

New Program Review Report

Bachelor in Information Technology

Educational Program at

Sitting Bull College

2023-2024

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Program Description

Role of the IT Education Program Within SBC

The purpose of the Information Technology program at Sitting Bull College is to provide students with the education and skills needed to succeed in the field of Information Technology and Technology. Our students will acquire knowledge conducive to beginning a life-long career in our ever-changing technological society, developing the skills to adjust to the fast-paced innovative field requiring security and privacy, while continuing to thrive in this evolving world. Students will use the attained critical thinking abilities to provide solutions to problems, implement ideas, and sustain our interconnected society.

Technology is driving businesses and governments today which require employees to have technological knowledge and skills. Individuals own personal computers, tablets, smartphones and home networks, and a wide variety of other computerized devices. Information Technology students at SBC will develop a firm foundation in Information Technology to prepare them for employment. The courses offered at SBC are standardized with the North Dakota University System's common course numbering system. (Sitting Bull College Bulletin, 2022, P. 157).

The course content emphasizes cybersecurity, data privacy, IT administration, hardware, software, networking, information systems, and electives complimentary to our core coursework. Students will accomplish the life-long skills that will give them the advantage-to prosper in our growing society and accomplish their goals.

REQUIREMENTS FOR A BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY General Education Requirements

ENGL 110	Composition I	3
ENGL 120	Composition II	3
COMM 110	Fundamentals of Public Speaking	3
MATH 103	College Algebra	4
PSYC 100	First Year Learning Experience	3
SOC 120	Transitions-Graduation & Beyond	2
NAS 101 or NAS 103	Ochethi Sakowin Language for Beginners/Introduction to Ochethi Sakowin Language, Culture & History	3
CSCI 101	Introduction to Computers	3
	Native American Studies Elective	3
	Humanities or Social & Behavioral Science - Select one course from: Arts, English, History, Humanities, Music, Native American Studies, Philosophy, Anthropology, Criminal Justice, Economics, Geography, Human Services, Political Science, Psychology, and Sociology	3
	Health/Physical Education- Select two one-hour courses or any one two-hour course	2
	Laboratory Science - Select two four-hour laboratory science courses	8
Total General Education Requirements		40

IT Core Requirements

CIS 128	Microcomputer Hardware I	3
CIS 141	Introduction to Cybersecurity	3
CIS 164	Networking Fundamentals I	3
CIS 212	Operating Systems Client	3
CIS 129	Microcomputer Hardware II	3
CIS 215	Implementing a Server Environment	3
CIS 185	Introduction to Programming with Python or Intro to Linux Administration	4
CIS 165	Networking Fundamentals II	4
CSCI 133	Database Concepts I (SQL)	3
CIS 168	Firewalls & Network Security	3
CIIS 243	Incident Response & Disaster Recovery	3
CIS 241	Intro to Digital Forensics	3
CIS 167	Enterprise Networking, Security, & Automation	3
<i>IT Core Electives: Required</i>		
CIS Elective 100+Level		3
CSCI Elective 100+ Level		3
Total Core Requirements		47

Professional Core Requirements

IT 301	Information Technology Concepts and Practices	3
IT 320	Hardware and Operating System Administration	3
IT 340	Network Technology and Architecture Administration	3
IT 375	Advanced Firewall Configuration	3
IT 400	Principles of Project Management in Information Technology	3
IT 410	Integrating Lakota Language into Technology	3
IT 497	Information Technology Capstone	4
<i>Professional Electives: Required</i>		
Upper Division Electives		12
Total Professional Requirements		34

TOTAL REQUIRED FOR GRADUATION.....120

Program Outcomes for: Bachelors in Information Technology (B.S.)

- I. The student will demonstrate their understanding of computer information systems and fundamental computer concepts.
- II. Students will engage in purposeful, ongoing learning activities that improve their knowledge, skills and competence in their personal and professional lives.
- III. Students will communicate professionally and effectively in a variety of contexts.
- IV. Recognize professional responsibilities and make informed and equitable judgments in computing practice based on legal and ethical principles.
- V. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

Program Personnel

The Online IT Instructor April Taylor joined SBC in August of 2023. She brings over twelve years of real world experience from these industries; such as USAF, Education k-12, Healthcare and Banking/Finance. Ms. Taylor held the following positions Work Group Manager, Technology Assistant, Technology Coordinator, Senior System Administrator, Information Site Security Officer, Public Information Officer, Help Desk Administrator, Database Administrator, Security Compliance Specialist. April has a Masters of Science in Technology for Education and Training from University of South Dakota and a graduate certificate in Cybersecurity and Information Assurance from Capella University, Minneapolis MN. She also has a Bachelor of Arts in American Indian Studies from University of Minnesota and she received her Associate of Science degree in Criminal Justice from Sitting Bull College in 2006(*cum laude*).

Steven Buchy joined the Information Technology faculty in August 2023 as the Information Technology Specialist. He earned a Bachelor of Sciences in Psychology from the University of South Dakota with minors in German & Spanish-and an Associates of Arts degree in Communications from Harrisburg Area Community College. He is CompTIA A+, Network +, & Security + certified. He has also completed MIT's XSeries Program in Computational Thinking using Python. He has nearly seven years of experience working in IT. Steven is a certified teacher and has taught CTE IT and Computer Science courses for over three years. His previous experience included teaching English as a foreign language in Korea.

Dr. Gabriella Arellano, began her-position as Cybersecurity faculty the summer of 2019. She earned a doctorate in Educational Leadership from Concordia University, St. Paul Minnesota, a Master's Degree in Education: Curriculum, Assessment, and Instruction from the University of Mary, in Bismarck North Dakota, Gabriella graduated from Mihaylo College of Business at California State University, Fullerton with a Bachelors in Business Administration and a concentration in Marketing. She has completed seminars, and clinical practices offered by North Dakota Career and Technical Education, and became certified in June 2019 as a Post-Secondary Cybersecurity Instructor. Dr. Arellano is also certified to teach the IT and Cybersecurity and Data Privacy curriculum at SBC consisting of the following: Cisco networking courses; IT Essentials courses; GIS/GPS; Microsoft Operating Systems and Server; Java Programming; Website Design; and Visual Basic Programming class.

The adjunct instructors for the Cybersecurity/Data Privacy and IT program and the classes they teach respectively include:

- Lisa McLaughlin, SBC Data Coordinator teaches SQL Database. Ms. McLaughlin earned a Bachelor of Science Business Administration, and has worked for SBC for 25 years.
- Mafany Mongoh, Ag/Science instructor, teaches GIS/GPS. Dr. Mongoh has a doctorate in Natural Resource Management and he has taught at SBC for 15 years.
- Jodi Thunder Hawk, SBC Python instructor teaches Python Programming. Ms. Thunder Hawk has one year of teaching experience at SBC in Information Technology. She has an associate's degree in Information Technology, a Bachelors in Business Administration, and a Master's degree in business administration. She has taught at SBC for eleven years.

Sitting Bull College is able to share instructor resources with the Turtle Mountain Community College (TMCC) at the Associate program level for Cybersecurity and Data Privacy. TMCC received the Indigenous Mutual Partnership to Advance Cybersecurity Technology (IMPACT) Grant Agreement with the U.S. Department of Energy, National Nuclear Security Administration, Office of Learning and Career Management Leadership and Workforce Development through a grant a National Science Foundation for three years beginning 2022. TMCC Instructors, their qualifications, and the years teaching at TMCC are the following:

- Chad Davis, IT Director Mr. Davis has a Master of Science, Management Information Systems and has taught for thirteen years at TMCC.
- Marlin Allery, IT Instructor Mr. Allery has a Bachelors Business Information Technology and has taught for ten years at TMCC;
- Ananth Ramaseri. Computer Science Instructor Dr. Ramaseri has a doctorate in Scientific Computing and has worked for two years at TMCC.

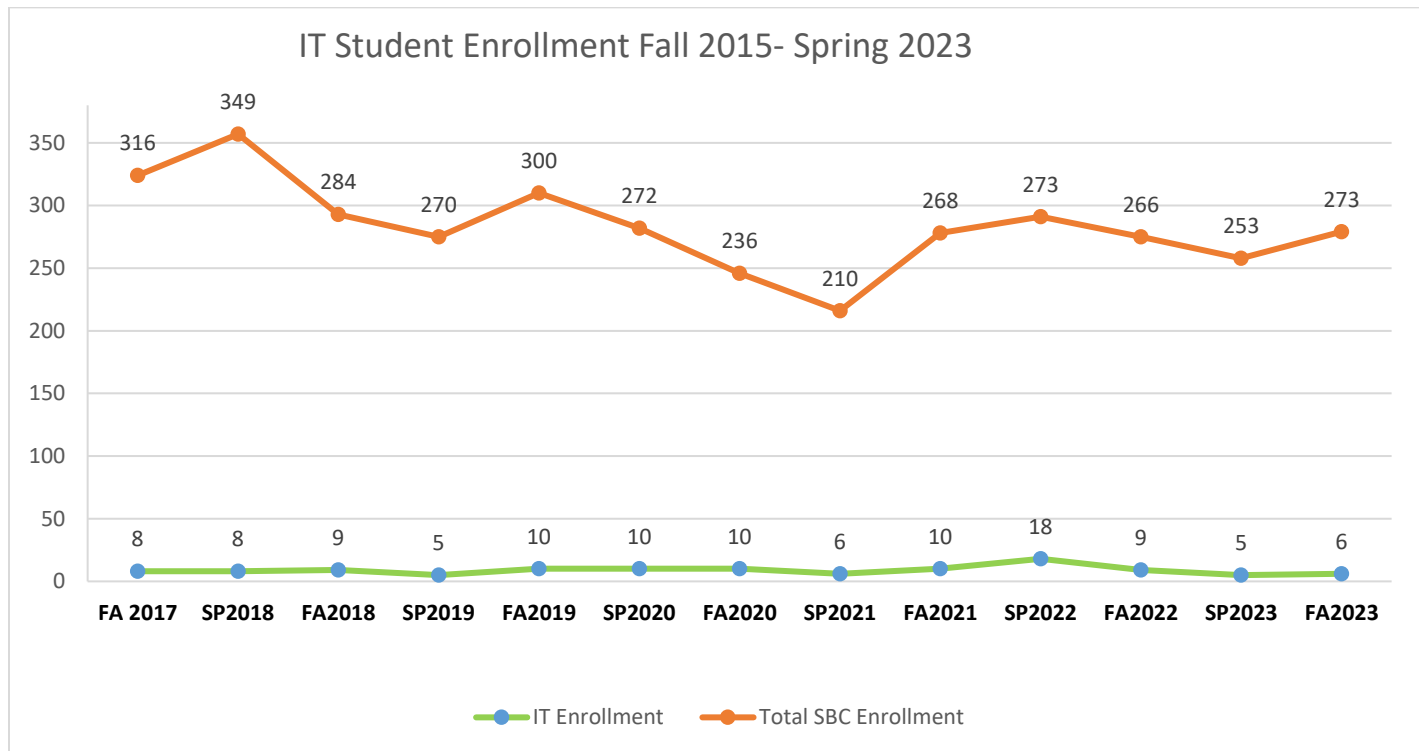
The faculty will provide post-secondary, learner-centered instruction in Information Technology in accordance with the Sitting Bull College Mission Statement. The faculty will encourage a culture of learning that values mutual responsibility, life-long learning, as well as personal and professional development. The qualifications for this position are the following:

1. Master’s Degree in Cybersecurity, Computer Science or related area preferred, Bachelor’s required.
2. Minimum of five years of experience in Information Technology or related field.
3. Teaching experience preferred.
4. Have knowledge and experience working with federal and tribal programs.

Program Productivity

The Bachelors in Information Technology program is new to SBC and currently only a feasibility study conducted on projected program productivity. However, the Associate’s Information Technology program has a history of variable enrollment, based on this we can anticipate similar enrollment outcomes for the Bachelors program. Student enrollment has generally been nearly equal by gender and almost fifty percent of the Association Science in IT graduates have been women. This gender equality is not consistent with industry trends as women enrollment and employment in IT has not been equivalent to men elsewhere in North Dakota and in the US (Andrade, 2014).

The IT enrollment and Sitting Bull College enrollment is displayed below (SBC Shared Data, 2023):



¹ Findings: enrollment excel spreadsheets years 2017-2023

Sitting Bull College student enrollment during the 2017-2023 fall and spring semesters has remained consistent with several variations in the six-year span. IT student enrollment did not seem to be affected by the COVID 19 pandemic, which rapidly required a shift to online education halfway through the spring 2020 semester. This may be a good predictable indicator for upcoming and future enrollment for Information Technology and Data Privacy students.

¹ (SBC Shared Data, 2023)

The department’s goal will be to increase enrollment, particularly, the Information Technology student enrollment as a percentage of total SBC enrollment. With the role out of the Bachelor’s in Information Technology being completely online as well as many other programs offering asynchronous classes we can predict student enrollment will continue to rise.

Student persistence and retention have long been a nationwide issue among colleges including Sitting Bull College. Student persistence is defined as being enrolled during the fall semester and returning for the spring semester at the same institution, while student retention is defined as continuing from one year to the next; that is, measured from fall semester of one year to fall semester of the next year (Tight, 2020). While the goal remains that of achieving a degree within a reasonable length of time, many factors influence a student’s persistence and retention; whether the student completes a degree program, drops out, or “stops out” may be influenced by both SBC and Information Technology program personnel, but is ultimately determined by each student. The following tables/graphs show the retention and persistence rates for SBC overall (SBC Shared Data, 2023):

Table 2 Sitting Bull College Persistence 2017-2023

SBC Full-Time Student Persistence				
First Semester	Second Semester	Total First Semester	Returning	% Percent Returning
Fall 2016	Spring 2017	218	130	59.6%
Fall 2017	Spring 2018	248	175	70.6%
Fall 2018	Spring 2019	226	154	68.1%
Fall 2019	Spring 2020	232	158	68.1%
Fall 2020	Spring 2021	182	118	64.8%
Fall 2021	Spring 2022	191	143	74.9%
Fall 2022	Spring 2023	200	140	70.0%
Fall 2023	Spring 2024	TBD	TBD	TBD

²Findings can all be found in the shared folder and the SBC public websites.

Table 3 Sitting Bull College Retention 2017-2023

SBC Full-Time Student Retention				
First Semester	Second Semester	Total First Semester	Returning	% Percent Returning
Fall 2016	Spring 2017	218	114	52.3%
Fall 2017	Spring 2018	248	121	48.8%
Fall 2018	Spring 2019	232	134	57.8%
Fall 2019	Spring 2020	229	132	57.6%
Fall 2020	Spring 2021	183	54	29.5%
Fall 2021	Spring 2022	186	120	64.5%
Fall 2022	Spring 2023	200	115	57.7%
Fall 2023	Spring 2024	TBD	TBD	TBD

² (SBC Shared Data, 2023) & S. (n.d.). SBC Persistence and Retention. Retrieved 2023, from <https://sittingbull.edu/wp-content/uploads/2020/10/Persistence-and-Retention-Fall-2020.pdf>

Program Graduates

Given that the program is new, an annual excel tracking process will be implemented by the Program Director. The formal process will begin to track Information Technology with the first program graduates this process will aim to connect both students and alumni to elicit career and networking opportunities. Currently, the available positions in Information Technology and related technology fields in North Dakota have salaries that range from \$40,000-\$180,000 per year (Indeed, 2023). However, no comprehensive survey has been conducted by SBC.

The Information Technology Department will ensure that building lasting relationships is set at the forefront of strategic goals for job placements. Building strong relationships with local businesses and large corporations will be a priority in order to grow internship opportunities for our students to work with local, tribal, statewide, and national businesses. Our goal is set a 100% employment rate for any Information Technology student who graduates from our program and ensure that those individuals are given the resources to continue their education and pursue a degree in higher education.

Program Revenue

The SBC Information Technology program revenue comes from the Bureau of Indian Affairs through the Tribally Controlled Community College Act for our Native students. The books, equipment, and supplies will all vary and the amounts to fund them differ based on the needs at the time of investment. Projected data itemizing tuition and Indian Student Count (ISC) revenue for the Information Technology education program, academic years 2024 through 2029, is itemized below:

Information Technology BS Program Revenue								
Academic Year	Fall ISC	Spring ISC	Tuition	IT BS Total	Projected SBC ISC Total	Projected SBC Tuition	Projected SBC Total (ISC + Tuition)	IT % of SBC Total
2024-2025	\$39,000	\$39,000	\$24,000	\$102,000	2,200,000	954,000	3,154,000	3.23%
2025-2026	\$39,000	\$39,000	\$24,000	\$102,000	2,200,000	954,000	3,154,000	3.23%
2026-2027	\$39,000	\$39,000	\$24,000	\$102,000	2,200,000	954,000	3,154,000	3.23%
2027-2028	\$39,000	\$39,000	\$24,000	\$102,000	2,200,000	954,000	3,154,000	3.23%
2028-2029	\$39,000	\$39,000	\$24,000	\$102,000	2,200,000	954,000	3,154,000	3.23%

Based on 10 full-time students each semester

Program Budget

The expenditures of the budget include the salary and fringe benefits of the department head, the instructor, and Information Technology Interns. The budget factors in professional development and (the instructor has traveled to receive the required training which is factored into the budget). The supplies that will be needed for the program are always evolving based on innovative technology needs and this is factored into the budget various as well. The following tables show the amounts projected.

³ (SBC Shared Data, 2023) & S. (n.d.). SBC Persistence and Retention. Retrieved 2020, from <https://sittingbull.edu/wp-content/uploads/2020/10/Persistence-and-Retention-Fall-2020.pdf>

Information Technology BS Program Cost					
Academic Year	Salary	Fringe	Supplies	Travel	Total
2024-2025	\$65,190	\$17,601		\$2,500	\$85,291
2025-2026	\$66,790	\$18,033	\$1,500	\$2,500	\$88,823
2026-2027	\$68,390	\$18,465		\$2,500	\$89,355
2027-2028	\$69,990	\$18,897		\$2,500	\$91,387
2028-2029	\$71,590	\$19,329	\$1,500	\$2,500	\$94,919

Based on one faculty member per year

Advisory Committee

An advisory committee comprising of members associated with the Technology community and SBC personnel supports the Information Technology program. The committee assists with suggestions designed to improve specific content areas; industry standards, the updating of curriculum, purchase of new instructional materials or equipment to modernize the classroom and adopting safety policies for faculty and students. The committee currently is comprised of the following members:

Advisory Fall 2023

Chad Davis	IT Director, TMCC
Herb Kraft	IT Director, Prairie Knights Casino
Josh Hammonds	Technical Leader, Cisco
Lisa McLaughlin	Registrar, SBC
Dave Mueller	IT /Finance Director, SBC

Summary of Advisory Meetings

Information Technology advisory meetings are held at the end of each fall and spring semester. The fall meeting will meet the week before the Thanksgiving holiday break and the spring meeting will take place in April after finals week.

Moreover, there will be spring meetings held in addition to the two formal advisory meetings. These meetings consist of conferences based on various vocation programs at Sitting Bull College who present a short description of their program and activities that they conducted over a certain period. The presentations also consist of upcoming plans and goals for each individual program. This allows for other advisory committee members to provide recommendations, suggestions, and feedback, which is typically positive.

Sitting Bull College will examine the Information Technology course offerings, in relation to similar programs at other tribal and state colleges. The review is to be administered every two years, prior to the publication of the Sitting Bull College Bulletin. The Bulletin displays the Information Technology and Data Privacy course offerings and changes are made to keep the program up to date and competitive; some courses have been eliminated, others modified, and new courses added. The committee also may suggest future classes and areas to consider for expansion. Likewise, this program provides various curriculum for the additional industry certifications, which also overlap across several courses.

The current faculty and the advisory committee have looked at a various IT, Information Technology and Computer science programs at other tribal and state colleges. The present consensus is that a Bachelor of Applied Science in Information Technology might best meet the needs of SBC students and their employers.

Similar programs exist at Minot State University and Dickinson State University, which require that incoming students have completed the Associate of Applied Science Degree, or Associate of Applied Science Degree, in IT or a related field.

Program Self-Evaluation

Faculty

The Information Technology department includes; April Taylor, Online IT Instructor, Steven Buchey, Associates in IT Instructor and Dr. Gabriella Arianna, Cybersecurity Instructor. In addition, there are also several adjunct instructors, faculty, and staff members that teach supplementary IT courses. To begin with, Lisa McLaughlin teaches SQL Database and Web Design, Jodi Thunder hawk teaches Python, and Mafany Mongoh teaches GIS/GPS. These instructors are outstanding in their fields and currently are sufficient in number to handle the required electives. The faculty at the TMCC and SCC will teach the additional cybersecurity courses through their perspective colleges to our SBC students.

Mike Selburg at Turtle Mountain Community College will teach the following courses: Introduction to Cybersecurity, Networking I & II, Operating System Client, Implementing a Server Environment, and the Internship course. Marlin Allery at Turtle Mountain Community College teaches the following: Firewalls & Network Security, Internship course, Incident Response & Disaster Recovery, Cybersecurity Infrastructure Configuration, Cybersecurity Prevention & Counter Measures, Cloud Foundations, and Ethical Hacking & Network Defense. Christian Davis at Turtle Mountain Community College teaches Cybersecurity Law and Ethics.

Several of the instructors are also on the assessment committee, curriculum committee, and advisory committee and offer insight to the needs of the program. The instructors experience and degrees have qualified them to teach the additional Cybersecurity coursework with the approval of the college administration. Furthermore, the program partners meet on a monthly basis, share a MOU agreement following specific procedures followed by each college to maintain proper organizational channels for curriculum design, content, professional development, and ensuring effective instruction.

Student Relations

Our focus is to build collaborative relationships between peers, faculty, employers, and the local community. The class sizes may range from two to ten students the first semester and grow from this starting point. Our computer labs have a capacity of more than 30 students combined.

Given the nature of the courses provided, our mentoring and collaboration has a solid foundation and continues to grow. We will also provide exceptional support via Zoom, Microsoft teams, phone, email, chat, and face-to-face (social distancing). This includes tutoring and help with navigating and utilizing the online platforms. The IT Specialist will assist any student and instructor with implementing and benefiting from online resources.

With the shift to online and hybrid education, all assessments, both formative and summative, will be administered both online and in-person. To begin with, student presentations will be online and in-person and consist of recorded media, slideshows, and virtual group collaboration, to limit large in-person group meetings. Educational resources will be offered online, including textbooks, videos, article links, software, and manuals. Students can utilize these resources in addition to their hard copy textbooks purchased from the college bookstore. All of our course assessments are offered through the following: SBC online, Cengage, TestOut, and Cisco Networking Academy. The only exception is the Hardware I class in which students can pick up computers and record the assembly and disassembly of the devices as a midterm and final assessment.

Sitting Bull College provides laptops to students who do not have access to computer devices at home. Dr. Arellano manages and tracks the laptops that are checked out using Prey tracking Software. Students who check out a laptop have the Prey software installed allowing the laptop to be tracked and notifying students when the laptop is due every two weeks. Given safety concerns, students are allowed to complete and sign a Laptop checkout contract online to re-checkout the laptop. Students that do not need to re-checkout the laptop

return it to Dr. Arellano's office the day that it is due. Students also receive email reminders on the due date and the day prior to returning the laptop. The IT contract also states that if laptops that are not returned on time they must be returned within a week or Dave Mueller, the IT Director at Sitting Bull College is contacted, and further measures are taken. These include posting a \$1,000 fee onto the student account until the laptop is safely returned and in working condition, as well as the locking of the device via Prey software.

All of the laptops checked out include a Microsoft subscription to use Word, Excel, PowerPoint, and Access. Moreover, all current students, staff, and faculty are included in the college's software subscription for Microsoft Office 365/2016 ProPlus, which includes Word, PowerPoint, Excel, Outlook, Access, OneNote, and more. Students are able to install versions of Office on five personal devices, including home desktop and laptop computers, tablets, and phones. In addition, Cybersecurity students in particular, will have unlimited subscription to Cisco Networking Academy and are registered by Dr. Arellano.

Curriculum Content, Design, and Delivery

The students' achievement of the learning outcomes of the IT Program education program are collected and reviewed throughout the academic year. These findings assist in recommending any changes to the curriculum content, design and delivery. Additional input is garnered from assessment committee members when these findings are presented annually to the committee.

The learning outcomes in this guidance represent core competencies that student in the Bachelor's in IT program will be expected to demonstrate. Several Bachelors in Information Technology programs across the state of North Dakota and Minnesota were cross referenced in determining the essential program outcomes implemented and foundations built upon. They are useful in mapping program and course outcomes to industry certifications and for course and program assessments.

Each learning outcome has an associated 3-tiered assessment rubric which provides further clarity and a meaningful evaluation of the outcome. Take note of their three levels of performance; Emerging, Developed, and Highly Developed (CCECC, 2020, pp. 1-12).

Additionally, incorporating Native American culture into the Information Technology Bachelors' program will be assessed informally. Students will be asked to introduce themselves in Lakota/Dakota prior to presenting projects and slideshow presentations. Students will be asked to create outlook signatures with their Lakota/Dakota names to include in emails.

Institutional Support

The main campus located at Fort Yates is the best example of Sitting Bull College's institutional support for the Bachelor's in Information Technology education program. The adjacent building houses the Student Center, Writing Lab, SBC Library, and support staff so these student resources are readily available. There are also faculty training opportunities to ensure that the Technology faculty member and adjuncts are up-to-date on current technology trends. The library provides a number of online resources with the library personnel helping as needed. Given the corona virus pandemic, many of these institutional resources moved online. Students can access Wi-Fi on campus conveniently from their vehicles, as well as mobile hotspots. The computer lab is limited in student capacity; therefore, students are allowed to checkout laptops, to complete course work from the comfort of their home, reducing exposure to the corona virus. Students also have access to the online library database where they can access all of the online library resources using their student log in information.

Academic assistance in the form of tutoring is available to students individually and group settings online via zoom as well as on campus. Tutoring is currently available to all students. Timely feedback is given on assignments, some class time is spent reviewing corrected work, and allowing students to redo assignments are some examples of strategies that have been implemented to assist the students. This has become more flexible, given that some students cannot make online times because they may have someone else in the home occupying the computer, such as a child.

The SBC Geek Oyate is a technology club focused on building leadership skills, exploring innovative ideas, and providing students with the opportunity to learn about various technology fields (SBC Shared Data, 2023). Students network with peers, employers, and community members to acquire additional skills in the

field. The SBC Geek Oyate also serves as a social purpose. Club members meet every two weeks in-person and build life-long networks through team building. Student Leadership and innovation is developed through technology workshops, fieldtrips, fundraisers, and club activities provided throughout the school year. Club members also meet peers that share their same interests and have the opportunity to establish their personal expansion in becoming a better leader. Club members learn the value of participation and collaboration, ultimately leading to a positive college experience with community involvement (SBC Shared Data, 2023).

The Geek Oyate was established in the fall of 2019. Geek Oyate students developed the club name and enrollment began. The Geek Oyate club enrolled five active members in the fall of 2019. Student enrollment in the club has increased substantially and outlines in Table 11. New members are continually recruiting which in turn, has the potential to increase the Cybersecurity student enrollment. Below is a table highlighting enrollment per semester:

Table 7 Geek Oyate Enrollment 2019-2023

Geek Oyate Enrollment 2019-Present		
	Students Actively Enrolled	Total Geek Students Enrolled
Fall 2019	5	5
Spring 2020	9	7
Fall 2020	12	16
Spring 2021	8	17
Fall 2021	9	15
Spring 2022	9	12
Fall 2022	9	12
Spring 2023	9	9
Fall 2023	5	5

⁴Findings can all be found in the shared folder.

In addition to the Geek Oyate club, IT students can participate in Student Government, American Indian Business Leaders, SBC’s Culture Club or the annual American Indian Higher Education Consortium competition.

Importance to the College and other Programs

The BS in Information Technology program will help to fill important computer support roles within the community. Future graduates have the opportunity to be employed Nationwide or at local jobs located on Standing Rock Reservation: at Sitting Bull College, in schools, in Indian Health Service clinics and hospitals, in two casinos, in tribal government, at Standing Rock Telecom and West River Telecom, and at private businesses. Others have the opportunity to work on the reservation in non-IT areas as well. Students may accept positions off of the reservation as well, in IHS hospitals, USDA offices, and school districts. Internships provide the student opportunities to gain supervised, practical experience working in an Information Technology profession.

Opportunities and Obstacles

The community of Standing Rock and the surrounding area is rich with opportunity. It is the mission of Sitting Bull College (SBC) to build the intellectual capital of the Standing Rock people and community. To realize this mission it is necessary to further educate the people of Standing Rock through the implementation of a degree offering. The area is highly agricultural and residents of the local community have expressed the need for increased economic development. A Bachelor’s in Information Technology will provide an avenue for increased intellectual thought as it pertains to current nationwide technology trends and will spur the potential for more economic growth within the Standing Rock Reservation. This growth will help retain and develop the

⁴ (SBC Shared Data, 2023) & S. (n.d.). SBC “Geek Oyate 2019-Present” folder. Retrieved 2020, from Sitting Bull College shared folder.

area's workforce. This proposal presents the need for an Bachelor's in Information Technology and outlines the degrees key points that address the community's needs. The intent of this study is to allow the college to move forward with accreditation requirements of the program of study.

With online learning, individual course enrollment is increasing and allowing for working individuals to complete courses on their own time as compared to prior years where courses were held during work hours. The increase in faculty training (including the competition of the ACUE faculty online training that took place in the summer of 2019), has allowed individuals to polish their online education skills to better provide online resources and meet the current needs of our students.

Another focus is the retention of students in the Bachelor's in IT program. American Indian and Alaska Native students experience the lowest rates of college retention and graduation at four-year institutions in the United States (Keith, J. F., Stastny, S., Agnew, W., & Brunt, A., 2017) SBC has formulated a retention management plan, which include activities such as the Student Summit and other student support activities.

The program has a number of suggested course sequences through the Bachelor's in information Technology Program, designed to take either four or five semesters, depending on the student schedule and how individual students plan to complete their coursework at their own pace.

BACHELOR OF SCIENCE
INFORMATION TECHNOLOGY PROGRAM
SUGGESTED SEQUENCE FOR STUDENT PROGRESSION

This sequence allows the student to complete the program in **eight semesters**.

Fall Term 1

PSYC	100	First Year Learning Experience	3 cr
ENG	110	Composition I.....	3 cr
MATH	103	College Algebra.....	3 cr
NAS	101	Lakota/Dakota Language I.....	.3 cr
HPR	123	Health/ Physical Education	2 cr
Total credits.....			14 cr

Spring Term 2

ENG	120	Composition II.....	3 cr
SOC	120	Transitions-Graduation & Beyond.....	2 cr
COMM	110	Fundamentals of Public Speaking	3 cr
CSCI	101	Introduction to Computers.....	3 cr
ENS	113	Introduction to Environmental Science.....	4 cr
Total Credits.....			15 cr

Fall Term 3

ENS	211	Intro to GIS/GPS.....	3 cr
NAS	103	Introduction to Ocheti Sakowin Language, Culture & History.....	3 cr
ENS	225	Environmental Sampling.....	4 cr
CIS	212	Operating Systems Client	3 cr
CIS	128	Microcomputer Hardware I	3 cr
Total Credits.....			16 cr

Spring Term 4

CSCI	119	Survey of Computer Information Systems.....	3 cr
CIS	129	Microcomputer Hardware II	3 cr

CIS	141	Introduction to Cybersecurity.....	3 cr
IT	301	Information Technology Concepts and Practices.....	3 cr
HUM	202	Native American Images in Film.....	3 cr
Total Credits.....			15 cr

Fall Term 5

CIS	220	Linux Administrator I.....	3 cr
CIS	164	Networking Fundamentals I.....	4 cr
CIS	167	Enterprise Networking, Security & Automation.....	3 cr
CIS	215	Implementing a Server Environment.....	3 cr
CIS	181	Creating Web Pages.....	3 cr
Total Credits.....			16 cr

Spring Term 6

CIS	165	Networking Fundamentals II.....	4 cr
CIS	223	Linux Administrator II.....	3 cr
CIS	168	Firewalls & Network Security.....	3 cr
CIS	241	Introduction to Digital Forensics.....	3 cr
CSCI	133	Database Concepts I (SQL).....	3 cr
Total Credits.....			16 cr

Fall Term 7

CIS	243	Incident Response & Disaster Recovery.....	3 cr
IT	320	Hardware and Operating System Administration.....	3 cr
IT	410	Integrating Lakota Language into Technology.....	3 cr
IT	340	Network Technology and Architecture.....	3 cr
IT	375	Advanced Firewall Configuration.....	3 cr
Total Credits.....			15 cr

Spring Term 8

NAS	318	Native American Literature.....	3 cr
BAD	301	Principles of Management.....	3 cr
IT	400	Principles of Project Management in IT.....	3 cr
IT	497	Information Technology Capstone.....	4 cr
Total Credits.....			13 cr

Total Degree Requirements..... 120 credits

DIVISION OF INFORMATION TECHNOLOGY

Courses and Descriptors for Bachelor’s in Information Technology

IT 301 Information Technology Concepts and Practices

Learners in this course use fundamental terminology, concept analysis, and practical knowledge of the components of computing systems to develop their understanding of the information technology and how it is integrated in every industry. Throughout the course, learners also build, demonstrate, and apply a general knowledge of IT skills needed for real world situations.

*Elective

IT 320 Hardware and Operating System Administration

In this course, learners demonstrate their knowledge of hardware and operating systems, focusing on peripherals and file management. Learners use modern operating systems, including Windows, Linux, and MacOS to demonstrate their skill with hardware and operating systems.

Prerequisite(s): CIS 129 Microcomputer Hardware II

IT 340 Network Technology and Architecture

Learners gain an understanding of the key concepts underlying Local Area Network (LAN), Metropolitan Area Network (MAN), and Wide Area Network (WAN). Learners examine the layered architecture of the network protocol stack, including the OSI and the TCP/IP models, and apply the principles of designing networks and implementing network protocols. Learners also apply topics of network topologies, cloud computing, networking devices, cabling, and basic network security

Prerequisite(s): IT 320 Hardware and Operating System Administration.

IT 375 Advanced Firewall Configuration

Learn how to troubleshoot the configuration and operation of the Palo Alto Networks® Next-Generation Firewalls and PAN-OS®. Gain visibility and control over applications, users, and content.

Gain an understanding of how to configure and manage Palo Alto Networks Next-Generation Firewalls (NGFWs).

Prerequisite(s): CIS 168 Firewalls and Network Security

IT 400 Principles of Project Management in Information Technology

An investigation of the project management techniques and appropriate software used to effectively manage projects. This course covers the knowledge areas and other topics as defined by the Project Management Body of Knowledge (PMBOK).

*Elective

IT 410 Integrating Lakota Language into Technology

This course focuses on using the Lakota Language keyboard to create digital media projects while integrating Lakota Language. Students will use what they have learned to create multiple digital compilations/presentations in Lakota Language.

*Elective

IT 497 Information Technology Capstone

Learners continue to apply knowledge and skills from other courses as they complete a project that benefits an organization, community, or industry. Learners prepare a proposal that includes a project description, deliverables, completion dates, and associated learning. Upon approval from the instructor, learners execute the proposal, complete deliverables to meet the needs of the client, and produce a final product. For BS in Information Technology learners only. Must be taken during the learner's final quarter. Cannot be fulfilled by transfer or credit for prior learning.

Program Planning

Every two years (in advance of the publication of the SBC Bulletin) the faculty members and advisory committee will examine the Information Technology course offerings, in relation to similar programs at other tribal and North Dakota state vocational colleges. Changes have been made to keep the program up to date and competitive; new courses have been added, others modified, and new courses updated. The number of credits required has been reduced overall, increasing the likelihood that students will complete the program without using up their eligibility for Pell Grant funding.

It is apparent that there are numerous Information Technology employment opportunities available in the region served by Sitting Bull College, and across the state of North Dakota, there are likely to be even more

openings in the near future. The challenge is making certain that interested students will consider SBC for their higher education choice.

Trends

As of January 2024, according to the Job Service of North Dakota, there are currently 200 Technology/Computer related positions available across the state of North Dakota requiring an Associate Degree or less (Job Service North Dakota, 2024). These positions consists of 200 Information Technology related positions based on the keyword “technology”, currently available across North Dakota under the Information Technology occupation group category requiring an associate degree or less (Job Service North Dakota, 2024). In addition, there are technology positions closely related to Technology, that are available statewide, requiring a bachelor’s degree (Job Service North Dakota, 2024). Lastly, there are currently five Information Technology related jobs available locally, on and near Standing Rock Reservation (Standing Rock Sioux Tribe, 2024). The following positions are available locally: MIS Technician, Prairie Knights Casino; IT Technician, Prairie Knights Casino; Information Technology Technician, Linton Hospital; Wireless Communications Technician, Standing Rock Telecom; Solutions Engineer, Plains Mobile.

The average annual wage for all technology occupations in the state of North Dakota is \$50,313 (Technology Council of North Dakota, 2023). According to the council, the state of North Dakota is estimated to need 6,500 technology positions through 2026 (Technology Council of North Dakota, 2023). Growth in the industry will create the need for 1,340 employees to fill new positions (Technology Council of North Dakota, 2023). The state’s computer and mathematical industry currently employs 6,780 statewide and new projected positions will equal 82% of the state’s current technology workforce (Bureau of Labor Statistics, 2022) Computer science teachers have the highest percentage of projected growth (30%) (Technology Council of North Dakota, 2023).

Given that Sitting Bull College serves both North Dakota and South Dakota, job trends in South Dakota will also be included in this review. According to the Department of Labor and Regulation, there are currently 13 Information Technology associated positions as of December 2022 (South Dakota Department of Labor and Regulation, 2023). According to the U.S Bureau of Labor statistics, there are currently 8,680 Technology and Mathematical positions currently occupied in the State of South Dakota (Bureau of Labor Statistics, 2022). The median hourly wage for these technology positions is \$33.34 per hour and the annual mean wage is \$77,210.

Table 8 North Dakota & South Dakota Information Technology & Data Privacy Related Positions Projected Growth

ND & SD Technology Positions Projected Growth 2026	
IT Position	Projected Growth
Computer Science Teacher, ND	30%
Information Security Analyst , ND	3.5%
Software Developers , ND	2.9%
Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic, SD	27.78%
Information Security Analyst, SD	27.35%
Software Developers, Applications, SD	29.07%

According to North Dakota job seekers the top three occupations in North Dakota in high demand are the following:

- Computer and Information Systems Managers
- Computer Network Support Specialists
- Computer Programmers
- Computer Systems Analysts
- Computer User Support Specialists

- Intelligence Analysts
- Information Security Analysts
- Software Developers
- Software Quality Assurance Analysts
- Testers
- Telecommunications Equipment Installers
- Repairers
- Except Line Installers
- Web Developers and Digital Interface Designers

In Sioux County, ND at present, there are two technology positions available, but they are not currently being advertised online. Below is a table outlining the current availability in Sioux county.

Table 9 Available Information Technology & Data Privacy Positions in Sioux County

Entity	Total Positions by Title	IT Job Openings
Grand River Casino	1 IT Director, 1 IT Technician	None
Prairie Knights Casino	1 IT Director, 2 IT Technician	Two
Sitting Bull College	1 IT Director, 1 IT Technician	One
IHS Hospital and Clinics	1 IT Director, 1 IT Technician	None
Standing Rock Schools, Ft. Yates	1 IT Director, 3 IT Technician	none
Standing Rock Sioux Tribe	1 IT Director, 4 IT Technician	Two
Standing Rock Telecom	1 IT Director, 2 IT Technician	One

⁵ Findings were taken from three websites (each company website was also visited)

As of November 2023, there are currently 6,382 Information Technology remote jobs available across the United States (Indeed, 2024). Python is required for 1,444 of these positions; Java, 890; PowerShell, 682; and C++, 426 (Indeed, 2024). Of these Information Technology positions, 446 only require an Associate’s degree in Information Technology or a related field (Indeed, 2024).

Below is a table outlining the current remote job openings, in alignments with the certificates that our Information Technology program currently prepares our Information Technology students to take online.

Table 10 Current Available Positions Requiring Industry Developer Skill November 2023

Remote Positions Available Requiring Developer Skills		
Certifications	Remote Positions Available	Type
Python	1,444	Remote Position
Java	890	Remote Position
PowerShell	684	Remote Position
C++	426	Remote Position

⁶ Findings were taken from indeed.com, link below. The Positions are all remote. Our curriculum prepares all of our Information Technology students to complete and pass the above certifications.

⁵ (Standing Rock Sioux Tribe, 2023) (Indeed, 2024)

⁶ (Indeed, 2024)

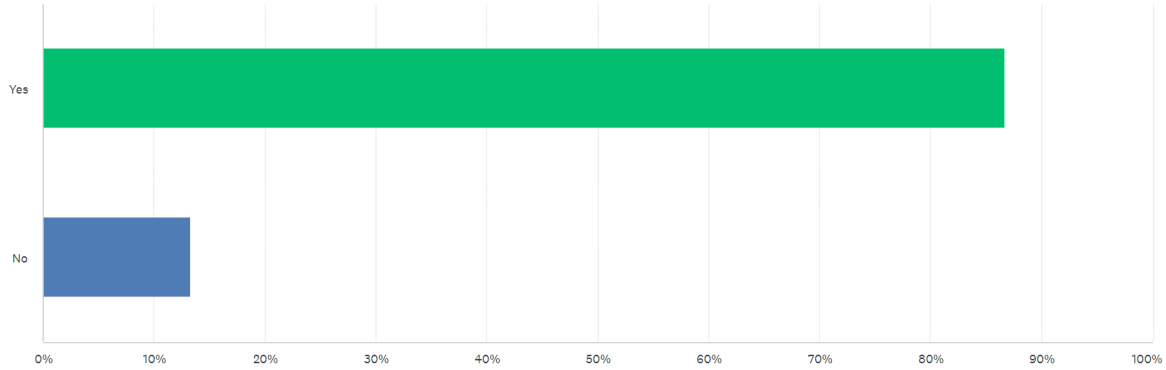
Appendices

- 1. Bachelor of Science in Information Technology Community Survey
- 2. Institutional Review

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY SURVEY RESULTS Employer Survey for Bachelor's in Information Technology Feasibility Study (Local)

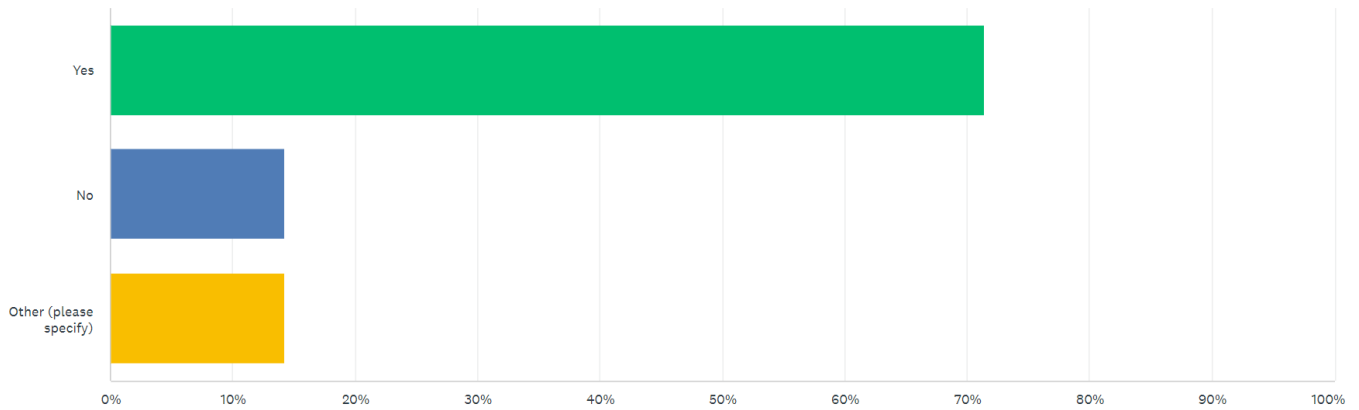
Do you have a need in your current place of employment for an Information Technology Professional? ...

Answered: 15 Skipped: 0



Would your organization have the capacity to add an IT position if there is currently not a position in place? ...

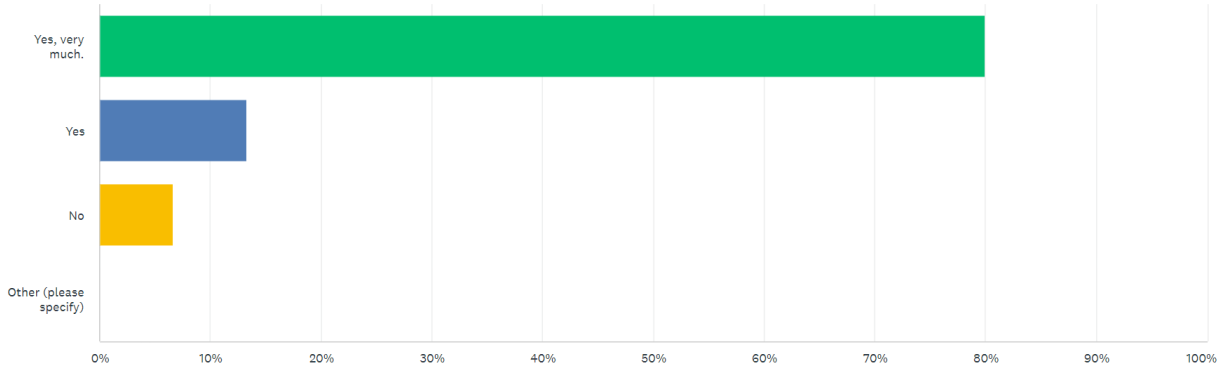
Answered: 14 Skipped: 1



Would having an IT Professional at your organization be beneficial?

...

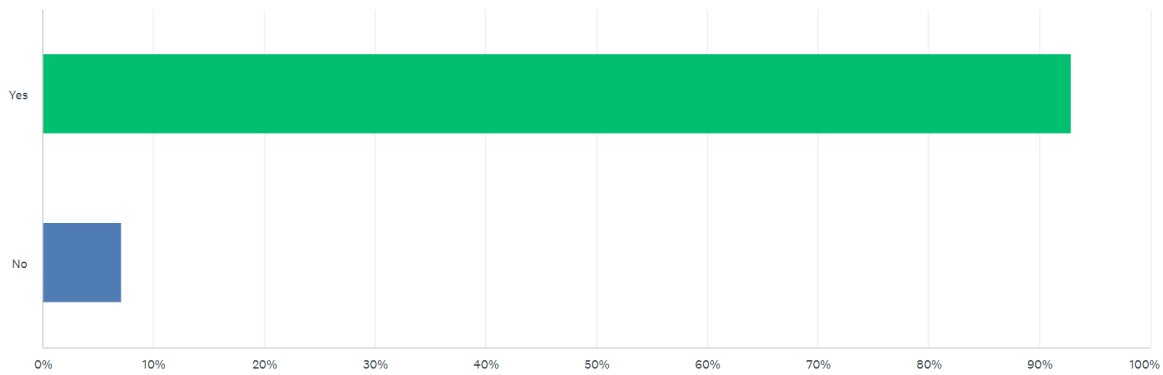
Answered: 15 Skipped: 0



Would your agency be willing and available for Information Technology internships?

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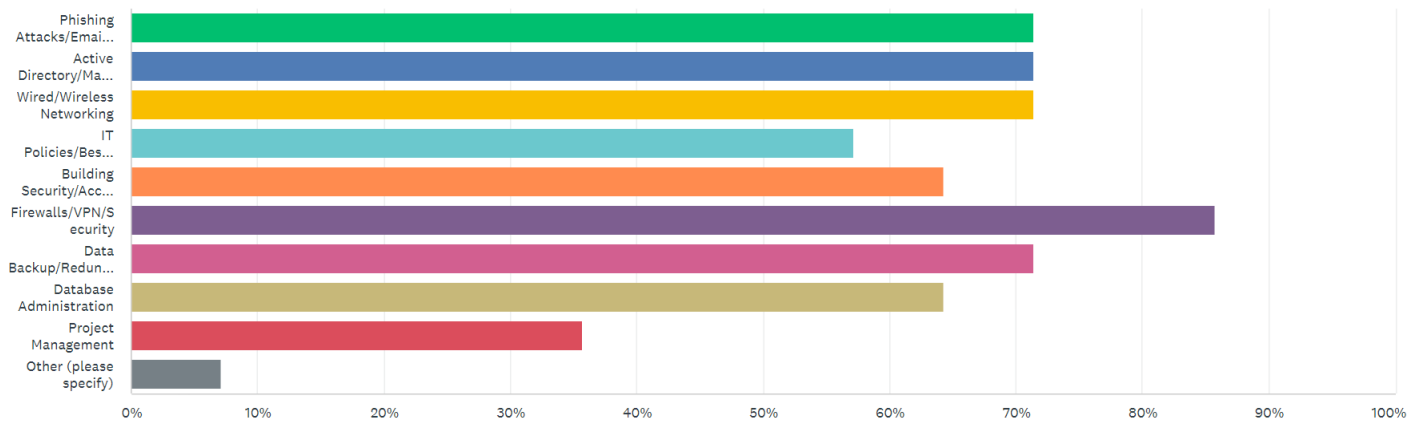
Answered: 14 Skipped: 1



What are important Technology topics that you would like your employees trained on?

...

Answered: 14 Skipped: 1



Do you currently have a fully staffed IT Department? If not, what challenge do you face in fulfilling those roles?

Answered: 15 Skipped: 0

No, we have trouble keeping IT staff. Also, we need more knowledgeable IT people in our area. We are losing our knowledgeable ITs to bigger businesses like WRT.

Need more staff

We have positions advertised for Outside Plant Technicians but it is difficult to find applicants with technology skills.

Standing Rock Sioux Tribe has an IT Department. The Standing Rock 0-5 Head Start Program does not.

Yes, but need more local experts that want to stay in the Area.

I believe our IT department is fully staffed, but the amount of work they have to do on a daily basis I can honestly say they need more trained staff.

Yes, but limited abilities.

Professional service Honesty Transparent

Yes. I cannot find people with skills that are willing to commute rather than work from home.

No, not enough daily tech support.

The Standing Rock Sioux Tribes IT Department is not fully staffed. I believe the biggest challenge is lack of trained professionals in that field.

IT director-vacant

Yes

No

No

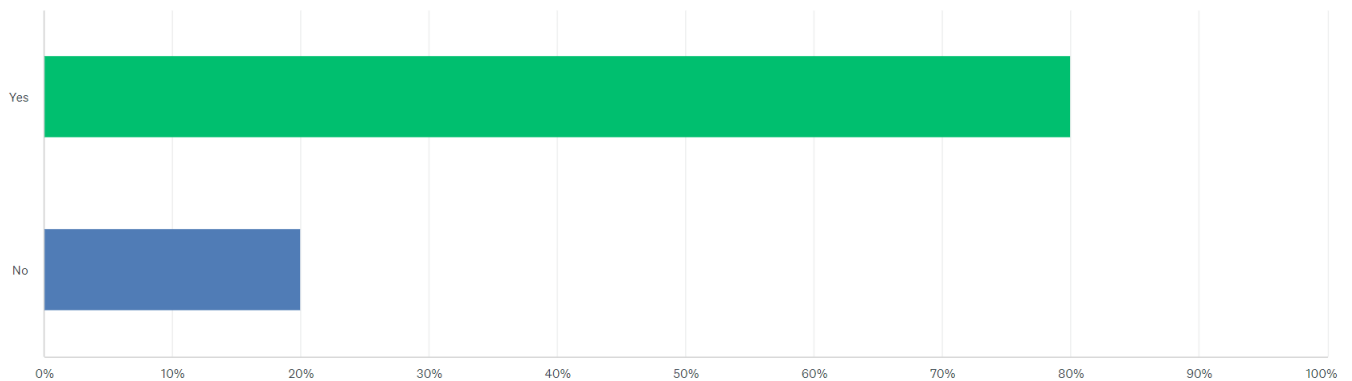
Employer Survey for Bachelor's in Information Technology Feasibility Study (Local)

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Community Member Survey Survey for Bachelor's in Information Technology Program at Sitting Bull College

Are you interested in earning a Bachelor's in Information Technology Degree?

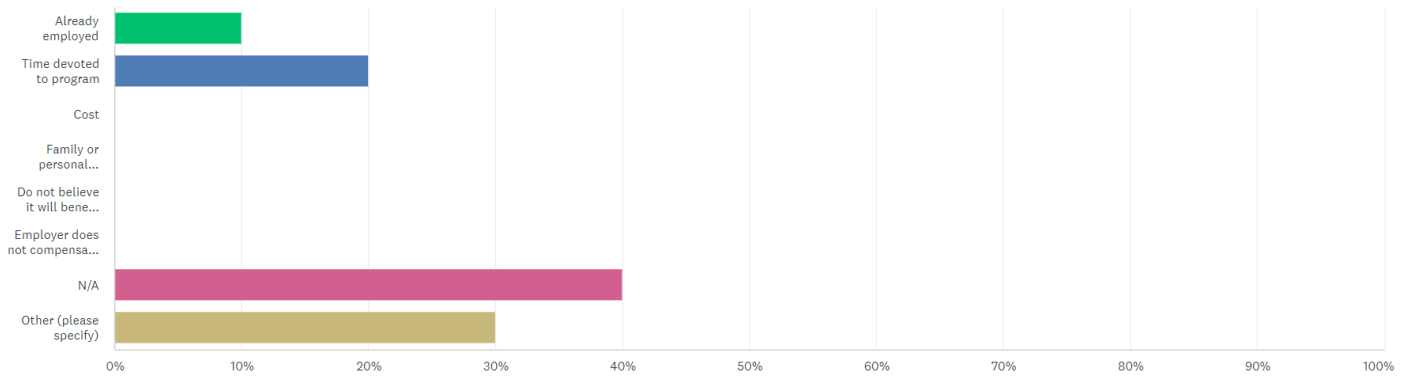
Answered: 10 Skipped: 0



If you are not interested in a Bachelor's degree in Information Technology program at this time, what is the reason for it?

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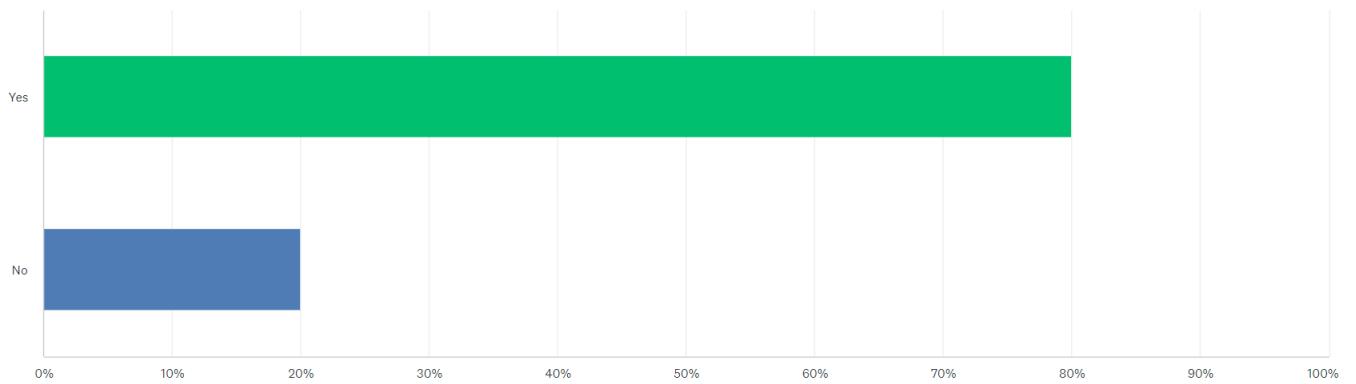
Answered: 10 Skipped: 0



If you are currently in a degree program would you consider changing majors or add another major if there was a Bachelor's in IT available?

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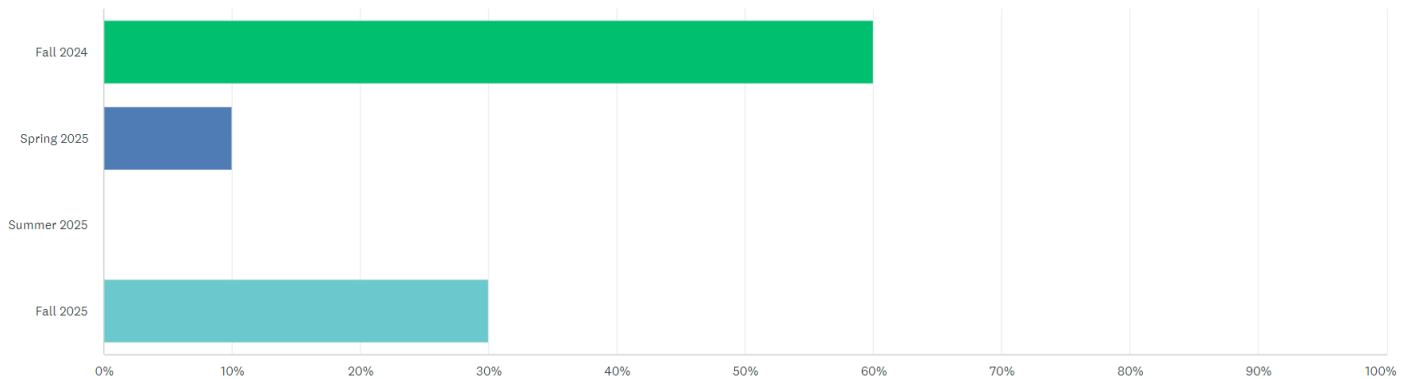
Answered: 10 Skipped: 0



If you are interested in enrolling in a Bachelor's in Information Technology program, how soon would you be willing to commit to the program?

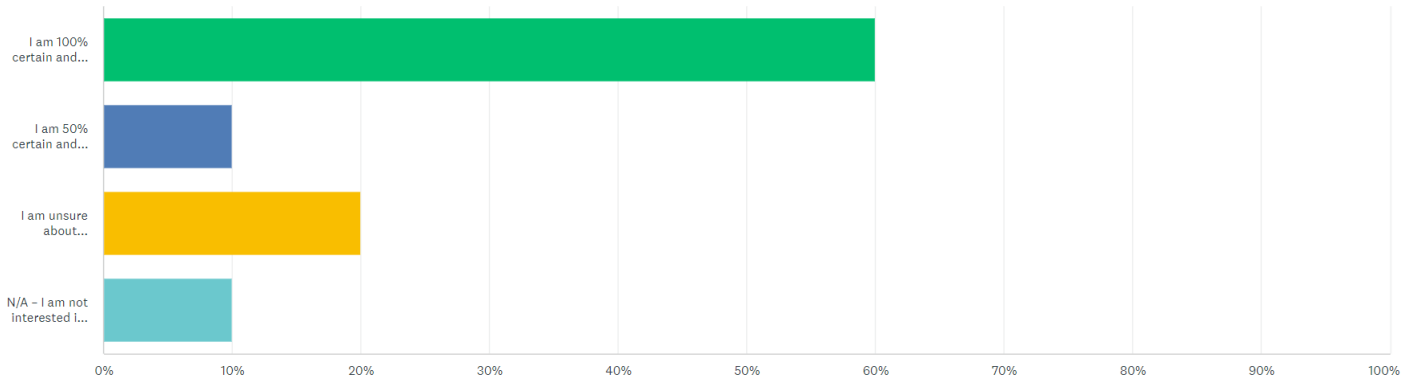
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Answered: 10 Skipped: 0



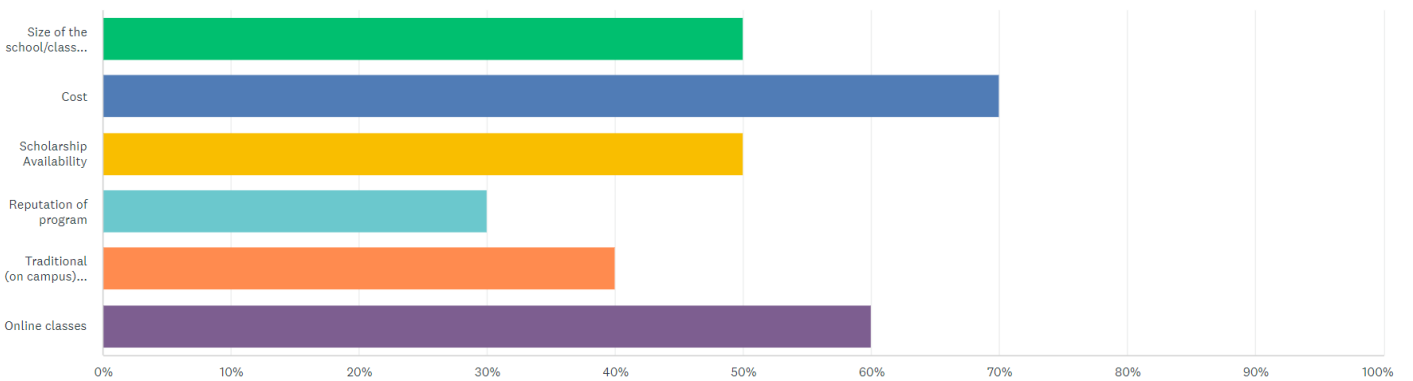
If you are interested and wanting to commit to a Bachelor's in IT degree at Sitting Bull College, what level of certainty do you see yourself at this time?

Answered: 10 Skipped: 0



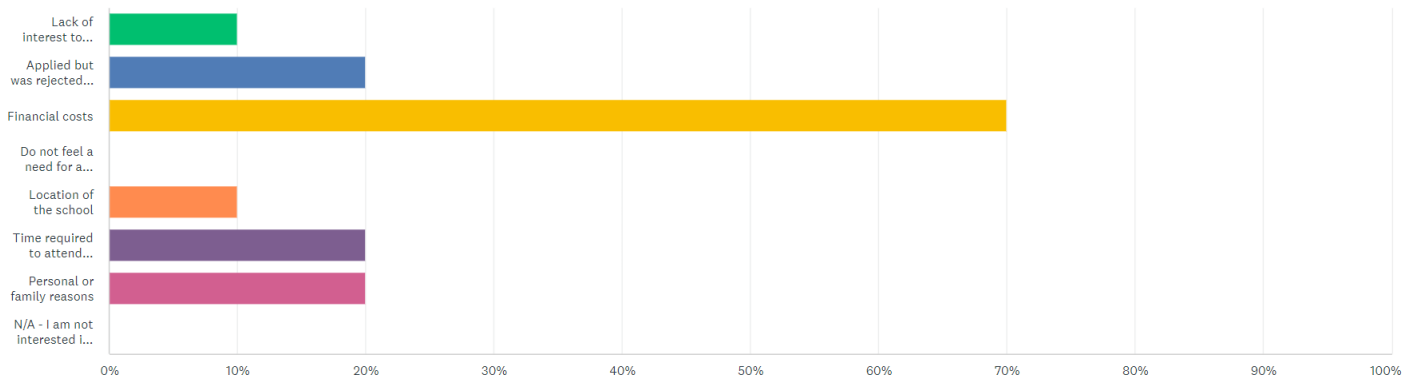
What factors are important in selecting a Bachelor's in Information Technology program? (Mark all that apply)

Answered: 10 Skipped: 0



What challenges do you believe may prohibit you from attending the Bachelor's in Information Technology program? (Mark all that apply)

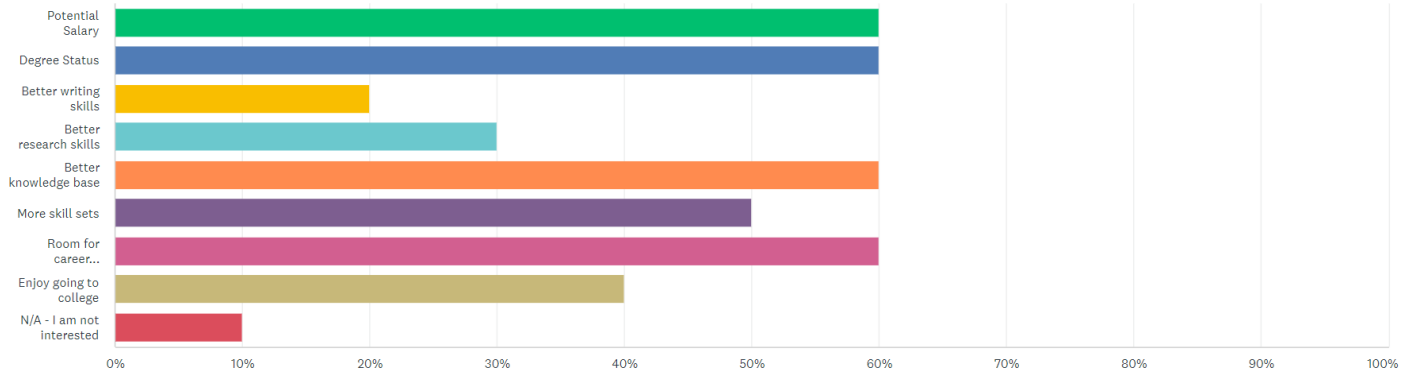
Answered: 10 Skipped: 0



What reason(s) are important to you about earning a Bachelor's in Information Technology degree? (Mark all that apply)

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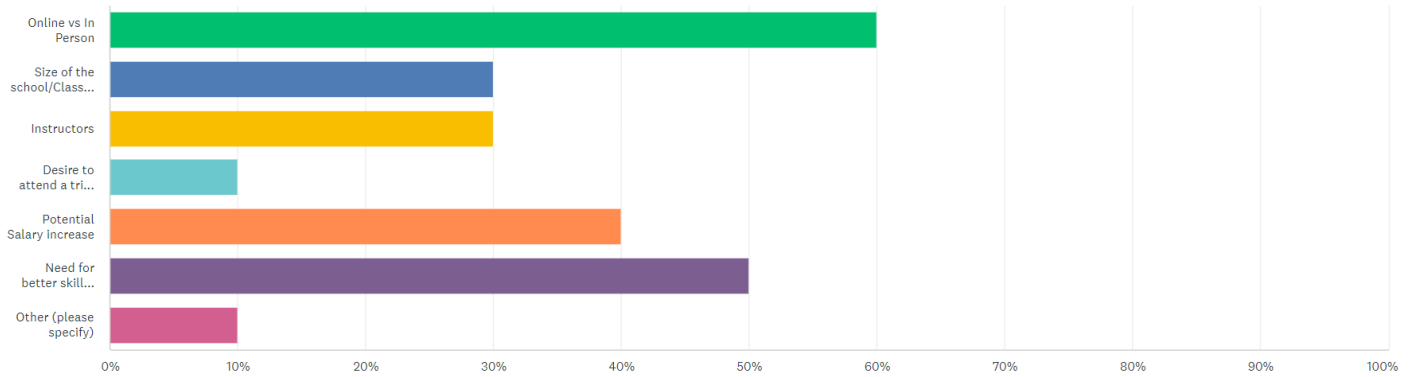
Answered: 10 Skipped: 0



What might influence you to enroll in the Bachelor's in Information Technology program at Sitting Bull College? (Mark all that apply)

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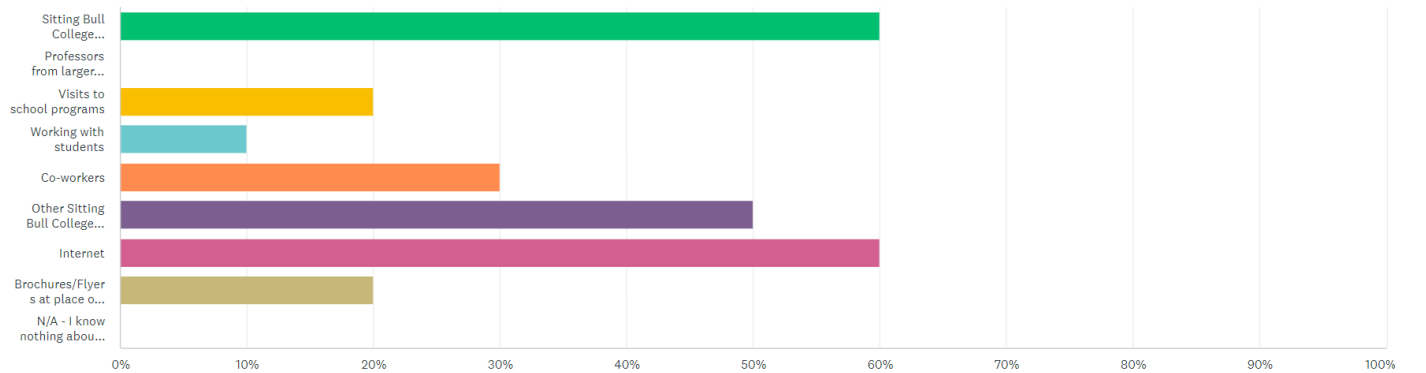
Answered: 10 Skipped: 0



Where have you found information about colleges and programs?

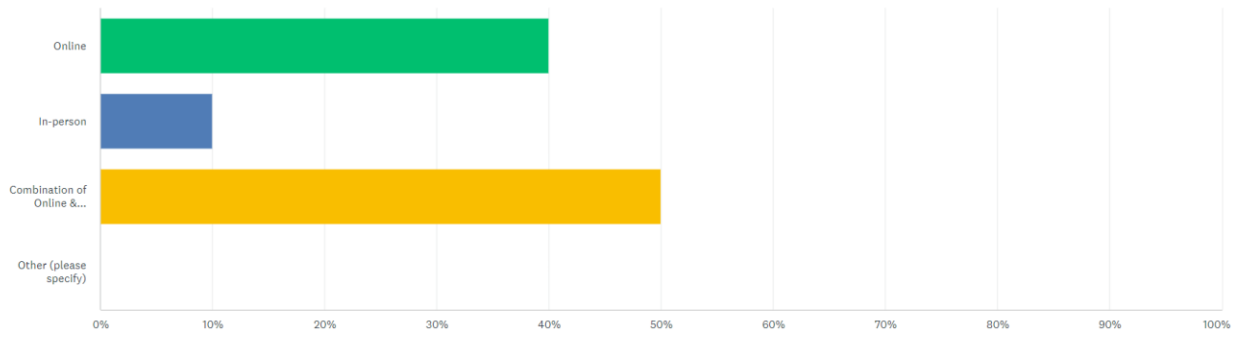
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Answered: 10 Skipped: 0



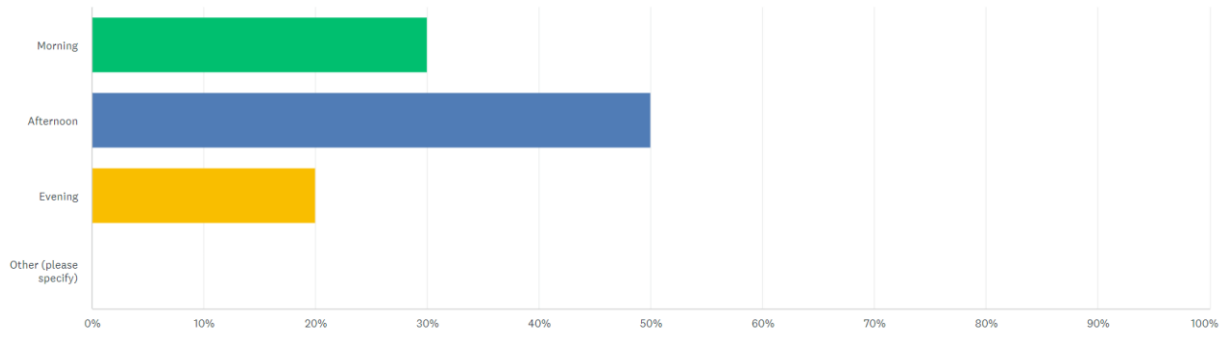
How would you prefer the program courses to be offered?

Answered: 10 Skipped: 0



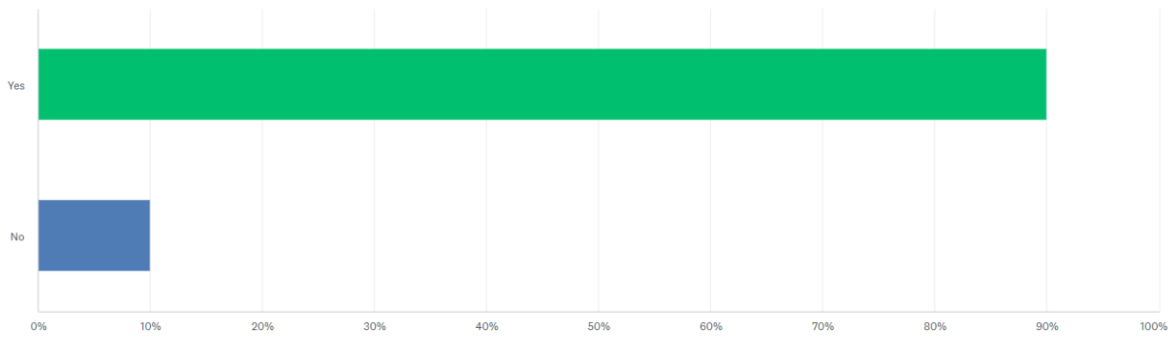
What are the best times for the courses to be offered?

Answered: 10 Skipped: 0



Would a Bachelor's degree in Information Technology result in a pay increase at your job?

Answered: 10 Skipped: 0



Institutional Review

Institution	Degree	Notes	Source
Dickinson State	BS Computer Technology Mgmt		https://dickinsonstate.smartcatalogiq.com/en/2022-2024/catalog/programs-of-study/bachelor-of-science-degree-computer-technology-management/
Minot State	BS Management Information Systems		https://catalog.minotstateu.edu/undergraduate/collegeofbusiness/departments/informationtechnology/managementinformationsystems/#bsmanagementinformationssystemstext
Capella University	BS Information Technology		https://www.capella.edu/online-information-technology-degrees/bs-information-technology-program/bachelors-information-technology/courses/

Program Review Participants

Bachelors of Science in Information Technology, 2023

April Taylor: Online Information Technology Instructor

Date of Submission: