Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**DEPARTMENT OF COMPUTER & INFORMATION SCIENCE**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David S. Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**		9 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**	Tammy Weaver	8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	**Effective Term: Fall 2017**
CSEC	**1113**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Introduction to Networking

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

◉ 01 Lecture	○ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? [ ] Select Fee Type

If selected other list fee type: [ ]

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Fall

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
i. Course objectives
j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **This course will require a dedicated classroom with dedicated equipment (computers and networking capability).**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?
dedicated lab

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at http://www.atu.edu/registrar/curriculum_forms.php. **N/A**

Syllabus

Department of Computer & Information Science

CSEC 1113 **Introduction to Networking**

Section #

OFFERED Fall

PRE-REQUISITE None

CO-REQUISITES None

DESCRIPTION Computer and communications networks are the very environment in which cyber operations are conducted. An understanding of these networks is essential to any discussion of cyber operations activities.

Specific topics to be covered to satisfy this knowledge unit must minimally include:

- Routing, network, and application protocols including:
  - TCP/IP (versions 4 and 6)
  - ARP, BGP, SSL/TLS
  - DNS
  - SMTP
  - HTTP
- Network architectures
- Network security
- Wireless network technologies
- Network traffic analysis
- Protocol analysis (examining component-to-component communication to determine the protocol being used and what it is doing)
- Network mapping techniques (active and passive)

NOTES None

COURSE INSTRUCTOR **Email:** **Office: Corley** **Phone:**

OFFICE HOURS

TEXTBOOK

BIBLIOGRAPHY There is **no** REQUIRED supplemental reading list for this course.

JUSTIFICATION The Internet is a network of networks. To be a knowledgeable, effective cybersecurity specialist, students must gain experience using networks.

OBJECTIVES After completing this course, the learner will be able to:

- explain how networks work at the infrastructure and network and applications layers.
- explain how networks transfer data
- explain how network protocols work to enable communication
- explain how the lower-level network layers support the upper ones.
- explain how the major network protocols enable communication and data transfer.

GENERAL EDUCATION REQUIREMENTS This course does not meet any of the General Education requirements.

ASSESSMENT The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE

The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in their own interest, are therefore responsible for attending all classes for which they are enrolled.

COURSE CONDUCT

Respect your peers. Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

PLAGIARISM & CHEATING

Refer to the rules set forth in the student handbook. Students are expected to do their **OWN** work. **Consider your actions carefully**: there will be no tolerance for conduct that even gives the appearance of cheating. Any questions regarding the policy of cheating or conduct in this class should be clarified with the instructor. Cheating will result in a negative score (deduction from the final course grade) and will be reported to appropriate governing bodies, e.g. the CIS ethics committee.

SCHEDULE

Week			Exercises
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Se Arkansas Tech University

Course Addition

Assessment Form

Our Mission
Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. The University offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 1113 Introduction to Networking
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meets these requirements. This course is a mandated requirement to qualify for designation as a Center of Excellence. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to explain how networks work at the infrastructure and network application levels. 2. Students will be able to explain how networks transfer data. 3. Students will be able to explain how network protocols work to enable communication.**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, research paper, hands-on completion of tasks, and presentations**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will demonstrate their understanding of concepts by actually completing assigned tasks during class so the professor can observe the students completing the task. In addition, students will complete quizzes, tests, assignments, and a presentation.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for**

	Homeland Security, this is a mandated course that must be included. To be a qualified cybersecurity student, the student must be trained extensively in networking. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David J. Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**	Neal Barlow	9 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**	Tammy Weaver	8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**1213**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Wireless and Cellular Security

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

◉ 01 Lecture	○ 02 Lecture/Laboratory	○ 03 Laboratory only
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○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? [ ] Select Fee Type

If selected other list fee type: [ ]

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Spring

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
i. Course objectives
j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **This course will require a dedicated classroom with dedicated equipment.**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?
dedicated lab

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Syllabus

Department of Computer & Information Science

CSEC 1213 **Wireless and Cellular Security**
Section #

OFFERED Spring

PRE-REQUISITE CSEC 1113 Introduction to Networking

CO-REQUISITES None

DESCRIPTION An overview of wireless and mobile security providing students with practical and theoretical experiences. Topics include threat analysis, security infrastructure, security services, wireless network security components. Topics include, but not limited to:

- Overview of smart phone technologies
- Overview of embedded operating systems (e.g., iOS, Android)
- Wireless technologies (mobile: GSM, WCDMA, CDMA2000, LTE; and Internet: 802.11b/g/n)
- Infrastructure components (e.g., fiber optic network, evolved packet core, PLMN)
- Mobile protocols (SS7, RR, MM, CC)
- Mobile logical channel descriptions (BCCH, SDCCH, RACH, AGCH, etc.)
- Mobile registration procedures
- Mobile encryptions standards
- Mobile identifiers (IMSI, IMEI, MSISDN, ESN, Global Title, E.164)
- Mobile and Location-based Services

NOTES None

COURSE INSTRUCTOR **Email:** **Office: Corley** **Phone:**

OFFICE HOURS

TEXTBOOK

BIBLIOGRAPHY There is **no** REQUIRED supplemental reading list for this course.

JUSTIFICATION

Using wireless and mobile technologies is rapidly increasing. This course will provide students with a deep understanding of the key technologies which enable the delivery of broadband communications and to the related security issues.

OBJECTIVES

After completing this course, the learner will be able to:

- understand the requirements to build a secure and robust wireless network.
- understand various attack methods used to target and exploit wireless network systems in intrusion detection process and countermeasures.
- explain the major standards and protocols for wireless and mobile systems and applications.
- Strategically design, implement, and maintain wireless and mobile networks.
- demonstrate skills to perform troubleshooting and performance tuning.
- describe the unique security and operational attributes in the wireless and mobile environment and their effects on network communications.
- identify the unique security implications of these effects and how to mitigate security issues associated with them.

GENERAL EDUCATION REQUIREMENTS

This course does not meet any of the General Education requirements.

ASSESSMENT

The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE

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enrolled.

COURSE CONDUCT

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PLAGIARISM & CHEATING

Refer to the rules set forth in the student handbook. Students are expected to do their **OWN** work. **Consider your actions carefully**: there will be no tolerance for conduct that even gives the appearance of cheating. Any questions regarding the policy of cheating or conduct in this class should be clarified with the instructor. Cheating will result in a negative score (deduction from the final course grade) and will be reported to appropriate governing bodies, e.g. the CIS ethics committee.

SCHEDULE

Week			Exercises
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Arkansas Tech University

Course Addition

Assessment Form

Our Mission
Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. The University offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 1213 Wireless and Cellular Security
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meets these requirements. This course is a mandated requirement to qualify for designation as a Center of Excellence. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to understand the requirements to build a secure and robust wireless network. 2. Students will be able to understand various attack methods used to target and exploit wireless network systems in intrusion detection process and countermeasures. 3. Students will be able to explain the major standards and protocols for wireless and mobile systems and applications.**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, research paper, hands-on completion of tasks, and presentations**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will demonstrate their understanding of concepts by actually completing assigned tasks during class so the professor can observe the students completing the task. In addition, students will complete quizzes, tests, assignments, and a presentation.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for**

	Homeland Security, this is a mandated course that must be included. To be a qualified cybersecurity student, the student must be trained extensively in wireless security because the use of wireless is dramatically increasing. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
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Department Head **Dr. David Hoelzeman**	David A. Hoelzeman	7-6-2016
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Teacher Education Council (if applicable)		
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Registrar **Ms. Tammy Weaver**	Tammy Weaver	8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**2113**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Introduction to Information Systems

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Intro to Info Systems

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

◉ 01 Lecture	○ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? Select Fee Type

If selected other list fee type:

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Every Fall

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
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j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **No**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?
No

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at http://www.atu.edu/registrar/curriculum_forms.php. **N/A**

Syllabus

Department of Computer & Information Science

CSEC 2113 **Introduction to Information Systems**

Section #

OFFERED Fall

PRE-REQUISITE None

CO-REQUISITES None

DESCRIPTION Computer and communications networks are the very environment in which cyber operations are conducted. An understanding of these networks is essential to any discussion of cyber operations activities.

Specific topics to be covered to satisfy this knowledge unit must minimally include:

- Routing, network, and application protocols including:
  - TCP/IP (versions 4 and 6)
  - ARP, BGP, SSL/TLS
  - DNS
  - SMTP
  - HTTP
- Network architectures
- Network security
- Wireless network technologies
- Network traffic analysis
- Protocol analysis (examining component-to-component communication to determine the protocol being used and what it is doing)
- Network mapping techniques (active and passive)

NOTES None

COURSE INSTRUCTOR **Email:** **Office: Corley** **Phone:**

OFFICE HOURS

TEXTBOOK

BIBLIOGRAPHY There is **no** REQUIRED supplemental reading list for this course.

JUSTIFICATION The Internet is a network of networks. To be a knowledgeable, effective cybersecurity specialist, students must gain experience using networks.

OBJECTIVES After completing this course, the learner will be able to:

- describe the major components and their functionality of a computer system.
- describe the major components and their function of an information system.
- describe the major components and their functionality of a network.
- use university and departmental computing resources.
- build a simple relational database.
- build a simple web site and describe how the web supports e-commerce.
- identify mechanisms for securing data in a networked environment.
- identify ethical issues related to privacy and security.
- define and employ technical terms related to information technology.
- explain Cloud computing and the security vulnerabilities associated.

GENERAL EDUCATION REQUIREMENTS This course does not meet any of the General Education requirements.

ASSESSMENT The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
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Provide an answer for each question. Your answers are to be typed single spaced.
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a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
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Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to describe the major components and their functionality of a computer system. 2. Students will be able to describe the major components and their function of an information system. 3. Students will be able to describe the major components and their functionality of a network.**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, and a research paper.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will complete quizzes, tests, assignments.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included. To be a qualified cybersecurity student, the student must be trained extensively in information systems.**

	(https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David A Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**		8 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**		8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**2213**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Forensics and Incident Response

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Forensics/Incident Response

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

◉ 01 Lecture	○ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? [ ] Select Fee Type

If selected other list fee type: [ ]

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Spring

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
i. Course objectives
j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **Yes**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)? **dedicated lab**

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at http://www.atu.edu/registrar/curriculum_forms.php. **N/A**

Syllabus

Department of Computer & Information Science

CSEC 2213 **Forensics and Incident Response**

Section #

OFFERED Spring

PRE-REQUISITE CSEC 1113 Introduction to Networking

CO-REQUISITES None

DESCRIPTION This course teaches the fundamentals of incident response and digital forensics. An overview of operating systems will then lead to a systematic approach to incident response will be reviewed, focusing on a six step process (Preparation, Identification, Containment, Eradication, Recovery, Lessons Learned.) Preservation of data (dd, ftk imager, DumpIt,) Data recovery (Scalpel, Foremost,) forensic analysis (Sleuthkit, SIFT workstation, Volatiilty, RegRipper, Supertimeline,) Network Forensics (tcpdump, Wireshark, nfsen,) and legal aspects of both investigation and preservation will be discussed.

NOTES None

COURSE INSTRUCTOR **Email:** **Office: Corley** **Phone:**

OFFICE HOURS

TEXTBOOK

BIBLIOGRAPHY There is **no** REQUIRED supplemental reading list for this course.

JUSTIFICATION As the world increasingly relies on computers to interact and to conduct business, the ability to conduct a thorough forensic investigation and to report on that investigation are critical.

OBJECTIVES After completing this course, the learner will be able to:

- analyze a variety of operating systems and applications for computer evidence.

- understand and correctly use forensic software and tools.
- understand the basics of network forensics and incident response.

GENERAL EDUCATION REQUIREMENTS

This course does not meet any of the General Education requirements.

ASSESSMENT

The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE

The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in their own interest, are therefore responsible for attending all classes for which they are enrolled.

COURSE CONDUCT

Respect your peers. Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

PLAGIARISM & CHEATING

Refer to the rules set forth in the student handbook. Students are expected to do their own work. **Consider your actions carefully**: there will be no tolerance for conduct that even gives the appearance of cheating. Any questions regarding the policy of cheating or conduct in this class should be clarified with the instructor. Cheating will result in a negative score (deduction from the final course grade) and will be reported to appropriate governing bodies, e.g. the CIS ethics committee.

SCHEDULE

Week			Exercises
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Arkansas Tech University

Course Addition

Assessment Form

Our Mission
Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. The University offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 2213 Forensics and Incident Response
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meets these requirements. This course is a mandated requirement to qualify for designation as a Center of Excellence. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to analyze a variety of operating systems and applications for computer evidence. 2. Students will be able to understand and correctly use forensic software and tools. 3. Students will be able to understand the basics of network forensics and incident response.**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, and a research paper.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will complete quizzes, tests, assignments.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included. To be a qualified cybersecurity student, the student must be trained extensively in forensics and incident**

	response. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David A. Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**	Neal Barlow	8 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**	Tammy Weaver	8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**2223**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Virtualization

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

◉ 01 Lecture	○ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? [ ] Select Fee Type

If selected other list fee type: [ ]

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?
Spring

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
i. Course objectives
j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **Yes**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?
dedicated lab

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at http://www.atu.edu/registrar/curriculum_forms.php. **N/A**

Syllabus

Department of Computer & Information Science

CSEC 2223 **Virtualization**

Section #

OFFERED Spring

PRE-REQUISITE None

CO-REQUISITES COMS 2703 Survey of Operating Systems
CSEC 1113 Introduction to Networking

DESCRIPTION Virtualization technology has rapidly spread to encompass workstations, servers, infrastructure devices, storage, and networks, and as such has become critical to cyber operations. Specific topics to be covered in this knowledge unit must minimally include, but are not limited to:

- Virtualization techniques
  Virtual machine architectures
  Uses of virtualization for:
  - Security
  - Efficiency
  - Simplicity
  - Resource savings (space, admin overhead)

NOTES None

COURSE INSTRUCTOR **Email:** **Office: Corley** **Phone:**

OFFICE HOURS

TEXTBOOK

BIBLIOGRAPHY There is **no** REQUIRED supplemental reading list for this course.

JUSTIFICATION Virtualization technology has rapidly spread to encompass workstations, servers, infrastructure devices, storage, and networks, and as such has become critical to cyber operations.

OBJECTIVES

After completing this course, the learner will be able to:

- demonstrate knowledge of virtualization technologies.
- install server and desktop virtualization.
- virtual machine installation, configuration, and administration.
- converting server to virtual server.
- describe backup, recovery, disaster recovery, business continuity, and replication concepts.
- monitor system resource usage and utilization.
- demonstrate understanding of network troubleshooting.

GENERAL EDUCATION REQUIREMENTS

This course does not meet any of the General Education requirements.

ASSESSMENT

The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE

The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in their own interest, are therefore responsible for attending all classes for which they are enrolled.

COURSE CONDUCT

Respect your peers. Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

PLAGIARISM & CHEATING

Refer to the rules set forth in the student handbook. Students are expected to do their **OWN** work. **Consider your actions carefully**: there will be no tolerance for conduct that even gives the appearance of cheating. Any questions regarding the policy of cheating or conduct in this class should be clarified with the instructor. Cheating will result in a negative score (deduction from the final course grade) and will be reported to appropriate governing bodies, e.g. the CIS ethics committee.

SCHEDULE

Week			Exercises
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Arkansas Tech University

Course Addition

Assessment Form

Our Mission
Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. The University offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 2223 Virtualization
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meets these requirements. This course is a mandated requirement to qualify for designation as a Center of Excellence. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to demonstrate knowledge of virtualization technologies. 2. Students will be able to install server and desktop virtualization. 3. Students will be able to convert a server to a virtual server.**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, and a research paper.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will complete quizzes, tests, assignments.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included. To be a qualified cybersecurity student, the student must be trained extensively in virtualization.**

	(https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. **. To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree. The use of virtualization is dramatically increasing.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David A Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**		9 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**	Tammy Weaver	8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**3113**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Assembly Programming

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

◉ 01 Lecture	○ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? Select Fee Type

If selected other list fee type:

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Fall

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
i. Course objectives
j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **No**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?
No

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at http://www.atu.edu/registrar/curriculum_forms.php. **N/A**

Syllabus

Department of Computer & Information Science

CSEC 3113 **Assembly Programming**

Section #

OFFERED Fall

PRE-REQUISITE COMS 2104 Foundations of Computer Programming
COMS 2903 Discrete Structures for Technical Majors

CO-REQUISITES None

DESCRIPTION An introduction to the study of the basic structure and language of machines. Topics include basic concepts of Boolean algebra, number systems, language, addressing techniques, data representation, file organization, symbolic coding and assembly systems, use of macros, batch operation and job handling.

NOTES None

COURSE INSTRUCTOR Email: **Office: Corley** **Phone:**

OFFICE HOURS

TEXTBOOK

BIBLIOGRAPHY There is **no** REQUIRED supplemental reading list for this course.

JUSTIFICATION Trained cybersecurity experts need to understand the basic microprocessor and small computer architecture and organization because they can control the operation through use of very low-level assembly programming. The information learned in this course will supplement the student's knowledge of high-level programming languages.

OBJECTIVES After completing this course, the learner will be able to:

- identify the major components of a computer, describe the steps involved in assembling, linking, and executing a program.
- given a request to perform a certain task (for example: keyboard inputs, screen outputs, perform arithmetic, sorting), write a

program in assembly language to perform the given task and run them.
- trace machine execution as an aid in program debugging.

GENERAL EDUCATION REQUIREMENTS

This course does not meet any of the General Education requirements.

ASSESSMENT

The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE

The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in their own interest, are therefore responsible for attending all classes for which they are enrolled.

COURSE CONDUCT

Respect your peers. Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student

who is requested to leave will not be excused from missing any class or class activities.

PLAGIARISM & CHEATING

Refer to the rules set forth in the student handbook. Students are expected to do their **OWN** work. **Consider your actions carefully**: there will be no tolerance for conduct that even gives the appearance of cheating. Any questions regarding the policy of cheating or conduct in this class should be clarified with the instructor. Cheating will result in a negative score (deduction from the final course grade) and will be reported to appropriate governing bodies, e.g. the CIS ethics committee.

SCHEDULE

Week			Exercises
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Arkansas Tech University

Course Addition

Assessment Form

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Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. The University offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 3113 Assembly Programming
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This degree supports the University's mission by being innovative and rigorous as individuals are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meets these requirements. This course is a mandated requirement to qualify for designation as a Center of Excellence. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to identify the major components of a computer and describe the steps involved in assembling, linking, and executing a program. 2. Students will be able to trace machine execution as an aid in program debugging. 3. Students will be able to write a program in assembly language to perform assigned tasks.**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, research paper, hands-on completion of tasks, and presentations**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will demonstrate their understanding of concepts by actually completing assigned tasks during class so the professor can observe the students completing the task. In addition, students will complete quizzes, tests, assignments, and a presentation.**

e.	Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included. To be a qualified cybersecurity student, the student must be trained extensively in networking. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)**
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David A Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**		8 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**		8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**3123**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Cyber Defense I

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

◉ 01 Lecture	○ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? Select Fee Type

If selected other list fee type:

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Fall

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
i. Course objectives
j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **Yes**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?
a dedicated lab

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at http://www.atu.edu/registrar/curriculum_forms.php. **N/A**

Syllabus

Department of Computer & Information Science

CSEC 3123 **Cyber Defense I**

Section #

OFFERED Fall

PRE-REQUISITE CSEC 2223 Virtualization

CO-REQUISITES None

DESCRIPTION This course introduces the fundamental principles of cyber defense. Topics covered include: security fundamental principles, vulnerability assessment, intrusion detection, cryptography protocols, network defense, trust relationships, and legal and ethical issues in computer security. A balance between theory and current practice will be presented. Topics to be covered include, but are not limited to:

- identification of reconnaissance operations
- anomaly/intrusion detection
- anomaly identification
- identification of command and control operations
- identification of data exfiltration activities
- identifying malicious code based on signatures, behavior and artifacts
- network security techniques and components (e.g., firewalls, IDS, etc.)
- cryptography (include PKI cryptography) and its uses in cybersecurity
- malicious activity detection
- system security architectures and concepts
- defense in depth
- virtualization.

NOTES None

COURSE INSTRUCTOR Email: **Office: Corley** **Phone:**

OFFICE HOURS

TEXTBOOK

BIBLIOGRAPHY There is **no** REQUIRED supplemental reading list for this course.

JUSTIFICATION To be competent in the field of cybersecurity, it is essential that graduates have a thorough understanding of cybersecurity and of techniques to detect and to protect networks and computing systems.

OBJECTIVES After completing this course, the learner will be able to:

- describe methods used to defend computer systems and networks.
- identify vulnerabilities and determine appropriate measures to reduce or eliminate vulnerabilities.
  describe basic use of cryptography.
- discuss and implement examples of layers of cyber defense.
- understand legal and ethical issues associated with cyber defense.

GENERAL EDUCATION REQUIREMENTS This course does not meet any of the General Education requirements.

ASSESSMENT The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in their own interest, are therefore responsible for attending all classes for which they are enrolled.

COURSE CONDUCT

Respect your peers. Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

PLAGIARISM & CHEATING

Refer to the rules set forth in the student handbook. Students are expected to do their **OWN** work. **Consider your actions carefully**: there will be no tolerance for conduct that even gives the appearance of cheating. Any questions regarding the policy of cheating or conduct in this class should be clarified with the instructor. Cheating will result in a negative score (deduction from the final course grade) and will be reported to appropriate governing bodies, e.g. the CIS ethics committee.

SCHEDULE

Week			Exercises
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Arkansas Tech University

Course Addition

Assessment Form

Our Mission
Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. The University offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 3123 Cyber Defense I
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meets these requirements. This course is a mandated requirement to qualify for designation as a Center of Excellence. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to describe methods used to defend computer systems and networks. 2. Students will be able to identify vulnerabilities and determine appropriate measures to reduce or eliminate vulnerabilities. Students will be able to discuss and implement examples of layers of cyber defense.**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, and a research paper.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will complete quizzes, tests, assignments.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included. To be a qualified cybersecurity student, the student must be trained extensively in cyber defense.**

	(https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David J. Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**	Neal Barlow	9 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**	Tammy Weaver	8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**3223**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Programming Embedded Systems

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

◉ 01 Lecture	○ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? Select Fee Type

If selected other list fee type:

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Spring

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
i. Course objectives
j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **No**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?
No

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at http://www.atu.edu/registrar/curriculum_forms.php. **N/A**

Syllabus

Department of Computer & Information Science

CSEC 3223	**Programming Embedded Systems**
Section #	
OFFERED	Spring
PRE-REQUISITE	COMS 2213 Data Structures CSEC 3113 Assembly Programming
CO-REQUISITES	None
DESCRIPTION	The course involves the design, coding, debugging, and implementation of programs for securing embedded systems. Embedded software vulnerabilities and secure programming methods are introduced through hands-on projects. Buffer overflow attacks are discussed. After completing the course content mapped to this knowledge unit, students will be able to develop programs that can be embedded into an OS kernel, such as a device driver, with the required complexity and sophistication to implement exploits for discovered vulnerabilities. Students will be able to write a program that implements a network stack to manage network communications.
NOTES	None
COURSE INSTRUCTOR Email:	**Office: Corley** **Phone:**
OFFICE HOURS	
TEXTBOOK	
BIBLIOGRAPHY	There is **no** REQUIRED supplemental reading list for this course.
JUSTIFICATION	Students need to gain an understanding of the process of writing low-level programs that interact directly with a computer's operating system and hardware.
OBJECTIVES	After completing this course, the learner will be able to:

hardware.

OBJECTIVES

After completing this course, the learner will be able to:

- use a computer to input, compile, and run a C program within an embedded system.
- trace by hand C code that includes assignments, selections, loops, and procedures.
- write a program or procedure given its input/output specifications.
- implement iterative methods for numerical calculation and data processing.
- design and implement a secure program for an embedded system.

GENERAL EDUCATION REQUIREMENTS

This course does not meet any of the General Education requirements.

ASSESSMENT

The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE

The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in their own interest, are therefore responsible for attending all classes for which they are enrolled.

COURSE CONDUCT

Respect your peers. Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain

an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

PLAGIARISM & CHEATING

Refer to the rules set forth in the student handbook. Students are expected to do their **OWN** work. **Consider your actions carefully**: there will be no tolerance for conduct that even gives the appearance of cheating. Any questions regarding the policy of cheating or conduct in this class should be clarified with the instructor. Cheating will result in a negative score (deduction from the final course grade) and will be reported to appropriate governing bodies, e.g. the CIS ethics committee.

SCHEDULE

Week			Exercises
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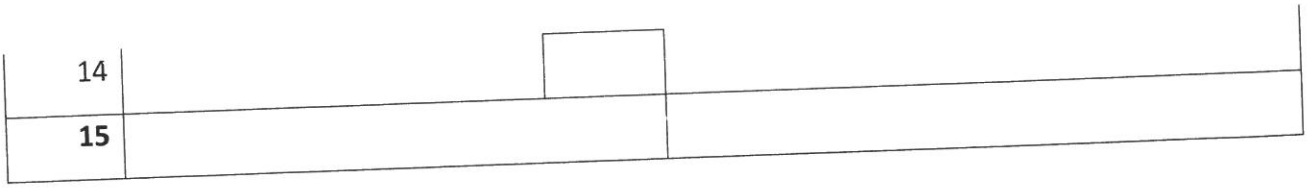
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Arkansas Tech University

Course Addition

Assessment Form

Our Mission
Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. The University offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 3223 Programming Embedded Systems
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meets these requirements. This course is a mandated requirement to qualify for designation as a Center of Excellence. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to use a computer to input, compile, and run a C program within an embedded system. 2. Students will be able to trace by hand C code that includes assignments, selections, loops, and procedures. 3. Students will be able to write a program or procedure given its input/output specifications.**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, and a research paper.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will complete quizzes, tests, assignments.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included. To be a qualified cybersecurity student, the student must understand C programming.**

	(https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. . **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David A. Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**	Neal Barlow	8 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**	TWeaver	8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**3233**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Cyber Defense II

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

◉ 01 Lecture	○ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? [ ] Select Fee Type

If selected other list fee type: [ ]

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Spring

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
i. Course objectives
j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **No**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?
No

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at http://www.atu.edu/registrar/curriculum_forms.php. **N/A**

Syllabus

Department of Computer & Information Science

CSEC 3233	**Cyber Defense II**
Section #	
OFFERED	Spring
PRE-REQUISITE	**CSEC 3233 Cyber Defense I**
CO-REQUISITES	None
DESCRIPTION	This course introduces penetration testing for the purposes of learning about cyber security vulnerabilities. Topics include: vulnerability taxonomies, buffer overflow attacks, password attacks, trust relationship exploitation, race condition exploitations, and local vs remote exploitations. The topics will be enhanced with hands-on examples using Kali Linux.
NOTES	None
COURSE INSTRUCTOR	**Email:** **Office: Corley** **Phone:**
OFFICE HOURS	
TEXTBOOK	
BIBLIOGRAPHY	There is **no** REQUIRED supplemental reading list for this course.
JUSTIFICATION	Trained cybersecurity esperts need to understand the underlying principles and techniques involved with penetration testing. The entire penetration testing process.
OBJECTIVES	After completing this course, the learner will be able to: • understand legal and ethical issues associated with hacking. • describe vulnerability taxonomies. • identify vulnerabilities and how the vulnerabilities can be exploited. • understand how to adapt vulnerabilities to be applied to alternative contexts.

Syllabus

Department of Computer & Information Science

CSEC 3233	**Cyber Defense II**
Section #	
OFFERED	Spring
PRE-REQUISITE	CSEC 3123 (Cyber Defense I)
CO-REQUISITES	None
DESCRIPTION	This course introduces penetration testing for the purposes of learning about cyber security vulnerabilities. Topics include: vulnerability taxonomies, buffer overflow attacks, password attacks, trust relationship exploitation, race condition exploitations, and local vs remote exploitations. The topics will be enhanced with hands-on examples using Kali Linux.
NOTES	None
COURSE INSTRUCTOR Email:	**Office: Corley** **Phone:**
OFFICE HOURS	
TEXTBOOK	
BIBLIOGRAPHY	There is **no** REQUIRED supplemental reading list for this course.
JUSTIFICATION	Trained cybersecurity esperts need to understand the underlying principles and techniques involved with penetration testing. The entire penetration testing process.
OBJECTIVES	After completing this course, the learner will be able to: • understand legal and ethical issues associated with hacking. • describe vulnerability taxonomies. • identify vulnerabilities and how the vulnerabilities can be exploited. • understand how to adapt vulnerabilities to be applied to alternative contexts.

- apply security design principles to reduce or eliminate vulnerabilities.

GENERAL EDUCATION REQUIREMENTS

This course does not meet any of the General Education requirements.

ASSESSMENT

The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE

The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in their own interest, are therefore responsible for attending all classes for which they are enrolled.

COURSE CONDUCT

Respect your peers. Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

PLAGIARISM & CHEATING

Refer to the rules set forth in the student handbook. Students are expected to do their **OWN** work. **Consider your actions carefully**: there will be no tolerance for conduct that even gives the appearance of cheating. Any questions regarding the policy of cheating or conduct in this class should be clarified with the instructor. Cheating will result in a negative score (deduction from the final course grade) and will be reported to appropriate governing bodies, e.g. the CIS ethics committee.

SCHEDULE

Week			Exercises
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Arkansas Tech University

Course Addition

Assessment Form

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Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 3233 Cyber Defense II
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meetings the requirements to become a Center of Excellence. This course is a mandated requirement to qualify for designation as a Center of Excellence. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to understand legal and ethical issues associated with hacking. 2. Students will be able to describe vulnerability taxonomies. 3. Students will be able to identify vulnerabilities and how the vulnerabilities can be exploited.**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, and a research paper.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will complete quizzes, tests, assignments.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included. To be a qualified cybersecurity student, the student must be trained extensively in penetration testing since most systems are running on a network.**

	(https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David S. Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**		9 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**		8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**3243**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Computer Architecture

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Computer Architecture

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

◉ 01 Lecture	○ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? Select Fee Type

If selected other list fee type:

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Spring

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
i. Course objectives
j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **No**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?
No

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at http://www.atu.edu/registrar/curriculum_forms.php. **N/A**

Syllabus

Department of Computer & Information Science

CSEC 3243 **Computer Architecture**

Section #

OFFERED **Spring**

PRE-REQUISITE COMS 3703 Operating Systems

CO-REQUISITES ELEG 2130 Digital Logic Design Lab
ELEG 2134 Digital Logic Design

DESCRIPTION Introduction to computer architecture. Aspects of computer systems, such as pipelining, memory hierarchy, and input/output systems. Performance metrics. Examines each component of a complicated computer system. Topics include:

- performance evaluation
- instruction set architecture
- machine arithmetic
- datapaths and pipelining
- memory hierarchy
- branch prediction
- scheduling techniques
- multiprocessors.

NOTES None

COURSE INSTRUCTOR **Email:** **Office: Corley** **Phone:**

OFFICE HOURS

TEXTBOOK

BIBLIOGRAPHY There is **no** REQUIRED supplemental reading list for this course.

JUSTIFICATION Basic understanding of computer architecture is essential to cybersecurity.

OBJECTIVES

After completing this course, the learner will be able to:

- understand processor design concepts in modern computer architecture. understand and evaluate constraints and tradeoffs in microprocessor design.
- use digital logic, Verilog, C, and some assembly for implementation and evaluation.
- enable you to design and build a mini computer.
- enable you to understand, use, and modify computer architecture simulation tools.

GENERAL EDUCATION REQUIREMENTS

This course does not meet any of the General Education requirements.

ASSESSMENT

The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE

The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in their own interest, are therefore responsible for attending all classes for which they are enrolled.

COURSE CONDUCT

Respect your peers. Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having

conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

PLAGIARISM & CHEATING

Refer to the rules set forth in the student handbook. Students are expected to do their **OWN** work. **Consider your actions carefully**: there will be no tolerance for conduct that even gives the appearance of cheating. Any questions regarding the policy of cheating or conduct in this class should be clarified with the instructor. Cheating will result in a negative score (deduction from the final course grade) and will be reported to appropriate governing bodies, e.g. the CIS ethics committee.

SCHEDULE

Week			Exercises
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Arkansas Tech University

Course Addition

Assessment Form

Our Mission
Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. The University offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 3243 Computer Architecture
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not an accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meets these requirements. This course is a mandated requirement to qualify for designation as a Center of Excellence. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to understand processor design concepts in modern computer architecture. 2. Students will be able to understand and evaluate constraints and tradeoffs in microprocessor design. 4. Students will be able to use digital logic, Verilog, C, and some assembly for implementation and evaluation.**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, and a research paper.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will complete quizzes, tests, assignments.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included. To be a qualified cybersecurity student, the student must acquire an extensive knowledge of computer**

	architecture to support an understanding of how a system can be attacked. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David A. Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**	Neal Barlow	8 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**	Tammy Weaver	8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**4123**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Cryptography

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

◉ 01 Lecture	○ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? [ ] Select Fee Type

If selected other list fee type: [ ]

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Fall

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
i. Course objectives
j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **No**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?
No

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at http://www.atu.edu/registrar/curriculum_forms.php. **N/A**

Syllabus

Department of Computer & Information Science

CSEC 4123 **Cryptography**

Section #

OFFERED Fall

PRE-REQUISITE CSEC 3223 Programming Embedded Systems

CO-REQUISITES None

DESCRIPTION This course covers multiple cryptography protocols and their application to cybersecurity. Techniques in modern cryptography will be presented such as stream ciphers, DES, AES, block ciphers, etc. The course will discuss the level of security that various protocols provide and how to select an appropriate protocol for a specific application with an understanding of the limitations of key management systems, such as symmetric and asymmetric encryption, will be presented. Select protocols will be implemented in the C programming language.

NOTES None

COURSE INSTRUCTOR **Email:** **Office: Corley** **Phone:**

OFFICE HOURS

TEXTBOOK

BIBLIOGRAPHY There is **no** REQUIRED supplemental reading list for this course.

JUSTIFICATION Students need an understanding in how cryptography can be used to solve security problems. Understanding attacks and vulnerabilities is critical to the cybersecurity expert.

OBJECTIVES After completing this course, the learner will be able to:

- identify features and limits of various cryptographic algorithms.
- compare key management systems and their classifications such as symmetric and asymmetric keys.

- select an appropriate cryptographic algorithm for a specified application.
- understand real-world cryptographic algorithms such as data encryption security and RSA public-key systems.
- implement cryptographic algorithms in the C programming language.

GENERAL EDUCATION REQUIREMENTS

This course does not meet any of the General Education requirements.

ASSESSMENT

The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE

The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in their own interest, are therefore responsible for attending all classes for which they are enrolled.

COURSE CONDUCT

Respect your peers. Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary,

you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

PLAGIARISM & CHEATING

Refer to the rules set forth in the student handbook. Students are expected to do their **OWN** work. **Consider your actions carefully**: there will be no tolerance for conduct that even gives the appearance of cheating. Any questions regarding the policy of cheating or conduct in this class should be clarified with the instructor. Cheating will result in a negative score (deduction from the final course grade) and will be reported to appropriate governing bodies, e.g. the CIS ethics committee.

SCHEDULE

Week		Exercises
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Arkansas Tech University

Course Addition

Assessment Form

Our Mission
Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. The University offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 4123 Cryptography
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meets these requirements. This course is a mandated requirement to qualify for designation as a Center of Excellence.**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to identify features and limits of various cryptographic algorithms. Students will be able to compare key management systems and their classifications such as symmetric and asymmetric keys. 3. Students will be able to select an appropriate cryptographic algorithm for a specified application.**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, and a research paper.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will complete quizzes, tests, assignments.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included. To be a qualified cybersecurity student, the student must understand how malicious software can be hidden in common documents, photos, etc.**

	(https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David L Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**		7 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**	Tammy Weaver	8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**4133**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Large Scale Distributed Systems

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Large Scale Distributed Sys.

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

◉ 01 Lecture	○ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? Select Fee Type

If selected other list fee type:

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Fall

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
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j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **No**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?
No

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at http://www.atu.edu/registrar/curriculum_forms.php. **N/A**

Syllabus

Department of Computer & Information Science

CSEC 4133 **Large Scale Distributed Systems**

Section #

OFFERED Fall

PRE-REQUISITE CSEC 3223 Programming Embedded Systems

CO-REQUISITES None

DESCRIPTION This course will provide an overview to large scale distributed systems. Topics include:

- concepts of distributed systems: threads, concurrency, dead/live lock, consistency, scalability, fault tolerant, etc.
- design and development of large scale distributed systems that include: TCP/IP, UDP, network data transfer, synchronization, threads, distributed locking, etc.
- basic distributed algorithms that can be applied in practical systems.
- different kinds of cloud computing architecture models, services, and security issues.
- components (logical and physical) of cloud architecture.
- data paths within a given cloud design.

NOTES None

COURSE INSTRUCTOR Email: **Office: Corley** **Phone:**

OFFICE HOURS

TEXTBOOK

BIBLIOGRAPHY There is **no** REQUIRED supplemental reading list for this course.

JUSTIFICATION Students need to understand scalability, replication, consistency, storage, services, issues, and programming modules to be competent as cybersecurity experts.

OBJECTIVES

After completing this course, the learner will be able to:

- demonstrate an ability to design and develop large scale distributed systems.
- understand the different components of cloud computing architecture models, and security issues.
- explain the components, both logical and physical, of cloud architecture.
- demonstrate the ability to discuss data paths within a given cloud design.

GENERAL EDUCATION REQUIREMENTS

This course does not meet any of the General Education requirements.

ASSESSMENT

The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE

The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in their own interest, are therefore responsible for attending all classes for which they are enrolled.

COURSE CONDUCT

Respect your peers. Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain

an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

PLAGIARISM & CHEATING

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SCHEDULE

Week			Exercises
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Arkansas Tech University

Course Addition

Assessment Form

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Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 4133 Large Scale Distributed Systems
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meets these requirements. This course is a mandated requirement for this designation. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to demonstrate an ability to design and develop large scale distributed systems. 2. Students will be able to understand the different components of cloud computing architecture models, and security issues. 3. Students will be able to explain components, both logical and physical, of cloud computing.**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, and a research paper.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will complete quizzes, tests, assignments.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included. Networks are a collection of multiple processors joined. The cybersecurity expert must possess a thorough understand of how large scale distributed systems work.**

	(https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. **. To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David S. Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**	Neal Barlow	8 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**	Tammy Weaver	8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**4143**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Building Secure Software

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Building Secure Software

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

○ 01 Lecture	◉ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? Select Fee Type

If selected other list fee type:

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Fall

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
i. Course objectives
j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **No**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?
No

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at http://www.atu.edu/registrar/curriculum_forms.php. **N/A**

Syllabus

Department of Computer & Information Science

CSEC 4143	**Building Secure Software**
Section #	
OFFERED	Fall
PRE-REQUISITE	**COMS2213 Data Structures**
CO-REQUISITES	None
DESCRIPTION	This course introduces reverse engineering techniques in general and reverse engineering for software specification recovery, malware analysis, and communications in particular. Tools and hands-on lab exercises will be applied to safely perform static and dynamic analysis of software of unknown origin to fully understand the software's functionality, recover the software specification, and discover data used by the software.
NOTES	None
COURSE INSTRUCTOR Email:	**Office: Corley** **Phone:**
OFFICE HOURS	
TEXTBOOK	
BIBLIOGRAPHY	There is **no** REQUIRED supplemental reading list for this course.
JUSTIFICATION	People around the world now depend vitally on computers in all aspects of life. This course will teach students how to prevent vulnerabilities from being in software during the design phase.

OBJECTIVES

After completing this course, the learner will be able to:

- demonstrate knowledge in the methods that lead to the development of robust, secure software.
- understand secure programming principles and practices.
- demonstrate 'good' constructive techniques (What process might provide for 'good code.')
- demonstrate common tools utilized in reverse engineering, including but not limited to: disassemblers, debuggers, virtualization-based sandbox environments, process and file activity monitors, and network activity monitors.
- understand the classes of well-known software defects, how they manifest themselves in various languages, and show that they are capable of authoring programs that are free from defects.
- demonstrate an understanding of reverse engineering techniques and techniques for software specific recovery.
- demonstrate an understanding for malware analysis.
- demonstrate an understanding of reverse engineering communications.

GENERAL EDUCATION REQUIREMENTS

This course does not meet any of the General Education requirements.

ASSESSMENT

The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE

The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in

their own interest, are therefore responsible for attending all classes for which they are enrolled.

COURSE CONDUCT

Respect your peers. Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

PLAGIARISM & CHEATING

Refer to the rules set forth in the student handbook. Students are expected to do their **OWN** work. **Consider your actions carefully**: there will be no tolerance for conduct that even gives the appearance of cheating. Any questions regarding the policy of cheating or conduct in this class should be clarified with the instructor. Cheating will result in a negative score (deduction from the final course grade) and will be reported to appropriate governing bodies, e.g. the CIS ethics committee.

SCHEDULE

Week			Exercises
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Arkansas Tech University

Course Addition

Assessment Form

Our Mission
Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. The University offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 4143 Building Secure Software
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meets these requirements. This course is a mandated requirement to qualify for designation.**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to demonstrate knowledge in the methods that lead to the development of robust, secure software. 2. Students will be able to understand secure programming principles and practices. 3. Students will be able to demonstrate 'good' constructive techniques (What process might provide for 'good code?')**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, and a research paper.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will complete quizzes, tests, assignments.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included. To be a qualified cybersecurity student, the student must understand how to build secure software because it is instrumental in understanding how to protect a system.**

	(https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David A. Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**	Neal Barlow	7 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**	Tammy Weaver	8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**4213**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Information Systems Risk Management

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

IS Risk Management

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

○ 01 Lecture	◉ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? Select Fee Type

If selected other list fee type:

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Spring

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
i. Course objectives
j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **No**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?
No

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at http://www.atu.edu/registrar/curriculum_forms.php. **N/A**

Syllabus

Department of Computer & Information Science

CSEC 4213	**Information Systems Risk Management**
Section #	
OFFERED	Spring
PRE-REQUISITE	CSEC 2113 Introduction to Information Systems CSEC 2213 Forensics and Incident Response
CO-REQUISITES	None
DESCRIPTION	This course provides an overview for Information Security and Assurance to allow students to understand the key issues associated with protecting information assets, determining the levels of protection and response to security incidents, and designing a consistent, reasonable information security system, with appropriate intrusion detection and reporting features. Topics include but are not limited to: • inspection and protection of information assets. • detection of and reaction to threats to information assets. • examination of pre- and post- incident procedures.
NOTES	None
COURSE INSTRUCTOR Email:	**Office: Corley** **Phone:**
OFFICE HOURS	
TEXTBOOK	
BIBLIOGRAPHY	There is **no** REQUIRED supplemental reading list for this course.
JUSTIFICATION	In today's world of rapid information flows, rising volatility, regulatory concerns and oversight, prudent management increasingly requires understanding and measuring risk.

OBJECTIVES

After completing this course, the learner will be able to:

- identify classes of possible threats and the consequences associated with each threat.
- demonstrate an understanding of the required actions to mitigate the threat.
- Review pre- and post- incident procedures.

GENERAL EDUCATION REQUIREMENTS

This course does not meet any of the General Education requirements.

ASSESSMENT

The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE

The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in their own interest, are therefore responsible for attending all classes for which they are enrolled.

COURSE CONDUCT

Respect your peers. Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be

asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

PLAGIARISM & CHEATING

Refer to the rules set forth in the student handbook. Students are expected to do their **OWN** work. **Consider your actions carefully**: there will be no tolerance for conduct that even gives the appearance of cheating. Any questions regarding the policy of cheating or conduct in this class should be clarified with the instructor. Cheating will result in a negative score (deduction from the final course grade) and will be reported to appropriate governing bodies, e.g. the CIS ethics committee.

SCHEDULE

Week			Exercises
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Arkansas Tech University

Course Addition

Assessment Form

Our Mission
Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. The University offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 4213 Information Systems Risk Management
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meets these requirements. This course is a mandated requirement to qualify for designation as a Center of Excellence. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to identify classes of possible threats and the consequences associated with each threat. 2. Students will be able to demonstrate an understanding of the required actions to mitigate the threat. 3. Students will be able to review pre- and post-incident procedures.**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, and a research paper.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will complete quizzes, tests, assignments.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included. Data is an organization's most valuable asset that is housed in an information system. The**

	cybersecurity expert must have a thorough understanding of the risks associated with it. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. . **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David S. Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**	Neal Barlow	8 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**	Tammy Weaver	8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**4233**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Legal Issues in Cybersecurity

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Legal Issues in Cybersecurity

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

○ 01 Lecture	◉ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? [ ] Select Fee Type

If selected other list fee type: [ ]

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Spring

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
i. Course objectives
j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **No**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?
No

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

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Syllabus

Department of Computer & Information Science

CSEC 4233 **Legal Issues in Cybersecurity**

Section #

OFFERED Spring

PRE-REQUISITE Junior Standing in CS, IS, IT, or Cybersecurity

CO-REQUISITES None

DESCRIPTION This course will provide a high-level explanation of the legal issues governing the authorized conduct of cyber operations and the use of related tools, techniques, technology and data. Both international and U.S. laws that operations in cyberspace must be in compliance will be introduced.

Specific topics to be covered in this knowledge unit must minimally include:

- International Law
  - Jus ad bellum
    - United Nations Charter
  - Jus in bello
    - Hague Conventions
    - Geneva Conventions
- U.S. Laws
  - Constitution
    - Article I (Legislative Branch)
    - Article II (Presidency)
    - Article III (Judiciary)
    - Amendment 4 (Search and Seizure)
    - Article 14 (Due Process)
  - Statutory Laws
    - Title 10 (Armed Forces)
    - Title 50 (Espionage and Covert Action)
    - Title 18 (Crimes)
      - 18 USC 1030 (Computer Fraud and Abuse Act)
      - 18 USC 2510-22 Electronic Communications Privacy Act
      - 18 USC 2701-12 Stored Communications Act
      - 18 USC 1831-32 Economic Espionage Acts

NOTES None

COURSE INSTRUCTOR **Email:** **Office: Corley** **Phone:**

OFFICE HOURS

TEXTBOOK

BIBLIOGRAPHY There is **no** REQUIRED supplemental reading list for this course.

JUSTIFICATION The ability to secure information within a modern enterprise large or small is a growing challenge. Threats to information security are global, persistent, and increasingly sophisticated. Long gone are the days when managers could hope to secure the enterprise through ad hoc means.

OBJECTIVES After completing this course, the learner will be able to:

- given a cyber operations scenario, students will be able to explain the authorities applicable to the scenario.
- provide a high-level explanation of the legal issues governing the authorized conduct of cyber operations and the use of related tools, techniques, technology and data.

GENERAL EDUCATION REQUIREMENTS This course does not meet any of the General Education requirements.

ASSESSMENT The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE

The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in their own interest, are therefore responsible for attending all classes for which they are enrolled.

COURSE CONDUCT

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PLAGIARISM & CHEATING

Refer to the rules set forth in the student handbook. Students are expected to do their **OWN** work. **Consider your actions carefully**: there will be no tolerance for conduct that even gives the appearance of cheating. Any questions regarding the policy of cheating or conduct in this class should be clarified with the instructor. Cheating will result in a negative score (deduction from the final course grade) and will be reported to appropriate governing bodies, e.g. the CIS ethics committee.

SCHEDULE

Week			Exercises
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Arkansas Tech University

Course Addition

Assessment Form

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Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 4233 Legal Issues in Cybersecurity
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meets these requirements for designation. This course is a mandated requirement to qualify for this designation. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to explain the authorities applicable to a scenario, given a cyber operations scenario. 2. Students will be able to provide a high-level explanation of the legal issues governing the authorized conduct of cyber operations and the use of related tools, techniques, technology and data.**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, and a research paper.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will complete quizzes, tests, assignments.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included. To be a qualified cybersecurity student, the student must be knowledgeable in the laws that are applicable**

	to the field. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David S. Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**	Neal Barlow	7/6/16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**	Tammy Weaver	8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**4240**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Software Security Analysis and Reverse Engineering Lab

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Software Sec Analysis & Rev En

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

○ 01 Lecture	◉ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? Select Fee Type

If selected other list fee type:

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Spring

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
i. Course objectives
j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **No**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?
No

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at http://www.atu.edu/registrar/curriculum_forms.php. **N/A**

Syllabus

Department of Computer & Information Science

CSEC 4240	**Software Security Analysis and Reverse Engineering LAB**
Section #	
OFFERED	Spring
PRE-REQUISITE	None
CO-REQUISITES	CSEC 4243 Software Security Analysis and Reverse Engineering
DESCRIPTION	This is a lab designed to support CSEC 4243.
NOTES	None
COURSE INSTRUCTOR Email:	**Office: Corley** **Phone:**
OFFICE HOURS	
TEXTBOOK	
BIBLIOGRAPHY	There is **no** REQUIRED supplemental reading list for this course.
JUSTIFICATION	OS-level and hardware protection cannot solve the security problem alone. Secure Software begins with developing truth worthy software.
OBJECTIVES	After completing this course, the learner will be able to: • demonstrate the ability to analyze source code. • demonstrate the ability to analyze binary code. • demonstrate the ability to analyze static code. • demonstrate the ability to analyze dynamic code. • demonstrate an understanding of various testing methodologies (Black Box/White Box/Fuzz).
GENERAL EDUCATION REQUIREMENTS	This course does not meet any of the General Education requirements.

ASSESSMENT

The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE

The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in their own interest, are therefore responsible for attending all classes for which they are enrolled.

COURSE CONDUCT

Respect your peers. Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

PLAGIARISM & CHEATING

Refer to the rules set forth in the student handbook. Students are expected to do their **OWN** work. **Consider your actions carefully**: there will be no tolerance for conduct that even gives the appearance of cheating. Any questions regarding the policy of cheating or conduct in this class

should be clarified with the instructor. Cheating will result in a negative score (deduction from the final course grade) and will be reported to appropriate governing bodies, e.g. the CIS ethics committee.

SCHEDULE

Week			Exercises
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Arkansas Tech University

Course Addition

Assessment Form

Our Mission
Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. The University offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 4240 Software Security Analysis and Reverse Engineering Lab
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meets these requirements. This course is a mandated requirement for this designation. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to demonstrate the ability to analyze source code. 2. Students will be able to demonstrate the ability to analyze binary code. 3. Students will be able to demonstrate an ability to analyze static code.**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, and a research paper.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will complete quizzes, tests, assignments.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **1. Students will be able to demonstrate the ability to analyze code. 2. Students will be able to analyze binary code. 3. Students will be able to demonstrate the ability to analyze dynamic code.**
f. How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program

provide comparative examples from regional educational institutions. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David A. Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**		
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**		8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**4243**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Software Security Analysis and Reverse Engineering

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Software Security & Reverse En

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

○ 01 Lecture	◉ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? Select Fee Type

If selected other list fee type:

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Spring

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
i. Course objectives
j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **No**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)?
No

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at http://www.atu.edu/registrar/curriculum_forms.php. **N/A**

Syllabus

Department of Computer & Information Science

CSEC 4243	**Software Security Analysis and Reverse Engineering**
Section #	
OFFERED	Spring
PRE-REQUISITE	**COMS 2213 Data Structures**
CO-REQUISITES	**CSEC 4240 Software Security Analysis and Reverse Engineering Lab**
DESCRIPTION	To learn code analysis techniques and apply testing methodologies to detect the presence of loopholes or weaknesses of software and to determine the effectiveness of security controls that are implemented in the software.
NOTES	None
COURSE INSTRUCTOR Email:	**Office: Corley** **Phone:**
OFFICE HOURS	
TEXTBOOK	
BIBLIOGRAPHY	There is **no** REQUIRED supplemental reading list for this course.
JUSTIFICATION	OS-level and hardware protection cannot solve the security problem alone. Secure Software begins with developing truth worthy software.
OBJECTIVES	After completing this course, the learner will be able to: • demonstrate the ability to analyze source code. • demonstrate the ability to analyze binary code. • demonstrate the ability to analyze static code. • demonstrate the ability to analyze dynamic code. • demonstrate an understanding of various testing methodologies (Black Box/White Box/Fuzz).

GENERAL EDUCATION REQUIREMENTS

This course does not meet any of the General Education requirements.

ASSESSMENT

The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE

The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in their own interest, are therefore responsible for attending all classes for which they are enrolled.

COURSE CONDUCT

Respect your peers. Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

PLAGIARISM &

Refer to the rules set forth in the student handbook. Students are

CHEATING

expected to do their **OWN** work. **Consider your actions carefully**: there will be no tolerance for conduct that even gives the appearance of cheating. Any questions regarding the policy of cheating or conduct in this class should be clarified with the instructor. Cheating will result in a negative score (deduction from the final course grade) and will be reported to appropriate governing bodies, e.g. the CIS ethics committee.

SCHEDULE

Week			Exercises
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Arkansas Tech University

Course Addition

Assessment Form

Our Mission
Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. The University offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 4243 Software Security Analysis and Reverse Engineering
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meets these requirements. This course is a mandated requirement to qualify for designation as a Center of Excellence. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to demonstrate the ability to analyze source code. 2. Students will be able to demonstrate the ability to analyze binary code. 3. Students will be able to demonstrate an ability to analyze static code.**
c. What assessment tool or measure will you use to assess student learning? **Quizzes, tests, assignments, and a research paper.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will complete quizzes, tests, assignments.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included. To be a qualified cybersecurity student, the student must be trained extensively in understanding secure software. This course is accompanied by a lab that will provide a hands-on experience to**

	support student learning. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
REQUEST FOR COURSE ADDITION

TO:	Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David S. Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**		9 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**	TWeaver	8/10/16
Vice President for Academic Affairs **Dr. Mohammed Abdelrahman**		

Course Subject: (e.g., ACCT, ENGL)	Course Number: (e.g., 1003)	Effective Term: **Fall 2017**
CSEC	**4293**	○ Spring ◉ **Summer I**

Official Catalog Title: (If official title exceeds 30 characters, indicate Banner Title below)

Cybersecurity Capstone Project / Internship

Banner Title: (limited to 30 characters, including spaces, capitalize all letters — this will display on the transcript)

Cybersecurity Capstone/Interns

Will this course be cross-listed with another existing course? If so, list course subject and number.

○ Yes ◉ No

Will this course be cross-listed with a course currently not in the undergraduate or graduate catalog?

If so, list course subject and number. ○ Yes ◉ No

Is this course repeatable for additional earned hours? ○ Yes ◉ No How many total hours?

Grading: ◉ Standard Letter ○ P/F ○ Other

Mode of Instruction (check appropriate box):

○ 01 Lecture	◉ 02 Lecture/Laboratory	○ 03 Laboratory only
○ 05 Practice Teaching	○ 06 Internship/Practicum	○ 07 Apprenticeship/Externship
○ 08 Independent Study	○ 09 Readings	○ 10 Special Topics
○ 12 Individual Lessons	○ 13 Applied Instruction	○ 16 Studio Course
○ 17 Dissertation	○ 18 Activity Course	○ 19 Seminar ○ 98 Other

Does this course require a fee? ○ Yes ◉ No How Much? Select Fee Type

If selected other list fee type:

☐ Elective ☑ Major ☐ Minor

(If major or minor course, you must complete the Request for Program Change form to add course to program.)

If course is required by major/minor, how frequently will course be offered?

Spring

For the proposed course, attach a syllabus in Word format that includes: **(Items a. through d. should be entered as they should appear in the catalog)**

a. Course subject
b. Course number
c. Catalog course title
d. Catalog description
    1. Arkansas Course Transfer System (ACTS) course number, if applicable
    2. Cross-listing
    3. Offered (e.g., Fall only, Spring only. Do not enter if offer course fall and spring)
    4. Prerequisites
    5. Co-requisites
    6. Description
    7. Notes (e.g., information not in description such as course may be repeated for credit)
    8. Contact Hours if different than lecture (e.g., Lecture three hours, laboratory three hours)
    9. Fees (e.g., $36 art fee)
e. Section for Name of instructor, office hours, contact information (telephone, email)
f. Text required for course
g. Bibliography (supplemental reading list)
h. Justification/rationale for the course
i. Course objectives
j. Description of how course meets general education objectives (courses included in the general education component should show how the course meets one or more of the objectives contained in General Education Objectives listed in undergraduate catalog)
k. Assessment methods (include grading policy with specific equivalents for A, B, C)
l. Policy on absences, cheating, plagiarism, etc.
m. Course content (outline of material to be covered in course).

Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? **No**

Will this course require a special classroom (computer lab, smart classroom, or laboratory)? **No**

Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/

If this course will affect other departments, a Departmental Support Form for each affected department must be attached. The form is located on the Curriculum forms web page at http://www.atu.edu/registrar/curriculum_forms.php. **N/A**

Syllabus

Department of Computer & Information Science

CSEC 4293	**Internship**
Section #	
OFFERED	Spring
PRE-REQUISITE	Departmental Approval
CO-REQUISITES	None
DESCRIPTION	An integrative and intensive learning project which culminates the cyber security program during the senior year. Student teams build on program course work to develop a strategic evaluation and plan for the management of secure information systems in an organization, either real or hypothetical. Students may use a start-up project as well. At the end of the internship, the student teams present their proposals, or findings and recommendations to a panel of representatives of an organization, faculty, and fellow students.
NOTES	None
COURSE INSTRUCTOR Email:	**Office: Corley** **Phone:**
OFFICE HOURS	
TEXTBOOK	
BIBLIOGRAPHY	There is **no** REQUIRED supplemental reading list for this course.
JUSTIFICATION	This course will serve as a capstone course that will allow students to Immerse themselves by monitoring, defending, and if required, monitor system recovery as a result of a data breach.
OBJECTIVES	After completing this course, the learner will be able to: • monitor a system for intrusion detection.

- implement defense strategies for a system.
- monitor system recovery from a data breach.

GENERAL EDUCATION REQUIREMENTS

This course does not meet any of the General Education requirements.

ASSESSMENT

The final grade will consist of 100 percentage points, with the following breakdown:

Homework	**XX%**
Lab and Programming Activities	**XX%**
Exams	**XX%**
Final Exam	**XX%**
Total	***100%***

The following percentage table will be used to assign scores:

90-100% - A 80-89% - B 70-79% - C 60-69% - D Below 60% - F

ATTENDANCE

The policy of the University in regard to class absences may be stated as the considered belief that regular class attendance is essential to the maximum growth and development of the student, and that students, in their own interest, are therefore responsible for attending all classes for which they are enrolled.

COURSE CONDUCT

Respect your peers. Students are expected to respect the rights of others. Students must conduct themselves in a professional manner, and maintain an atmosphere that does not distract other students from learning. Students whose behavior the instructor deems to be disruptive will be asked to leave. This includes, but is not limited to, cell phones ringing, talking on a cell phone or text messaging, use of a laptop computer in a distracting manner, consuming food or beverage, and/or having conversations with other students that are not part of the class instruction. If for some reason you feel that one or more of these items are necessary, you must get express permission from the instructor beforehand. A student who is requested to leave will not be excused from missing any class or class activities.

PLAGIARISM & CHEATING

Refer to the rules set forth in the student handbook. Students are expected to do their **OWN** work. **Consider your actions carefully**: there will be no tolerance for conduct that even gives the appearance of cheating. Any questions regarding the policy of cheating or conduct in this class should be clarified with the instructor. Cheating will result in a negative score (deduction from the final course grade) and will be reported to appropriate governing bodies, e.g. the CIS ethics committee.

SCHEDULE

Week			Exercises
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Arkansas Tech University

Course Addition

Assessment Form

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Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. The University offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Provide an answer for each question. Your answers are to be typed single spaced.
CSEC 4293 Internship
a. How does this course fit with the university mission? **This course is a required course for the proposed BS in Cybersecurity. This course supports the University's mission by being innovative and rigorous for students as they are educated to become professionals in the field of Cybersecurity.**
b. If this course is mandated by an accrediting or certifying agency, include the directive. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in Cybersecurity to be designated as a Center of Excellence. This proposed program is rigorous and meets these requirements. This course is a mandated requirement to qualify for designation as a Center of Excellence. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)**
Provide up to three student learning outcomes students will achieve after completing this course? **1. Students will be able to monitor a system for intrusion detection. 2. Students will be able to implement defense strategies for a system. 3. Students will be able to monitor system recovery from a data breach.**
c. What assessment tool or measure will you use to assess student learning? **Students will be required to complete a review of task that were assigned and completed throughout the internship. The organization providing the internship will complete an analysis of the student's strengths/weaknesses.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning? **Students will complete a review of tasks that were assigned to him/her during the internship. In addition, the organization where the internship was completed with complete documentation that pertains to the students' abilities.**
e. Provide an example or examples of student learning assessment evidence which supports the addition of this course. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included. This course will**

	provide the student with a 'real-world' experience so the student can utilize what they have learned as well as increase his/her level of knowledge. (https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-operations/requirements.shtml)
f.	How does this course fit in the current state of the discipline? Include Arkansas institutional comparisons. If Arkansas educational institutions do not have the course or program provide comparative examples from regional educational institutions. **To become a Center of Excellence for Cybersecurity for Homeland Security, this is a mandated course that must be included in this degree.**

Arkansas Tech University
PROPOSAL FOR NEW PROGRAM

TO:	Select Appropriate Committee Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David L. Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**	Neal Barlow	9 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**	Tammy Weaver	8/10/16
Vice President for Academic Affairs **Dr. Mohamed Abdelrahman**		

Program Title: Associate of Applied Science in Cybersecurity	CIP Code: 11.1003
Contact Person: Name: Dr. David Hoelzeman Institution Name: Arkansas Tech University Address: 1811 North Boulder, Corley 232 Russellville, AR 72801 E-mail Address: dhoelzeman@atu.edu Phone Number: 479.880.4376	Proposed Date: Fall 2017
Program Summary: (Include general description of program with overview of any curriculum additions or modifications, proposed cost, faculty resources, library resources, facilities and equipment, purpose, and any other important information)	

The rise in cyber threats has created an unprecedented demand for cybersecurity specialists. Data breaches, malware infections, and software vulnerabilities are common in today's technology and it is critical to fully understand how these attacks occur, how to prevent them, and how to recover. An Associate of Applied Science in Cybersecurity is an introduction to the field. Students seeking the Associate of Applied Science in Cybersecurity will be completing courses in:

- Wireless and cellular security
- Digital logic design
- Introduction to Information Systems
- Computer Programming courses
- Forensics and Incident Response
- Virtualization

List existing degree programs that support the proposed program:
Computer Science
Electrical Engineering
General Education
Information Technology
Mathematics

Need for the Program: (Survey data on student interest in the program (numbers not percentages), job availability, corporate demands, and employment/wage projections). Focus mostly on state needs.
As an attachment, include letters of support from organizations and businesses that can speak to number of job vacancies, whether the degree will provide opportunities for job advancement, increase in wages based on additional education, etc.) **Cybersecurity threats are rapidly increasing. The following link is to the Department of Homeland Security's website for cybersecurity.**
https://www.dhs.gov/cybersecurity-overview

The U. S. Bureau of Labor Statistics includes information that this field is rapidly increasing.
http://www.bls.gov/ooh/computer-and-information-technology/home.htm

In further support, the following website is to the Comprehensive National Cybersecurity Initiative.
https://www.whitehouse.gov/issues/foreign-policy/cybersecurity/national-initiative

Curriculum Outline by Semester: **Please see attached document**

Total number of Semester Hours Required for Graduation:	Can the program be completed in 8 semesters?
60	(•) Yes ( ) No If not, provide justification. N/A

List New Courses (Please attach New Course Proposals):
CSEC 1113 Introduction to Networking
CSEC 1213 Wireless and Cellular Security

CSEC 2113 Introduction to Information Systems
CSEC 2213 Forensics and Incident Response
CSEC 2223 Virtualization

Identify General Education Courses, Core Courses, and Major Courses:

General Education Courses

ENGL 1013/1023
MATH 2914
4 hours Science with Lab
3 hours US Hist/Pols
3 hours Social Science
3 hours FAH
3 hours COMM
26 hours total

Major Courses:

CSEC 1113 Introduction to Networking
CSEC 1213 Wireless and Cellular Security
CSEC 2113 Introduction to Information Systems
CSEC 2213 Forensics and Incident Response
CSEC 2223 Virtualization

Courses currently offered via distance technology: (moved from above section)
None

Program Admission Requirements:
Mirror of the University's admission policy

Attach the New Program Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/
Please see attached.

List the names and credentials of all faculty teaching course in the proposed program.
Dr. Matt Brown – Ph.D. Information Systems
Dr. Roger Fang – Ph.D. Electrical and Computer Engineering
Mr. Roger Frye – ABD Engineering Science
Dr. Nan Harrell – Ph.D. Information Systems with an emphasis in Information Security
Dr. David Hoelzeman – Ph.D. Computer Science
Dr. Rick Massengale - Ph.D. Information Assurance
Dr. David Middleton – Ph.D. Computer Science
Dr. Johnette Moody - DBA Business with emphasis in
Dr. Larry Morell – Ph.D. Computer Science
Dr. Nobuyuki Nezu – Ph.D. Computer Science
Mr. Ron Robison – Masters in Business
Ms. Sarah Robison – Masters in Mathematics
Dr. Jerry Wood (Ph.D. Information Assurance)

Dr. Jerry Wood (Ph.D. Information Assurance)
Total number of faculty required (existing and new) For new faculty members include expected credentials/experience and hire date **No new faculty will be needed.**
For proposed graduate programs attach curricula vitae for the faculty teaching the program **N/A**
Description of Resources **The current are adequate for this degree.**
Current Library and instructional facilities **The library and instructional facilities are adequate to support this program.**
New Resources Required (include costs and acquisition plan): **None**
New Program Costs (Expenditures for first three years of program operation) Include: New administrative costs – **none; this program will be housed in the Department of Computer & Information Science and the administrative structure is currently in place.** New faculty - **none** New library resources and costs - **none** New/renovated facilities and costs - **none** New instructional equipment and costs - **none** Distance delivery costs - **none** Other new costs **- none**
Detail Marketing Plan and Costs **Please see attached.**

Associate of Applied in in Cybersecurity Degree Proposed Curriculum
6.30.2016

Freshman Fall (13 hours)
ENGL 1013 Composition
Fine Arts & Humanities
US History / Government
Tech 1001 Orientation to the University
CSEC 1113 Introduction to Networking

Freshman Spring (17 hours)
ENGL 1023 Composition II
Social Science
MATH 2914 Calculus I
CSEC 1213 Wireless and Cellular Security
COMS 2104 Foundations of Computer Programming I

Sophomore Fall (13 hours) 14
ELEG 2130 Digital Logic Design Lab
ELEG 2134 Digital Logic Design
CSEC 2113 Introduction to Information Systems
COMS 2203 Foundations of Computer Programming II -
COMS 2903 Discrete Structures for Technical Majors
1 hour LD Elective

Sophomore Spring (16 hours)
COMM 2173 Business and Professional Speaking (previously SPH 2173)
Science Sequence I
COMS 2213 Data Structures
CSEC 2213 Forensics and Incident Response
CSEC 2223 Virtualization

Arkansas Tech University

Proposal for New Program Assessment Form

Associate of Applied Science in Cybersecurity

Our Mission
Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. The University offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Provide an answer for each question. Your answers are to be typed single spaced.
a. How does this proposal for the new program fit with the university mission? **The Associate of Applied Science in Cybersecurity will provide students with training in the latest detection and protection methods in cybersecurity. This degree is in an introduction into the field of Cybersecurity and will provide a student with the knowledge necessary to assume entry level positions in the field of Cybersecurity. This degree supports the University's mission by being innovative as it trains individuals for entry-level positions.**
b. If this program is mandated by an accrediting or certifying agency, include the directives. If not, state not applicable. **The Associate of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in cybersecurity to be designated as a Center of Excellence. This new program is rigorous and meets the requirements to become a Center of Excellence.**
c. How will this new program enhance learning for students enrolled in the program? **This program will enhance student learning because it offers extensive training in cybersecurity for detection and prevention of intrusion into systems. Students will be involved in 'real-world' situations, through assignments, tests, projects, etc., as they learn. Students will be be assessed on how a computer functions and processes at the most basic level, how to detect intrusions, how to prevent intrusions, how to write secure software, cryptography, and how to restore a system that has been compromised.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning once they complete the program? **Students will be required to complete an internship or capstone project. The coursework is designed so that students will be able to complete tests, quizzes, hands-on assignments, and labs to support learning.**
e. Provide an example or examples of assessment evidence which supports adding this new program. **Cybersecurity threats are rapidly increasing. The following link is to the Department of Homeland Security's website for cybersecurity: https://www.dhs.gov/cybersecurity-overview. The U. S. Bureau of Labor Statistics includes information that this field is rapidly increasing. The link to this site: http://www.bls.gov/ooh/computer-and-information-technology/home.htm. To further support this new program, the following website is to the Comprehensive National**

	Cybersecurity Initiative: https://www.whitehouse.gov/issues/foreign-policy/cybersecurity/national-initiative. In addition the Advisory Board for the Department of Computer & Information Science met during April of this year and urged the department to offer this degree because graduates are and will continue to be in high demand.
f.	Attach a detailed assessment plan including three to five specific program student learning outcomes, means or instructional measures to assess each outcome, identify program courses where learning will be assessed, and performance standards or criteria for success which demonstrate student learning for each outcome. (Examples for assessment plans/curriculum mapping can be found at the Office of Assessment and Institutional Effectiveness web page.) **See below.**

Arkansas Tech University

Academic Cycle: New Program Proposal

Program: Associate of Applied Science in Cybersecurity

Program Objectives/Standards (align with mission)	Learning Objectives/ Outcome Assessment (3-5 unless otherwise specified)	Courses (program core)	Means of Assessment (direct and indirect measures)	Criteria for Success (performance standard)
PO1: Understand information systems	LO1: Analyze and evaluate information systems	CSEC 2113 – Introduction to	Tests, assignments, projects	High Pass 90-100% Pass 70-89%

		Information Systems		
PO2: Understand wireless security and cellular technologies	L01: Analyze current industry standards L02: Assessment of wireless and cellular systems and security risks	CSEC 1213 – Wireless Security and Cellular Technologies	Tests, quizzes, assignments; hands-on projects	High Pass 90-100% Pass 70-89%
PO3: Install and administer virtual machines	LO1: Implement standard procedures to install virtual machines L02: Monitor networks	CSEC 2223 - Virtualization	Tests, quizzes, assignments, hands-on projects	High Pass 90-100% Pass 70-89%
PO4: Understand Forensics and Incident Response	LO1: Evaluate forensic tools L02: Analyze variety of operating systems and applications for computer evidence	CSEC 2213 – Forensics and Incident Response	Tests, quizzes, assignments, Hands-on assignments	High Pass 90-100% Pass 70-89%

Assessment Plan Implementation				
Assessment	**CPGE Form or Department Method**	**CPGE System or Department Method**	**Actual Results Obtained (CPGE Report or Department Method)**	**Use of Results for Improvement**

Course Embedded	Department of Computer & Information Science utilizes FCAR (Faculty Course Assessment Report) and CABS (Course Assessment Binder)	Department of Computer & Information Science utilizes FCAR (Faculty Course Assessment Report) and CABS (Course Assessment Binder). Assessment data will be submitted annually.	Review and analyze departmental assessment data.	Course, instructional or program changes.
Indirect and Direct Measures Alignment	Graduates will complete exit survey in the CSEC 4983. A survey will be sent to those providing an internship.	Graduates will complete exit survey in the CSEC 4983. A survey will be sent to those providing an internship.	Analyze survey results	Program and Curriculum changes

Continuous Improvement Plan
Summarize each category from assessment results and conclusions.

Categories of Improvement:	Recommended Changes:
A. Student Learning	Course Embedded Student Learning Outcome Assessment
B. Instruction and Curriculum	Course Embedded Student Learning Outcome Assessment
C. Assessment	Evaluate assessment from Student Learning Outcome results
D. Program Quality	Evaluate changes from Student and Employer Satisfaction Surveys
E. Budget	Budget requests supported by student learning and program assessment.

Marketing Plan
Cybersecurity Degree
June 28, 2016

Arkansas Tech University engages in a variety of marketing initiatives to inform prospective students about the educational opportunities that it offers. These include advertisements on television, online, in print and through other channels as they become available and constructive in reaching stated objectives. All marketing messages and placements are tailored to reach specific audiences based upon regularly conducted research about the educational needs of prospective students and their awareness of Arkansas Tech.

These marketing efforts are supported by internal and external communication initiatives that leverage internal channels such as www.atu.edu, www.arkansastechnews.com and Arkansas Tech's social media presences as well as external channels such as newspapers, television stations, radio stations and press services. The external communication initiatives aid in constantly elevating the brand of Arkansas Tech, while internal communications represent an important retention tool by creating a better informed and more engaged student population.

As it relates to new academic programs such as the proposed cybersecurity degree in the Arkansas Tech Department of Computer and Information Science, marketing and communication programs are designed to create awareness of the new degree, points of differentiation that make it a good option for prospective students and potential positive outcomes for graduates of the program. Specific tactics may include some or all of the following options: a presence on www.atu.edu, news releases announcing the new program, inclusion in marketing campaigns on behalf of the university and brochures and similar publications that include information about the program. These marketing and communication goals are established and pursued through collaboration between staff from the Office of University Relations and faculty members from the academic discipline.

Arkansas Tech University
DEPARTMENTAL SUPPORT FORM

This form must be completed for every department affected by the course change.

Department Affected: MATHEMATICS	This department ☒ supports ☐ does not support the change.
Comments: The Department of Computer & Information Science is proposing an **Associate of Applied Science in Cybersecurity.** This degree requires math 2914. MATH 2914 is required during the spring of the Freshman year.	

Department Head Signature: Jeanie L. Myers

Date: 8-9-16

Arkansas Tech University
DEPARTMENTAL SUPPORT FORM

This form must be completed for every department affected by the course change.

Department Affected: Electrical Engineering	This department ☑ supports ☐ does not support the change.
Comments: The Department of Computer & Information Science is proposing an **Associate of Applied Science in Cybersecurity**. This degree requires ELEG 2130 and ELEG 2134. The course will be required during the fall of the Sophomore year.	

Department Head Signature:

Date: 8/4/14

Arkansas Tech University
DEPARTMENTAL SUPPORT FORM

This form must be completed for every department affected by the course change.

Department Affected:	This department
Department of English and World Languages	☑ supports ☐ does not support the change.
Comments:	
The Department of Computer & Information Science is proposing an **Associate of Applied Science in Cybersecurity.** This degree requires the 35 hours of required general education courses.	

Department Head Signature: _____

Date: 8-9-16

Arkansas Tech University
PROPOSAL FOR NEW PROGRAM

TO:	Select Appropriate Committee Curriculum Committee
FROM (Initiating Department):	**Department of Computer & Information Science**
DATE SUBMITTED:	6.30.2016

Title	Signature	Date
Department Head **Dr. David Hoelzeman**	David L Hoelzeman	7-6-2016
Dean **Dr. Neal Barlow**	John T Harlow	9 Aug 16
Teacher Education Council (if applicable)		
Graduate Council (if applicable)		
Registrar **Ms. Tammy Weaver**	T Weaver	8/10/16
Vice President for Academic Affairs **Dr. Mohamed Abdelrahman**		

Program Title: Bachelor of Science in Cybersecurity	CIP Code: 11.1003
Contact Person: Name: Dr. David Hoelzeman Institution Name: Arkansas Tech University Address: 1811 North Boulder, Corley 232 Russellville, AR 72801 E-mail Address: dhoelzeman@atu.edu Phone Number: 479.880.4367	Proposed Date: Fall 2017
Program Summary: (Include general description of program with overview of any curriculum additions or modifications, proposed cost, faculty resources, library resources, facilities and equipment, purpose, and any other important information)	

The rise in cyber threats has created an unprecedented demand for cybersecurity specialists. Data breaches, malware infections, and software vulnerabilities are common in today's technology and it is critical to fully understand how these attacks occur, how to prevent them, and how to recover. A cybersecurity major will understand the techniques used to hack systems as well as the best methods to protect data. The cybersecurity degree includes courses in programming, wireless technologies, mathematics, and networking concentrating on theory and hands-on experience. Coursework includes:

* Forensics and Incident Response
* Virtualization
* Computer Architecture
* Operating Systems Theory
* Penetration Testing
* Applied Cryptography
* Large Scale Distributed Systems
* Building Secure Software
* Risk Management
* Legal Issues in Cybersecurity
* Software Security Analysis and Reverse Engineering (with lab)
* Cybersecurity Capstone Project/Internship

Cybersecurity graduates will be able to:

* protect an organization's data and assets.
* implement cybersecurity best practices and risk management.
* understand and develop software to minimize vulnerabilities.
* analyze persistent threats and utilize appropriate counter measures.
* conduct risk and liability assessments of information systems.
* examine cybercrimes and support recovery of operations.

List existing degree programs that support the proposed program:

Computer Science
Electrical Engineering
General Education
Information Technology
Mathematics

Need for the Program: (Survey data on student interest in the program (numbers not percentages), job availability, corporate demands, and employment/wage projections). Focus mostly on state needs.
As an attachment, include letters of support from organizations and businesses that can speak to number of job vacancies, whether the degree will provide opportunities for job advancement, increase in wages based on additional education, etc.) **Cybersecurity threats are rapidly increasing. The following link is to the Department of Homeland Security's website for cybersecurity.**
https://www.dhs.gov/cybersecurity-overview

The U. S. Bureau of Labor Statistics includes information that this field is rapidly increasing.
http://www.bls.gov/ooh/computer-and-information-technology/home.htm

In further support, the following website is to the Comprehensive National Cybersecurity Initiative.
https://www.whitehouse.gov/issues/foreign-policy/cybersecurity/national-initiative

In addition, the Advisory Board for the Department of Computer & Information Science met during April of this year and urged the department to offer this degree because graduates are and will continue to be in high demand.

Curriculum Outline by Semester: **Please see attached document**

Total number of Semester Hours Required for Graduation:	Can the program be completed in 8 semesters?
120	(•) Yes ( ) No If not, provide justification.

List New Courses (Please attach New Course Proposals):
CSEC 1113 (Intro to Networking)
CSEC 1213 (Wireless and Cellular Security)
CSEC 2113 (Introduction to Information Systems)
CSEC 2213 (Forensics and Incident Response)
CSEC 2223 (Virtualization)
CSEC 3113 (Assembly Programming)
CSEC 3123 (Cyber Defense I)
CSEC 3243 (Computer Architecture)
CSEC 3223 (Programming Embedded Systems)
CSEC 3233 (Cyber Defense II)
CSEC 4123 (Cryptography)
CSEC 4133 (Large Scale Distributed Systems)
CSEC 4143 (Building Secure Software)
CSEC 4213 (Information Systems Risk Management)
CSEC 4233 (Legal Issues in Cybersecurity)
CSEC 4243 (Software Security Analysis and Reverse Engineering
CSEC 4240 (Lab for Software Security Analysis and Reverse Engineering)
CSEC 4293 (Cybersecurity Capstone Project / Internship

Identify General Education Courses, Core Courses, and Major Courses:

General Education Courses

ENGL 1013/1023
MATH 2914
Science I/II 8 hours Science with Lab
US Hist/Pols
6 hours Social Science
6 hours FAH
3 hours COMM
36 hours total

Major Courses:

COMS 2104 (Foundations of Computer Programming I)
COMS 2203 (Foundations of Computer Programming II)
COMS 2903 (Discrete Structures for Technical Majors)
COMS 2213 (Data Structures)
COMS 3213 (Advanced Data Structures and Algorithm Design
COMS 3703 (Operating Systems Theory)
CSEC 1113 (Intro to Networking)
CSEC 1213 (Wireless and Cellular Security)
CSEC 2113 (Introduction to Information Systems)
CSEC 2213 (Forensics and Incident Response)
CSEC 2223 (Virtualization)
CSEC 3113 (Assembly Programming)
CSEC 3123 (Cyber Defense I)
CSEC 3243 (Computer Architecture)
CSEC 3223 (Programming Embedded Systems)
CSEC 3233 (Cyber Defense II)
CSEC 4123 (Cryptography)
CSEC 4133 (Large Scale Distributed Systems)
CSEC 4143 (Building Secure Software)
CSEC 4213 (Information Systems Risk Management)
CSEC 4233 (Legal Issues in Cybersecurity)
CSEC 4243 (Software Security Analysis and Reverse Engineering
CSEC 4240 (Lab for Software Security Analysis and Reverse Engineering)
CSEC 4293 (Cybersecurity Capstone Project / Internship
ELEG 2130 (Digital Logic Design Lab)
ELEG 2134 (Digital Logic Design)

Courses currently offered via distance technology: (moved from above section)

None

Program Admission Requirements:

Mirror of the University's admission policy

Attach the New Program Assessment Form. The form is located on the Assessment & Institutional Effectiveness web page at http://www.atu.edu/assessment/
Please see attached.

List the names and credentials of all faculty teaching course in the proposed program.
Dr. Matt Brown – Ph.D. Information Systems
Dr. Roger Fang – Ph.D. Electrical and Computer Engineering
Mr. Roger Frye – ABD Engineering Science
Dr. Nan Harrell – Ph.D. Information Systems with an emphasis in Information Security
Dr. David Hoelzeman – Ph.D. Computer Science
Dr. Rick Massengale - Ph.D. Information Assurance
Dr. David Middleton – Ph.D. Computer Science
Dr. Johnette Moody - DBA Business with emphasis in
Dr. Larry Morell – Ph.D. Computer Science
Dr. Nobuyuki Nezu – Ph.D. Computer Science
Mr. Ron Robison – Masters in Business
Ms. Sarah Robison – Masters in Mathematics
Dr. Jerry Wood (Ph.D. Information Assurance)

Total number of faculty required (existing and new)
For new faculty members include expected credentials/experience and hire date

- **Two (2) new faculty members**
  - **Hiring to be staggered with hiring of first new faculty member for fall 2018**
    - **0 for first year (2017-2018) and then 1 per year for next 2 years**
- **Credentials for additional faculty include:**
  - **Ph.D. in Computer Security, Information Security, Information Technology, Information Assurance, Computer Science**

For proposed graduate programs attach curricula vitae for the faculty teaching the program
N/A

Description of Resources
The current resources (computer lab, virtual machines, software, etc.) are adequate for the first and second (1st / 2nd) years of this program.

Current Library and instructional facilities
The library and instructional facilities are adequate to support this program.

New Resources Required (include costs and acquisition plan):
None for first two (2) years of program

New Program Costs (Expenditures for first three years of program operation)
Include:
New administrative costs – **none; this program will be housed in the Department of Computer & Information Science and the administrative structure is currently in place.**
New faculty **0 for first year (2017-2018) and then 1 per year for next 2 years (2018-2019 & 2019-2020)**

New library resources and costs - **none** New/renovated facilities and costs – **none through second (2nd) year of program** New instructional equipment and costs – **none through second (2nd) year of program** Distance delivery costs – **none** Other new costs - **none**
Detail Marketing Plan and Costs **Please see attached.**

BS Cybersecurity Degree Proposed Curriculum
6.30.2016

Freshman Fall (13 hours)
ENGL 1013 Composition
Fine Arts & Humanities
US History / Government
Tech 1001 Orientation to the University
CSEC 1113 Introduction to Networking

Freshman Spring (17 hours)
ENGL 1023 Composition II
Social Science
MATH 2914 Calculus I
CSEC 1213 Wireless and Cellular Security
COMS 2104 Foundations of Computer Programming I

Sophomore Fall (16 hours)
ELEG 2130 Digital Logic Design Lab
ELEG 2134 Digital Logic Design
CSEC 2113 Introduction to Information Systems
COMS 2203 Foundations of Computer Programming II -
COMS 2903 Discrete Structures for Technical Majors
COMS 2733 Introduction to Computer Forensics and Security

Sophomore Spring (16 hours)
COMM 2173 Business and Professional Speaking (previously SPH 2173)
Science Sequence I
COMS 2213 Data Structures
CSEC 2213 Forensics and Incident Response
CSEC 2223 Virtualization

Junior Fall (16 hours)
MATH 3153 Applied Statistics I
CSEC 3113 Assembly Programming
COMS 3213 Advanced Data Structures and Algorithm Design
CSEC 3123 Cyber Defense I
Science Sequence II

Junior Spring (15 hours)
Fine Arts & Humanities
CSEC 3223 Programming Embedded Systems
COMS 3703 Operating Systems
CSEC 3233 Cyber Defense II
CSEC 3243 Computer Architecture

Senior Fall (12 hours)
Social Sciences
CSEC 4123 Cryptography
CSEC 4133 Large Scale Distributed Systems
CSEC 4143 Building Secure Software

BS Cybersecurity Degree Proposed Curriculum
6.30.2016

Senior Spring (15 hours)

CSEC 4213 Information Systems Risk Management

Upper Level Elective

CSEC 4233 Legal Issues in Cybersecurity
CSEC 4243 Software Security Analysis and Reverse Engineering
CSEC 4240 Software Security Analysis and Reverse Engineering LAB
CSEC 4293 CyberSecurity Capstone Project / Internship

Arkansas Tech University

Proposal for New Program Assessment Form

Bachelor of Science in Cybersecurity

Our Mission
Arkansas Tech University, a state-supported institution of higher education, is dedicated to nurturing scholastic development, integrity, and professionalism. The University offers a wide range of traditional and innovative programs which provide a solid educational foundation for life-long learning to a diverse community of learners.

Provide an answer for each question. Your answers are to be typed single spaced.
a. How does this proposal for the new program fit with the university mission? **The Bachelor of Science in Cybersecurity will provide students with training in the latest detection and protection methods in cybersecurity. This degree is rigorous so that it will provide a student with the knowledge necessary to enter the business world or for those interested, to enter a Master's program in Cybersecurity once the Bachelor of Science is completed. This degree supports the University's mission by being innovative and rigorous as individuals are trained to enter the field of cybersecurity.**
b. If this program is mandated by an accrediting or certifying agency, include the directives. If not, state not applicable. **The Bachelor of Science in Cybersecurity is not accredited by an accrediting body. However, the Department of Homeland Security provides requirements for programs in cybersecurity to be designated as a Center of Excellence. This new program is rigorous and meets the requirements to become a Center of Excellence.**
c. How will this new program enhance learning for students enrolled in the program? **This program will enhance student learning because it offers extensive training in cybersecurity for detection and prevention of intrusion into systems. Students will be involved in 'real-world' situations, through assignments, tests, projects, etc., as they learn. Students will be assessed on how a computer functions and processes at the most basic level, how to detect intrusions, how to prevent intrusions, how to write secure software, cryptography, and how to restore a system that has been compromised. As a culmination of this degree, the student will be required to complete an Internship or a capstone project.**
d. What will students demonstrate, represent, or produce to provide evidence of their learning once they complete the program? **Students will be required to complete an internship or capstone project. The coursework is designed so that students will be able to complete tests, quizzes, hands-on assignments, and labs to support learning.**
e. Provide an example or examples of assessment evidence which supports adding this new program. **Cybersecurity threats are rapidly increasing. The following link is to the Department of Homeland Security's website for cybersecurity: https://www.dhs.gov/cybersecurity-overview. The U. S. Bureau of Labor Statistics includes information that this field is rapidly increasing. The link to this site:**

	http://www.bls.gov/ooh/computer-and-information-technology/home.htm. **To further support this new program, the following website is to the Comprehensive National Cybersecurity Initiative: https://www.whitehouse.gov/issues/foreign-policy/cybersecurity/national-initiative. In addition the Advisory Board for the Department of Computer & Information Science met during April of this year and urged the department to offer this degree because graduates are and will continue to be in high demand.**
f.	Attach a detailed assessment plan including three to five specific program student learning outcomes, means or instructional measures to assess each outcome, identify program courses where learning will be assessed, and performance standards or criteria for success which demonstrate student learning for each outcome. (Examples for assessment plans/curriculum mapping can be found at the Office of Assessment and Institutional Effectiveness web page.) **See below.**

Arkansas Tech University				
Academic Cycle: New Program Proposal				
Program: Bachelor of Science in Cybersecurity				
Program Objectives/Standards (align with mission)	**Learning Objectives/ Outcome Assessment (3-5 unless otherwise specified)**	**Courses (program core)**	**Means of Assessment (direct and indirect measures)**	**Criteria for Success (performance standard)**

PO1: Protect an organization's data and assets	LO1: Evaluate appropriate security measures LO2: Implement appropriate security measures and software	CSEC 4293 – Capstone or Internship	Reports from employer providing internship Weekly meetings between advisor and student Feedback from employer	High Pass 90-100% Pass 70-89%
PO2: Implement cybersecurity best practices and risk management.	L01: Analyze current industry standards and implement appropriate standards L02: Assessment of systems at system level for risk of security breaches	CSEC 4213 – Information Systems Risk Management CSEC 4293 – Capstone or Internship	Tests, quizzes, assignments; hands-on projects Reports from employer providing internship Weekly meetings between advisor and student Feedback from employer	High Pass 90-100% Pass 70-89%
PO3: Understand and develop software to minimize vulnerabilities.	LO1: Create appropriate software that meets or exceeds industry security standards	CSEC 4243 – Software Security Analysis and Reverse Engineering CSEC 4240 – Lab CSEC 4143 – Building Secure Software	Tests, quizzes, assignments Hands-on assignments Tests, quizzes, assignments	High Pass 90-100% Pass 70-89% High Pass 90-100% Pass 70-89% High Pass 90-100% Pass 70-89%
PO4:	LO1: Monitor networks	CSEC 4243 –	Tests, quizzes, assignments	High Pass 90-100%

Analyze persistent threats and utilize appropriate counter measures.	L02: Evaluate security measures	Software Security Analysis and Reverse Engineering CSEC 4240 – Lab	Hands-on assignments	Pass 70-89%
PO5: Examine cybercrimes and support recovery of operations.	LO1: Maintain knowledge level of industry standards L02: Implement steps to recover and secure system	CSEC 2123 – Cyber Defense I	Tests, quizzes, assignments, hands-on projects	High Pass 90-100% Pass 70-89%

Assessment Plan Implementation

Assessment	CPGE Form or Department Method	CPGE System or Department Method	Actual Results Obtained (CPGE Report or Department Method)	Use of Results for Improvement
Course Embedded	Department of Computer & Information Science utilizes FCAR (Faculty Course Assessment Report) and CABS (Course Assessment Binder)	Department of Computer & Information Science utilizes FCAR (Faculty Course Assessment Report) and CABS (Course Assessment Binder). Assessment data will be submitted annually.	Review and analyze departmental assessment data.	Course, instructional or program changes.
Indirect and Direct Measures Alignment	Graduates will complete exit survey in the CSEC 4983. A survey	Graduates will complete exit survey in the CSEC 4983. A survey	Analyze survey results	Program and Curriculum changes

	will be sent to those providing an internship.	will be sent to those providing an internship.		

Continuous Improvement Plan **Summarize each category from assessment results and conclusions.**	
Categories of Improvement:	**Recommended Changes:**
A. Student Learning	Course Embedded Student Learning Outcome Assessment
B. Instruction and Curriculum	Course Embedded Student Learning Outcome Assessment
C. Assessment	Evaluate assessment from Student Learning Outcome results
D. Program Quality	Evaluate changes from Student and Employer Satisfaction Surveys
E. Budget	Budget requests supported by student learning and program assessment.

Marketing Plan
BS in Cybersecurity

Arkansas Tech University engages in a variety of marketing initiatives to inform prospective students about the educational opportunities that it offers. These include advertisements on television, online, in print and through other channels as they become available and constructive in reaching stated objectives. All marketing messages and placements are tailored to reach specific audiences based upon regularly conducted research about the educational needs of prospective students and their awareness of Arkansas Tech.

These marketing efforts are supported by internal and external communication initiatives that leverage internal channels such as www.atu.edu, www.arkansastechnews.com and Arkansas Tech's social media presences as well as external channels such as newspapers, television stations, radio stations and press services. The external communication initiatives aid in constantly elevating the brand of Arkansas Tech, while internal communications represent an important retention tool by creating a better informed and more engaged student population.

As it relates to new academic programs such as the proposed cybersecurity degree in the Arkansas Tech Department of Computer and Information Science, marketing and communication programs are designed to create awareness of the new degree, points of differentiation that make it a good option for prospective students and potential positive outcomes for graduates of the program. Specific tactics may include some or all of the following options: a presence on www.atu.edu, news releases announcing the new program, inclusion in marketing campaigns on behalf of the university and brochures and similar publications that include information about the program. These marketing and communication goals are established and pursued through collaboration between staff from the Office of University Relations and faculty members from the academic discipline.

Arkansas Tech University
DEPARTMENTAL SUPPORT FORM

This form must be completed for every department affected by the course change.

Department Affected: MATHEMATICS	This department ☒ supports ☐ does not support the change.
Comments: The Department of Computer & Information Science is proposing a **Bachelor of Science in Cybersecurity**. This degree requires math 2914 and MATH 3153. MATH 2914 is required during the spring of the Freshman year. MATH 3153 is required during the fall of the JUNIOR year.	

Department Head Signature: Jeanie L. Myers

Date: 8-9-16

Arkansas Tech University
DEPARTMENTAL SUPPORT FORM

This form must be completed for every department affected by the course change.

Department Affected: Electrical Engineering	This department ☒ supports ☐ does not support the change.
Comments: The Department of Computer & Information Science is proposing a **Bachelor of Science in Cybersecurity**. This degree requires ELEG 2130 and ELEG 2134. The course will be required during the fall of the Sophomore year.	

Department Head Signature:

Date:

Arkansas Tech University
DEPARTMENTAL SUPPORT FORM

This form must be completed for every department affected by the course change.

Department Affected: Department of English and World Languages	This department ☑ supports ☐ does not support the change.
Comments: The Department of Computer & Information Science is proposing **a Bachelor of Science in Cybersecurity.** This degree requires the 35 hours of required general education courses.	

Department Head Signature: _____

Date: 8-9-16