identify what local and cloud resources would be best to implement required	List of courses that would see the most benefit from project-based learning. Description of project-based learning activities. Description of resources required to implement project-based learning activities. Plan for	No progress yet.	List of courses that would benefit from project-based learning completed. I was just notified that we will no longer be able to run our own servers for project-based learning. We will have to identify a budget for Cloud based servers to carry	Identify budget for Cloud based servers.

Count of Strategic Goal Objective	Column Labels				
Row Labels	**Deferred**	**In Progress**	**Ongoing**	**Completed**	**Grand Total**
SG1.1	1			2	3
SG2.1		3	5	2	10
SG2.2				2	2
SG2.3		1			1
SG3.1	1	1		1	3
Grand Total	**2**	**5**	**5**	**7**	**19**



Totals by Term

IT and P Asssessment Report

Term Code	# Planned Assessments	# Term Assessments	# Complete Term Assessments	% Complete Term Assessments	# Section Assessments	# Complete Section Assessments	% Complete Section Assessments
201930	0	0	0	0	0	0	0
201970	50	122	46	37.7049	138	51	36.9565
202030	229	170	91	53.5294	184	93	50.5435
202070	292	164	56	34.1463	167	164	98.2036
202130	380	128	124	96.875	132	128	96.9697
202170	371	108	54	50	129	65	50.3876
202230	383	99	76	76.7677	99	76	76.7677

Term	Course	Count Term Assessment	Count Term Assessment Met Target	Term Assessment Percent Complete	Term Assessment Percent Met Target
201970	CSCI292	0	0	0	0
201970	CSCI298	0	0	0	0
201970	CSCI299	0	0	0	0
201970	CSCI100	6	4	83.3333	80
201970	CSCI100	6	4	83.3333	80
201970	CSCI221	10	10	100	100
201970	CSCI245	8	7	87.5	100
201970	CSCI276	15	13	93.3333	92.8571
201970	CSCI292	0	0	0	0
201970	CSCI298	0	0	0	0
201970	CSCI299	0	0	0	0
201970	CSCI121	10	0	0	0
201970	CSCI211	8	0	0	0
201970	CSCI172	0	0	0	0
201970	ITS218	1	0	0	0
201970	ITS230	1	0	0	0
201970	ITS255	23	0	0	0
201970	ITS231	0	0	0	0
201970	MART145	10	0	0	0
201970	MART145	10	0	0	0
201970	NTS104	0	0	0	0
201970	NTS104	0	0	0	0
201970	NTS204	20	0	0	0
201970	NTS104	0	0	0	0
202030	CSCI292	0	0	0	0
202030	CSCI298	0	0	0	0
202030	CSCI299	0	0	0	0
202030	CSCI100	6	4	83.3333	80
202030	CSCI100	6	4	83.3333	80
202030	CSCI221	10	10	100	100
202030	CSCI245	8	7	87.5	100
202030	CSCI276	15	13	93.3333	92.8571
202030	CSCI292	0	0	0	0
202030	CSCI298	0	0	0	0
202030	CSCI299	0	0	0	0
202030	CSCI121	10	0	0	0
202030	CSCI211	8	0	0	0
202030	CSCI172	0	0	0	0
202030	ITS218	1	0	0	0
202030	ITS230	1	0	0	0
202030	ITS255	23	0	0	0
202030	ITS231	0	0	0	0
202030	MART145	10	0	0	0

Term	Course	Count Term Assessment	Count Term Assessment Met Target	Term Assessment Percent Complete	Term Assessment Percent Met Target
202030	MART145	10	0	0	0
202030	NTS104	0	0	0	0
202030	NTS104	0	0	0	0
202030	NTS204	20	0	0	0
202030	NTS104	0	0	0	0
202070	ITS164	11	0	0	0
202070	ITS218	16	0	0	0
202070	ITS231	10	0	0	0
202070	ITS230	10	0	0	0
202070	ITS255	23	0	0	0
202070	NTS204	24	0	0	0
202070	CSCI100	6	5	100	83.3333
202070	CSCI121	10	10	100	100
202070	CSCI172	0	0	0	0
202070	CSCI211	8	8	100	100
202070	CSCI245	8	8	100	100
202070	CSCI292	0	0	0	0
202070	CSCI292	0	0	0	0
202070	CSCI298	2	0	0	0
202070	CSCI298	2	0	0	0
202070	CSCI299	0	0	0	0
202070	CSCI299	0	0	0	0
202070	CSCI276	15	14	93.3333	100
202070	CSCI194	9	9	100	100
202130	CSCI111	12	12	100	100
202130	CSCI172	0	0	0	0
202130	CSCI206	8	8	100	100
202130	CSCI212	0	0	0	0
202130	CSCI221	10	9	100	90
202130	CSCI240	5	0	0	0
202130	CSCI292	0	0	0	0
202130	CSCI292	0	0	0	0
202130	CSCI298	2	0	0	0
202130	CSCI298	2	0	0	0
202130	ITS212	11	10	100	90.9091
202130	ITS224	25	0	0	0
202130	ITS274	12	11	100	91.6667
202130	ITS280	14	14	100	100
202130	NTS103	11	11	100	100
202130	NTS104	12	12	100	100
202130	NTS205	26	25	96.1538	100
202130	CSCI100	6	6	100	100
202130	CSCI299	4	3	75	100

By Term and Course IT and P Asssessment Report

Term	Course	Count Term Assessment	Count Term Assessment Met Target	Term Assessment Percent Complete	Term Assessment Percent Met Target
202170	CSCI100	6	4	83.3333	80
202170	CSCI100	6	4	83.3333	80
202170	CSCI121	10	10	100	100
202170	CSCI172	0	0	0	0
202170	CSCI194	10	10	100	100
202170	CSCI211	8	8	100	100
202170	CSCI245	7	6	100	85.7143
202170	CSCI292	3	3	100	100
202170	CSCI298	2	0	0	0
202170	CSCI298	2	0	0	0
202170	CSCI299	3	0	0	0
202170	ITS164	11	0	0	0
202170	ITS164	11	0	0	0
202170	ITS218	16	0	0	0
202170	ITS230	10	0	0	0
202170	ITS231	10	10	100	100
202170	NTS105	0	0	0	0
202230	CSCI111	12	11	100	91.6667
202230	CSCI172	0	0	0	0
202230	CSCI206	8	7	100	87.5
202230	CSCI212	0	0	0	0
202230	CSCI221	10	10	100	100
202230	CSCI240	5	0	0	0
202230	CSCI257	4	0	0	0
202230	CSCI276	15	12	93.3333	85.7143
202230	CSCI292	3	3	100	100
202230	CSCI298	3	3	100	100
202230	CSCI299	6	6	100	100
202230	ITS165	10	7	100	70
202230	ITS224	1	0	0	0
202230	NTS204	24	0	0	0
202230	MART145	10	10	100	100

Course LO Mapping Counts

IT and P Asssessment Report

TermCode	Count Mapping Course Outcome to Credential Outcome
201970	0
202030	0
202050	0
202070	0
202130	0
202150	10
202170	10
202230	10
202250	10

FullName	CreationDate	Status
Curriculum revision for NETWORKING FUNDAMENTALS	2/21/2020	Completed
New Course: NTS103 CCNA1 - Intro to Netwoerking Lab	2/24/2020	Completed
Curriculum revision for CCNA 2: ROUTING AND SWITCHING ESSENTIALS	2/24/2020	Completed
Curriculum revision for NETWORK OPERATING SYSTEM - SERVER ADMIN	2/25/2020	Completed
Curriculum revision for NETWORK SECURITY	2/25/2020	Completed
Curriculum revision for ETHICAL HACKING AND NETWORK DEFENSE	2/25/2020	Completed
Curriculum revision for CCNA 1: INTRODUCTION TO NETWORKS	2/26/2020	Completed
Curriculum revision for COMPUTER REPAIR AND MAINTENANCE	2/27/2020	Completed
New Course: CSCI192 CT Seminar	3/8/2020	Completed
Curriculum revision for THESIS/CAPSTONE	3/8/2020	Completed
Curriculum revision for PROGRAMMING WITH JAVA I	3/11/2020	Completed
Curriculum revision for PROGRAMMING WITH JAVA II	3/11/2020	Completed
New Course: ITS221 Project Management	1/19/2021	Completed
New Course: ITS179 Cloud Systems	1/19/2021	Completed
New Course: ITS165 Introduction to Operating Systems and the Command Line	1/19/2021	Completed
Curriculum revision for SYSTEMS ANALYSIS AND DESIGN	1/19/2021	Completed
Curriculum revision for MODERN DATABASE SYSTEMS	1/21/2021	Completed
Curriculum revision for WEB SERVICES	1/21/2021	Completed
Curriculum revision for PROGRAMMING WITH JAVA II	2/10/2021	Completed
Curriculum revision for PROGRAMMING WITH JAVA I	2/11/2021	Completed
Curriculum revision for CLIENT SIDE WEB DEVELOPMENT	2/11/2021	Completed
Curriculum revision for INTRODUCTION TO LINUX	2/11/2021	Completed
Curriculum revision for APPLICATION SECURITY	4/28/2021	Completed
New Course: CSCI215 Social and Ethical Issues in CS	12/14/2021	Completed
New Course: CSCI232 Intermediate Data Structures and Algorithms	12/14/2021	Completed
New Course: CSCI246 Discrete Structures	12/14/2021	Completed
New Course: CSCI205 Programming Languages with C/C++	12/14/2021	Completed
Curriculum revision for INTRODUCTION TO LINUX	12/28/2021	Completed
Inactivation of THE JOY AND BEAUTY OF DATA	11/9/2022	Completed
Inactivation of WEB PROGRAMMING	11/9/2022	Completed
Inactivation of WEB SERVER ADMINISTRATION	11/9/2022	Completed
Inactivation of XML DATA PROCESSING	11/9/2022	Completed
Inactivation of NETWORK OPERATING SYSTEM - SERVER ADMIN	11/9/2022	Completed
Inactivation of ADMINISTRATIVE SCRIPTING USING WINDOWS POWERSHELL	11/9/2022	Completed
Inactivation of ADMINISTRATIVE SCRIPTING USING PYTHON	11/9/2022	Completed
Inactivation of ETHICAL HACKING AND NETWORK DEFENSE	11/9/2022	Completed
Inactivation of CCNA1 - Introduction to Networks Lab	11/9/2022	Completed
Inactivation of CCNA 1: INTRODUCTION TO NETWORKS LECTURE	11/9/2022	Completed
Inactivation of CCNA 2: Switching, Routing and Wireless Essentials	11/9/2022	Completed

FullName	CreationDate	Status
Inactivation of CCNA 3: SCALING NETWORKS	11/9/2022	Completed
Inactivation of CCNA 4: CONNECTING NETWORKS	11/9/2022	Completed
Inactivation of STANDARDS BASED MOBILE APPLICATIONS	11/9/2022	Completed
New Course: ITS219 Directory Services and Identity Federation	11/21/2022	Registrar
New Course: ITS233 Introduction to DevOps	11/21/2022	Registrar
Curriculum revision for Modern Database Systems	11/21/2022	Completed
New Course: ITS213 Cloud Networks and Storage	11/21/2022	Registrar
New Course: ITS222 Enterprise Security	11/21/2022	Completed
New Course: ITS286 Operations of DevOps: Release, Deploy, Operate, Monitor, and Secure	11/21/2022	AssistRegistrar
New Course: ITS276 Development of DevOps: Plan, Develop, Build, Test, and Secure	11/21/2022	Registrar
New Course: ITS289 Professional Certification	11/21/2022	Registrar
Curriculum revision for COMPUTER REPAIR AND MAINTENANCE	11/21/2022	Registrar
Inactivation of NETWORK SECURITY	12/2/2022	AssistRegistrar
Inactivation of IP TELEPHONY	12/2/2022	AssistRegistrar

2021-22 Programming Pathway Course Outcomes Mapped to Program Outcomes

Courses	Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5	Outcome 6	Outcome 7
	Students will demonstrate knowledge of programming concepts, logic, design and problem solving techniques.	Develop, deploy and test desktop, distributed, and web applications.	Write computer programs using fundamental software development skills.	Write computer programs using Object oriented programming features	Demonstrate critical thinking by applying appropriate data structures and Abstract Data Types (ADTs).	Analyze and design information systems and database applications solutions to achieve business/organizational goals.	Implement a designed solution to solve business IT problems using state-of-the-art programming techniques and applications software
CSCI100	R I	R	R I	R I	R		R
CSCI111	R	M	R M	M	M		M
CSCI121	M	M	M	M	M	M	M
CSCI194							
CSCI206				M	M	R M	M
CSCI211	M		M		M		M
CSCI221	M					M	M
CSCI240							
CSCI245		M		M		R M	M
CSCI257							
CSCI276		M	M	M			M
CSCI292						M	
CSCI298						R	M
CSCI299						M	
ITS164							
ITS165		M					
ITS221							
ITS224							
ITS279							
MART145	R I	R M					R M

Montana University System
Academic Degree Program Inventory

Use filters below to search academic programs by campus, degree, major/program or concentration. Click on the catalog link to view the campus program listing in a new browser tab.

Campus	Degree Type	Major/Program	Concentration	Catalog Link	Minimum Credits Required
City College	Associate	Computer Programming and Application Development		https://catalog.msubillings.edu/cc/academic-..	69
		Computer Systems Technology		https://catalog.msubillings.edu/cc/academic-..	67
		Cyber Security / Network Technology	Cyber Security / Network Technolo..	https://catalog.msubillings.edu/cc/academic-..	60
		Cybersecurity / Network Support		https://catalog.msubillings.edu/cc/academic-..	69
Flathead Valley Community College	Associate	Information Technology and Security		https://www.fvcc.edu/programs/business-ec..	67
		Programming and Game Development		https://www.fvcc.edu/programs/business-ec..	60
Gallatin College	Associate	Information Technology Cyber Security		http://catalog.montana.edu/undergraduate/..	60
		Information Technology Networking Technology		http://catalog.montana.edu/undergraduate/..	60
	Certificate	Cyber Security & Information Assurance		http://catalog.montana.edu/undergraduate/..	16
		Network Technology		http://catalog.montana.edu/undergraduate/..	35
Great Falls College	Associate	Computer Information Technology	Information Systems Support	http://catalog.gfcmsu.edu/academic-progra..	61
			Network Support & Security	http://catalog.gfcmsu.edu/academic-progra..	62
		Computer Programming		http://catalog.gfcmsu.edu/academic-progra..	61
		Cybersecurity		http://catalog.gfcmsu.edu/academic-progra..	64
	Certificate	Cybersecurity		http://catalog.gfcmsu.edu/academic-progra..	20
Helena College	Associate	Software Development		http://www.helenacollege.edu/academics/pr..	60
Highlands College	Associate	Computer Networks and Cyber Security		https://catalog.mtech.edu/preview_program..	62
Miles Community College	Associate	Information Technology	Graphic & Web Design	https://content.milescc.edu/DownloadFiles/..	60
			Networking & PC Maintenance	https://content.milescc.edu/DownloadFiles/..	62
	Certificate	Networking Technician		https://content.milescc.edu/DownloadFiles/..	28
Missoula College	Associate	Information Technology	Network Administration an..	https://catalog.umt.edu/colleges-schools-pro..	62
	Certificate	Computer Support		https://catalog.umt.edu/colleges-schools-pro..	30
		Cybersecurity		https://catalog.umt.edu/colleges-schools-pro..	29

Program Review Data Summary - Information Technology & Programming	AY 2017-18 to AY 2021-22

Enrollment									
Unduplicated Annual Enrollment	**AY 1718**	**AY 1819**	**AY 1920**	**AY 2021**	**AY 2122**	**5-Yr Avg**	**5-Yr Trd**	**Notes**	**Source**
Networking AAS	36	35	29	15	11	25	-69%		Institutional Research
Prog AAS / Software Dev AAS	31	38	38	32	29	34	-6%		Institutional Research
IT & P Overall	70	75	67	47	40	60	-43%		Institutional Research
Helena College	1,785	1,906	1,797	1,730	1,846	1813	3%		Institutional Research

Average Annual FTE	**AY 1718**	**AY 1819**	**AY 1920**	**AY 2021**	**AY 2122**	**5-Yr Avg**	**5-Yr Trd**	**Notes**	**Source**
Networking AAS	23	23	17	9	3	15	-85%		Institutional Research
Prog AAS / Software Dev AAS	21	22	24	19	17	21	-23%		Institutional Research
IT & P Overall	47	46	41	28	20	36	-57%		Institutional Research
Helena College	836	804	746	657	659	740	-21%		Institutional Research

Retention									
Entering cohort	**Fall 17**	**Fall 18**	**Fall 19**	**Fall 20**	**Fall 21**	**5-Yr Avg**	**5-Yr Trd**	**Notes**	**Source**
Networking AAS	10	16	10	6	0	8	-100%	Fall 2017 to fall 2021 cohorts	Institutional Research
Prog AAS / Software Dev AAS	6	12	23	7	8	11	33%	Fall 2017 to fall 2021 cohorts	Institutional Research
IT & P Overall	16	28	33	13	8	20	-50%	Fall 2017 to fall 2021 cohorts	Institutional Research
Helena College	290	278	309	188	257	264	-11%	New and transfer only	Institutional Research

Retention Rate	**Fall 17**	**Fall 18**	**Fall 19**	**Fall 20**	**Fall 21**	**5-Yr Avg**	**5-Yr Trd**	**Notes**	**Source**
Networking AAS	40%	38%	0%	50%	N/A	32%		Fall to fall, retained in credential	Institutional Research
Programming AAS / Software Dev AAS	83%	33%	48%	71%	25%	52%	-58%	Fall to fall, retained in credential	Institutional Research
IT & P Overall	56%	43%	33%	62%	25%	44%	-31%	Fall to fall, retained in program	Institutional Research
Helena College	55%	58%	65%	54%	52%	57%	-3%	Fall to fall, retained at HC	Institutional Research

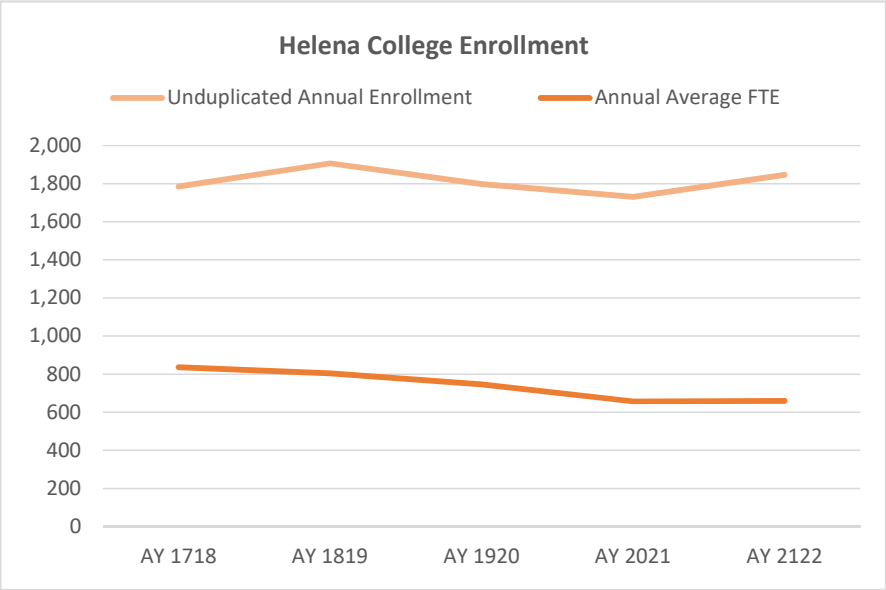
Course Completion Rate									
Metric	**AY 1718**	**AY 1819**	**AY 1920**	**AY 2021**	**AY 2122**	**5-Yr Avg**	**5-Yr Trd**	**Notes**	**Source**
Networking AAS	80%	77%	70%	78%	62%	73%	-18%	All courses required for credential, excluding gen eds	Institutional Research
Prog AAS / Software Dev AAS	74%	74%	70%	78%	61%	71%	-13%	All courses required for credential, excluding gen eds	Institutional Research
IT & P Overall	78%	77%	72%	70%	62%	72%	-16%	All coures requied for either credential, excluding gen eds	Institutional Research
Helena College	84%	84%	82%	87%	83%	84%	0%		Institutional Research

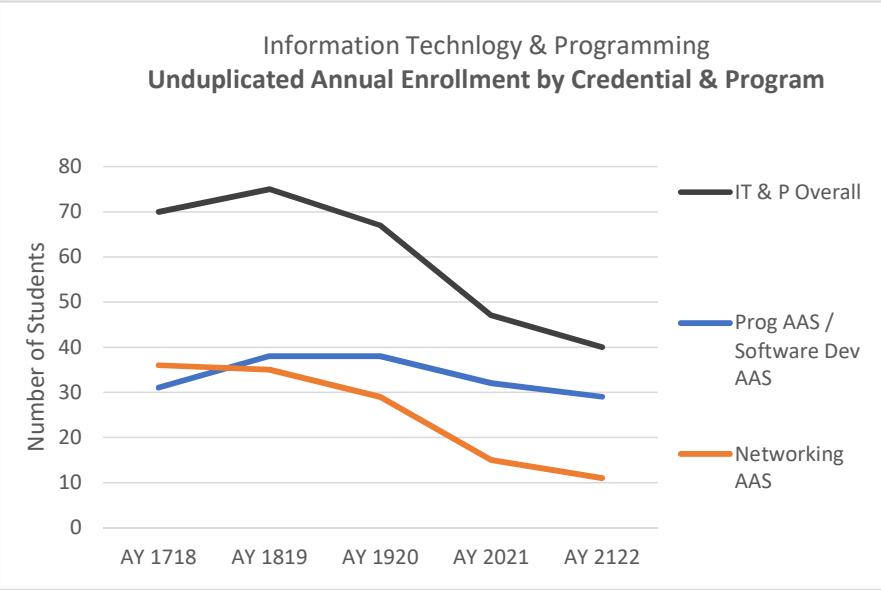
Completions									
Degrees/Certificates Awarded	**AY 1718**	**AY 1819**	**AY 1920**	**AY 2021**	**AY 2122**	**5-Yr Avg**	**5-Yr Trd**	**Notes**	**Source**
Networking AAS	6	7	6	2	3	5	-50%		Institutional Research
Prog AAS / Software Dev AAS	5	8	5	4	5	5	0%		Institutional Research
IT & P Overall	11	15	11	6	8	10	-27%		Institutional Research
Helena College	224	289	228	210	209	232	-7%		Institutional Research

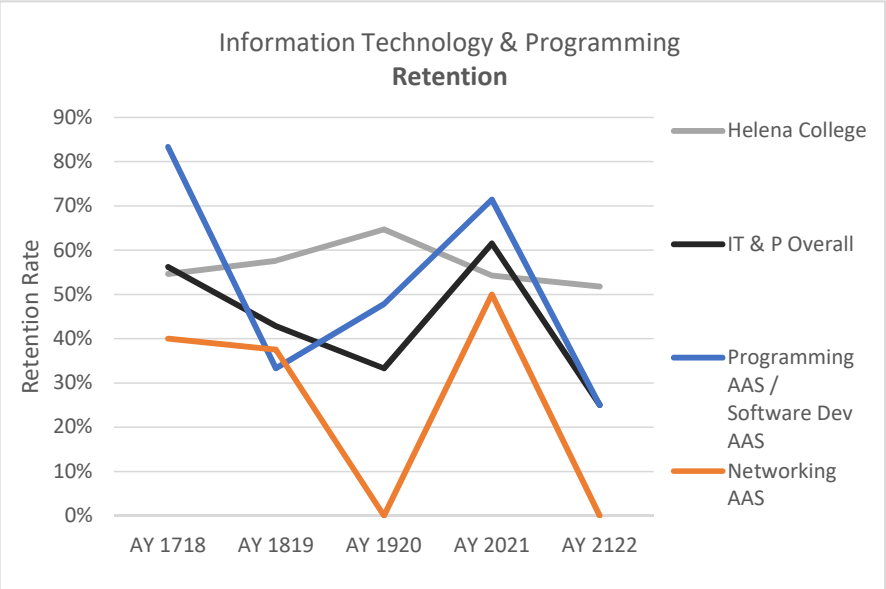
Degree Production Rate	**AY 1718**	**AY 1819**	**AY 1920**	**AY 2021**	**AY 2122**	**5-Yr Avg**	**5-Yr Trd**	**Notes**	**Source**
Networking AAS	28.2	31.2	25.3	10.5	18.2	23	-35%		Institutional Research
Prog AAS / Software Dev AAS	23.5	35.6	21.1	21.1	30.3	26	29%		Institutional Research
IT & P Overall	23.6	32.8	26.7	21.5	40.3	29	71%		Institutional Research
Helena College	26.8	35.9	30.6	32.0	31.7	31.4	18%	Number of degrees awarded (unduplicated) for 100 AAFTE	Institutional Research

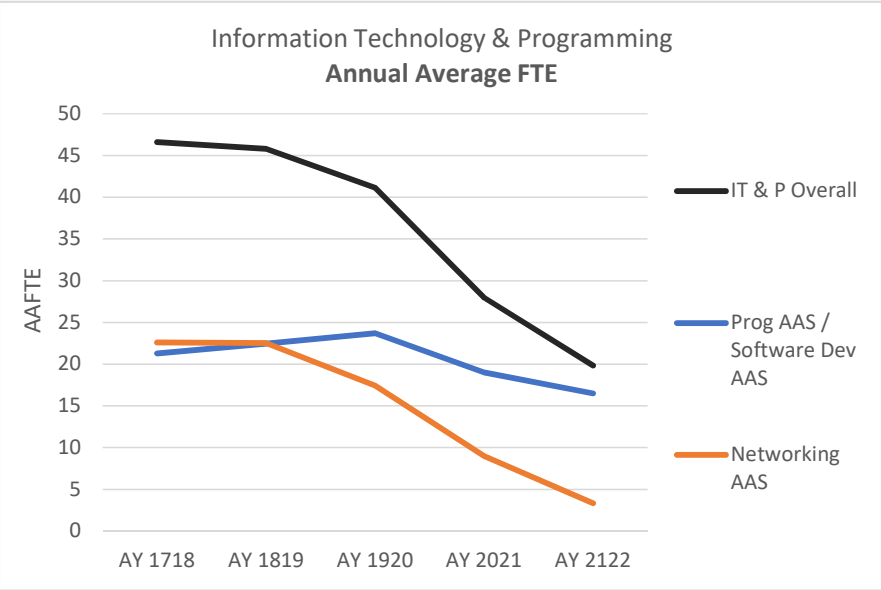
150% Graduation Rate	**Fall 2014**	**Fall 2015**	**Fall 2016**	**Fall 2017**	**Fall 2018**	**5-Yr Avg**	**5-Yr Trd**	**Notes**	**Source**
Networking AAS	33%	17%	56%	30%	25%	32%	-8%	Entering students graduating within 3 years	Institutional Research
Prog AAS / Software Dev AAS	15%	27%	25%	50%	25%	28%	10%	Entering students graduating within 3 years	Institutional Research
IT & P Overall	19%	26%	34%	38%	25%	28%	6%	Entering students graduating within 3 years	Institutional Research
Helena College	27%	26%	28%	32%	34%	29%	7%		Institutional Research

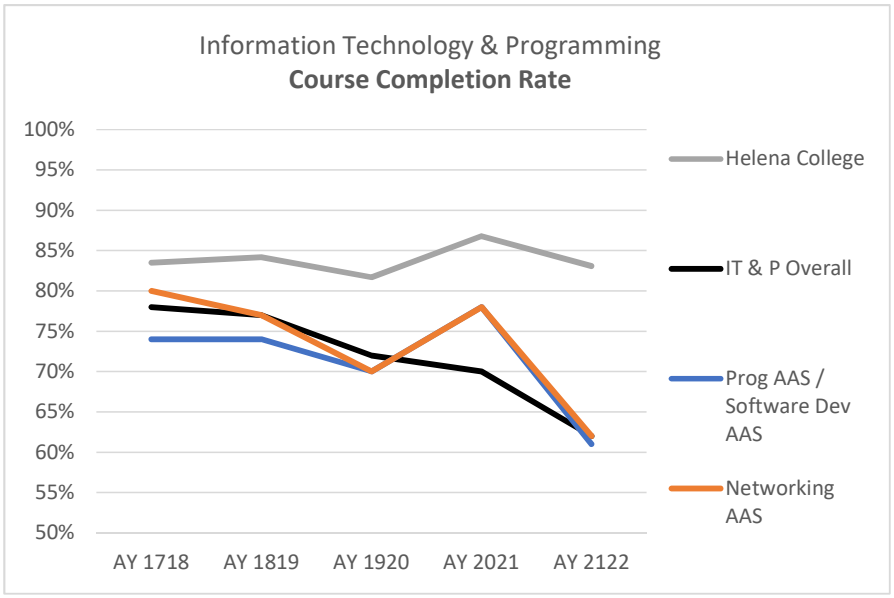
Completed 10/27/2022

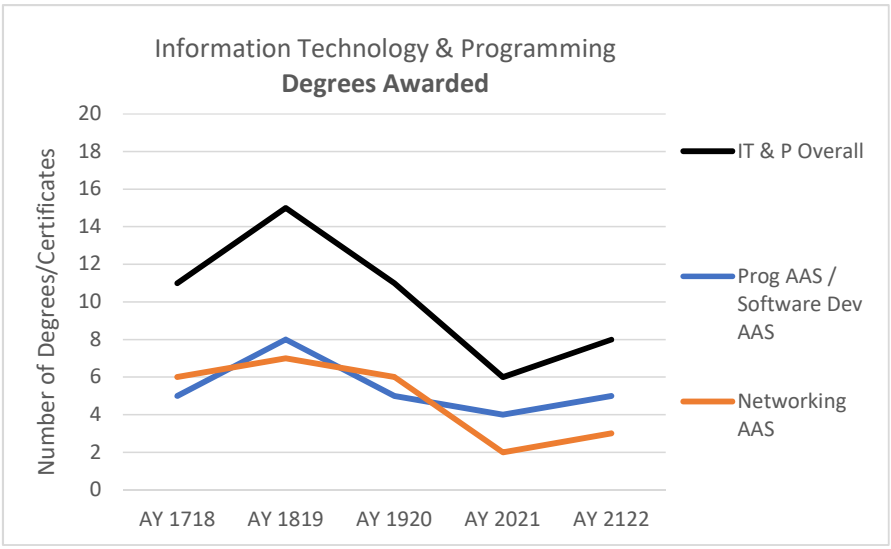

Helena College Enrollment
Unduplicated Annual Enrollment
Annual Average FTE
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
AY 1718
AY 1819
AY 1920
AY 2021
AY 2122

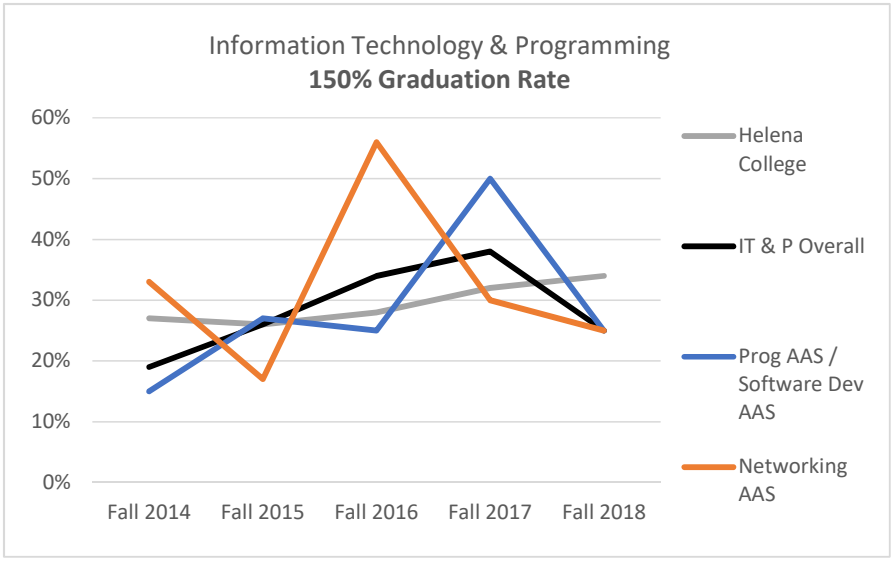

Information Technlogy & Programming
Unduplicated Annual Enrollment by Credential & Program
Number of Students
80
70
60
50
40
30
20
10
0
AY 1718
AY 1819
AY 1920
AY 2021
AY 2122
IT & P Overall
Prog AAS / Software Dev AAS
Networking AAS

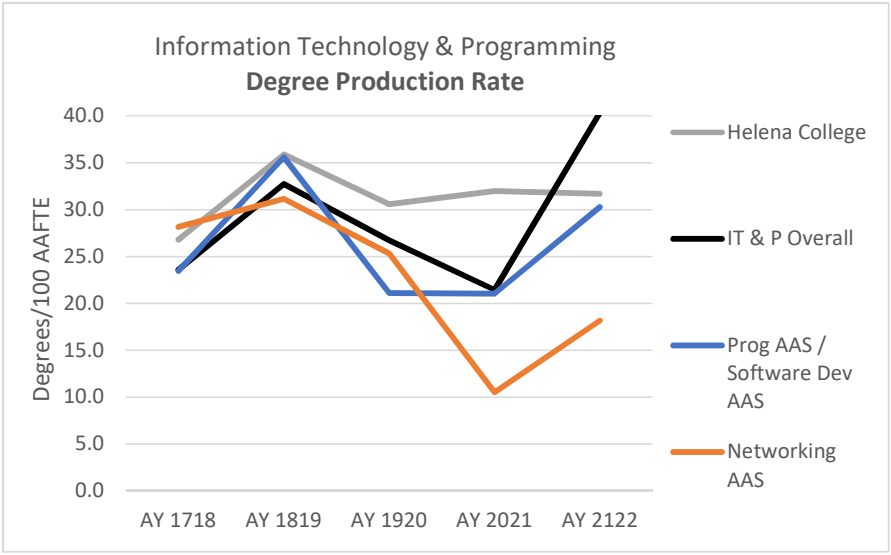

Information Technology & Programming
Retention
Retention Rate
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
AY 1718
AY 1819
AY 1920
AY 2021
AY 2122
Helena College
IT & P Overall
Programming AAS / Software Dev AAS
Networking AAS


Information Technology & Programming
Annual Average FTE
AAFTE
50
45
40
35
30
25
20
15
10
5
0
AY 1718
AY 1819
AY 1920
AY 2021
AY 2122
IT & P Overall
Prog AAS / Software Dev AAS
Networking AAS


Information Technology & Programming
Course Completion Rate
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
AY 1718
AY 1819
AY 1920
AY 2021
AY 2122
Helena College
IT & P Overall
Prog AAS / Software Dev AAS
Networking AAS

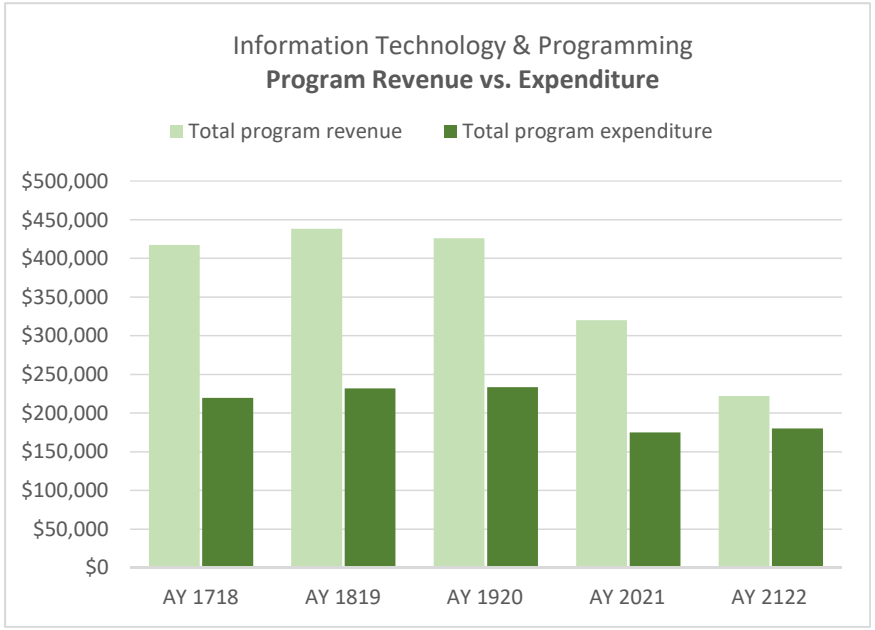

Information Technology & Programming
Degrees Awarded
Number of Degrees/Certificates
20
18
16
14
12
10
8
6
4
2
0
AY 1718
AY 1819
AY 1920
AY 2021
AY 2122
IT & P Overall
Prog AAS / Software Dev AAS
Networking AAS

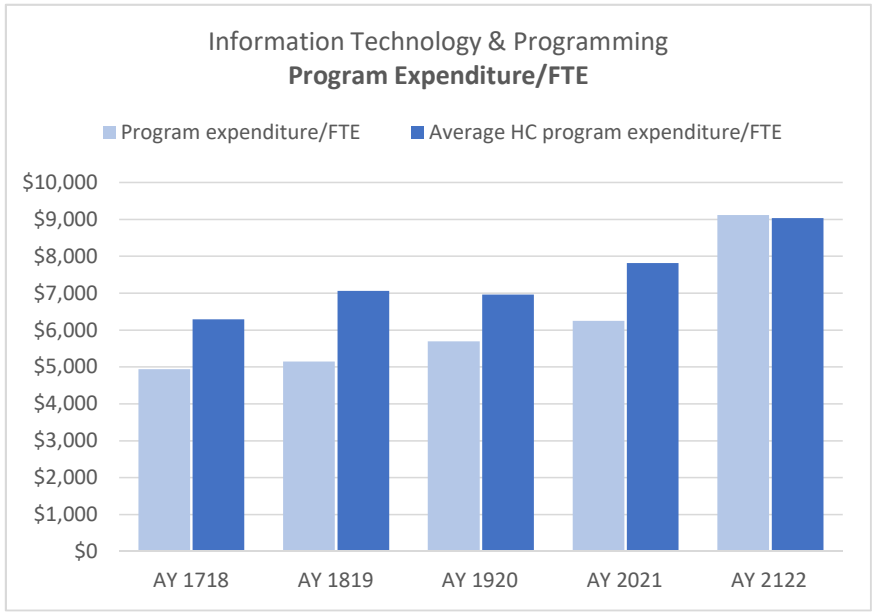

Information Technology & Programming
150% Graduation Rate
60%
50%
40%
30%
20%
10%
0%
Fall 2014
Fall 2015
Fall 2016
Fall 2017
Fall 2018
Helena College
IT & P Overall
Prog AAS / Software Dev AAS
Networking AAS

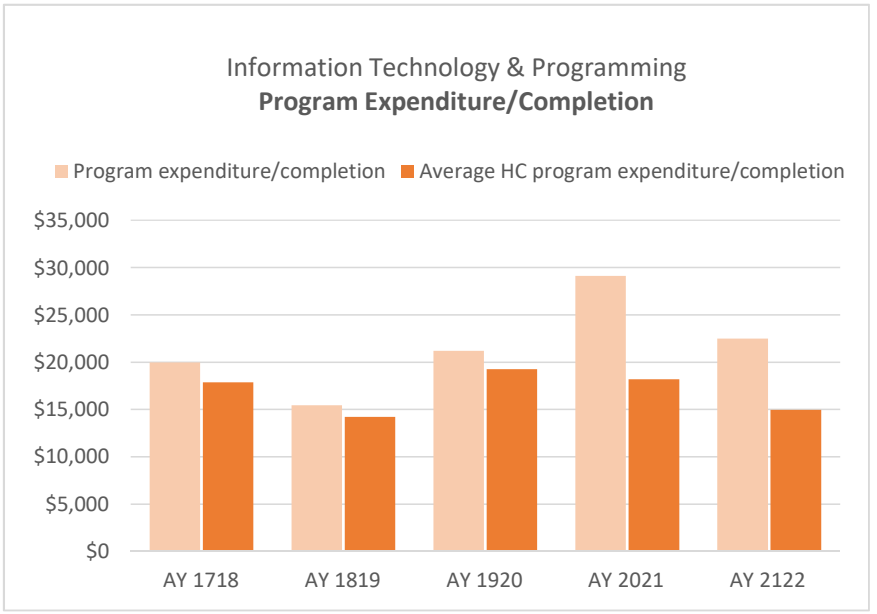

Information Technology & Programming
Degree Production Rate
Degrees/100 AAFTE
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
AY 1718
AY 1819
AY 1920
AY 2021
AY 2122
Helena College
IT & P Overall
Prog AAS / Software Dev AAS
Networking AAS

Program Review Data Summary - Information Technology & Programming									AY 2017-18 to AY 2021-22
Fiscal Resources									
Metric	**AY 1718**	**AY 1819**	**AY 1920**	**AY 2021**	**AY 2122**	**5-Year Avg**	**% Change 5 Years**	**Program Notes**	**Source**
Total program revenue	$417,145	$438,040	$425,704	$319,650	$221,895	$364,487	-47%		Institutional Research/Finance
Overall HC revenue/FTE	$9,736	$9,730	$10,383	$11,430	$11,245	$10,505	15%		Institutional Research/Finance
Total program expenditure	$219,596	$231,616	$233,073	$174,561	$179,836	$207,736	-18%		Institutional Research/Finance
Program expenditure/FTE	$4,935	$5,147	$5,689	$6,242	$9,113	$6,225	85%		Institutional Research/Finance
Average HC program expenditure/FTE	$6,284	$7,057	$6,956	$7,812	$9,031	$7,428	44%		Institutional Research/Finance
Difference IT&P vs HC average expenditure/FTE	-21%	-27%	-18%	-20%	1%	-17%	-104%		
Program expenditure/completion	$19,963	$15,441	$21,188	$29,094	$22,479	$21,633	13%		Institutional Research/Finance
Average HC program expenditure/completion	$17,867	$14,198	$19,255	$18,180	$14,942	$16,888	-16%		Institutional Research/Finance
Difference IT&P vs HC average program expenditure/completion	12%	9%	10%	60%	50%	28%	330%		Institutional Research/Finance

Completed 10/27/2022


Information Technology & Programming
Program Revenue vs. Expenditure
Total program revenue
Total program expenditure
$500,000
$450,000
$400,000
$350,000
$300,000
$250,000
$200,000
$150,000
$100,000
$50,000
$0
AY 1718
AY 1819
AY 1920
AY 2021
AY 2122


Information Technology & Programming
Program Expenditure/FTE
Program expenditure/FTE
Average HC program expenditure/FTE
$10,000
$9,000
$8,000
$7,000
$6,000
$5,000
$4,000
$3,000
$2,000
$1,000
$0
AY 1718
AY 1819
AY 1920
AY 2021
AY 2122


Information Technology & Programming
Program Expenditure/Completion
Program expenditure/completion
Average HC program expenditure/completion
$35,000
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$0
AY 1718
AY 1819
AY 1920
AY 2021
AY 2122

Program Data Summary - Information Technology & Programming					AY 2018-19 to AY 2021-22
Definitions					Completed 10/18/2022
Term	**Abbreviation**	**Use**	**Defintion**	**Source**	**Date added/u**	**Used in Report**
150% graduation rate		Standard	Percentage of students graduating within 150% of normal time to		10/19/2022	Program Data Summary
Academic Year	**AY**	Standard	Summer, fall, and spring terms (e.g. AY 2020-21 includes summer 2020, fall	MUS Enrollment Reporting Procedures		Program Data Summary
Annual average full-time equivalent	**AAFFTE**	Standard	Calculated in the following way: (Fall Official FTE + Summer Official FTE + Spring Official FTE)/2. See also **Full-**	MUS Enrollment Reporting Procedures	3/17/2022	Annual Enrollment History Completion and Transfer History
Calendar Year	**CY**	Standard	One year from January to December		10/19/2022	Program Data Summary
Cohort		Standard/IPEDS	A specific group of students established for tracking purposes.	IPEDS Glossary	3/17/2022	Course Completion History Completion and Transfer History Retention History
Course completion		Standard	Percent of students earning a passing grade in a course. May also be counted as credit hours. Does not include		3/17/2022	Course Completion History Developmental & Gateway Completion History
Credential course completion rate		Standard	Percent of students earning a passing grade in a course required for a credential. Incompletes, audits, and		10/19/2022	Program Data Summary
Degree production per 100 AAFTE		Standard	Number of degrees awarded in an academic year divided by the AAFTE for the same year, multiplied by 100. Allows for longitudunial comparison of degrees awarded while taking into		3/17/2022	Completion and Transfer History Program Data Summary
Degree production rate		Standard	Number of degrees awarded in an academic year divided by the AAFTE for the same year, multiplied by 100. Allows for longitudunial comparison of degrees awarded while taking into account changes in enrollment. Also		10/19/2022	Program Data Summary

Term	Abbreviation	Use	Defintion	Source	Date added/u	Used in Report
Entering cohort		HC	All new **first-time**, transfer in, and readmit/returning students coming to Helena College for the first time,		10/19/2022	Program Data Summary
Expenditure/Completion		HC	Program expenses (personnel, operating, and adjunct salaries) divided by number of degrees awarded for the		10/19/2022	Program Data Summary
Expenditure/FTE		HC	Program expenses (personnel, operating, and adjunct salaries) divided by FTE for the academic year		10/19/2022	Program Data Summary
Fiscal Year	**FY**	Standard	One year as defined for financial reporting, from July 1 to June 3		10/19/2022	Program Data Summary
Full-time equivalent	**FTE**	Standard	Calculated for a term by dividing total credit hours earned at the end of term (**EOT**) by 15.	MUS Enrollment Reporting Procedures	3/17/2022	Annual Enrollment History Completion and Transfer History Enrollment History
Headcount		Standard	Count of unique students. See also **Unduplicated**		3/22/2022	Annual Enrollment History Enrollment History Program Data Summary
Job placement rate		MUS, HC	Percent of graduates employed in-state for at least 1 quarter following graduation	Montana University System Workforce Development Dashboard	10/19/2022	Program Data Summary
Montana University System	**MUS**		Comprised of sixteen public universities and colleges in the state of Montana, including Helena College. Administered by the Office of the Commissioner of Higher Education and Governed by the	MUS website	4/15/2022	Annual Enrollment History Retention History Developmental & Gateway Completion History
Percent program capacity		Standard	Calculation = (Unduplicated Annual Enrollment) / (**Program Capacity**)		10/19/2022	Program Data Summary
Program capacity		Standard	Maximum number of students a program can accommodate in one academic year (first year maximum +	Program records	10/19/2022	Program Data Summary

Definitions

IT&P Program Data Summary by Credential AY18 to AY22

Term	Abbreviation	Use	Defintion	Source	Date added/u	Used in Report
Retention		Standard	Precentage of fall entering cohort returning for either the subsequent spring or subsequent fall semseter		4/1/2022	Retention History Program Data Summary
Unduplicated		Standard	Each student is counted only once (count of unique students)		3/17/2022	Annual Enrollment History Completion and Transfer History

The University of Montana
Multi-Year Comparison of Operating Accounts
H03020

Fund: 411000 General Operating

Orgn: 443102 Computer Technology

Account Type Levels / Accounts			2018	2019	2020	2021	2022
60	**Personal Services**						
61	**Salaries and Wages**						
	61123	Contract Faculty	145,994	152,767	157,107	109,078	69,542
	61132	Contract Faculty-Extra Comp	0	0	0	10,173	24,068
	61133	Termination Pay-Sick Leave	0	0	2,055	0	15,350
		Salaries and Wages:	**145,994**	**152,767**	**159,162**	**119,251**	**108,960**
62	**Hourly Wages**						
	61228	Student Work Study-State	0	286	0	0	0
		Hourly Wages:	**0**	**286**	**0**	**0**	**0**
64	**Employee Benefits**						
	61401	FICA	5,171	8,633	9,820	6,333	7,174
	61402	Retirement	0	0	0	0	0
	61403	Group Insurance	35,836	37,944	37,944	25,296	17,918
	61404	Workers Compensation	163	139	571	437	274
	61409	Medicare Tax	1,209	2,019	2,297	1,481	1,678
	61410	State Unemployment Tax	322	631	445	269	423
	61415	TIAA-CREF Retirement	13,278	14,647	16,031	10,124	11,578
	61415A	TIAA-CREF 1% HB95	1,418	1,521	1,612	1,148	999
	61499	Benefits-General	0	0	0	0	0
		Employee Benefits:	**57,398**	**65,535**	**68,720**	**45,086**	**40,043**
		Personal Services:	**203,392**	**218,588**	**227,882**	**164,338**	**149,003**
70	**Operating and Capital**						
72	**Supplies**						
	62229	Shop Supplies & Tools	300	0	0	0	0
	62241	Office Supplies	0	0	0	0	0
	62249	Minor Software < $100,000	0	200	0	0	0
		Supplies:	**300**	**200**	**0**	**0**	**0**
74	**Travel**						
	62415	Out of State-Other	0	0	0	0	-723
		Travel:	**0**	**0**	**0**	**0**	**-723**
77	**Repair & Maintenance**						
	62743	Computer Hardware Maintenance	0	0	0	0	0
	62750	Software Maintenance	320	0	0	0	0
	62799	Repairs & Maintenance-General	0	0	0	0	0
		Repair & Maintenance:	**320**	**0**	**0**	**0**	**0**
78	**Other Expenses**						

Criteria: COAS_CODE = 'C' and ((FUND_CODE = '411000' AND ORGN_CODE = '443102' AND PROG_CODE = '01')) and FSYR_CODE in ('22','21','20','19','18') and FSPD_CODE ='14'

The University of Montana
Multi-Year Comparison of Operating Accounts
H03020

Fund: 411000 General Operating

Orgn: 443102 Computer Technology

Account Type Levels / Accounts			2018	2019	2020	2021	2022
70	**Operating and Capital**						
78	**Other Expenses**						
	62801	Dues	300	0	1,039	300	0
	62802	Subscriptions	0	0	377	417	278
	62899	Other Expenses-General	0	0	0	0	0
		Other Expenses:	**300**	**0**	**1,416**	**717**	**278**
7D	**Capital Equipment**						
	63113	Shop/Plant/Industrial	0	0	0	0	0
	63199	Equipment-General	0	0	0	0	0
	63401	Multi-user Software >$100,000	0	0	0	0	0
		Capital Equipment:	**0**	**0**	**0**	**0**	**0**
		Operating and Capital:	**920**	**200**	**1,416**	**717**	**-445**
Orgn 443102 Total:		Income (Credits)	**$0**	**$0**	**$0**	**$0**	**$0**
		Expenses (Debits)	**$204,312**	**$218,788**	**$229,298**	**$165,055**	**$148,558**

Criteria: COAS_CODE = 'C' and ((FUND_CODE = '411000' AND ORGN_CODE = '443102' AND PROG_CODE = '01')) and FSYR_CODE in ('22','21','20','19','18') and FSPD_CODE ='14'

The University of Montana
Multi-Year Comparison of Operating Accounts
H03020

Fund: 411000 General Operating

Orgn: 443102 Computer Technology

Account Type Levels / Accounts		2018	2019	2020	2021	2022
Fund 411000 Total:	Income (Credits)	**$0**	**$0**	**$0**	**$0**	**$0**
	Expenses (Debits)	**$204,312**	**$218,788**	**$229,298**	**$165,055**	**$148,558**

Criteria: COAS_CODE = 'C' and ((FUND_CODE = '411000' AND ORGN_CODE = '443102' AND PROG_CODE = '01')) and FSYR_CODE in ('22','21','20','19','18') and FSPD_CODE ='14'

The University of Montana
Multi-Year Comparison of Operating Accounts

Account Type Levels / Accounts		2018	2019	2020	2021	2022
Grand Total:	Income (Credits)	**$0**	**$0**	**$0**	**$0**	**$0**
	Expenses (Debits)	**$204,312**	**$218,788**	**$229,298**	**$165,055**	**$148,558**

Criteria: COAS_CODE = 'C' and ((FUND_CODE = '411000' AND ORGN_CODE = '443102' AND PROG_CODE = '01')) and FSYR_CODE in ('22','21','20','19','18') and FSPD_CODE ='14'

The University of Montana
Multi-Year Comparison of Operating Accounts
H60170

Fund: 431102 Materials Fee

Orgn: 443803 CISCO Program Fees

Account Type Levels / Accounts			2018	2019	2020	2021	2022
50	**Revenue**						
51	**Tuition and Fees**						
50010	Class Fees, Other		690	560	2,884	1,820	280
		Tuition and Fees:	**690**	**560**	**2,884**	**1,820**	**280**
		Revenue:	**690**	**560**	**2,884**	**1,820**	**280**
70	**Operating and Capital**						
72	**Supplies**						
62229	Shop Supplies & Tools		0	0	0	0	0
62238	Minor Office Equipment ($1000-4999)		0	0	0	0	0
		Supplies:	**0**	**0**	**0**	**0**	**0**
77	**Repair & Maintenance**						
62743	Computer Hardware Maintenance		2,742	2,771	0	0	0
62750	Software Maintenance		0	320	0	0	0
62799	Repairs & Maintenance-General		0	0	0	0	0
		Repair & Maintenance:	**2,742**	**3,091**	**0**	**0**	**0**
78	**Other Expenses**						
62801	Dues		0	300	0	0	0
62899	Other Expenses-General		0	0	0	0	0
		Other Expenses:	**0**	**300**	**0**	**0**	**0**
7D	**Capital Equipment**						
63199	Equipment-General		0	0	0	0	0
		Capital Equipment:	**0**	**0**	**0**	**0**	**0**
		Operating and Capital:	**2,742**	**3,391**	**0**	**0**	**0**
Orgn 443803 Total:		Income (Credits)	**$690**	**$560**	**$2,884**	**$1,820**	**$280**
		Expenses (Debits)	**$2,742**	**$3,391**	**$0**	**$0**	**$0**

Criteria: COAS_CODE = 'C' and ((FUND_CODE = '431102' AND ORGN_CODE = '443803' AND PROG_CODE = '01')) and FSYR_CODE in ('22','21','20','19','18') and FSPD_CODE ='14'

The University of Montana
Multi-Year Comparison of Operating Accounts
H60170

Fund: 431102 Materials Fee

Orgn: 443803 CISCO Program Fees

Account Type Levels / Accounts		2018	2019	2020	2021	2022
Fund 431102 Total:	Income (Credits)	**$690**	**$560**	**$2,884**	**$1,820**	**$280**
	Expenses (Debits)	**$2,742**	**$3,391**	**$0**	**$0**	**$0**

Criteria: COAS_CODE = 'C' and ((FUND_CODE = '431102' AND ORGN_CODE = '443803' AND PROG_CODE = '01')) and FSYR_CODE in ('22','21','20','19','18') and FSPD_CODE ='14'

The University of Montana
Multi-Year Comparison of Operating Accounts

Account Type Levels / Accounts		2018	2019	2020	2021	2022
Grand Total:	Income (Credits)	**$690**	**$560**	**$2,884**	**$1,820**	**$280**
	Expenses (Debits)	**$2,742**	**$3,391**	**$0**	**$0**	**$0**

Criteria: COAS_CODE = 'C' and ((FUND_CODE = '431102' AND ORGN_CODE = '443803' AND PROG_CODE = '01')) and FSYR_CODE in ('22','21','20','19','18') and FSPD_CODE ='14'