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| Spokane Falls Community College |
| AAS and BAS Degree Restructure |
| NSA CAE-CO and NSA CAE-CDE Designations |

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| Nielsen, Brady  10-18-2020 |

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AAS and BAS Degree Plan Restructure for CAE CO Inclusion

# Introduction

The primary objective is to improve our quality of courses, students and graduates without creating new degrees, eliminating current designation, harm reputation or significantly decreasing the program’s enrollment.

The resulting degree will be eligible to apply for the National Security Agency and Department of Homeland Security Center of Academic Excellence in Cyber Operations (NSA/DHS CAE-CO) designation. This new designation will compliment, not replace our current NSA/DHS CAE designation in Cyber Defense Education (CAE-CDE). Both designations are evaluated using Knowledge Units (KUs). Some courses could contain multiple KUs. Some KUs might span multiple courses to satisfy the requirements. This will require a few adjustments to our program and a vigilant awareness to maintain the elements that allow our AAS IT degree to meet the CAE-CDE designation. The most visible might be in changes to our existing BAS Cyber Security degree. The less visible will be an improved rigor to our existing courses. We will also need to create several new courses and re-order our TSS to affect the changes. The implementation of electives may make scheduling easier and simplify many aspects in evaluation and financial aid. The CAE-CO requires discrete math. SFCC offers it, but Calculus 1 is a requirement. Discrete math should be offered in the BAS to meet the math requirement for that degree. We could have some conversation with Math about this moving forward. At present we will move forward with what is on the books and we know will work. This math requirement eliminates many of our current students. The current plan will be to keep Math245 Discrete Math with Calculus 1 as a prerequisite. The degree plan includes Math 141, 142, 151 and 245. This provides the most flexibility for incoming students. It also helps to satisfy general education requirements of the BAS degree.

This process will also include what will equate to an additional area of emphasis, Cyber Operations to the AAS IT. A proposal to rename Cybersecurity to Cyber Defense to better align with NSA naming standards is included.

This hinges on higher quality students in the long-term strategic view. Our growing sentiment is that we will need to focus on current high school students enrolled in Computer Science courses. We have access to the instructors in the region that teach CS in the high school.

The first adjustment will be program application and informal cohorts. Students will apply to the program or areas of emphasis in the program. It is possible for the AAS IS Cyber Operations emphasis to apply to the BAS Cyber Operations degree. This would potentially decrease enrollment to the BAS CO degree in the short term. We believe students interested in a BAS that cannot complete the AAS CO would pursue the BAS ISIT. There will need to be some conversation about administrative process and precedence on student selection. We do not want to reduce our over-all enrollments in the short-term as we build the program. The current student base cannot be discarded. Our enrollments have been steadily increasing over the past five plus years. We are intending to have excellent students, but not all current students will be able to pass the rigor of the new designation. Options like no emphasis for the AAS with MATH088 would make the degree attainable for most of our current students that graduate.

The first quarter of the program will be rigorous quarter intentionally. Even when we implement a competitive entry, we will have many students that want to do this program but will not possess the aptitude or discipline. We intend to set the expectation of effort and commitment early. The second year of classes are primarily electives to focus on an emphasis. Tracking student progress for scheduling is a significant concern. Previous degree plans with multiple emphasis was a scheduling challenge.

The first year of classes are the same for all students in all areas of emphasis. The second year has two common courses and two general educations courses for all emphasis. Each area of emphasis requires specific classes to graduate with that designation. The elective model makes registration and course scheduling for faculty more complicated. We are aggressively pursuing competency-based education (CBE) that would allow for better flexibility and a broader range of course offerings. The elective model gives students to be flexible in what they want to study. If a student fails a course, changes their mind, whatever the circumstance can still complete a degree with just the generic degree meeting the credits threshold. This will also open the opportunity to add additional areas of emphasis or workforce retraining/upskilling certificates. The first year itself might be a certificate program. The focus of this document is to highlight the Cyber Offense emphasis transitioning into a revised BAS Cyber Security (Operations) degree. For completeness the two existing areas of emphasis are included and the BAS ISIT degree which will also need some adjustment caused by the AAS IT degree renovation.

# NSA/DHS CAE Cyber Operations Designation Notes

This designation is described as an interdisciplinary degree; Blending Computer Science, Information Systems, Engineering and Math. The have twenty-seven knowledge units that span these disciplines. As previously mentioned, a KU can span multiple courses, or one course might contain more than one KU. All KUs require presentation of theory and assessment. Most KUs require ‘hands-on activities’ to reinforce the learning. Ten KUs are required. Seventeen are optional. We as a school must offer ten optional KUs that any student could take during their studies. Each student is required to complete all ten required KUs and a minimum of 4 optional KUs. More information about the CAE-CO designation can be found here <https://www.nsa.gov/Resources/Students-Educators/centers-academic-excellence/cae-co-fundamental/requirements>

We have composed a long document that is a summary of information about this designation that will be available to all that request it.

# Typical Student Schedule AAS IT (Cyber Operations Emphasis)

Note: The separate TSS document is the most current offering/plan and is the TSS that will be submitted to the Curriculum Graduation Requirements Committee for approval to be made official. This TSS has a narrative and defined elective courses we will recommend for each area of emphasis. Full course descriptions are not included in this document. We have them in a separate document available on request.

## Quarter One

### ENGL101 Composition 1 – 5 Credits

### IS101 IT Planning – 1 Credit

### IS102 IT Careers – 2 Credits

### IS103 IT Fundamentals – 5 Credits

IS103 will be an A+ based course. This will put students into a ‘technical’ course day one. They will take the CompTIA IT Fundamentals (ITF)+ exam in the course. We can proctor it in our classroom. This is a weed-out course. We can consider passing the ITF+ for admission. This is a radical concept, but they will get a voucher in the course via lab fee. If we don’t require it, the cert can count as points towards the application to CO emphasis. The A+ covers many elements of the NSA CAE-CDE requirements. It would be more difficult to cobble some of the knowledge units out of other courses. The A+ also plays a possible connection to apprenticeship. We can discuss this in the future. The A+ exams will not be given or required.

### Math 141, MATH 142 or MATH151 for entrance into CO emphasis of AAS IT – 5 Credits

Math 107 for entrance into any other area of emphasis. We will include a footnote to describe this and to designate Math088, 094 or 098 as an acceptable substitute if students will not pursue a BAS degree. This is likely the current eliminating entry piece for our student base. Very few of our current students could make it to MATH141 (pre-calc 1) by the end of their AAS, much less the end of their first quarter. The objective is to draw in students that do math well! More aptly students with logical aptitude. Students that can learn math can typically learn coding, logic and technology. It is a requirement to do discrete math to understand cryptography per the guidelines of the NSA CO program.

## Quarter Two

### IS165 Networking Fundamentals – 5 Credits

This will include Network+ content and prep materials. It is not intended to be a bootcamp. The elements of Network+ make the CAE-CDE mapping easy and the Network+ would assist in apprenticeship in the future.

### CS223 Programming for IT (Python) – 5 Credits

This course is critical for this degree. The CAE-CO requires a lot of development related knowledge units. The next class in this sequence will be CS211 C for Programmers. That is a significant prep. They will also be required to conduct reverse engineering and electives covering secure coding, analysis and system level coding.

### IS125 Linux Fundamentals – 5 Credits

This course will be re-written to remove the ‘and Python’ from the title and learning outcomes. We might be pushed to build a new class altogether. The transition period might be the deciding factor.

## Quarter Three

### IS244 Network Security – 5 Credits

This will include Security+ content and prep materials. It is not intended to be a bootcamp. The elements of Security+ make the CAE-CDE mapping easy and the Network+ would assist in apprenticeship in the future. This class will also cover CAE-CO KUs.

### IS166 Wireless Networking and Security – 5 Credits

This will be a new class. This will be about mobile computing, wireless, cellular and best security practices. This will be to satisfy one or more CAE-CO KUs. Our advisory board has mentioned mobile every time we discuss degree review.

### IS266/IS267 – 2Credits

We might consider a new course for work-based or experiential learning. This is a confusing pair. Adding this class at the end of year one (spring quarter for traditional starters) is intended to be a job shadow element. The ATE grant is working towards established relationships with regional employers. Step one – Job Shadow (works like a long interview), Step two – work full time over the summer, Step three – work part-time for the remainder of year two. Perhaps we implement an internship prep class? Maybe we adjust IS266 to be prep and IS267 as an elective in 5 credit increments later in the quarter?

## Quarter Four

Start of the second year might be when students declare or apply to be in a program. This would be a milestone event.

### IS222 – Cloud Computing and Cloud Security – 5 Credits

This will require some collaboration to get the best results. – 5 credits. Proposed course to be developed. The intent will be to leverage Amazon’s AWS training to make this valuable. The intro training course content from Amazon is not a full quarter. We include elements of how to secure. This is a required CAE-CO KU.

### Elective – 5 Credits

Recommended is CS211 C for Programmers. This is a required CAE-CO KU.

(IS – IS106, CD – IS141)

### Elective – 5 Credits

Recommended is IS234 Computer Forensics 1. This is an elective CAE-CO KU.

(IS- IS262, CD – IS234)

## Quarter Five

### Lab Science Course – 5 Credits

Helps with the Gen Ed requirements for BAS and antiquated transfer degree with EWU.

### Elective – 5 Credits

Recommended is MATH142 (if needed). If students have already completed MATH151 they can select any general education elective from the list.

(IS – 260, CD – IS241)

### Elective – 5 Credits

Recommended IS IS245 Network Security. It covers required CAE-CO KUs.

(IS – IS210, CD IS245)

## Quarter Six

### Speech – 5 Credits

The specific course should be considered. This is here to both meet Gen Ed requirements in AAS and BAS degrees. This is a skill our students need.

### Elective – 5 Credits

Recommended is MATH151 (if needed). If students have already completed MATH151 they can select any general education elective from the list.

(IS – 228, CD – IS243 [10 credits])

### Elective – 5 Credits

Recommended is IS215 Operating System Theory. This is a new class to meet mandatory CAE-CO KUs.

(IS – Any Elective, CD – IS243 [10 credits])

## Other AAS IT degree items for consideration

We have a non-emphasis degree for students. Complete the common courses (8 IS/CS and the Gen Eds) and 7 electives from the list. I don’t know if this is a good idea or not. This might also allow for students to be flexible in the courses they take and maybe take more courses they are interested in versus what they must take for ‘X’ specialty. This might also open room for expansion into other areas of emphasis in the future or even continuing education connections, take the data analytics emphasis (as a certificate) or DevOps?

All courses have a pre-requisite. This can be a pain in the butt come registration time. It can prevent students that shouldn’t be in these courses from signing up for these courses. I believe we will be implementing a twice a year start with unofficial cohorts. If we can do controlled registration for the cohorts, this is a non-issue. Each start will be a competitive entry.

The only course presently that is restricted to Cyber Operations is The OS Theory course. I envision this to be similar if not identical to how Dan Eshner is currently teaching IS103. If we do that course, we might make the pre-req only students in the CO program can take it. It is the only one that would work with the current model. For this ends it might be easier to require Math141 before you can sign up?

This means that all the other courses need to be more in-depth to produce students that have a more in-depth understanding of the topic. The only other alternative for more in-depth courses is to create new courses. We already have scheduling issues with bodies to put in classrooms. Hopefully we can get the school on-board with Open Entry/Early Exit competency-based classes. This might make it easier to cover courses with additional adjuncts.

We might consider IS101 (or IS101 and IS102) as the pre-req for any course without a legit pre-req.

We must remember that BT uses IS210 and IS132 in their degree. It will break their degree if we make it as rigorous as we want it. This might mean we create a new course that fits our degree better. We could also work with Business Technology to create their own version. Historically they want IS courses we teach in their degree. This is a conversation that will need to happen with us then with us and Business Technology.

Business Technology also uses IS132 Computer Law and Ethics in their digital marketing degree. The CO requirements will increase the required content in this course. It will not make it too difficult for the Business Technology Students.

## Common to all three areas in TSS order

|  |
| --- |
| Quarter 1 - ENGL101 |
| Quarter 1 - IS101 |
| Quarter 1 - IS102 |
| Quarter 1 - IS103 |
| Quarter 2 - IS165 |
| Quarter 2 - CS223 |
| Quarter 2 - IS125 |
| Quarter 3 - IS166 |
| Quarter 3 - Internship |
| Quarter 4 - IS222 |
| Quarter 5 - Science |
| Quarter 6 - Speech |

|  |
| --- |
| Electives |
| IS106 |
| IS132 |
| IS141 |
| IS210 |
| IS215 |
| IS228 |
| IS234 |
| IS241 |
| IS243 |
| IS245 |
| IS260 |
| IS262 |
| ENGR190 |
| CS211 |
| MATH142 |
| MATH151 |
| CMST227 |
| ENGL102 |
| Other gen eds? |
|  |

## Courses Required for Emphasis Designations

|  |  |  |
| --- | --- | --- |
| Information Systems | Cyber Defender | Cyber Operations |
| IS106 | IS141 | IS215 |
| IS210 | IS234 | IS234 |
| IS228 | IS241 | IS245 |
| IS260 | IS243 | CS211 |
| IS262 | IS244 | MATH151 |
|  | IS245 |  |

## Logical groupings of courses for academic certificates

Data management (excel, sql, python), Network services, Cybersecurity, App development, Incident Response. Not too sure if these ARE logical. Are there more areas?

These groupings could be individual certificates that qualify for financial aid. The hip term in industry is stackable certificates. These might not be true stackable because we might offer too many electives, but that is not worth discussing at this stage of the conversation.

# Degree Considerations before, during and after restructure

## Degree description

Have we included entrance expectations and requirements? This is more than English and Math. Should we include language about who should apply? Know how to use a computer? Should we have an entrance exam? Should we include a statement about home computer use and internet requirements?

### Current language

The Information Technology AAS degree program is designed to provide students with capabilities in several areas of information technology:

* Computer and network installation and maintenance skills.
* Business computing skills including daily systems operations and applications programs.
* Security and forensics skills.
* Various Internet and network skills including web pages design, client/server-side programming, web server installation and maintenance.
* Transfer option to a four-year institution.

This degree ensures that the student is knowledgeable in a broad spectrum of information technology subjects that are often needed by the IT industry.

## Degree Learning Outcomes

Current list is very difficult to measure and assess. It is a legacy of the original degree. If we change these it can get complicated with curriculum approval. We should review and update. I don’t know if there is a change threshold where it is a ‘major’ or ‘substantive’ change.

### Current Language

Upon graduation from the Information Technology program, graduates will be prepared to:

1. Maintain and administer networks and related computing environment including computer hardware, systems software, applications software, and all configurations.
2. Plan, coordinate and implement network/systems security measures to protect data, software and hardware.
3. Provide users with technical support for network, computer/systems problems.
4. Demonstrate professional conduct including responsibility, effective communication and ethical standards.

## Graduation Criteria

Do we include specific requirements? Presently we only have all courses, 2.0 GPA, nothing too special. If we include electives, we might have to identify ‘areas of emphasis’. This is a larger conversation that will need to include people outside of our department. We should have an idea of what we want before we ask for assistance/clarification.

## Storyboard for the entire AAS Degree and Each BAS Degree

I use the term storyboard to describe the content and order of a course. In most courses we will likely have a scenario; students will follow along as they work on their competencies. I have something like this in my current IS234 Computer Forensics 1 course. I created tasks and assignments without a solid back story and the effectiveness was impacted negatively. We need them to guide the students through courses. Continuity is essential. They will not be one stream. Each logical area or emphasis should have one. We need to be mindful of pre-requisites.

# Typical Student Schedule BAS Cyber Operations (Currently Cyber Security)

## Quarter Seven

### MATH245 Discrete Math – 5 Credits

### PHIL330 Business Ethics – 5 Credits

### CYBR320 Ethical Hacking – 5 Credits

Students must be accepted into the BAS program (and thereby have a completed AAS) to take the 300 and 400 level courses, state requirement. Math 245 Discrete Math is a CAE-CO requirement. CYBR320 Ethical Hacking is a CAE-CO requirement.

## Quarter Eight

### ENGL335 Technical Writing – 5 Credits

### PHIL330 Business Ethics – 5 Credits

### CYBR410 Cryptography – 5 Credits

English 335 is a general education course that satisfies a Humanities requirement and adds to the 300/400 credit requirement. Psychology 333 satisfies general education, social science requirements. CYBR 410 Encryption is a CAE-CO optional KU.

## Quarter Nine

### Non-Lab Science – 5 Credits

### Economics 202 Macroeconomics – 5 Credits

### CS301 Software Reverse Engineering – 5 Credits

Non-Lab Science is selected from the school distribution list. It meets the general education requirement and the natural science requirement. Economics 201 satisfies general education, social science requirements. CS301 Software Reverse Engineering is a new class and a CAE-CO requirement. This might be a point of contention with many entities. 300 level is needed to satisfy the number of 300/400 level credits to graduate.

## Quarter Ten

### CYBR355 Cyber Law – 5 Credits

### Elective – 5 Credits

### Elective – 5 Credits

CYBR355 (new law class), Elective (CS302 Secure Software Design and Analysis), Elective (CYBR310 New Class Industrial Control Systems)

## Quarter Eleven

### Elective – 5 Credits

### Elective – 5 Credits

### Elective – 5 Credits

Elective (CS303 System Programming), Elective (CYBR330), Elective (CYBR335 merge of Compliance, Policy and Framework)

## Quarter Twelve

### Elective – 5 Credits

### Elective – 5 Credits

### Elective – 5 Credits

Cyber Operations recommended courses- It is a free for all. Contingent that students meet the credit requirements for general education, upper division and CAE-CO elective KUs (courses above are a sample)

## List of BAS Cyber Operations Electives

ISIT 344 (not 100% we can do this), CYBR475, BMGT 342, CYBR330, CYBR430/440 (collapsed into one course), CS302 – Secure Software Design and Analysis (new CAE-CO optional covers 2 topics), CS 303 Systems Programming (new course CAE-CO elective), CYBR310 Industrial Controls (new CAE-CO elective), CYBR470, CMST227, MATH300

# Typical Student Schedule BAS Information Systems Technology (ISIT)

## Quarter Seven

### MATH300 Bachelor Math – 5 Credits

### PHIL330 Business Ethics – 5 Credits

### ISIT310 Routing and Switching – 5 Credits

Students must be accepted into the BAS program (and thereby have a completed AAS) to take the 300 and 400 level courses, state requirement. Math 300 is a math competency based course built just for the BAS programs. This course might be reworked and dubbed virtual networking?

## Quarter Eight

### ENGL335 Technical Writing – 5 Credits

### PSYC333 Motivation – 5 Credits

### ISIT344 Virtualization – 5 Credits

English 335 is a general education course that satisfies a Humanities requirement and adds to the 300/400 credit requirement. Psychology 333 satisfies general education, social science requirements. ISIT344 should be revamped to be bigger cloud stuff.

## Quarter Nine

### Non-Lab Science – 5 Credits

### Economics 202 Macroeconomics – 5 Credits

### ISIT ??? Datawarehouse/App Dev classes merged into one - 5 Credits

Non-Lab Science is selected from the school distribution list. It meets the general education requirement and the natural science requirement. Economics 201 satisfies general education, social science requirements. Data warehousing and Databased Application Development courses are probably need to be merged.

## Quarter Ten

### CMST 227 – 5 Credits

### General Education Elective – 5 Credits

### ISIT444 Automation Configuration (DevOps?) – 5 Credits

Two gen eds to meet the requirements. ISIT444 is automation configuration management, but this is now mostly known as DevOps.

## Quarter Eleven

### Project Management– 5 Credits

### ISIT410 – 5 Credits

### ISIT470 – 5 Credits

Elective (CS303 System Programming), Elective (CYBR330), Elective (CYBR335 merge of Compliance, Policy and Framework)

## Quarter Twelve

### ISIT475 – 5 Credits

### ISIT460 Cloud Solutions Architect stuff? – 5 Credits

### ISIT315 New Ent. Security Course? – 5 Credits

Ran out of gas, you tell me?

## List of BAS Cyber Operations Electives

All of the ISIT and the BMGT could be ‘electives’ in a list. This is the significant change that preps us for future changes. We also up the requirement to get into the BAS to college level math. This might be two years out. We add it to the AAS degree. We put a \* next to it and say, can substitute Math088 or Math094 for students that do not intend to pursue a BAS degree.

# NSA/DHS CAE-CO List of Knowledge Units

## Mandatory Content Knowledge Units (KUs) must teach, assess, and do hands on activities for

**M.1 Low Level Programming Languages - CS211 C for Programmers (might need to review CLOs)**

M.2 Software Reverse Engineering - New CS 333 Software Reverse Engineering

M.3 Operating System Theory- New IS2## Operating Systems Theory

**M.4 Networking (must include hands-on lab exercises)- IS165 Networking Fundamentals**

M.5 Cellular and Mobile Technologies – IS2## or ISIT3## or CYBR3## Networking 2 Maybe in IS165

**M.6 Discrete Math and Algorithms – Math 245** This could be a conversation about Math 301

**M.7 Overview of Cyber Defense (must include hands-on lab exercises) IS244 or IS245**

**M.8 Security Fundamental Principles (i.e., "First Principles") IS244 or IS245**

**M.9 Vulnerabilities – Cyber320 Ethical Hacking**

M.10 Legal and Ethics – New CYBR ### or a new IS2## IS132 is not adequate and we can’t modify because BT uses IS132

Optional Program Content: (Knowledge Units)

We must offer 10 or more – Each student needs to complete 4 or more to be designated [this won’t be an issue for us]

**O.1 Programmable Logic (must include hands-on lab exercises) ENGR190 Electronic Logic**

O.2 Wireless Security New IS2## or CYBR### or ISIT ###

O.3 Virtualization ISIT344 (will need to be reviewed for rigor) Might need to be cross-listed as CYBR###

O.4 Cloud Security/Cloud Computing New IS2##, might need to look at level of security

**O.5 Risk Management of Information Systems CYBR 350 Risk Management**

O.6 Computer Architecture Would be new ENGR, probably not needed

O.7 Microcontroller Design Would be new ENGR, probably not needed

O.8 Software Security Analysis New CS3## Could be the same class as O.9?

O.9 Secure Software Development (Building Secure Software) New CS3## Could be same class as O.8?

O.10 Embedded Systems (must include hands-on lab exercises) Would be new ENGR, probably not needed

**O.11 Digital Forensics (must include hands-on lab exercises) – IS234 Computer Forensics 1**

O.12 Systems Programming (must include hands-on lab exercises) – New CS 3## class

**O.13 Applied Cryptography – CYBR 410 Cryptography**

O.14 Industrial Control System (ICS) – New CYBR or IS class? Could be an elective IS would reduce the change to the BAS

O.15 User Experience (UX)/Human Computer Interface (HCI) Security – Not a good fit for us

**O.16 Offensive Cyber Operations – CYBR 320 Ethical Hacking**

O.17 Hardware Reverse Engineering - Would be new ENGR, the NERD in me WANTS this, probably not needed and would be hard to find a qualified instructor

# Appendix A – Course Creation or Conversion Worksheets AAS IT

Courses listed in Alphabetical Order by Course Number

These courses worksheets will be populated as build the degree storylines. The objective will be to have continuity in course sequences. The worksheets are truncated for space savings. The blank template is in a later appendix. For example, a student would learn HTML in IS210 and build a front end for a database that they will build in IS260 that they implement into a fully functional ecommerce solution in IS228. They must have the content from the first to build the second to complete the third. This would also allow us to assign a student a unique ‘product line’ so students would not be as likely to copy a peer.

## Course Number and Title CS211 C for Programmers

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title CS223 Programming for IT

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS101 Planning for IT Students

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS102 IT and Cybersecurity Careers

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS103 IT Fundamentals

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS106 IT Applications

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS125 Linux and Python Fundamentals

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS132 Computer Law & Ethics

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS141 Cyber Defender 1

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS165 Networking Fundamentals

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS210 Internet Programming

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS228 Internet Servers

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS234 Computer Forensics 1

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS241 Cyber Defender 2

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS243 Malware Analysis and Exploitation

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS245 Network Security 2

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS260 Database Theory

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS262 Network Administration

Learning Outcomes (How do these relate to competencies?)

## Course Number and Title IS266/IS267 Cooperative Work (Internship)

Learning Outcomes (How do these relate to competencies?)

# Appendix B – Course Creation or Conversion Worksheets BAS Cyber

## Course Number and Title Pending

Learning Outcomes (How do these relate to competencies?)

# Appendix C – Course Creation or Conversion Worksheets BAS ISIT

## Course Number and Title Pending

Learning Outcomes (How do these relate to competencies?)

# Appendix D – Proposed Course Conversion or Creation Template

Course Number and Title (actual or proposed)

Learning Outcomes (How do these relate to competencies?)

Identify corresponding CDE KUs

Identify corresponding CO KUs

Identify corresponding NICE tasks?

Compulsory content based on CDE, CO, NICE

Pre-Requisites to start course

Course(s)

Knowledge or competency proof

Number of Credits

Number of Hours (Carnegie Units if relevant)

Number of Hours to complete tasks for a student new to the topic (should be roughly equivalent to Carnegie Units?)

Task(s) per Learning Outcome

-Self Learning

Estimated time

List of resources (as exhaustive as possible during proposal)

-Completion

Estimate time

Documentation – how does a student submit

Rubric for assessment (shared with student?)

-Proof of Concept task

If possible, screen shots or video

Storyboard

What are the tasks?

What is the story behind doing the tasks?

Who requests, why, when?

Does this require previous course content?

Will this completed content be used in another course?

# Working Notes and Questions

BIG NOTE HERE

**If we redesign our AAS IT for Cyber Operations, we won’t have students in the BAS for two years. We can make some structural changes now to prepare for two years out. It will make it look like a less dramatic change. We can also get rid of mandatory communication studies courses from the typical student schedule.**

First quarter will identify students that are ready to join our program. The rigor is notable for a first quarter schedule.

As a department, we unanimously agree that we have too many students that do not have the aptitude or dedication to complete the program. Our current graduation rate is approximate 31% over the past 5 years. It is slowly increasing, and it is better than the school’s rate. The students that are not ready to be full-time college students will not pass the first quarter. We fill our first quarter courses every quarter. This doesn’t give us an accurate reflection of how many students are interested in our program that would be excellent students but are not able to start. We have agreed to implement a competitive application process for the program.

The exact implementation will involve some conversation. We are willing to admit everyone if we have low application numbers. I think a simple application with an essay and placement scores into English and Math are probably all we will ask in the first iteration. SFCC has seven programs with additional application requirements. <https://sfcc.spokane.edu/What-to-Study/Programs-with-Additional-Application-Requirements>. SCC has 13 programs. <https://scc.spokane.edu/What-to-Study/Programs-with-Additional-Application-Requirements> We have ample examples ranging from ‘have an email address’ to 30 credits worth of courses before you can start. The objective is to identify the best qualified students before they fill those courses. If we have a large applicant pool, we will have to devise a more involved application pool such as a technical competency/placement test. We will have a application scoring matrix to limit any potential bias or perceived bias.

If we create new classes that are SFCC only SCC doesn’t have a chance to veto or reject? Thinking about AWS they already have an AWS class. Maybe so other programming related classes.

We will have some very specific CS programming discussions. The CAE-CO has some significant requirements and a few elective options for software development/coding. The inclusion of CS300 level courses is a very bold move. We can justify it, but it can easily be perceived we are encroaching on a BS of CS degree. The CAE-CO is interdisciplinary in nature, so the use of CS is essential. The BAS requires 60 credits of upper level credits. Therefore we need 300 level CS courses. Secure Software Development and Software Security Analysis, can they be collapsed into one class? The CLOs will be driven by CAE-CO 100%

IS132 and IS210 would remain on the books and be taught for BT students/degrees. Probably once a year (Scheduled annually), coordinated with BT. They would also remain on the electives list. Perhaps a new and improved IS210 is not in order? Conversation item.

Can we change the name of the BAS Cyber Security to BAS Cyber Operations without much scrutiny or complication?

I have not implemented our conversations for revising our ISIT degree plan that occurred on October 20th during Campus Development Day. Many of those changes are improvements to current courses. They are 7 years old and we will be infusing Cloud, IoT, Security and other stuff I can’t remember off the top of my head.

Checklists – Mandatory and optional KUs, Gen Eds, Upper Division

# BAS General Education and Upper Division Credits Guidance

60 Credits of Gen Ed is a recommendation

These are required (plus 15 from list of Gen Eds)

10 Credits Communications – English 101, Speech 101

5 Credits Quant – Math 245 Discrete Math

10 Credits Humanities – English 335, Philosophy 330

10 Credits Social Science – Economics 201, Psychology 333

10 Credits Natural Science – Lab Science, Non-Lab Science

15 extras can be all Math (141, 142, 151 to get into Discrete) or from the groups above. BAS ISIT students will need to fill this group. We will need to build a list of electives for gen ed in BAS.

60 Credits of 3xx/4xx coursework

Cyber 410 Crypto, English 335, Philosophy 330, Psychology 333, Cyber 355 Law, Cyber 350 Risk, plus 30 electives (Cyber Operations List)

# Electives Lists

Electives Group 1 (From All AAS Offerings)

IS106, IS132, IS141, IS210, IS228, IS241, IS243, IS245, IS260, IS262, CS211, ENGR190, MATH142, MATH146, MATH151, CMST227

Electives Group 2 (From All BAS Offerings kind of)

ISIT 344 (not 100% we can do this), CYBR475, BMGT 342, CYBR330, CYBR430/440 (collapsed into one course), CS302 – Secure Software Design and Analysis (new CAE-CO optional covers 2 topics), CS 303 Systems Programming (new course CAE-CO elective), CYBR310 Industrial Controls (new CAE-CO elective), CYBR470, CMST227, MATH300