# Arkansas Tech University REQUEST FOR COURSE ADDITION

TO:		Curriculum Committee					
FROM (Initiating Depar	rtment):	DEPARTMENT OF COMPUTER & INFORMATION SCIENCE					
DATE SUBMITTED:		6.30.2016					
Title		Signatu	re		Date		
Department Head  Dr. David Hoelzeman		Va	vil I Llow	lenn	7-6-2010		
Dean  Dr. Neal Barlow			1/1/19		7-6-2010 9A=16		
Teacher Education Cour	ncil (if applica	ble)	MANNE		They 16		
Graduate Council (if app	olicable)						
Registrar  Ms. Tammy Weaver		Sh	20aller		8110/16		
Vice President for Acade <b>Dr. Mohammed Abdelr</b>							
- The state of the	umum		<del></del>		1		
Course Subject: (e.g., ACC	T, ENGL)	ourse Number: (e	e.g., 1003)	Effective T	erm: Fall 2017		
CSEC		1113		← Spring	• Summer I		
Official Catalog Title: (If of		eeds 30 character	rs, indicate Banner	Title below)			
Introduction to Network							
anner Title: (limited to 30	characters, inc	luding spaces, capit	talize all letters — thi	s will display o	n the transcript)		
Vill this course be cross-li	sted with ano	ther existing cour	rse? If so, list course	e subject and	number.		
1	ما الله المالية						
/ill this course be cross-li		Yes • No	t in the undergradu	uate or gradu	ate catalog?		
so, list course subject an	a number.	1					
s this course repeatable	for additional	earned hours?	Yes • No Ho	w many total	hours?		
rading: • Standard Le	etter	⊂ P/F	○ Other				
lode of Instruction (check	k appropriate	box):					
01 Lecture	C 02 Lectu	re/Laboratory	C 03 Laboratory	onlv			
05 Practice Teaching	C 06 Inter	nship/Practicum	C 07 Apprentice:	ship/Externshi	0		
08 Independent Study	C 09 Read	lings	☐ 10 Special Top	oics			
12 Individual Lessons	C 13 Appl	ied Instruction	← 16 Studio Cour	rs e			
17 Dissertation	€ 18 Activ	ity Course	C 19 Seminar	C	98 Other		

Does this course require a fee?	← Yes	€ No	How Much	?	Select Fee Type
If selected other list fee type:					
☐ Elective	✓ Major		Г	Minor	
(If major or minor course, you m program.)	ust comple	ete the I	Request for F	Program Cha	nge form to add course to
If course is required by major/mi	inor, how t	frequent	ly will cours	e be offered	?
Fall					
For the proposed course, attach entered as they should appear in a. Course subject b. Course number c. Catalog course title d. Catalog description 1. Arkansas Course Transfer S 2. Cross-listing 3. Offered (e.g., Fall only, Spri 4. Prerequisites 5. Co-requisites 6. Description 7. Notes (e.g., information not 8. Contact Hours if different the 9. Fees (e.g., \$36 art fee) e. Section for Name of instructor f. Text required for course g. Bibliography (supplemental rest). Justification/rationale for the cit. Course objectives j. Description of how course mee education component should so General Education Objectives I course content (outline of mat will this course course content (outline of mat will this course content (outline of	t in descriphan lecture, office ho ading list) course ets general show how isted in ungrading populagiarism, erial to be	ortion such e (e.g., Lurs, con leducate the coundergrade etc.	ch as course ecture three tact information objective se meets on uate catalog a specific equal to the course).	f applicable course fall and may be repe hours, labor tion (telephot s (courses in e or more of ) livalents for	eated for credit) ratory three hours) one, email) ocluded in the general of the objectives contained in A, B, C)
Will this course require any special software, distance learning equipred dedicated equipment (computers	ment, etc.? and netw	? This co	ourse will recapability).	quire a dedio	cated classroom with
Will this course require a special c ledicated lab					
Attach the Course Addition Assess Effectiveness web page at <a href="http://veleticolorized-to-septembergs">http://veleticolorized-to-septembergs</a>	<u>vww.atu.e</u>	du/asse	ssment/		
f this course will affect other depa nust be attached. The form is loca http://www.atu.edu/registrar/cur	ated on th	e Curric	ulum forms v	ort Form for veb page at	each affected department

# **Syllabus**

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**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:

XX%
XX%
XX%
XX%
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
1	
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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 Depart	tment): Department	of Computer & Information	n Science		
DATE SUBMITTED:	6.30.2016				
Title	Signati	ure /	Date		
Department Head  Dr. David Hoelzeman	4	wil I bulo	7-10-2016		
Dean	/-/	1-1/2/1	ail 11		
Dr. Neal Barlow		MUUNTUN	1 Heg/6		
Teacher Education Coun	cil (if applicable)		0.		
Graduate Council (if app	licable)	-			
Registrar Ms. Tammy Weaver	Su	Walle	8/10/16		
Vice President for Acade	mic Affairs				
Dr. Mohammed Abdelra	ahman				
Course Subject: (e.g., ACC	T, ENGL) Course Number: (	(e.g. 1003) Effor	ctive Term: Fall 2017		
CSEC	1213		oring • Summer I		
	ficial title exceeds 30 characte				
Wireless and Cellular Sec		ers, mulcate banner fille be	now)		
		** 1. *** *** *** *** *** *** *** ***			
Danner Title. (illilited to 50	characters, including spaces, cap	this will dis	splay on the transcript)		
Will this source he eross li	stad with an athen a wisting and				
Yes No	sted with another existing cou	arse? If so, list course subject	ct and number.		
	stad with a course surrently m	at in the condense of the con-			
	sted with a course currently n	of in the undergraduate or	graduate catalogr		
If so, list course subject an	a number.		-		
Is this course repeatable f	for additional earned hours?	Yes No How many	/ total hours?		
Grading: © Standard Le		C Other			
Mode of Instruction (check					
© 01 Lecture	© 02 Lecture/Laboratory	© 03 Laboratory only			
05 Practice Teaching	C 06 Internship/Practicum	© 07 Apprenticeship/Ext	ternship		
© 08 Independent Study	C 09 Readings	10 Special Topics			
12 Individual Lessons	13 Applied Instruction	C 16 Studio Course			
C 17 Dissertation	18 Activity Course	C 19 Seminar	© 98 Other		

Does this course require a fee?	⊂ Yes   ♠ No	How Much?	Select Fee	Туре
If selected other list fee type:				
☐ Elective	<b>▽</b> Major	Г	Minor	
(If major or minor course, you m program.)	ust complete th	e Request for Pr	ogram Change form to ac	dd course to
If course is required by major/m	inor, how freque	ently will course	be offered?	
Spring				
For the proposed course, attach entered as they should appear i a. Course subject b. Course number c. Catalog course title d. Catalog description 1. Arkansas Course Transfer S 2. Cross-listing 3. Offered (e.g., Fall only, Spr 4. Prerequisites 5. Co-requisites 6. Description 7. Notes (e.g., information not) 8. Contact Hours if different to 9. Fees (e.g., \$36 art fee) e. Section for Name of instructo f. Text required for course g. Bibliography (supplemental re) h. Justification/rationale for the i. Course objectives j. Description of how course me education component should General Education Objectives k. Assessment methods (include l. Policy on absences, cheating, m. Course content (outline of ma Will this course require any speci	System (ACTS) coring only. Do not than lecture (e.g. r, office hours, corrections and listed in undergold grading policy with plagiarism, etc. atterial to be covered at resources such and resources such as the	such as course notes, if such as course notes information objectives ourse meets one raduate catalog) with specific equipment of the course meets one raduate catalog) with specific equipment of the course meets one raduate catalog) with specific equipment of the course meets one raduate catalog) with specific equipment of the course of	applicable urse fall and spring) hay be repeated for creditional formula and spring three has been declared in the factor of the objective valents for A, B, C)	t) ours) general es contained in
dedicated equipment.				
Will this course require a special dedicated lab	classroom (comp	outer lab, smart	classroom, or laboratory)	?
Attach the Course Addition Asses	sment Form. Th	e form is located	on the Assessment & In	stitutional
Effectiveness web page at <a href="http://">http://</a>				
If this course will affect other dep	partments, a Dep	partmental Supp	ort Form for each affecte	d department
must be attached. The form is lo	cated on the Cur	riculum forms w	eb page at	
http://www.atu.edu/registrar/cu	rriculum forms.	php. N/A		

### 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** 

Office: Corley

Phone:

INSTRUCTOR Email:

**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:

XX%
XX%
XX%
XX%
100%

The following percentage table will be used to assign scores:

#### **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

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 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 Depar	tment):	Department of Computer & Information Science					
DATE SUBMITTED:		6.30.2016					
Title	90	Signati	ure		Date		
Department Head  Dr. David Hoelzeman		Da	vil A Has	Jun-	7-6-801		
Dean Dead Barden					7-6-801		
<b>Dr. Neal Barlow</b> Teacher Education Cour	ncil (if applic	cable)	GELI'MI	Mu	Thuy 16		
Graduate Council (if app	olicable)						
Registrar  Ms. Tammy Weaver		Sus	100114		8/10/16		
Vice President for Acade							
Dr. Mohammed Abdelr	ahman						
Course Subject: (e.g., ACC	T, ENGL)	Course Number: (	e.g., 1003)	Effective	Term: Fall 2017		
CSEC		2113		← Spring	g		
Official Catalog Title: (If of	ficial title e	xceeds 30 characte	ers, indicate Banner	Title below	)		
Introduction to Informa	tion System	ıs					
anner Title: (limited to 30	characters, i	ncluding spaces, cap	italize all letters — thi	is will display	on the transcript)		
Intro to Info Systems							
Vill this course be cross-li	sted with a	nother existing cou	urse? If so, list cours	e subject ar	nd number.		
Yes • No							
Vill this course be cross-li	sted with a	course currently n	ot in the undergrad	uate or grad	duate catalog?		
so, list course subject an	d number.	← Yes ← No					
ls this course repeatable	for addition	al earned hours?	⊂ Yes • No Ho	w many tot	al hours?		
rading: • Standard Le	etter	⊂ P/F	○ Other				
Node of Instruction (chec	k appropria	te box):					
01 Lecture	○ 02 Le	cture/Laboratory	C 03 Laboratory	only			
05 Practice Teaching	€ 06 In	ternship/Practicum	C 07 Apprentice	s hip/Externs	ship		
08 Independent Study	€ 09 Re	adings	C 10 Special Top	oics			
12 Individual Lessons	← 13 Ap	plied Instruction	C 16 Studio Cou	rs e			
17 Dissertation	C 18 Ac	tivity Course	C 10 Seminar		C 00 Othor		

Does this course require a fee?	C Yes	No	How Much?		Select Fee Type
If selected other list fee type:					
☐ Elective	<b>▼</b> Majo	or	Г	Minor	
(If major or minor course, you m program.)	ust comp	olete the	Request for P	rogram Cha	nge form to add course to
If course is required by major/m	inor, how	/ frequen	tly will course	be offered	?
Every Fall					
For the proposed course, attach entered as they should appear in a. Course subject b. Course number c. Catalog course title d. Catalog description 1. Arkansas Course Transfer S 2. Cross-listing 3. Offered (e.g., Fall only, Spr 4. Prerequisites 5. Co-requisites 6. Description 7. Notes (e.g., information not 8. Contact Hours if different t 9. Fees (e.g., \$36 art fee) e. Section for Name of instructo f. Text required for course g. Bibliography (supplemental re h. Justification/rationale for the i. Course objectives j. Description of how course me education component should General Education Objectives k. Assessment methods (include l. Policy on absences, cheating, m. Course content (outline of ma	or the cat Gystem (A ing only. of in desc chan lecture r, office hading list course eets gene show hor listed in grading plagiarism terial to	ription sure (e.g., nours, cont) ral education with continuer etc. be covered.	enter if offer couch as course Lecture three ntact informations objective urse meets on duate catalog th specific equed in course).	f applicable ourse fall ar may be repe hours, labo cion (telepho s (courses in e or more o ) nivalents for	eated for credit) ratory three hours) one, email) ncluded in the general of the objectives contained in
Will this course require any speci software, distance learning equip			as unusual ma	aintenance o	costs, library resources, special
Will this course require a special <b>No</b>	classroor	n (compı	uter lab, smari	classroom,	or laboratory)?
Attach the Course Addition Asses				ed on the As	sessment & Institutional
Effectiveness web page at http://	www.atı	u.edu/ass	sessment/		
If this course will affect other depmust be attached. The form is lo http://www.atu.edu/registrar/cu	cated on	the Curr	iculum forms	oort Form fo web page at	or each affected department

# **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 ecommerce.
- 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%
Total	100%

The following percentage table will be used to assign scores:

#### **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 2113 Introduction to Information 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 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:	Curriculur	Curriculum Committee				
FROM (Initiating Depa	rtment): Departn	Department of Computer & Information Science				
DATE SUBMITTED:	6.30.203	16				
Title	Sig	nature	Date			
Department Head  Dr. David Hoelzeman		David Alla Ser	7-6-7016			
Dean  Dr. Neal Barlow  Teacher Education Coun	ncil (if applicable)	Maleste	u 1-6-7016			
Graduate Council (if app	olicable)					
Registrar  Ms. Tammy Weaver  Vice President for Acade  Dr. Mohammed Abdelr	DO 50 1 DO 50	lwalle	8/10/16			
Course Subject: (e.g., ACC	2213	C	ective Term: Fall 2017 Spring • Summer I			
Official Catalog Title: (If of Forensics and Incident R		acters, indicate Banner Title b	pelow)			
,	<del></del>	capitalize all letters — this will o	display on the transcript)			
Forensics/Incident Resp			- ' '			
← Yes ← No		course? If so, list course subj				
If so, list course subject an	nd number. Yes • No	o living the undergraduate o	or graduate catalog?			
		rs? C Yes • No How man	ny total hours?			
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Mode of Instruction (chec	k appropriate box):	<u> </u>				
	© 02 Lecture/Laboratory	03 Laboratory only				
C 05 Practice Teaching	C 06 Internship/Practice	um 🦰 07 Apprenticeship/E	externship			
C 08 Independent Study	○ 09 Readings	← 10 Special Topics				
12 Individual Lessons	C 13 Applied Instruction	n C 16 Studio Course				
C 17 Dissertation	18 Activity Course	C 19 Seminar	C 00 Othor			

					- Carlot 1997 -		
Does this course require a fee?	← Yes	No	How Much?		Select Fee Type		
If selected other list fee type:							
☐ Elective	<b>✓</b> Majo	or	Г	Minor			
(If major or minor course, you m program.)	ust comp	olete the	Request for Pi	ogram Char	nge form to add course to		
If course is required by major/mi	If course is required by major/minor, how frequently will course be offered?						
Spring							
For the proposed course, attach entered as they should appear in a. Course subject b. Course number c. Catalog course title d. Catalog description 1. Arkansas Course Transfer S 2. Cross-listing 3. Offered (e.g., Fall only, Spri 4. Prerequisites 5. Co-requisites 6. Description 7. Notes (e.g., information no 8. Contact Hours if different the 9. Fees (e.g., \$36 art fee) e. Section for Name of instructor f. Text required for course g. Bibliography (supplemental reh. Justification/rationale for the cit. Course objectives j. Description of how course medication component should sequenced and course objectives j. Assessment methods (include l. Policy on absences, cheating, p. m. Course content (outline of material sequenced).	System (A System (A Sing only. In desc han lecture, office hading list course ets general show how listed in a grading polagiarism terial to l	ription sure (e.g., nours, cont)  ral educate with a coundergrapolicy with n, etc. one covered	enter if offer content if offer content if offer content in the course in the course in the course meets one duate catalogy in specific equate in course).	applicable ourse fall and may be rependently be hours, laboration (telepholical is (courses in the or more of t	ated for credit) ratory three hours) one, email) cluded in the general f the objectives contained in A, B, C)		
Will this course require any special software, distance learning equip	al resour	ces such	as unusual ma	intenance co	osts, library resources, special		
Will this course require a special on dedicated lab							
Attach the Course Addition Assess Effectiveness web page at							

### **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, Dumplt,) 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** 

Office: Corley

Phone:

**INSTRUCTOR** Email:

**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

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 Depar	tment):	Department of Computer & Information Science					
DATE SUBMITTED:		6.30.2016					
Title		Signatu	ıre		Date		
Department Head  Dr. David Hoelzeman		Da	ind I La	lan	7-6-201		
Dean  Dr. Neal Barlow		(2)	Max		CA 11		
Teacher Education Cour	icil (if applic	cable)	jen ajx	ance	7/19/6		
Graduate Council (if app	licable)						
Registrar Ms. Tammy Weaver		Sa	Xalle		8/10/16		
Vice President for Acade							
Dr. Mohammed Abdelra	ahman						
Course Subject: (e.g., ACC	T, ENGL)	Course Number: (	e.g., 1003)	Effective -	Term: <b>Fall 2017</b>		
CSEC		2223		← Spring	Summer I		
Official Catalog Title: (If of	ficial title ex	xceeds 30 characte	rs, indicate Banner	Title below)	,		
Virtualization							
Banner Title: (limited to 30	characters, i	ncluding spaces, capi	italize all letters — th	is will display	on the transcript)		
Will this course be cross-li	sted with ar	nother existing cou	rse? If so, list cours	e subject and	d number.		
Yes • No							
Will this course be cross-li	sted with a		ot in the undergrad	uate or grad	uate catalog?		
f so, list course subject an	d number.	↑ Yes ♠ No					
Is this course repeatable	for addition	al earned hours?	⊂ Yes	w many tota	I hours?		
Grading: © Standard Le	etter	C P/F	○ Other				
Mode of Instruction (check	appropria	te box):					
01 Lecture	○ 02 Le	cture/Laboratory	C 03 Laboratory	only			
05 Practice Teaching	C 06 In	ternship/Practicum	C 07 Apprentice	es hi p/Externs h	ip		
08 Independent Study	○ 09 Re	adings	€ 10 Special To	pics			
12 Individual Lessons	← 13 Ap	pplied Instruction	← 16 Studio Cou	rse			
17 Dissertation	← 18 Ac	tivity Course	C 19 Seminar	C	98 Other		

Does this course require a fee?	⊂ Yes	How Much?		Select Fee Type	
If selected other list fee type:			The state of the s		
□ Elective	✓ Major	Г	Minor		
(If major or minor course, you m program.)	ust complete the	Request for P	rogram Cha	ange form to add course to	
If course is required by major/mi	inor, how frequer	ntly will course	be offered	1?	
For the proposed course, attach	a syllahus in Wor	d format that	includes: (II	tems a through d should be	
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a. Course subject	in the cutulog,				
b. Course number					
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1. Arkansas Course Transfer S	System (ACTS) cor	urse number, i	f applicable	2	
2. Cross-listing					
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4. Prerequisites					
5. Co-requisites					
6. Description					
7. Notes (e.g., information no					
8. Contact Hours if different t	than lecture (e.g.,	Lecture three	hours, labo	oratory three hours)	
9. Fees (e.g., \$36 art fee)					
e. Section for Name of instructor	r, office hours, co	ntact informa	tion (teleph	ione, email)	
f. Text required for course	1: 1: - 1\				
g. Bibliography (supplemental re					
h. Justification/rationale for the	course				
i. Course objectives	ata sanaual adi				
<ul> <li>j. Description of how course me education component should General Education Objectives</li> </ul>	show how the co	urse meets on	ne or more o		
k. Assessment methods (include				r A. B. C)	
I. Policy on absences, cheating,				, ., .,	
m. Course content (outline of ma	5 9 <del>5</del> 0	ed in course).			
Will this course require any speci	al resources such	as unusual m	aintenance	costs, library resources, special	
software, distance learning equip	ment, etc.? Yes				
Will this course require a special dedicated lab	classroom (comp	uter lab, smar	t classroom,	, or laboratory)?	
Attach the Course Addition Asses	sment Form. The	form is locate	ed on the As	ssessment & Institutional	
Effectiveness web page at <a href="http://">http://</a>	www.atu.edu/as	sessment/			
If this course will affect other dep	partments, a Denz	artmental Sun	oort Form fo	or each affected department	
must be attached. The form is lo	cated on the Curr	iculum forms	web page at	t	
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** 

Office: Corley

Phone:

INSTRUCTOR Email:

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

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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 (	Curriculum Committee  Department of Computer & Information Science				
FROM (Initiating Depart	ment): Departmen					
DATE SUBMITTED:	6.30.2016					
Title	Signa	ture Date				
Department Head  Dr. David Hoelzeman	4	avid & Jargen 7-6-201				
Dean						
Dr. Neal Barlow	Q C	Bluffille 9Hugh				
Teacher Education Coun	cil (if applicable)					
Graduate Council (if app	licable)					
Registrar  Ms. Tammy Weaver	H	Weauce 8/10/16				
Vice President for Acade		general on the				
Dr. Mohammed Abdelra						
Course Subject: (e.g., ACCT	, ENGL) Course Number:	: (e.g., 1003) Effective Term: <b>Fall 2017</b>				
CSEC	3113	☐ Spring				
Official Catalog Title: (If off	icial title exceeds 30 charac	ters, indicate Banner Title below)				
Assembly Programming						
Banner Title: (limited to 30 o	characters, including spaces, ca	apitalize all letters — this will display on the transcript)				
		,				
Will this course be cross-lis	sted with another existing co	ourse? If so, list course subject and number.				
C Yes ♠ No		Tariber in 30) had boarde subject und marriser.				
Will this course be cross-lis	ted with a course currently	not in the undergraduate or graduate catalog?				
If so, list course subject and	0	In a supergraduate or graduate eatenog.				
		Yes No How many total hours?				
Grading: • Standard Le		Other				
Mode of Instruction (check	appropriate box):					
	○ 02 Lecture/Laboratory	C 03 Laboratory only				
C 05 Practice Teaching	C 06 Internship/Practicum	07 Apprenticeship/Externship				
○ 08 Independent Study	€ 09 Readings	C 10 Special Topics				
C 12 Individual Lessons	← 13 Applied Instruction	C 16 Studio Course				
17 Dissertation 18 Activity Course		C 19 Seminar C 98 Other				

Does this course require a fee?	C Yes	• No	How Much		Select Fee Type
If selected other list fee type:					
☐ Elective	✓ Major		Г	Minor	
(If major or minor course, you m program.)	ust comple	te the	Request for F	rogram Char	nge form to add course to
If course is required by major/m	inor, how fi	requen	tly will cours	e be offered?	>
Fall					
For the proposed course, attach entered as they should appear i a. Course subject b. Course number c. Catalog course title d. Catalog description 1. Arkansas Course Transfer S 2. Cross-listing 3. Offered (e.g., Fall only, Spr 4. Prerequisites 5. Co-requisites 6. Description 7. Notes (e.g., information not) 8. Contact Hours if different i 9. Fees (e.g., \$36 art fee) e. Section for Name of instructo f. Text required for course g. Bibliography (supplemental re) h. Justification/rationale for the i. Course objectives j. Description of how course me education component should General Education Objectives k. Assessment methods (include l. Policy on absences, cheating, m. Course content (outline of ma	or the catalog system (ACT) ing only. Do not in descript than lectured and ing list) course sets general show how allowed in ungrading poplagiarism, terial to be fall resource.	or not experience (e.g., urs, condition subsettion subs	enter if offer of uch as course Lecture three ntact informa tion objective urse meets or duate catalog th specific eq ed in course).	if applicable course fall and may be repersented the hours, laboration (telephotes (courses in the or more of t	eated for credit) ratory three hours) one, email) included in the general of the objectives contained in A, B, C)
software, distance learning equip	ment, etc.?	? No			
Will this course require a special <b>No</b>					
Attach the Course Addition Asses				ed on the As	sessment & Institutional
Effectiveness web page at http://					
If this course will affect other dep must be attached. The form is lo http://www.atu.edu/registrar/cu	cated on th	e Curri	culum forms	port Form fo web page at	r each affected department

#### **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** 

Office: Corley

Phone:

**OFFICE HOURS** 

**INSTRUCTOR** Email:

**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:

XX%
XX%
XX%
XX%
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 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/cyberoperations/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 Departr	FROM (Initiating Department): Department of Computer & Information Science						
DATE SUBMITTED:	6.30.2016						
Title	Signat	ure /	Date				
Department Head  Dr. David Hoelzeman	We	ind flagen	7-le-2016				
Dean Borlow	(N)	1.00	ON 11				
<b>Dr. Neal Barlow</b> Teacher Education Counc	:il (if applicable)	me a Ha	E Wig 6				
Graduate Council (if appl	icable)						
Registrar Ms. Tammy Weaver	Le	Mallu	8/10/16				
Vice President for Acader	mic Affairs						
Dr. Mohammed Abdelra	hman						
Service Subjects (a.e. ACCT	- FNCI \ Course Number	/o. ~ 1003\	ctive Term: Fall 2017				
ourse Subject: (e.g., ACCT	Course Number:	(-0,	oring Summer I				
	icial title exceeds 30 charact	ers, mulcate banner Title be	ilow)				
Cyber Defense I		5 P H L 10 - 11 - 11 - 11 - 11 - 11 - 11 - 11					
anner litle: (limited to 30 c	characters, including spaces, ca	pitalize all letters — this will di	splay on the transcript)				
		216 - 11-1					
Yes • No	ted with another existing co	ourse? If so, list course subje	ct and number.				
	sted with a course currently i	not in the undergraduate or	graduate catalog?				
	CV CN-	not in the undergraduate of	graduate catalog:				
so, list course subject and	a number.						
Is this course repeatable f	or additional earned hours?	Yes No How man	y total hours?				
Grading: • Standard Le	tter CP/F	Other					
Mode of Instruction (check	appropriate box):						
01 Lecture	© 02 Lecture/Laboratory	© 03 Laboratory only					
05 Practice Teaching	C 06 Internship/Practicum	© 07 Apprenticeship/Ex	ternship				
08 Independent Study	C 09 Readings	C 10 Special Topics					
12 Individual Lessons	C 13 Applied Instruction	C 16 Studio Course					
17 Dissertation	C 18 Activity Course	C 19 Seminar	C 19 Seminar C 98 Other				

Does this course require a fee?	⊂ Yes	No	How Much?	,	Select Fee Type
If selected other list fee type:					
☐ Elective	<b>✓</b> Majo	or	T	_ Min	or
(If major or minor course, you m program.)	ust com	olete the	Request for F	'rogra	am Change form to add course to
If course is required by major/m	inor, hov	v freauei	ntly will cours	e be c	offered?
Fall					
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Will this course require any spec software, distance learning equi				nainte	enance costs, library resources, special
Will this course require a specia	l classroc	om (com	puter lab, sma	ırt cla	ssroom, or laboratory)?
a dedicated lab					
Attach the Course Addition Asse Effectiveness web page at					

#### **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** 

Office: Corley

Phone:

**INSTRUCTOR** Email:

**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**

CHEDULE		
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:	TO: Curriculum Committee				
FROM (Initiating Departm	nent): Department	of Computer & Information	on Science		
DATE SUBMITTED: 6.30.2016					
Title	Signatu	ıre	Date		
Department Head  Dr. David Hoelzeman  Dean  Dr. Neal Barlow		wind for form	- 7-6-2016 La 9 Ag/6		
Teacher Education Counci Graduate Council (if applied					
Registrar  Ms. Tammy Weaver  Vice President for Acaden	nic Affairs	Walla	8/10/16		
Dr. Mohammed Abdelrah	nman				
ourse Subject: (e.g., ACCT,	Course Number:	(0.)	Fective Term: Fall 2017 Spring Summer I		
Official Catalog Title: (If offi	cial title exceeds 30 charact	ers, indicate Banner Title	below)		
Programming Embedded					
anner Title: (limited to 30 c	haracters, including spaces, cap	oitalize all letters — this will	display on the transcript)		
Yes No  Vill this course be cross-list  f so, list course subject and	ted with another existing co ted with a course currently of d number. Yes No or additional earned hours?	not in the undergraduate	or graduate catalog?		
Grading: • Standard Le		C Other			
Mode of Instruction (check	appropriate box):				
01 Le cture	© 02 Lecture/Laboratory	C 03 Laboratory only	***		
05 Practice Teaching	C 06 Internship/Practicum	C 07 Apprenticeship	/Externship		
08 Independent Study	© 09 Readings	€ 10 Special Topics			
12 Individual Lessons	C 13 Applied Instruction	16 Studio Course			
17 Dissertation	18 Activity Course	C 19 Seminar	C 98 Other		

Does this course require a fee?	⊂ Yes	No	How Much?		Select Fee Type
If selected other list fee type:					
□ Elective	<b>▼</b> Majo	or	Г	Minor	
(If major or minor course, you m program.)	ust comp	olete the	Request for Pr	ogram Ch	ange form to add course to
If course is required by major/m	inor, hov	v frequei	ntly will course	be offere	d?
Spring					
For the proposed course, attach entered as they should appear i a. Course subject			d format that i	nciudes: (	items a. through d. should be
b. Course number					
c. Catalog course title					
<ul><li>d. Catalog description</li><li>1. Arkansas Course Transfer</li></ul>	System (	ACTS) co	urse number, i	f applicab	le
2. Cross-listing	.,	,		ā, ē	
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5. Co-requisites					
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7. Notes (e.g., information n 8. Contact Hours if different 9. Fees (e.g., \$36 art fee)	than lect	cription s cure (e.g.	, Lecture three	hours, lal	poratory three hours)
e. Section for Name of instructor	or. office	hours, co	ontact informa	tion (telep	ohone, email)
f. Text required for course	,	,		•	
g. Bibliography (supplemental r	eading li	st)			
h. Justification/rationale for the					
i. Course objectives				9	
j. Description of how course m	eets gen	eral edu	cation objective	es (course	s included in the general
					e of the objectives contained in
General Education Objective k. Assessment methods (includ					for A B C)
I. Policy on absences, cheating			vitii specific cq	arvaichts	10. 7, 2, 2,
m. Course content (outline of m			ered in course).		
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Will this course require any spe software, distance learning equ				aintenand	ce costs, library resources, special
Will this course require a specia	ıl classro	om (com	puter lab, sma	rt classroo	om, or laboratory)?
Attach the Course Addition Asso	essment	Form. T	he form is locat	ed on the	Assessment & Institutional
Effectiveness web page at http:					
If this course will affect other domust be attached. The form is <a href="http://www.atu.edu/registrar/o">http://www.atu.edu/registrar/o</a>	located c	n the Cu	rriculum forms	port Forn web page	n for each affected department e at

#### **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** 

Office: Corley

Phone:

INSTRUCTOR Email:

**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

#### **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.

Below 60% - F

## 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.

<b>HEDULE</b> Week	Exercises
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#### **Arkansas Tech University**

#### **Course Addition**

#### **Assessment Form**

#### Our Mission

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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 Co	Curriculum Committee				
FROM (Initiating Departm	ent): Department	of Computer & Informatio	n Science			
DATE SUBMITTED:	6.30.2016					
Title	Signato	ure ( )	Date			
Department Head  Dr. David Hoelzeman		wil I flexen	7-le-7016			
Dean  Dr. Neal Barlow  Teacher Education Council	il (if applicable)	Mill Wall	a 9Agg/6			
Graduate Council (if appli	cable)					
Registrar Ms. Tammy Weaver Vice President for Acaden Dr. Mohammed Abdelrah	nic Affairs	Vealle	8/10/16			
Course Subject: (e.g., ACCT,	3233	((,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	ective Term: Fall 2017 Spring Summer I			
	cial title exceeds 30 charact	ers, indicate Banner Title b	pelow)			
Cyber Defense II Banner Title: (limited to 30 c	haracters, including spaces, ca	pitalize all letters — this will o	display on the transcript)			
Yes No  Will this course be cross-list  f so, list course subject and	ted with another existing co ted with a course currently d number. • No or additional earned hours?	not in the undergraduate o	or graduate catalog?			
Grading: © Standard Le		Other				
Mode of Instruction (check	appropriate box):					
© 01 Lecture	© 02 Lecture/Laboratory	C 03 Laboratory only				
05 Practice Teaching	C 06 Internship/Practicum	07 Apprenticeship/	Externship			
08 Independent Study	© 09 Readings	10 Special Topics				
C 12 Individual Lessons	13 Applied Instruction	← 16 Studio Course				
C 17 Discontation	C 18 Activity Course	C 19 Seminar	C 98 Other			

Does this course require a fee?	⊂ Yes	No	How Much?		Select Fee Type
If selected other list fee type:					
□ Elective	<b>▼</b> Majo	or	Γ	Minor	
(If major or minor course, you m program.)	iust comp	plete the	Request for Pro	ogram Ch	nange form to add course to
If course is required by major/m	inor, hov	v frequer	ntly will course	be offere	d?
Spring					
For the proposed course, attach	a syllabı	ıs in Wor	d format that in	ncludes: (	Items a. through d. should be
entered as they should appear	in the ca	talog)			
a. Course subject					
b. Course number					
c. Catalog course title					
d. Catalog description					
Arkansas Course Transfer	System (	ACTS) co	urse number, it	applicab	le
2. Cross-listing				C 11	
3. Offered (e.g., Fall only, Sp	ring only	. Do not	enter if offer co	ourse fall	and spring)
4. Prerequisites					
5. Co-requisites					
6. Description					anastad for cradit)
7. Notes (e.g., information n	ot in des	cription	such as course i	haurs la	horatory three hours)
8. Contact Hours if different	than lec	ture (e.g.	., Lecture three	nours, ia	boratory timee mours,
9. Fees (e.g., \$36 art fee)		h	antast informat	tion Italau	nhone email)
e. Section for Name of instructo	or, office	nours, c	ontact informat	ion (tele)	priorie, errian)
f. Text required for course	الممانممان	:c+\			
g. Bibliography (supplemental i		ist)			
h. Justification/rationale for the	2 Course				
<ul><li>i. Course objectives</li><li>j. Description of how course m</li></ul>	oots gon	oral adu	cation objective	s (course	es included in the general
j. Description of how course m	d chow h	ow the c	ourse meets on	e or mor	e of the objectives contained in
General Education Objective					
k. Assessment methods (include	le gradin	a nolicy v	with specific ear	., uivalents	for A. B. C)
I. Policy on absences, cheating			vitir specime eq.		,,
m. Course content (outline of m			ered in course).		
III. Course content (outline or ii	iateriai ti	0 50 00 00			
Will this course require any spe	cial reso	urces suc	h as unusual m	aintenan	ce costs, library resources, special
software, distance learning equ	inment.	etc.? No	)		200 July 200
software, distance rearring equ					
Will this course require a specia	al classro	om (com	puter lab, smar	t classroc	om, or laboratory)?
No.					
Attach the Course Addition Ass	essment	Form. T	he form is locat	ed on the	Assessment & Institutional
Effectiveness web page at http					
Lifectiveness web page at <u>intep</u>	.// ** ** **	aca.cua/t			
If this course will affect other d	epartme	nts, a De	partmental Sup	port Forr	m for each affected department
must be attached. The form is	located (	on the Cu	ırriculum forms	web pag	e at
http://www.atu.edu/registrar/					

#### 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.

OBJEQTIVES

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 8	<b>Information</b>	Science
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**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

Office: Corley

Phone:

INSTRUCTOR Email:

**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

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.

<b>HEDULE</b> 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 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 Departr	nent):	Department o	f Computer & Inforr	nation Science		
DATE SUBMITTED:		6.30.2016				
Title		Signatur	e	Date		
Department Head  Dr. David Hoelzeman		Pa	vid & flew	Jun 7-6	2016	
Dean		(1)	1.19	1. 21.	11	
Dr. Neal Barlow	il /if applicable	- July	MUTT	in THE	10	
Teacher Education Counc	л (п аррисавіє	=)				
Graduate Council (if appl	icable)					
Registrar		200	100100	0/-/		
Ms. Tammy Weaver		Su	Waller	8/10/	. 6	
Vice President for Acade						
Dr. Mohammed Abdelra	nman		-			
Course Subject: (e.g., ACCT	ENGL) Cor	urse Number: (e	.g., 1003)	Effective Term: Fall 2	017	
CSEC	<u> </u>	243		C Spring • Summer	1	
Official Catalog Title: (If off	icial title excee	eds 30 character	s, indicate Banner T	itle below)		
Computer Architecture				A		
Banner Title: (limited to 30 o	characters, inclu	ding spaces, capit	calize all letters — this	will display on the transc	ript)	
Computer Architecture		В -р,р				
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C Yes © No	ica with anoth	ici chisting cour	30. 11 30, 113t course	Subject and Hamilton		
Will this course be cross-lis	ted with a cou	irse currently no	at in the undergradu	ate or graduate catalog	2?	
			tem the undergrade	ace of Bradesia construction		
If so, list course subject an	d number.			2		
Is this course repeatable f	or additional e	earned hours?	Yes * No Hov	many total hours?		
Grading: © Standard Le	tter	⊂ P/F	○ Other			
Mode of Instruction (check	cappropriate b	oox):				
© 01 Lecture	C 02 Lectur	re/Laboratory	C 03 Laboratory	onlv		
C 05 Practice Teaching	C 06 Intern	nship/Practicum	C 07 Apprentices	hip/Externship		
C 08 Independent Study	€ 09 Readi	ings	C 10 Special Top	ics		
C 12 Individual Lessons	C 13 Appli	ed Instruction	C 16 Studio Cour	se		
C 17 Dissertation	C 18 Activit	ty Course	C 19 Seminar	€ 98 Other		

Does this course require a fee?	← Yes	€ No	How Much?		Select Fee Type
selected other list fee type:					
Elective	<b>▼</b> Majo	or	Г	Minor	
If major or minor course, you morogram.)	nust com	plete the	Request for P	rogram Ch	nange form to add course to
f course is required by major/m	ninor, hov	w freque	ntly will cours	e be offere	ed?
K. Assessment methods (included). Policy on absences, cheating. Course content (outline of	r System oring only not in de t than led tor, office meets ge ald show wes listed ade grading, plagia material	(ACTS) constructions (e.g. list) e.g. neral edithow the in undering policy rism, etc to be constructed to be constructed to be constructed to the	such as cours g., Lecture thre contact inform ucation object course meets graduate cata with specific e	if applicate course fall e may be ree hours, la nation (televives (cours one or molog) equivalents e).	ole I and spring) repeated for credit) aboratory three hours) ephone, email) ses included in the general are of the objectives contained in
software, distance learning ed	quipment	, etc.? N	lo		
Will this course require a spec					
Attach the Course Addition As Effectiveness web page at htt	ssessmer p://www	nt Form. v.atu.edu	The form is lo /assessment/	cated on th	he Assessment & Institutional
	departm	nents, a D	Departmental S Curriculum for	Support Fo	orm for each affected department age at

# **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

Phone:

**INSTRUCTOR** Email:

**OFFICE HOURS** 

**TEXTBOOK** 

**BIBLIOGRAPHY** 

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

Office: Corley

**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:

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

## **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 Com	nmittee		
FROM (Initiating Department): Department of Computer & Information Science				
DATE SUBMITTED:	6.30.2016			
	Si-not:		Date	
Title	Signatu	,		
Department Head  Dr. David Hoelzeman	Van	id A Mary	7-6-2016	
Dean		1.63110	a Stall	
Dr. Neal Barlow	A Company	en appece	710	
Teacher Education Council	(if applicable)			
Graduate Council (if applica	able)			
Registrar	911	2 elelle	8/10/16	
Ms. Tammy Weaver	9	Muu	0/10/10	
Vice President for Academi				
Dr. Mohammed Abdelrahr	man			
	ENGL) Course Number:	(e.g. 1003) Effe	ective Term: Fall 2017	
Course Subject: (e.g., ACCT, I	4123	(0.8.)	Spring • Summer I	
CSEC				
Official Catalog Title: (If offic	ial title exceeds 30 charact	ers, indicate balliler fitte b	Clowy	
Cryptography				
Banner Title: (limited to 30 ch	aracters, including spaces, ca	pitalize all letters — this will o	display on the transcript)	
 Will this course be cross-list	ed with another existing co	ourse? If so, list course subj	ect and number.	
C Ves & No.				
Will this course be cross-list	ed with a course currently	not in the undergraduate o	or graduate catalog?	
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If so, list course subject and	number.		uny total hours?	
Is this course repeatable for	or additional earned hours?	Yes No now ma	iny total nodisi j	
Grading:	tter C P/F	○ Other		
Mode of Instruction (check	appropriate box):			
© 01 Lecture	© 02 Lecture/Laboratory	© 03 Laboratory only		
05 Practice Teaching	C 06 Internship/Practicur		/Externship	
© 08 Independent Study	C 09 Readings	C 10 Special Topics		
12 Individual Lessons	13 Applied Instruction	7 16 Studio Course		
C 17 Dissertation	18 Activity Course	C 19 Seminar	C 98 Other	

Does this course require a fee?	← Yes	No	How Much?		Select Fee Type
f selected other list fee type:					
Elective	✓ Majo	or	Γ	Minor	
(If major or minor course, you m	ust comp	olete the	Request for F	rogram Ch	nange form to add course to
If course is required by major/m	inor, hov	v freque	ntly will cours	e be offere	ed?
Fall					
For the proposed course, attach entered as they should appear i a. Course subject b. Course number c. Catalog course title d. Catalog description 1. Arkansas Course Transfer 2. Cross-listing 3. Offered (e.g., Fall only, Sp 4. Prerequisites 5. Co-requisites 6. Description 7. Notes (e.g., information n 8. Contact Hours if different 9. Fees (e.g., \$36 art fee) e. Section for Name of instruct f. Text required for course g. Bibliography (supplemental h. Justification/rationale for th i. Course objectives j. Description of how course n education component shoul General Education Objective k. Assessment methods (includ l. Policy on absences, cheating m. Course content (outline of r	System ( ring only not in des than lec or, office reading le course heets ger ld show le es listed if de gradir g, plagiar	ACTS) construction (e.g. hours, construction)  the hours, construction (e.g. hours, construction)  the hours of the hours	such as cours contact informatication object course meets graduate cata with specific o	if applicate course falle may be refer hours, land the fallow (televises (cours one or molog) equivalents	ole I and spring) repeated for credit) aboratory three hours) ephone, email) ses included in the general are of the objectives contained in
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No Attach the Course Addition As	sessmen	t Form.	The form is lo	cated on tl	he Assessment & Institutional
Effectiveness web page at http	o://www	.atu.edu	/assessment/		
If this course will affect other must be attached. The form is <a href="http://www.atu.edu/registrar">http://www.atu.edu/registrar</a>	s located	on the C	Curriculum for	Support Fo ms web pa	rm for each affected department age at

# 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

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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.

<b>HEDULE</b> Week	Exercises
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### **Arkansas Tech University**

#### **Course Addition**

#### **Assessment Form**

#### **Our Mission**

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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:	Currio	culum Commit	tee		
FROM (Initiating Departm	ent): Der	partment of Co	mputer & Inform	ation Scien	ce
DATE SUBMITTED:	6.3	0.2016			
Title		Signature			Date
Department Head  Dr. David Hoelzeman		Vavie	lforf	em	7-6-2016
Dean  Dr. Neal Barlow	(	And	With the	lle	9Ang/6
Teacher Education Counci	l (if applicable)				
Graduate Council (if appli	cable)			-	
Registrar Ms. Tammy Weaver		Florid	llle		8/10/16
Vice President for Acaden					
Dr. Mohammed Abdelrah	nman				
Course Subject: (e.g., ACCT,	ENGL) Course	Number: (e.g.,	1003)		Term: Fall 2017
CSEC	4133				• Summer I
Official Catalog Title: (If offi	cial title exceeds 3	0 characters, ir	ndicate Banner T	itle below)	
Large Scale Distributed Sy					
Banner Title: (limited to 30 c	haracters, including	spaces, capitalize	e all letters — this	will display	on the transcript)
Large Scale Distributed Sy					1
Will this course be cross-lis	ted with another e	xisting course?	If so, list course	subject an	number.
Yes No	tad with a course o	surrantly not in	the undergradu	ate or grad	uate catalog?
Will this course be cross-lis	ted with a course t	• No	the undergradu	ate or grad	uute eutuiog.
f so, list course subject and	d number.		6 0		l hours?
Is this course repeatable f	or additional earne	ed hours?	Yes '* No Hov	v many tota	ii nours :
Grading: © Standard Le	tter C	P/F	○ Other	1	
Mode of Instruction (check	appropriate box):				
© 01 Lecture	○ 02 Lecture/La	boratory	C 03 Laboratory	onlv	
C 05 Practice Teaching	C 06 Internship	/Practicum	C 07 Apprentice	ship/Externs	hip
C 08 Independent Study	○ 09 Readings		C 10 Special Top	oics	
C 12 Individual Lessons	C 13 Applied In	struction	C 16 Studio Cou	rse	
C 17 Dissertation	C 18 Activity Co	urse	← 19 Seminar		98 Other

Does this course require a fee?	⊂ Yes	No	How Much?	Select Fee Type
If selected other list fee type:				
☐ Elective	<b>▼</b> Maj	or	Γ	Minor
(If major or minor course, you m program.)	ust com	olete the	Request for Pro	ogram Change form to add course to
If course is required by major/m	inor, hov	v frequei	ntly will course	be offered?
Fall				
For the proposed course, attach	a syllabı	ıs in Wor	d format that ir	ncludes: (Items a. through d. should be
entered as they should appear i	n the ca	talog)		
a. Course subject				
b. Course number				
c. Catalog course title				
d. Catalog description				
1. Arkansas Course Transfer	System (	ACTS) co	urse number, if	applicable
2. Cross-listing				
3. Offered (e.g., Fall only, Spi	ring only	. Do not	enter if offer co	ourse fall and spring)
4. Prerequisites				
5. Co-requisites				
6. Description				
7. Notes (e.g., information n	ot in des	cription	such as course r	nay be repeated for credit)
8. Contact Hours if different	than lec	ture (e.g.	, Lecture three	hours, laboratory three hours)
9. Fees (e.g., \$36 art fee)				
e. Section for Name of instructo	or, office	hours, c	ontact informat	ion (telephone, email)
f. Text required for course				
g. Bibliography (supplemental r	eading li	st)		
h. Justification/rationale for the	course			
i. Course objectives				
education component should General Education Objective	d show h s listed ii	ow the c n underg	ourse meets on raduate catalog	e or more of the objectives contained in
k. Assessment methods (includ			vith specific equ	livalents for A, B, C)
I. Policy on absences, cheating				
m. Course content (outline of m	aterial to	o be cove	ered in course).	
				aintenance costs, library resources, special
software, distance learning equ	ipment,	etc.? <b>No</b>	ĺ	
Will this course require a specia				
Attach the Course Addition Asse	essment	Form. T	he form is locate	ed on the Assessment & Institutional
Effectiveness web page at http:	//www.a	atu.edu/a	assessment/	
If this course will affect other d	epartme	nts, a De	partmental Sup	port Form for each affected department
must be attached. The form is	located o	on the Cu	ırriculum forms	web page at
http://www.atu.edu/registrar/o	curriculu	m forms	s.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:

XX%
XX%
XX%
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**

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 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:	Currio	culum Committee		
FROM (Initiating Departr	nent): Der	partment of Computer &	Information Sc	ience
DATE SUBMITTED:	6.30	0.2016		
Title		Signature	200	Date
Department Head  Dr. David Hoelzeman  Dean		Jowil &	enfen	7-le-2016
<b>Dr. Neal Barlow</b> Teacher Education Counc	cil (if applicable)	Sylli li	Myslu	Maylo
Graduate Council (if appl	icable)			
Registrar Ms. Tammy Weaver Vice President for Acades		Hillaube		8/10/16
Dr. Mohammed Abdelra			F. (C 1)	T F-II 2017
Course Subject: (e.g., ACCT	(, ENGL) Course N	lumber: (e.g., 1003)		re Term: Fall 2017
Official Catalog Title: (If off	, , , , , , , , , , , , , , , , , , ,	characters, indicate Ba	anner Title belov	w)
Building Secure Software				
Sanner Title: (limited to 30 o	characters, including s	paces, capitalize all letters	s — this will displa	ay on the transcript)
<b>Building Secure Software</b>				
Vill this course be cross-lis	ted with another ex	isting course? If so, list	course subject a	and number.
~ Yes	etad with a course of	urrantly not in the unde	argraduate or gr	aduate catalog?
f so, list course subject an			igraduate or gre	addate catalog.
f so, list course subject and Is this course repeatable f	d number.	d hours? C Vac @ N	La How many to	otal hours?
is this course repeatable i	or additional earned	inours: Yes '	10 HOW IIIally to	
Grading: 🕝 Standard Le	etter C F	r/F C	Other	
Mode of Instruction (check	appropriate box):			
01 Lecture		oratory C 03 Labo	oratory only	
05 Practice Teaching	C 06 Internship/	Practicum C 07 App	rentices hip/Exter	nship
08 Independent Study	○ 09 Readings		cial Topics	
12 Individual Lessons	C 13 Applied Ins	truction C 16 Stud	dio Course	
17 Dissertation	C 18 Activity Cou	rse C 19 Sem	ninar	€ 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						
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)						
<ul> <li>Policy on absences, cheating, plagiarism, etc.</li> <li>m. Course content (outline of material to be covered in course).</li> </ul>						
Will this course require any special resources such as unusual maintenance costs, library resources, special software, distance learning equipment, etc.? <b>No</b>						
Will this course require a special classroom (computer lab, smart classroom, or laboratory)?						
Attach the Course Addition Assessment Form. The form is located on the Assessment & Institutional						
Effectiveness web page at <a href="http://www.atu.edu/assessment/">http://www.atu.edu/assessment/</a>						
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 <a href="http://www.atu.edu/registrar/curriculum forms.php">http://www.atu.edu/registrar/curriculum forms.php</a> . 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

CHEDULE		
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 C	Curriculum Committee				
FROM (Initiating Depart	tment): Departmen	Department of Computer & Information Science				
DATE SUBMITTED:	6.30.2016					
Title	Signa	ture Date				
Department Head  Dr. David Hoelzeman	Wa	wil f. Jones 7-6-7011	( <sub>0</sub>			
Dean			<u>se</u>			
Dr. Neal Barlow	(h)	all Hale They	2			
Teacher Education Coun	cil (if applicable)	you of some integer				
Graduate Council (if app	licable)					
Registrar  Ms. Tammy Weaver	S	lucaucy 8/10/16				
Vice President for Acade		70 00000				
Dr. Mohammed Abdelra						
Course Subject: (e.g., ACC	Γ, ENGL) Course Number:	(e.g., 1003) Effective Term: Fall 2017				
CSEC	4213	○ Spring  Summer!				
Official Catalog Title: (If of	ficial title exceeds 30 charact	ters, indicate Banner Title below)	+			
Information Systems Ris						
Banner Title: (limited to 30	characters, including spaces, ca	apitalize all letters — this will display on the transcript)				
IS Risk Management						
Will this course be cross-lis	sted with another existing co	ourse? If so, list course subject and number.				
Yes No						
Vill this course be cross-lis	sted with a course currently	not in the undergraduate or graduate catalog?				
f so, list course subject an	d number.					
Is this course repeatable f	for additional earned hours?	Yes No How many total hours?				
Grading: • Standard Le	etter CP/F	Other				
Mode of Instruction (check	appropriate box):		1			
01 Le cture	© 02 Lecture/Laboratory	03 Laboratory only				
05 Practice Teaching	C 06 Internship/Practicum	07 Apprenticeship/Externship				
08 Independent Study	C 09 Readings	C 10 Special Topics				
12 Individual Lessons	13 Applied Instruction	16 Studio Course				
17 Dissertation	18 Activity Course	C 19 Seminar C 98 Other				

Does this course require a fee?	← Yes	No	How Much	?		Select Fee Type
If selected other list fee type:						
☐ Elective	<b>▼</b> Majo	or	9	Г	Minor	
(If major or minor course, you m program.)	ust comp	olete the	Request for	Pro	ogram Ch	ange form to add course to
If course is required by major/m	inor, hov	v frequer	ntly will cour	se l	be offere	d?
Spring						
For the proposed course, attach entered as they should appear i a. Course subject b. Course number c. Catalog course title			d format tha	t in	ncludes: (	Items a. through d. should be
<ul><li>d. Catalog description</li><li>1. Arkansas Course Transfer S</li><li>2. Cross-listing</li></ul>	System (A	ACTS) cou	urse number,	if	applicabl	e
3. Offered (e.g., Fall only, Spr 4. Prerequisites 5. Co-requisites 6. Description 7. Notes (e.g., information not) 8. Contact Hours if different to 9. Fees (e.g., \$36 art fee) e. Section for Name of instructo f. Text required for course g. Bibliography (supplemental re h. Justification/rationale for the i. Course objectives j. Description of how course me	ot in describent lecture, office heading listourse show ho listed in grading plagiarism	ription so ure (e.g., nours, co t) ral educa w the co undergra policy wi m, etc.	uch as course Lecture thre ntact inform ation objectiv urse meets of aduate catalo th specific ed	e m e h atio	nay be replaced to the courses or more	peated for credit) foratory three hours) hone, email) included in the general of the objectives contained in
Will this course require any speci software, distance learning equip	al resour oment, et	ces such	as unusual n	nai	ntenance	e costs, library resources, special
Will this course require a special <b>No</b>						
Attach the Course Addition Asses Effectiveness web page at <a href="http://">http://</a>				tec	on the A	Assessment & Institutional
If this course will affect other dep must be attached. The form is lo http://www.atu.edu/registrar/cu	cated on	the Curr	iculum forms	opc s w	ort Form eb page a	for each affected department at

### **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**

CHEDOLE		
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:	Curricul	um Committee				
FROM (Initiating Depa	rtment): Depar	tment of Computer & Info	rmation Science			
DATE SUBMITTED:	6.30.2	6.30.2016				
Title	S	Signature	Date			
Department Head  Dr. David Hoelzeman		Deval I Son	7-le-2011			
Dean  Dr. Neal Barlow  Teacher Education Cour	ncil (if applicable)	Lague (X	else Haylb			
Graduate Council (if app	olicable)					
Registrar  Ms. Tammy Weaver  Vice President for Acade  Dr. Mohammed Abdelr	20100-07-1001-1-001-1-00-1-00-1-00-0	Lucauer	8/10/16			
Course Subject: (e.g., ACC  CSEC  Official Catalog Title: (If of	4233	nber: (e.g., 1003) aracters, indicate Banner	Effective Term: Fall 2017  Spring • Summer I			
Legal Issues in Cybersec	***	aracters, indicate balliler	Title below)			
		es, capitalize all letters — this	s will display on the transcript)			
Will this course be cross-li  Yes No  Will this course be cross-li	sted with another existing	ntly not in the undergradu				
If so, list course subject an	d number.	No				
Is this course repeatable	for additional earned ho	urs? C Yes • No Hov	v many total hours?			
Grading: • Standard Le	etter C P/F	○ Other				
Mode of Instruction (chec	k appropriate box):					
C 01 Lecture	© 02 Lecture/Laborato	ory © 03 Laboratory o	only			
○ 05 Practice Teaching	C 06 Internship/Pract	icum C 07 Apprentices	hip/Externship			
C 08 Independent Study	€ 09 Readings	10 Special Top	ics			
C 12 Individual Lessons	C 13 Applied Instructi					
C 17 Dissertation	18 Activity Course	C 19 Saminar	C 00 0+h 0 r			

Does this course require a fee?	⊂ Yes	How Much?		Select Fee Type
If selected other list fee type:			CONTRACTOR OF THE PROPERTY OF	
☐ Elective	✓ Major	Г	Minor	
(If major or minor course, you m program.)	nust complete the	Request for Pr	ogram Chan	ge form to add course to
If course is required by major/m	inor, how freque	ntly will course	be offered?	
Spring				
For the proposed course, attach entered as they should appear is a. Course subject b. Course number c. Catalog course title d. Catalog description 1. Arkansas Course Transfer 2. Cross-listing 3. Offered (e.g., Fall only, Spi 4. Prerequisites 5. Co-requisites 6. Description 7. Notes (e.g., information notes) 8. Contact Hours if different 9. Fees (e.g., \$36 art fee) e. Section for Name of instructor f. Text required for course g. Bibliography (supplemental red) h. Justification/rationale for the i. Course objectives j. Description of how course me education component should General Education Objectives k. Assessment methods (include l. Policy on absences, cheating, m. Course content (outline of ma	in the catalog)  System (ACTS) co ring only. Do not  ot in description s than lecture (e.g., or, office hours, co eading list) course  eets general educ show how the co slisted in undergra e grading policy w plagiarism, etc.	urse number, if enter if offer co such as course n Lecture three I entact informati ation objectives ourse meets one aduate catalog) ith specific equi	applicable ourse fall and hay be repea hours, labor on (telepho	d spring)  ated for credit) ratory three hours) rne, email)  cluded in the general the objectives contained in
Will this course require any spec		n as unusual ma	intenance co	osts, library resources, special
software, distance learning equi	pment, etc.? <b>No</b>			
Will this course require a special <b>No</b>	classroom (comp	uter lab, smart	classroom, o	or laboratory)?
Attach the Course Addition Asse			d on the Ass	sessment & Institutional
Effectiveness web page at <a href="http://">http://</a>	/www.atu.edu/as	ssessment/		
If this course will affect other de	partments, a Dep	artmental Supp	ort Form for	each affected department
must be attached. The form is lo			eb page at	
http://www.atu.edu/registrar/cu	arriculum forms.	onp. N/A		

## **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
  - o Jus ad bellum
    - United Nations Charter
  - o Jus in bello
    - Hague Conventions
    - Geneva Conventions
- U.S. Laws
  - o 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

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**

CHEDULE	
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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 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:	С	Curriculum Co	ommittee		
FROM (Initiating Depa	rtment):	Department	t of Computer & Info	ormation Scie	nce
DATE SUBMITTED:		6.30.2016			
Title		Signat	ure		Date
Department Head  Dr. David Hoelzeman		De	wid I Lee	Jen	7-6-201
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Dr. Neal Barlow	a sil /:f a muli a a la la V	AG	fleft Ta	M	THey(C)
Teacher Education Cour	icii (if applicable)				
Graduate Council (if app	olicable)		<del></del>		
Registrar		40	llaule		Cholin
Ms. Tammy Weaver Vice President for Acade	amaia Affaira	<u> </u>	and		8/10/16
Dr. Mohammed Abdelr					
- Trionallinea Abacil	umman				
Course Subject: (e.g., ACC	T, ENGL) Cours	se Number: (	e.g. 1003)	Effective 7	erm: Fall 2017
CSEC	424		2.8., 2003)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	• Summer I
Official Catalog Title: (If of	ficial title exceeds	s 30 characte	are indicate Bannar		, Summer I
Software Security Analys				Title below)	
Banner Title: (limited to 30	characters, includir	ng spaces, cap	italize all letters — th	is will display o	on the transcript)
Software Sec Analysis &					in the transcript,
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C Yes © No	seed With another	CAISTING COO	1130; 1130, 1131 COUTS	e subject and	number.
1	stad with a source	a currentli	-		
Will this course be cross-li		s • No	ot in the undergrad	uate or gradu	iate catalog?
If so, list course subject an	d Hullibel.	,			
Is this course repeatable	for additional ear	ned hours?	C Yes ♠ No Ho	w many total	hours?
Grading: © Standard Le		P/F	○ Other		
Mode of Instruction (checl	appropriate box	):			
C 01 Lecture	02 Lecture/L	.a bora tory	C 03 Laboratory	onlv	
C 05 Practice Teaching	C 06 Internshi	p/Practicum	C 07 Apprentice	ship/Externsh	р
© 08 Independent Study	€ 09 Readings	i	↑ 10 Special Top	pics	
12 Individual Lessons	13 Applied I	nstruction	C 16 Studio Cou	rse	
C 17 Dissertation	18 Activity Co	ourse	↑ 19 Seminar	C	98 Other

Does this course require a fee?	⊂ Yes	No	How Much?		Select Fee Type
If selected other list fee type:					
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Spring					
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m. Course content (outline of ma	terial to	be cover	ed in course).		
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Will this course require a special <b>No</b>			×		
Attach the Course Addition Asses Effectiveness web page at <a href="http://">http://</a>	www.at	u.edu/as	sessment/		
If this course will affect other depmust be attached. The form is lohttp://www.atu.edu/registrar/cu	cated on	the Curr	iculum forms v	ort Form veb page	for each affected department at

# **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** 

Office: Corley

Phone:

**INSTRUCTOR** Email:

**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

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**

CHEDULE		
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

Office of Assessment and Institutional Effectiveness (2015)

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:	Curriculu	m Committee	
FROM (Initiating Depa	rtment): Depart	ment of Computer & Information	n Science
DATE SUBMITTED:	6.30.20	16	
Title	Si	gnature	Date
Department Head  Dr. David Hoelzeman		David L. Consen	- 7-10-701
Dean			1 0 001
Dr. Neal Barlow	0		2 gd/1/2
Teacher Education Cou	ncil (if applicable)	man minimum	1 Hogin
Graduate Council (if ap	olicable)		
Registrar Ms. Tammy Weaver		Accelle	8/10/16
Vice President for Acad	amic Affairs	7.00000000	0/14/6
Dr. Mohammed Abdelr			
J. Monaninea Abaen	aiiiiaii		
Course Subject: (e.g., ACC	T. FNGL) Course Numb	er: (e.g., 1003) Effect	tive Terror Fell 2047
CSEC	4243		tive Term: Fall 2017
'			ring • Summer I
		acters, indicate Banner Title bel	ow)
	sis and Reverse Engineerin	_	
Banner Title: (limited to 30	characters, including spaces	capitalize all letters — this will disp	play on the transcript)
Software Security & Rev	erse En		
Will this course be cross-li	sted with another existing	course? If so, list course subject	t and number
⊂ Yes   No			
Will this course be cross-li	sted with a course current	ly not in the undergraduate or g	graduate catalog?
If so, list course subject an	d number. Yes 🙃 No		
		s? C Yes • No How many	total hours?
Grading: © Standard Le		Other	
Mode of Instruction (checl	( appropriate box):		
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© 05 Practice Teaching	C 06 Internship/Practice	um C 07 Apprenticeship/Exte	rnship
© 08 Independent Study	○ 09 Readings	← 10 Special Topics	
12 Individual Lessons	C 13 Applied Instruction	16 Studio Course	
17 Dissertation	18 Activity Course	€ 19 Seminar	C 98 Other

Does this course require a fee?	C Yes	No	How Much	?	Select Fee Type
If selected other list fee type:					
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entered as they should appear in	n the cat	alog)			
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3. Offered (e.g., Fall only, Spr	ing only.	Do not e	enter if offer o	ourse fa	all and spring)
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<ol> <li>Co-requisites</li> <li>Description</li> </ol>					
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f. Text required for course	, office in	iours, cor	itact iiiioiiiia	tion (ter	ephone, email)
g. Bibliography (supplemental re	ading list	+)			
h. Justification/rationale for the		-1			
i. Course objectives					
<ul> <li>Description of how course me education component should seneral Education Objectives</li> </ul>	show hov listed in u	w the cou undergra	urse meets or duate catalog	ne or mo g)	ore of the objectives contained in
k. Assessment methods (include	grading p	policy wit	th specific equ	uivalents	s for A, B, C)
<ol> <li>Policy on absences, cheating, p</li> </ol>					
m. Course content (outline of ma	terial to b	be covere	ed in course).		
Will this course require any special software, distance learning equip	al resoure ment, et	ces such c.? <b>No</b>	as unusual m	aintenar	nce costs, library resources, speci
Will this course require a special o					
Attach the Course Addition Assess	sment Fo	rm. The	form is locate	ed on th	e Assessment & Institutional
Effectiveness web page at http://w					
f this course will affect other dep	artmento	s a Dena	rtmental Sun	ort For	m for each affected department
must be attached. The form is loc	cated on	the Curri	culum forme	weh nac	ni ioi eacii allected department
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# **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

Office: Corley

Phone:

INSTRUCTOR Email:

**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 Co	mmittee		
FROM (Initiating Depa	artment):	Department	of Computer & Info	ormation Scie	ence
DATE SUBMITTED:	Γ	6.30.2016			
Title		Signatu	ire		Date
Department Head  Dr. David Hoelzeman		De	wid I lo	den	7-6-2016
Dean		700	The same of the sa	011	1 0 2016
Dr. Neal Barlow			1/1/1/1/1/1/	7///	911.11
Teacher Education Cou	ncil (if applicable)		CHILLY	HU _	Hylo
Graduate Council (if ap	plicable)				
Registrar  Ms. Tammy Weaver		411)	laler		Clinti
Vice President for Acad	omic Affairs	- Com	alle		8/10/16
Dr. Mohammed Abdeli					*
- Wolldmilled Abdell	aiiiiaii				
Course Subject: (e.g., ACC	T. FNGL) Cours	se Number: (e	n g 1002)	F.66	
CSEC	429		.g., 1003)		erm: Fall 2017
Official Catalog Title: (If o				Spring	• Summer I
Official Catalog Title: (If o			rs, indicate Banner	Title below)	
Cybersecurity Capstone					
Banner Title: (limited to 30	characters, includir	ng spaces, capit	talize all letters — thi	is will display o	on the transcript)
Cybersecurity Capstone	/Interns				
Will this course be cross-l	isted with another	existing cour	se? If so, list course	e subject and	number.
⊂ Yes   • No				-	
Will this course be cross-li	sted with a course	currently no	t in the undergradu	uate or gradu	ate catalog?
If so, list course subject ar	nd number.	s 🗭 No			3
Is this course repeatable			⊂ Yes ♠ No Hov	w many total	hours?
Grading: © Standard Lo		P/F	○ Other		
Mode of Instruction (chec	k appropriate box	):			
C 01 Lecture			C 03 Laboratory	onlv	
C 05 Practice Teaching	€ 06 Internshi	p/Pra cti cum	C 07 Apprentices	ship/Externshi	p
C 08 Independent Study	○ 09 Readings		← 10 Special Top	ics	
C 12 Individual Lessons	C 13 Applied I	nstruction	C 16 Studio Cour	se	
17 Dissertation	18 Activity Co	ourse	C 19 Seminar	C	98 Other

If selected other list fee type:    Elective
(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)  2. Section for Name of instructor, office hours, contact information (telephone, email)  1. Text required for course  3. Bibliography (supplemental reading list)  1. Justification/rationale for the course
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)  2. Section for Name of instructor, office hours, contact information (telephone, email)  Text required for course  g. Bibliography (supplemental reading list)  1. Justification/rationale for the course
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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)  9. Section for Name of instructor, office hours, contact information (telephone, email)  7. Text required for course  8. Bibliography (supplemental reading list)  10. Justification/rationale for the course
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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)  Assessment methods (include grading policy with specific equivalents for A, B, C)  Policy on absences, cheating, plagiarism, etc.  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 oftware, distance learning equipment, etc.? No  Will this course require a special classroom (computer lab, smart classroom, or laboratory)?  Io  Ittach the Course Addition Assessment Form. The form is located on the Assessment & Institutional ffectiveness web page at <a href="http://www.atu.edu/assessment/">http://www.atu.edu/assessment/</a>

# Syllabus

Department of	of	Computer	&	Information	Science
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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

- 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	11.00	Exercises
1		
2		
3		
4	·	
5		
6		
7		
8	7	
9		
10		
11		
12		
13		
14		
15		

### **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 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 2 // 0	Date
Department Head	1/10/1/1	
Dr. David Hoelzeman	1/ Brief f- do Nous	7-10-2016
Dean		10 10
Dr. Neal Barlow	Jan Jan Ballan	91/2 1/2
Teacher Education Council (if applicable)	CANON WE MENT	1Hy 10
Graduate Council (if applicable)		
Registrar		
Ms. Tammy Weaver	Flixeauli	8/10/16
Vice President for Academic Affairs		
Dr. Mohamed Abdelrahman		

Program Title:	CIP Code:
Associate of Applied Science in Cybersecurity	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. <a href="https://www.dhs.gov/cybersecurity-overview">https://www.dhs.gov/cybersecurity-overview</a>

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

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 atta	ched document
Total number of Semester Hours Required for Graduation:	Can the program be completed in 8 semesters?  • Yes • No
60	If not, provide justification. N/A
List New Courses (Please attach New Course Prop CSEC 1113 Introduction to Networking CSEC 1213 Wireless and Cellular Security	osals):

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 <a href="http://www.atu.edu/assessment/">http://www.atu.edu/assessment/</a>

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

**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

# 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)

ELEG 2130

Digital Logic Design Lab

ELEG 2134

Digital Logic Design

Introduction to Information Systems

CSEC 2113

Foundations of Computer Programming II -

COMS 2203 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:

  <a href="https://www.dhs.gov/cybersecurity-overview">https://www.dhs.gov/cybersecurity-overview</a>. The U. S. Bureau of Labor Statistics includes information that this field is rapidly increasing. The link to this site:

  <a href="http://www.bls.gov/ooh/computer-and-information-technology/home.htm">http://www.bls.gov/ooh/computer-and-information-technology/home.htm</a>. To further support this new program, the following website is to the Comprehensive National</a>

Cybersecurity Initiative: <a href="https://www.whitehouse.gov/issues/foreign-policy/cybersecurity/national-initiative">https://www.whitehouse.gov/issues/foreign-policy/cybersecurity/national-initiative</a>. 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%

PO2: Understand wireless security and cellular technologies	L01: Analyze current industry standards L02: Assessment of wireless and cellular systems and security risks	Information Systems  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 LO2: 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 LO2: 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 fo Improvement

Indirect and Direct Measures Alignment	Department of Computer & Information Science utilizes FCAR (Faculty Course Assessment Report) and CABS (Course Assessment Binder)  Graduates will complete exit survey in the CSEC 4983. A survey	(Course Assessment Binder). Assessment data will be submitted annually.  Graduates will complete exit survey in the CSEC	Review and analyze departmental assessment data.  Analyze survey results	Course, instructional or program changes  Program and Curriculum changes
	will be sent to those providing an internship.	4983. A survey will be sent to those providing an internship.	*	
	Con	tinuous Improvement	Plan	
Sun	nmarize each catego	ory from assessment re	esults and conclusion	ns.
Categories of Impro				
A C. 1		Recommended Change	S:	
B. Instruction and Curriculum		Course Embedded Student Learning Outcome Assessment		
C A		Course Embedded Student Learning Outcome Assessment		
D. Program Qua	,	Evaluate assessment from Student Learning Outcome results 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.

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

The Department of Computer & Information Science is proposing an <b>Associate of Applied Science</b> in <b>Cybersecurity.</b> This degree requires math 2914. MATH 2914 is required during the spring of the Freshman year.	Department Affected: MATHEMATICS	This department supports	☐ does not support
MATH 2914 is required during the annual state of the second state	Comments:	the change.	
	This degree requires math 291	e is proposing an <b>As</b> s 4. MATH 2914 is rec	sociate of Applied Science guired during the spring of the

Department Head Signature:

Date: 8-9-16

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

Department Affected: Electrical Engineering	This department	
	the change.	
Comments:		
The Department of Computer & Information Science <b>Cybersecurity</b> . This degree requires ELEG 2130 and fall of the Sophomore year.		

Department Head Signature

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

Department Affected: Department of English and World Languages Comments:	This department Supports the change.	☐ does not support
The Department of Computer & Information Scier Cybersecurity. This degree requires the 35 hour	nce is proposing an <b>Ass</b> s of required general e	sociate of Applied Science in 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 0 //	Date
Department Head	11 11 11 11	Date
Dr. David Hoelzeman	Mary Valley Ver	7-6-2016
Dean	The state of the s	1 6 6016
Dr. Neal Barlow	Jehn College	91 11
Teacher Education Council (if applicable)	Jagin WILLOW	Hug/b
Graduate Council (if applicable)		
Registrar		
Ms. Tammy Weaver	Lacalle	8/10/16
Vice President for Academic Affairs		
Dr. Mohamed Abdelrahman		

Program Title:	CIP Code:
Bachelor of Science in Cybersecurity	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 additions or modifications, proposed cost, faculty equipment, purpose, and any other important in	v resources, library resources, facilities and

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. <a href="https://www.dhs.gov/cybersecurity-overview">https://www.dhs.gov/cybersecurity-overview</a>

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?

F Yes No

120

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 <a href="http://www.atu.edu/assessment/">http://www.atu.edu/assessment/</a> 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  $\mathbf{N/A}$ 

Description of Resources

The current resources (computer lab, virtual machines, software, etc.) are adequate for the first and second  $(1^{st}/2^{nd})$  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 (2<sup>nd</sup>) year of program

New instructional equipment and costs - none through second (2<sup>nd</sup>) 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 Managemen
	milorination systems kisk Managemen

### Upper Level Elective

Opper Level	Liettive
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: <a href="https://www.dhs.gov/cybersecurity-overview">https://www.dhs.gov/cybersecurity-overview</a>. 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: <a href="https://www.whitehouse.gov/issues/foreign-policy/cybersecurity/national-initiative">https://www.whitehouse.gov/issues/foreign-policy/cybersecurity/national-initiative</a>. 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: Ne	w 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)
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PO1:	LO1: Evaluate	CSEC 4293 -		High Pass 90-
Protect an	appropriate security measures	Capstone or	Fire for browing	100%
organization's data and assets	L02: Implement	Internship	internship	Pass 70-89%
and assets	appropriate		Wookly montings	
	security measures		Weekly meetings between advisor and	
	and software		student	
			Feedback from	
PO2:	L01: Analyze	CSEC 4213 -	employer	
Implement	current industry	Information	Tests, quizzes,	High Pass 90-
cybersecurity best	standards and	Systems Risk	assignments; hands- on projects	100%
practices and risk	implement	Management		Pass 70-89%
management.	appropriate	genene		
management.	standards	CSEC 4293 -		
	L02: Assessment	Capstone or		
	of systems at	Internship	Reports from	
	system level for		employer providing	
	risk of security breaches		internship	
	breaches		) N/	
			Weekly meetings between advisor and	
			student	
			student	
			Feedback from	
			employer	
PO3:	LO1: Create	CSEC 4243 –	Tosts guinna	
Understand and	appropriate	Software	Tests, quizzes, assignments	High Pass 90-
develop software to	software that	Security	assigninents	100% Pass 70-89%
minimize	meets or exceeds	Analysis and		Pass 70-89%
ulnerabilities.	industry security	Reverse		
	standards	Engineering		
				High Pass 90-
		CSEC 4240 -	Hands-on	100%
		Lab	assignments	Pass 70-89%
		CSEC 4143 -	Tests, quizzes,	High Pass 90-
		Building	assignments	100%
		Secure		Pass 70-89%
		Software		. 300 70 00/0
04:	LO1: Monitor	CSEC 4243 -	Tests, quizzes,	High Pass 90-
	networks		assignments	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 LO2: 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
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.
Summarize each cat	Continuous Improvement Plan tegory from assessment results and conclusions.
Categories of Improvement:	Recommended Changes:
A. Student Learning	Course Embodded St. J.
B. Instruction and Curriculum	Course Embedded Student Learning Outcome Assessment
C. Assessment	Course Embedded Student Learning Outcome Assessment
D. Program Quality	Evaluate assessment from Student Learning Outcome results
E. Budget	Evaluate changes from Student and Employer Satisfaction Surveys  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.

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

Department Affected: MATHEMATICS	This department	☐ does not support
Comments:	the change.	— чоез пос зарроге
The Department of Computer & Information S <b>Cybersecurity</b> . This degree requires math 29 spring of the Freshman year. MATH 3153 is re	114 and MATH 2152 MAT	11.004.41

Department Head Signature:

Date: 8-9-16

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

Department Affected: Electrical Engineering Comments:	This department supports the change.	☐ does not support
The Department of Computer & Information Science Cybersecurity. This degree requires ELEG 2130 and fall of the Sophomore year.	e is proposing a <b>Bach</b> d ELEG 2134. The co	nelor of Science in urse will be required during the

Department Head Signature:

Date: Les

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

Department Affected: Department of English and World Languages	This department supports the change.	□ does not support	
Comments:	_ in onunger		
The Department of Computer & Information Science Cybersecurity. This degree requires the 35 hours of	e is proposing <b>a Bac</b> l of required general e	helor of Science in ducation courses.	

Department Head Signature: Date: 8-9-14