Fiscal Unit/Academic Org	UG International Studies Prog - D0709
Administering College/Academic Group	Arts and Sciences
Co-adminstering College/Academic Group	
Semester Conversion Designation	New Program/Plan
Proposed Program/Plan Name	Information Security
Type of Program/Plan	Undergraduate minor
Program/Plan Code Abbreviation	INFOSEC
Proposed Degree Title	Information Security

Credit Hour Explanation

Program credit hour requirements		A) Number of credit hours in current program (Quarter credit hours)	B) Calculated result for 2/3rds of current (Semester credit hours)	C) Number of credit hours required for proposed program (Semester credit hours)	D) Change in credit hours
Total minimum credit hours required for completion of program				16	
Required credit hours offered by the unit	Minimum			6	
	Maximum			6	
Required credit hours offered outside of the unit	Minimum			4	
	Maximum			4	
Required prerequisite credit hours not included above	Minimum			14	
	Maximum			16	

Program Learning Goals

Note: these are required for all undergraduate degree programs and majors now, and will be required for all graduate and professional degree programs in 2012. Nonetheless, all programs are encouraged to complete these now.

Program Learning Goals

- Students acquire an understanding of the nature of cyber threats to the security, integrity, and availability of digitalized information as well as of the laws, regulations and standards designed to counter these threats.
- Students understand such information security procedures as intrusion detection, risk management framework management, penetration testing and identity and access management through the analysis of case studies and personal reflection.
- Through exposure to computer programming coursework, students develop an understanding of computer network security issues.
- Students gain an understanding of the social contexts in which information security issues arise, including organized crime, inter-state relations and insider threats.

Assessment

Assessment plan includes student learning goals, how those goals are evaluated, and how the information collected is used to improve student learning. An assessment plan is required for undergraduate majors and degrees. Graduate and professional degree programs are encouraged to complete this now, but will not be required to do so until 2012.

Is this a degree program (undergraduate, graduate, or professional) or major proposal? No

Program Specializations/Sub-Plans

If you do not specify a program specialization/sub-plan it will be assumed you are submitting this program for all program specializations/sub-plans.

Pre-Major

Does this Program have a Pre-Major? No

Attachments

- InfoSecProposal_Final.docx

  (Program Proposal. Owner: Mughan,Anthony)
- IS 3702_Syllabus_ Revised.docx: syllabus

  (Other Supporting Documentation. Owner: Mughan,Anthony)
- IS 4702_Syllabus_Revised.docx: syllabus

  (Other Supporting Documentation. Owner: Mughan,Anthony)
- Gable.docx

  (Other Supporting Documentation. Owner: Mughan,Anthony)
- CSEConcurrenceII.docx

  (Support/Concurrence Letters. Owner: Mughan,Anthony)
- InfoSecAdvising Sheets_Revised.pdf

  (Semester Advising Sheet(s). Owner: Mughan,Anthony)
- Memo about revised proposal.docx

  (Letter from Program-offering Unit. Owner: Mughan,Anthony)

Comments

- See 1-16-18 email to T Mughan. *(by Vankeerbergen,Bernadette Chantal on 01/16/2018 03:52 PM)*
- As part of this request, two new courses have to be approved INTSTDS 3702 and INTSTDS 4702. A syllabus for each of them is attached. *(by Mughan,Anthony on 12/19/2017 11:05 AM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Mughan,Anthony	12/19/2017 11:05 AM	Submitted for Approval
Approved	Mughan,Anthony	12/19/2017 11:06 AM	Unit Approval
Approved	Haddad,Deborah Moore	12/19/2017 03:13 PM	College Approval
Revision Requested	Vankeerbergen,Bernadette Chantal	01/16/2018 03:52 PM	ASCCAO Approval
Submitted	Mughan,Anthony	03/22/2018 03:57 PM	Submitted for Approval
Approved	Mughan,Anthony	03/22/2018 04:06 PM	Unit Approval
Approved	Haddad,Deborah Moore	03/23/2018 05:01 PM	College Approval
Pending Approval	Nolen,Dawn Vankeerbergen,Bernadette Chantal Oldroyd,Shelby Quinn Hanlin,Deborah Kay Jenkins,Mary Ellen Bigler	03/23/2018 05:01 PM	ASCCAO Approval

MEMO

To: SBS Curriculum Committee
From: Anthony Mughan

Re: Revised Info. Sec. minor
Date: 3/21/2018

Dear Committee Members,

This note is intended as a guide to the changes you requested to the International Studies Information Security minor proposal that the committee initially reviewed on January 9 of this year. Dealing with them in the order they appear in Bernadette's memo to me after this initial review, I'll simply enumerate the changes made without comment.

1) As the committee noted, the CSE courses required in the minor have different prerequisites in the Course Catalog (where they apply mainly to CSE majors) and the IS proposal. This is because CSE determined that the prerequisites were appropriately relaxed a little for Information Security minors. See the updated concurrence (CSEConcurrenceII from Rafe Wenger of CSE. The revised proposal also details how advisors will manually enroll Information Security minors through a procedure called a prerequisite override. This procedure was adopted after discussion with Michael Gable, Senior Assistant Registrar. The memo from him is attached to this proposal (Gable.docx). Both the department and ASC minor fliers have been updated with language indicating the student must contact an International Studies advisor to gain entry to the CSE 2501 and CSE 4471 classes. See "Revised Advising Fliers" attached to this proposal.

2) The proposal has been revised so that 4 hours in the proposed minor can be counted toward the IS major.

3) In addition to its approval of the Information Security minor as a whole and the inclusion of two CSE courses (2501 and 4471) as required of all students taking it, CSE has now also offered its concurrence with the two IS courses (3702 and 4702) that have been designed explicitly for the minor. See CSE's original concurrence statement together with CSEConcurrenceII.

4) All the requested changes in the syllabus for IS 3702 have been made and CSE concurrence for the course has been obtained.

5) CSE concurrence for IS 4702 has been obtained. In addition, the syllabus has been purged of typos, grammatical mistakes and various redundancies. Lastly, the level of difficulty of the course has been raised by increasing the number of writing assignments in it (12 instead of 4) and requiring students to take a final examination.

PROPOSAL FOR A MULTIDISCIPLINARY B.S.
MINOR IN INFORMATION SECURITY

To: ASC Curriculum Committee

From: Anthony Mughan, Director, Undergraduate International Studies Program (UISP)

Date: March 13, 2018

Background

Human knowledge is based on information and the data generated from it. As today's world has become more complex, technology more advanced and states more interdependent, ready-to-hand information on all facets of human existence is unprecedented in its diversity and volume. Moreover, whether it relates to national economic strategy, corporate product development, advanced weapons research, or whatever, much of this information has great economic and/or strategic value to competitors as well as its owners. Protecting information, therefore, is, and has long been, a major preoccupation for a wide array of actors, including governments, research agencies, institutions of higher education, corporations, and marketers. Their goals include not only keeping it safe from competitors, but also maintaining its integrity against efforts to corrupt it as well as ensuring its availability to targeted consumers in the face of ransomware or denial of service attacks. In one sense, of course, nothing is new here. Nations, corporations and private individuals have long employed technology, spies and insiders to steal intellectual property, ranging from customer/sales data to fully articulated weapons system blueprints. Those at the receiving end of such activities have, needless to say, responded by going to great lengths to protect their assets.

Thus, there is nothing new in the need to keep certain information secure, but what is new is that today's world has witnessed perhaps unprecedented change in the information security environment. While the filing cabinet, lockbox and safe remain important means of storing physical manifestations of information, more and more the means of storage is digital (whether local or in the Cloud) which means that it can be accessed remotely. This makes for a very different, and challenging, information security environment. Digitalized personal, private and public systems have become unprecedentedly interconnected and at the same time cheap, adaptable technology is now readily available to an array of national and international actors intent on breaching information defences for personal or national advantage. Immense damage and disruption can ensue. For example, basic infrastructure (power, water, food production, transport, and the like) is increasingly managed digitally, making effective information security a matter of national survival as well as security. The stakes for individuals can also be high. Breaches of their privacy may go undetected for some time and the harm done to them may be all the more severe for this delay.

For all these reasons, protecting the integrity of systems that collect, house and transmit information and data has become an unprecedentedly complex preoccupation for many in the modern, "internet-enabled" world.

Rationale

Information security is not only a practice, but also an emergent and increasingly diverse field of academic study. Lying at the heart of the data protection enterprise commonly known as cybersecurity, the study of information security addresses broad issues relating to the confidentiality, integrity and availability of information and data. Topics covered include risk and its management, ethics, law, policy and education. In this sense, the study of information security functions as a necessary background to more technical discussions of the mechanics of data protection once digitalized. Generally known as cybersecurity, these discussions focus largely on the role of computers and computing in promoting information security. Thus, the just-introduced bachelor's degree in cybersecurity at the University of Akron promises that "(s)tudents in the cybersecurity track will learn about computer network configuration, computer network and data security, network intrusion prevention and detection, as well as computer networking forensics and digital forensics" (*Akron Beacon Journal*, June 21, 2017).

The minor that we are proposing starts from the premise that the information security enterprise is about more than just computers and computing. At a minimum, core issues relating to the confidentiality, integrity and confidentiality of information and data need to be addressed and understood, albeit perhaps as a prelude to a more specialized focus on the mechanics of keeping information safe once digitalized. But this proposed minor also recognizes that understanding and countering challenges to information security must take account of the larger social, economic and security environment in which threats emerge and crystallize. It is, in other words, a necessarily multi-disciplinary endeavor. Cybersecurity educators widely acknowledge that "(h)acking is a crime that involves creativity, an understanding of human behavior, and expertise in the full range of endeavors that involve computers." Thus, "even for institutions still focused mainly on teaching (computer) code, extensive worker shortages mean that cybersecurity graduates will find jobs, especially if they come with a solid liberal-arts education. Companies are accustomed to taking entry-level workers with raw ability and teaching them additional skills specific to their jobs" (*Chronicle of Higher Education*, March 23, 2017).

Ohio State is well-placed to offer a first-class minor in Information Security because of the faculty expertise and the breadth and depth of relevant courses on which it can draw. Moreover, all involved in the new minor will be better off for its being in existence. Take the University itself, for example. With the minor's topicality and profound implications for personal and national security, as well as for our understanding and management of patterns of international cooperation and conflict, it amply fulfils one of the core missions of The Ohio State University, which is to create and discover knowledge to improve the well-being of our state, regional, national and global communities. The student body also has the potential to draw great benefit from it. The minor has been designed with the curricular needs of the multi-disciplinary International Studies program in mind, and especially those of its students choosing the BS *Security & Intelligence* specialization. It should, however, also appeal to students across the University, and especially those in the Colleges of Business and Engineering. In addition, at the

same time as enriching the curricular choices available to undergraduate students, the minor could well help prepare them better for the labor market after graduation or for graduate work in high-quality programs like Carnegie-Mellon's *Master of Science in Information Security Policy and Management* or Johns Hopkins University's *Master of Science in Security Informatics*.

Curriculum

The proposal is for a 16-hour multi-disciplinary minor in Information Security. All students will take four required courses, which must be passed with a grade of C-, or higher. The first (CSE 2501) is a general introduction to the major social, ethical and professional issues involved in computing. Then comes another general introductory course, this time on the subject of information security management. Students have to pass both these introductory courses to be able to proceed to take the two remaining required courses CSE 4471 and INTSTDS 4702. CSE 4471, in turn, is a prerequisite for INTSTDS 4702 and they introduce students to the study of computer networks and data security on the one hand and they cover strategies, processes, and tools aimed at preserving the confidentiality, integrity and availability of information and the systems used to store and process it on the other. The remaining six credit hours will be satisfied by choosing two courses from a set of electives that essentially places the pursuit of information security in a broader economic, social and security context involving considerations of espionage, global crime, ethical dilemmas, and the like. To be precise, the proposed curriculum is:

Required Courses (10 hours)

Computer Science and Engineering 2501: Social, Ethical and Professional Issues in Computing (1 credit hour) (Students must have the permission of an IS advisor to enroll in this course.)
International Studies 3702: Herding Cyber Cats: Information Security Management (3 credit hours)
Computer Science and Engineering 4471: Information Security (3 credit hours) (Students must have the permission of an IS advisor to enroll in this course)
International Studies 4702: Case Studies in Information Security (3 credit hours)

Electives (6 hours)

Communication 3332: Risk Communication (3 credit hours)
Computer Science and Engineering 5351: Introduction to Cryptography (3 credit hours)
Computer Science and Engineering 5473: Network Security (3 credit hours)
International Studies 3700: Introduction to Intelligence (3 credit hours)
International Studies 3701: Introduction to Homeland Security (3 credit hours)
International Studies 5191: Internship (3 credit hours)
Linguistics 3801: Code Making and Code Breaking (3 credit hours)
Linguistics 3802: Language and Computers (3 credit hours)
Public Affairs 4000: Public Policy Evaluation (3 credit hours)

Sociology 5525: Global Criminology (3 credit hours)

Course Synopses

Required

Computer Science and Engineering 2501: *Social, Ethical and Professional Issues in Computing*	Social, ethical, and professional issues facing computing professionals; ethical principles; discussion of case studies.	Prereqs: CSE 2122 or CSE 2123 or CSE 2231, and a Gen Ed Writing Level 2.

International Studies 3702: *Herding Cyber Cats: Information Security Management*	Focus on information security governance tools and processes. Students will learn the basic structures and activities used by Information Security professionals to manage information security and cyber risks	Prereq: None

Computer Science and Engineering 4471: *Information Security*	Introduction to security of digital information; threats and attacks; regulations; risk management; attack detection and response; cryptography; forensics; technical training and certifications	Prereq: CSE 2122 or CSE 2123 or CSE 2231

International Studies 4702: *Case Studies in Information Security*	This course will provide students with a deeper understanding of core elements of Information Security through review and analysis of real-world case studies, security frameworks,	Prereqs: INTSTDS 3702, and CSE 4471

	annual trend/survey reports and related materials.	

Electives

Communication 3332: *Risk Communication*	Students will learn how to plan, implement and evaluate a risk communication effort. Message design is an integral part of this class.	Prereq: Not open to students with credit for 632.
Computer Science and Engineering 5351: *Introduction to Cryptography*	Foundations of cryptography, mathematical formulations/proofs of security goals; theory and practical constructions of encryption schemes, MACs, digital signatures; zero-knowledge proof systems; cryptographic protocols.	Prereqs: CSE 2331 (680), CSE 5331, Math 4573 (573), or Math 4580 (580), and Stat 3460 (427) or 3470.
Computer Science and Engineering 5473: *Network Security*	Security threats and services, elements of cryptography, protocols for security services, network and internet security, advanced security issues and technologies.	Prereq: CSE 3461 (677) or CSE 5461.
International Studies 3700: *Introduction to Intelligence*	Comprehensive introduction to the gathering, analysis, and use of military and political intelligence in a number of countries.	Prereq: None.
International Studies 3701: *Introduction to Homeland Security*	Comprehensive overview of U.S. homeland security. Threats from natural disasters, terrorism, and other domestic and external sources will be studied, as will programs and technologies involved in disaster prevention and response.	Prereq: Soph standing or higher.
International Studies 5191: *Internship*	Opportunity to gain knowledge of the policy process in a local,	Prereq: GPA 3.0 or above, and Jr. or Sr. or Grad

		national international or government agency.	standing. Graded S/U.
	Linguistic 3801: *Code Making and Code Breaking*	Introduction to old and new technology associated with codes and code-breaking and the ways in which it has impacted people's lives.	Prereq: None
	Linguistic 3802: *Language and Computers*	Introduction to human language technology, explaining the computational and linguistic principles behind such familiar technologies as web search, machine translation, and spelling correction.	Prereqs: Soph standing or above. GE quant reason math and logical analysis course.
	Public Affairs 4000: *Public Policy Evaluation*	The purpose of this course is to develop and apply research design and analytic methods to public policy evaluation. The course will enable students to design and perform policy evaluations focused on policy processes and outcomes, using both qualitative and quantitative data.	Prereqs: PubAfrs 3000, Stat 1350 or above, and Econ 2001.01 or equiv, or permission of instructor.
	Sociology 5525: *Global Criminology*	Provides students with an introduction to global crime from a criminal justice perspective.	Prereq: Jr., Sr. or Grad standing, or permission of instructor or department.

The Department of Computer Science and Engineering determined that the prerequisite requirement for CSE 2501 and CSE 4471 need not be as stringent for IS minors as for CSE majors. It therefore specified a set of requirements for these two courses that are not the same as those found in the University's Course Catalog. See the attached concurrence statement from Professor Rephael Wenger. Upon consultation with Senior Assistant Registrar Michael Gable, it was concluded that the most appropriate way to enroll students would be for an International Studies advisor to check the student's Advising Report to confirm that the modified prerequisites had been taken. Enrollment would then be accomplished through a prerequisite override. See attached note from Michael Gable.

This minor has been planned as an addition to the list of minors approved for students pursuing

the BS version of the International Studies major. However, it will also be open to all members of Ohio State's undergraduate student body. Up to four hours of the proposed minor may count toward the IS major. Two of the courses required in this minor (INTSTDS 3702 and INTSTDS 4702) are being submitted for approval at the same time as is the minor as a whole. All its elective courses are approved and already on the books; they are also generally taught by faculty in the departments offering them. Students must maintain a C average in the minor, and no grade lower than C- will count towards the minor.

Administration

Although this minor is a joint venture with Office of the Chief Information Officer, the academic home of this minor is the Undergraduate International Studies Program and it will be listed in the OSU Bulletin as "a multidisciplinary minor offered by the Undergraduate International Studies Program." Individual departments will not be listed so as to allow for the addition and subtraction of courses as circumstances in the contributing units change and/or as new units choose to list courses in the minor. To declare a minor, students will meet with a UISP advisor, with whom they will plan their minor program. Proposed curriculum changes to the minor will be discussed by the Steering Committee that created it ((Anthony Mughan, Director of International Studies, Helen Patton (Chief Information Security Officer), and Steve Romig (Director-Security Advisor)) and referred to the UISP Oversight Committee for approval.

Departments wishing to propose courses for the Information Security minor should submit the following to the UISP Director:

- A fully articulated syllabus for the course(s);
- A statement (two pages maximum) describing how the proposed course(s) would add to the Information Security minor;
- A description of the history of the proposed course – i.e., is it new? How many times has it been offered before and how often will it be offered in the future?
- A short biography of the faculty member who will have primary responsibility for teaching the course

All the courses that figure, now or in the future, in the proposed minor will have to share the characteristics of being offered regularly, preferably once a year but no less than once every two years.

Competition

In the state of Ohio, a number of community colleges (e.g., Columbus State and Stark State) have two-year cybersecurity programs and Kent State University offers a post-secondary certificate in Computer Forensics and Information Security. As for four-year degrees, three universities offer a major in the general area of cybersecurity, all of which have an overwhelming computer science emphasis. Ohio State offers an Information Security focus within its BS in Computer Science and Engineering, the University of Akron has just introduced a BS degree in cybersecurity, and Tiffin University offers a BS in Cyber Defense and Information Assurance.

A good number of similar programs can be found in surrounding states. The University of Charleston in West Virginia, for example offers a BS in Cyber Security, while the University of Pittsburgh is similar to Ohio State in that it has a Networks and Security specialization within its BS in Information Sciences. The state of Michigan has a number of programs, including an Information Assurance major at Eastern Michigan University and a BS in Cybersecurity and Information Assurance at the University of Michigan-Dearborn. A fuller listing can be found at *cyberdegrees.org*.

What distinguishes our proposed Information Security minor from these other programs is its multi-disciplinary character, its goal of placing the study of information security in its economic, social and security context as well as within the broader framework of a first-class liberal arts education. For those who wish to pursue a career in cybersecurity, it is designed to provide a solid conceptual and technical foundation for the acquisition of the advanced computer skills that they will need.

Expected Student Enrollment

Year 1: 15 students

Year 2: 30 students

Year 3: 50 students

Implementation of Proposed Minor

Letters of concurrence from contributing departments have been submitted with the original PACER proposal. It is hoped that the proposal will be approved by both ASC Curriculum Committee and CAA by the end of the 2018 Spring semester so that implementation will be possible in Autumn 2018.

Questions regarding this proposal should be addressed to Anthony Mughan, 33 Townshend Hall, 1885 Neil Avenue, CAMPUS; his telephone number is 292-9657 and his e-mail address is mughan.1@osu.edu.

International Studies 3702
Herding Cyber Cats: Information Security Management
Spring 2019

Instructor

Helen Patton

Chief Information Security Officer, Enterprise Security, Office of the CIO

220F Mount Hall

Patton.91@osu.edu

(614) 292-7831

Office Hours: By appointment

Class Time: Tues/Thurs 5:30 – 6:50

Location/Room: TBD

Contact Hours: 160min/week

Course Description

This hands on course will focus on information security governance tools and processes. Students will learn the basic structures and activities used by Information Security professionals to manage information security and cyber risks which threaten us as individuals and organizations. This applied knowledge will enable students to understand the context of information security risks in its broader organizational, political and societal contexts.

Course activities will include organizational and threat analysis, creation of continuity, threat mitigation plans, analysis of industry standards and frameworks, and investigation of cyber laws and regulations.

This is a 3 Credit Hour course, lasting 14 weeks, offered in Spring of each year. There are no pre-requisites for this course. There is no assigned textbook. Instead there will be weekly readings drawn from publicly available sources.

Course Goals

By the end of this course, you should be able to understand:

- Types of cyber security threats to individuals and organizations
- Current laws, regulations and standards prevalent in this discipline
- How Security programs and tools work to mitigate the impact of cyber threats to an organization
- The role people, processes and tools play in combating cyber threats
- How to protect yourself from common cyber threats

Course Topics

- Information Security Risk Management Intro - The Confidentiality-Integrity-Availability (C.I.A.) triad, and the Privacy 4th domain
- Security Threats – Nation State, Organized Crime, Hacktivists, Insider Threats
- Security Frameworks – discussion of standard frameworks, how they relate to managing security
    - Assess, Implement, Monitor, Respond
    - NIST, ISO, CSA, FISMA
- Data Management Planning
- Governance lifecycles and maturity management
- Laws and Regulations – HIPAA, FERPA, GLBA, GDPR, etc.
- Organizational Policies and Strategies – Acceptable Use, Data Management Policies, and Training Options
- Assessing Risk in an Enterprise – where to focus efforts, where to accept risk
- Business Continuity and Disaster Recovery planning for people, process and tools
- Stakeholder Engagement, reporting and metrics for Risk
- Emerging trends: Cloud, Internet of Things (IOT), Big Data, Digital Identities
- Strengths and weaknesses of Security accreditation and certification

Required Readings

Students will be expected to read all materials (freely available online readings, case studies, policies and other texts) assigned by the instructor. Their knowledge and understanding of the material will be evaluated through the course journal, presentation, written assignments and in class discussions.

Students will be expected to stay abreast of current events related to Information Security. This can be readily done by (e.g.) a daily review of online newspapers, e.g. *The New York Times*, etc. and online magazines e.g. *https://www.csoonline.com/*. Students will be introduced to sources the first week of class. Student knowledge and comprehension of current events will be evaluated through participation in class discussions. For each class session, students should be prepared to share with the class the current event that has occurred within the past few days that they think is particularly noteworthy.

Course Strategy and Structure

The course will provide a broad overview of Information Security management as it has developed in recent decades. However, the subject matter of this course is constantly evolving. As such, considerable attention will be given to discussing current events and case studies during the course. As needed, the instructor will adjust the schedule of topics to be discussed during the course, to take advantage of changing circumstances and contemporary issues. The course schedule might also be modified to take advantage of the unforeseen availability of guest experts.

The course will employ a number of learning mechanisms to accomplish the course objectives, including:

- Lectures by the course instructor
- Lectures by guest speakers
- Discussions of various topics and issues, guided by the instructor and/or students; and
- Presentations by students

Course Assignments/Grading

Grades will be assigned according to the following scheme:

Evaluation	Description	Points	Due	% of Grade
Personal Threat Analysis	Identify major activities (e.g. attending class, student group participation, employment). Create threat matrix for these activities, including compensating controls	20	Week 4	10
Create a Data Management Plan	Understand and document what data you use, how it is handled, how it is regulated, who can access it, and how to protect it.	30	Week 9	15
Create a BC plan	Create a business continuity plan for a hypothetical business function	30	Week 12 & 14	15
Create a Personal Learning Plan	Create a learning plan for furthering the students' security understanding and experience	20	Week 13	10
Reflection Journal	A weekly diary reflecting	10	Week 6 & 14	5

	questions and observations on readings, class exercises and assignments.			
Cyber Law/Regulation Presentation	Depending on class size, a group or individual presentation on the assigned regulation, including history, authority, components, pros/cons of regulation	40	TBD	20
Participate in Tabletop exercise	Using the previously created BC plan, participate in a table top exercise to validate the quality of the plan.	10	Week 13	5
Table Top Lessons Learned	A formal report to outline opportunities to improve the Business Continuity Plan, and reflect on the Table Top Exercise itself.	30	Week 14	15
Attendance		10	All	5
Total Points In Course		**200**		

Grading Scale

93-100%	A
90-92%	A-
87-89%	B+
83-86%	B
80-82%	B-
77-79%	C+
73-76%	C
70-72%	C-
67-69%	D+
60-66%	D
0-59%	E

Course Policies

Attendance and Participation

Attendance will be recorded for each class meeting. Failure to sign the attendance sheet could lead to the loss of attendance points.

Please let the instructor know before class or within 48 hours of missing the class (via email is fine). Additionally, if you miss a class you are responsible for getting notes and information missed from your fellow classmates.

Writing

All assignments to be written in 12-point font with 1-inch margins. Everything should be double-spaced and should always include a title, your name, the date, and the course. Writing is a tool that allows us to express ourselves throughout our lives. If you need assistance, do not be afraid to ask your instructor or consult a university resource, such as the Writing Center, which offers free tutorials on writing

Make-up Presentations

Make-up presentations will be arranged for university-excused or unavoidable circumstances (e.g., deaths, personal/family illness and emergencies) with prior notification or written verification within 72 hours of your absence. If you are not present in a class during an exam or presentation, and you do not have the proper documentation, you will not be allowed to make it up.

Late Work

Assignments should be handed in on time. However, we understand that situations occasionally come up. We are generally not concerned if an assignment is a few hours late, but if your assignment is more than a day late it will be graded for full credit only in situations where (1) the assignment was late due to unavoidable circumstances and (2) you let the instructor know about your situation within 48 hours of missing the deadline. If you do not turn something in and you don't communicate with your instructor within 48 hours of missing the deadline, you will receive zero points.

Grade Disputes

We are happy to revisit grades and to discuss the evaluation of your work with you. Grade change requests can be made in-person or via email. Please be ready to outline where you believe you should have received additional points and how many points you should have received.

Plagiarism

All work in this course is to be individually developed. Plagiarism includes using another person's writing without giving them credit, using large verbatim sections of the work of another person or online source (even a public source) or submitting something you have written for another class. If you unsure, please give credit to your source or talk to your instructor about it. Students who plagiarize will be penalized and reported to university officials. You will also receive a grade of zero for the assignment where plagiarism occurred.

Academic Misconduct

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct (http:studentaffairs.osu.edu/infofor students/csc.asp).

Disability Services

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health,chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Statement on Diversity

The Ohio State University embraces and maintains an environment that respects diverse traditions, heritages, experiences, and people. Our commitment to diversity moves beyond mere tolerance to recognizing, understanding, and welcoming the contributions of diverse groups and the value group members possess as individuals. The faculty, students, and staff are dedicated to building a tradition of diversity with principles of equal opportunity, personal respect, and the intellectual interests of those who comprise diverse cultures.

Class Schedule

Week (SP18)	Dates	Topic	Readings (under development)	Assignments Due
Security Strategies and Influences				
1 – Jan 8	Day 1	Course overview & syllabus • Creating a Reflections Journal	Syllabus	None
	Day 2	Finding resources for Information Security – Security communities (Professional and Personal)	Investigate Security Sources	**Bring examples of Security Sources to class**
2 – Jan 15	Day 1	Intro to Cyber Risk Management – the CIA Triad and the role of Privacy	*Target* Use Case The CIA Secret https://www.sagedatasecurity.com/blog/fundamental-objectives-of-information-security-the-cia-triad 11 Simple Ways to Protect Your Privacy	
	Day 2	Creating Data Management Plans for work and personal use • Mid Term Assignment Overview	OSU Data Management Plans Ten Simple Rules for Creating a Good Data Management Plan How to Keep Your Personal Information Secure Data Protection Tips	Presentation: CFAA
3 – Jan 22	Day 1	Security Threats - Nation State, Organized Crime, Hacktivists, Insider Threats *Guest speaker re: Nation State threat	Threat Actor Types Overview of Threat and Risk Analysis	
	Day 2	Creating a Personal Threat Analysis	Creating a Personal Threat Analysis Creating a Threat Profile for your Organization Personal Threat Models	Presentation: HIPAA

4 – Jan 29	Day 1	Cyber Compliance - Laws and Regulations • How difference Business sectors respond to compliance issues	US Cyber Law Summary Cyber Security Regulatory Crackdown RSA Cyber Laws and Responsibilities Data Protection in the United States - Overview	**Personal Threat Analysis**
	Day 2	Risk Tolerance – understanding decision making	Cyber Risk Appetite How to understand your risk tolerance What is Your Risk Appetite? Naomi Klein Addicted to Risk	Presentation: PCI
5 – Feb 5	Day 1	Organizational Policies and Compliance • Difference between policies, standards and procedures • Roles & Responsibilities across an organization	OSU Policies Describing Policies, Standards, Guidelines and Procedures Policy Hierarchy FFIEC IT Examination – Roles & Responsibilities	
	Day 2	User expectations of company management of data	*Equifax* use case *Equifax* case study Executive Expectations Consumer Expectations Millennial Expectations Regulator Expectations	Presentation: GDPR
6 – Feb 12	Day 1	Security Frameworks - Assess, Implement, Monitor & Respond • Understanding when/how standards are used • Understand elements of a framework • Understand value in organizational change	NIST Framework NIST vs. ISO Frameworks	**Reflections Journal (part 1) due**

		management		
	Day 2	Implementing governance lifecycle into Data Management Plans	ISACA Governance lifecycles MITRE Cyber Security Governance	Presentation: GLBA
7 – Feb 19	Day 1	Data Classifications models • What is asset classification • Sensitivity vs. Criticality • Risk vs. Impact	OSU IDP Policy and Data Classifications CISSP Classifying Data	
	Day 2	Classifying Data for Data Management Plans	Berkeley Data Classification Standard USF Sensitivity and Criticality of Data	Presentation: FERPA
8 – Feb 26	Day 1	Emerging Trends in Security – Cloud, IOT, Big Data, Identity Management	*AWS* Use Case MIRAI Botnet Use Case Ecosystem Risk Big Data Risk	
	Day 2	Security's relationship to other corporate functions: Finance, HR, Law, Facilities, Internal Audit, etc.	Internal Audit's role in Cyber Security The role of HR in mitigating Cyber Security threats	Presentation: Ohio Breach Notification
9 – Mar 5	Day 1	Creating a Security Business Case • Why a Bus. Case is needed, when they are used • Elements of a Bus. Case	4 Steps to a Perfect Business Case Building a business Case for Information Security	
	Day 2	Optional Class for questions	Mid Term Exams week	**Data Management Plan Due**
Influencing People and Behaviors				
Mar 12	Day 1	No Class	Spring Break	
	Day 2	No Class	Spring Break	
10 – Mar 19	Day 1	Business Continuity Planning Basics Part 1 • What are BC plan elements	Creating an effective business continuity plan 7 Key elements of business continuity	
	Day 2	Writing a BC Plan *Guest speaker re: BC Planning	12 Attributes of a Successful BC Plan	Presentation: FISMA
11 – Mar 26	Day 1	Business Continuity	BC Scenarios	

		Planning Basics Part 2 • BC Scenarios • Table top exercises	Types of Exercises	
	Day 2	Writing a BC Plan • 3rd Parties • Communications	Crisis Communications BC Plans and 3rd Parties	Presentation: COPPA
12 – Apr 2	Day 1	Security Training and Awareness • Training others • Certifications/Training for practitioners *Guest Speaker re: Training	Importance of Security Awareness Training Security Certifications you should have Cyber Security Certifications	**BC Plan Due**
	Day 2	Class Discussion: Phishing Awareness	FTC Phishing Information	Presentation: ITAR
13 – Apr 9	Day 1	**Participate in Table Top Exercise**		**Learning Plan Due**
	Day 2	**Debrief Table Top Exercise**		
14 - Apr 16	Day 1	Reporting and Metrics for Risk • Strategic vs. management metrics • KGIs, KPIs and KRIs • How to communicate throughout the enterprise	Board Level Cyber Metrics KPIs and KRIs	**Reflections Journal**
	Day 2	More Metrics	Amazon Dashboard	
Apr 23	Day 1	Optional Class for questions	Final Exams Week	**Table Top Lessons Learned and updated BC/DR Plan Due**

International Studies 4702
Case Studies in Information Security

Spring 2019

Short Description

This course will provide students with a deeper understanding of core elements of Information Security through review and analysis of real-world case studies, security frameworks, annual trend/survey reports and related materials.

Instructor

Steve Romig, Office of the CIO

Mount Hall

romig.1@osu.edu

(614) 688-3412

Office Hours: TBD

Class Time: T/Th 5:30-6:50PM, 160 minutes per week

Location/Room: TBD

Course Description

The goal of this course is to provide students who have taken an introductory Information Security course (such as CSE 4471) with a more advanced understanding of the background, terminology, and concepts of Information Security. This will prepare students to engage in deeper study of Information Security and to apply what they have learned in business and technical contexts.

This course will focus heavily on outcomes demonstrating the ability to use knowledge gained in an introductory course, such as developing security requirements from business use-cases, comparing security requirements against implementation reality, and conducting post-incident reviews.

Course material will be drawn from real world events such as Stuxnet, SONY Pictures, Target, and EquiFax; emerging information technologies such as Social Media, Cloud Computing, Big Data and the Internet of Things; and perennial concerns such as privacy, public safety and business considerations.

This is a 3 Credit Hour course, lasting 14 weeks, offered in Spring of each year. There is no assigned textbook: weekly readings are drawn from publicly available sources.

Pre-Requisites

CSE 4471, “Introduction to Information Security”
International Studies 3702, “Herding Cyber Cats: Information Security Management”

Course Goals

By the end of this course, you should have a deeper understanding of the following topics using case studies and real-world examples:

- The application of a variety of security controls to address risk based on real-world examples
- Threats, with a focus on organized crime and nation-states
- Intrusion detection, threat hunting and incident response/investigations
- Penetration testing
- The underground economy
- Vulnerability, patch and related service management areas
- Identity and access management
- Inside threats and user behavior analytics

Edited 03/13/2018

Course Assignments and Grading

Reading

This course includes reading assignments in preparation for most of the lectures which are meant to give background material for the lectures. Students are encouraged to do some additional research on relevant current events to supplement in-class and on-line discussions and their writing assignments. Reading assignments listed in the schedule below are due on the day they are listed.

Grading

Grades will be determined by attendance (10%), a Final Examination (30%), and through regular discussion and short writing assignments (12 papers, 42 pages total), which will account for the other 60% of your grade. The deadline for writing assignments is 5:00 PM on the Friday of the week of the assignment.

Each paper will count for 5.0% of the final grade. See weekly Class Schedule for additional details. Paper requirements will be fully explained in class.

Paper 1	4 Pages	Week 2	Attack graph for “cookies” problem, mitigations, costs.
Paper 2	3 Pages	Week 3	Internet services/data, restrictions/conditions.
Paper 3	3 Pages	Week 5	Benchmarks, system hardening, budget constraints.
Paper 4	2 Pages	Week 6	Ransomware, mitigation, prevention, attack response.
Paper 5	6 Pages	Week 7	Response to malware attacks, response/patching.
Paper 6	3 Pages	Week 8	Identity management, authentication, accountability.
Paper 7	3 Pages	Week 10	Insider threats, detection/prevention/privacy.
Paper 8	4 Pages	Week 10	Kill chains tactics/techniques. Mitigations of attacks.
Paper 9	4 Pages	Week 11	Intrusion detection. Table top exercise analysis.
Paper 10	3 Pages	Week 13	Cloud services. Securing/auditing/authentication.
Paper 11	3 Pages	Week 14	The changing Information Security environment.
Paper 12	4 Pages	Week 14	Reflection paper about what was learned in this class.

Grading Scale

93-100%	A
90-92%	A-
87-89%	B+
83-86%	B
80-82%	B-
77-79%	C+
73-76%	C
70-72%	C-
67-69%	D+
60-66%	D

0-59% E

Grade Disputes

I am happy to revisit grades and to discuss my evaluation of your work with you. Grade change requests can be made in-person or via email. Please be ready to outline where you believe you should have received additional points and how many points you should have received.

Discussions/Participation

Students are expected to discuss the weekly readings and "current events" in class and on-line. Grading for these will be based on the relevance of your comments, the accuracy of your analysis and your application of common security principles and controls.

Writing

I expect all assignments to be written in 12-point font with 1-inch margins. Everything should be double-spaced and should always include a title, your name, the date, and the course. Writing is a tool that allows us to express ourselves throughout our lives. If you need assistance, do not be afraid to ask me or consult a university resource, such as the Writing Center, which offers free tutorials on writing

Attendance and Participation

Attendance will be recorded for each class meeting. Failure to sign the attendance sheet could lead to the loss of attendance points.

You must let me know before class or within 48 hours of missing the class (via email is fine). Additionally, if you miss a class you are responsible for getting notes and information missed from your fellow classmates.

Course Policies

Late Work

Assignments should be handed in on time. However, I do understand that situations occasionally come up that prevent this. I'm generally not concerned if an assignment is a few hours late, but if your assignment is more than a day late I will grade it for full credit only in situations where (1) the assignment was late due to unavoidable circumstances and (2) you let me know about your situation within 48 hours of missing the deadline. If you do not turn something in and you don't communicate with me within 48 hours of missing the deadline, you will receive zero points.

Plagiarism

All work in this course is to be individually developed. Plagiarism includes using another person's writing without giving them credit, using large verbatim sections of the work of another person or online source (even a public source) or submitting something you have written for another class. If you unsure, please give credit to your source or talk to me about it. Students who plagiarize will be penalized and reported to university officials. You will also receive a grade of zero for the assignment where plagiarism occurred.

Academic Misconduct

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct (http://studentaffairs.osu.edu/info_for_students/csc.asp).

Disability Services

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health,chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Statement on Diversity

The Ohio State University embraces and maintains an environment that respects diverse traditions, heritages, experiences, and people. Our commitment to diversity moves beyond mere tolerance to recognizing, understanding, and welcoming the contributions of diverse groups and the value group members possess as individuals. The faculty, students, and staff are dedicated to building a tradition of diversity with principles of equal opportunity, personal respect, and the intellectual interests of those who comprise diverse cultures.

Edited 03/13/2018

Class Schedule

This schedule includes a tentative list of topics, readings and assignment due dates. Reading assignments should be completed before the class session they are listed in, discussion and writing assignments are due a week or two later (details below).

Topic	Day	Details	Assignments
Course Overview	1	Course Overview; syllabus review; beyond the CIA triad; privacy, anonymity, attribution, repudiation	Read: "Beyond the CIA Triad", Jim West (https://isc2usmg.org/images/documents/Beyond_the_CIA_Triad.pdf) Read: "Dilemmas of the Internet Age: Privacy vs Security", Deena Zaru (http://www.cnn.com/2015/02/04/politics/deena-zaru-internet-privacy-security-al-franken/index.html) Discussion: Privacy and security: how do you define these? What's the relationship between the two? (1 week)
Course Overview	2	Concepts and Terminology	Read: "An Inquiry into the Nature and Causes of the Wealth of Internet Miscreants", Paxson et al (http://www.icir.org/vern/papers/miscreant-wealth.ccs07.pdf) Read: "Show Me the Money: Characterizing Spam Advertised Revenue" (http://www.icir.org/vern/papers/ppair-usesec11.pdf) Discussion: Find an example of something security related being shared or sold on the Internet, share it with the class (1 week)
Tools for Thinking About Security	3	Attack trees, attack graphs	Read: Attack Trees, Shneier (https://www.schneier.com/academic/archives/1999/12/attack_trees.html) Read: Attack Graphs (https://blogs.technet.microsoft.com/johnla/2015/04/26/defenders-think-in-lists-attackers-think-in-graphs-as-long-as-this-is-true-attackers-win/) Discussion: What costs are associated with risks and the security controls we use to address them? (1 week) Writing: Create an attack graph for the

			"cookie" problem, indicate possible mitigations and relative costs. 4 pages (1 week)
Risk	4	Overview of Risk	Read: Sample risk assessment, risk assessment template (to be provided)
OSU's Security Policies and Framework	5	Security policies and standards	Read: OSU Responsible Use Policy : https://it.osu.edu/sites/default/files/files-1477502439/responsible-use-of-university-computing-and-network-resources-policy.pdf Read: OSU Data Classification Policy: https://it.osu.edu/sites/default/files/files-1477502242/institutionaldata.pdf Read: OSU Data Elements: https://cybersecurity.osu.edu/system/files/2017/08/30/osuidp-dataelementclassificationassignments.pdf Read: OSU IT Security Policy: https://it.osu.edu/sites/default/files/files-1477502296/itsecurity.pdf
OSU's Security Policies and Framework	6	Information Security Standards	Read: OSU Information Security Standard: https://cybersecurity.osu.edu/system/files/osu.iss.v1.5.pdf Skim: OSU Information Security Control Requirements (ISCR): https://cybersecurity.osu.edu/system/files/osu.iscr.v1.5.1.pdf Writing: classify a given list of data (to be provided), and for each list the services where it can be stored. Also, for a given list of Internet services and data (to be provided) indicate whether that service can be used for that data, under what restrictions/conditions it could be used, and what acceptable alternatives would be. 3 pages (1 week).

OSU's Security Policies and Framework	7	Information Security Standards	Read: OSU ISCR IT1-IT9, selected sample evidence of implementation (to be provided)
OSU's Security Policies and Framework	8	Information Security Standards	Read: OSU ISCR IT10-IT18, selected sample evidence of implementation (to be provided) Discuss: Thoughts on the OSU policies and standards? What is missing? What would you remove? Is there a better approach? How might you go about answering these questions if you don't know? (1 week)
System Security	9	System hardening: CIS and related benchmarks, guides	Read: CIS documentation, especially their Benchmarks. https://www.cisecurity.org/ Read: Sample CIS scan of a Windows desktop (to be provided)
System Security	10	System hardening: CIS and related benchmarks, guides	Writing: Review a sample benchmark report, decide where to spend fake money to address the remaining issues, and get scored against revealed threats, 3 pages (1 week)
System Security	11	Malware case studies	Read: Understanding the Mirai Botnet (https://www.usenix.org/system/files/conference/usenixsecurity17/sec17-antonakakis.pdf) Read: Lenovo (https://www.sans.org/reading-room/whitepapers/casestudies/lenovo-terrible-horrible-good-bad-week-35965) Discussion: Do some research, discuss an example of malware, why you found it interesting, what vulnerabilities (if any) were associated with it. (1 week)
System Security	12	Anti-malware, host-based IDS, related topics	Read: Next Gen Security Software: Myths and Marketing (https://www.welivesecurity.com/2017/02/13/next-gen-security-software-myths-marketing/) Writing: Research ransomware, write a brief summary of why it is a problem now (as opposed to 10 years ago), what mitigations help prevent/handle it, etc. 2 pages (1 week)

System Security	13	Vulnerabilities, scanning, management CVSS, CVE	Read: Common Vulnerabilities and Exploits (CVE, https://cve.mitre.org/) Read: Common Vulnerability Scoring System (CVSS, https://www.first.org/cvss/) Writing: assess the risk of several fictional vulnerabilities (to be provided), including justification for the values chosen. How would this guide your response to malware exploiting that vulnerability? What mitigations might be employed to counter these vulnerabilities if they couldn't be patched right away? 6 pages (2 weeks)
System Security	14	Vulnerability case studies	Read: Everything You Know About the Vulnerabilities Equities Market is Wrong (https://www.lawfareblog.com/everything-you-know-about-vulnerability-equities-process-wrong) Read: Zero Days, Thousands of Nights… (https://www.rand.org/pubs/research_reports/RR1751.html) Read: For Good Measure: To Burn or Not To Burn (https://www.usenix.org/publications/login/summer2017/geer) Discuss: reflect on the readings - should the US expose or hide known vulnerabilities? Can you find other relevant material on this question? (1 week)
System Security	15	Patch management; Asset management; Configuration management; Change management; File Integrity Management	Discussion: Between keystroke logging, session hijacking, password guessing, phishing: which presents the greatest risk to modern systems? How do you protect against this? Are there other authentication related threats? (1 week)
Identity and Access Management	16	Review and discussion of elements of Identity Management through a role playing exercise (exploring authentication, authorization, accountability, single sign-on, multi-factor, password management, access management, and privileged account management).	Read: Designing an Authentication System: A Dialogue in Four Scenes (http://web.mit.edu/kerberos/dialogue.html) Writing: Give your reflections on the in-class "game": what did you learn, what worked and didn't work in the exercise, what changes would you make, etc. 3 pages (1 week)

Threats	17	Threats, Threat Agents	Read: The Landscape of Internet Threats (http://www.icir.org/vern/talks/ThreatLandscape.Brazil.May15.pdf) Read: Recent CrowdStrike (or other) threat reports. The 2013 report was especially interesting to me. Discussion: why might someone want to "attack" OSU's assets (systems, data, accounts…)? How important is that we enumerate/understand *all* of these? What's the difference between defending against nation-state attackers and other threats, such as "hacktivists" or spammers? (1 week)
Threats	18	Nation-state threats	Read: Stuxnet: https://www.wired.com/2014/11/countdown-to-zero-day-stuxnet/ Watch: Stuxnet: Zero Days (the movie) (optional) Read: Kaspersky: https://www.nytimes.com/2017/10/10/technology/kaspersky-lab-israel-russia-hacking.html Discuss: Comment on the readings and find other examples of "nation-state" cyber attacks to compare/contrast with.
Threats	19	Insider Threat, User Behavior Analytics	Read: FBI's Counterintelligence Vulnerability Assessment for Academia Read: CERT Insider Threat readings (https://www.cert.org/insider-threat/) Writing: reflect on Inside Threats. What's easy/hard about preventing and detecting these? What's the relationship between an Inside Threat program and security program? What privacy concerns does this generate? How might this differ between corporations and Universities? 3 pages (1 week)

Attacks, Intrusions, Intrusion Detection/Incident Response/Forensics	20	Kill chains; Tactics, Techniques and Procedures;	Read: Lockheed Martin "Kill Chain" (https://www.lockheedmartin.com/content/dam/lockheed/data/corporate/documents/LM-White-Paper-Intel-Driven-Defense.pdf) Read: Anything on TTP (Tactics, Techniques and Procedures) Writing: Discuss mitigations for three attack patterns (to be provided) 4 pages (1 week)
Attacks, Intrusions, Intrusion Detection/Incident Response/Forensics	21	Security incident and data breach case studies.	Read: Case studies on security incidents (SONY, Target, Home Depot, Equifax) Discuss: find other case studies (preferably not mentioned by others), compare/contrast (1 week)
Attacks, Intrusions, Intrusion Detection/Incident Response/Forensics	22	Intrusion Detection, Incident Response and Hunting table-top exercise	Read: Sample Incident Response Process (to be provided) Writing: Intrusion Detection and Incident Response Tabletop post-mortem: your observations, what worked, what didn't work, suggestions for improvement in the incident response process and in the exercise. 4 pages (1 week)
Attacks, Intrusions, Intrusion Detection/Incident Response/Forensics	23	Penetration Testing: Red, Blue and Purple Teams	Read: Sample pen-test scope document, template and report. Discuss: what are the benefits and short-comings of penetration testing? How can the Red and Blue teams help each other improve? (1 week)
Industrial Control Systems (ICS)	24	Industrial Control Systems, PERA Model	Read: Material from the PERA web site (http://www.pera.net/) Research: Current ICS related incidents Discussion: Reflections on reading/lecture, what's the worst that could happen? (1 week)

Cloud	25	Cloud services and the challenges we face in securing them - assessments and auditing, authentication, monitoring, investigations…	Read: Cloud Security Alliance Guide (https://downloads.cloudsecurityalliance.org/assets/research/security-guidance/csaguide.v3.0.pdf) Read: Security Operations Perspective on Cloud Services (OSU paper, to be provided) Writing: in light of everything discussed so far, where are the challenges in adopting cloud solutions? What Cloud Services are in use at OSU? Any special challenges to the secure use of these services? 3 pages (1 week)
Internet of Things	26	The challenge of securing the Internet of Things.	Read: Zigbee Exploited (https://www.blackhat.com/docs/us-15/materials/us-15-Zillner-ZigBee-Exploited-The-Good-The-Bad-And-The-Ugly-wp.pdf) Read: Dolphin Attack: Inaudible Voice Commands (https://arxiv.org/abs/1708.09537) Read: This Doll May Be Recording What Children Say, Privacy Groups Charge (https://www.npr.org/sections/alltechconsidered/2016/12/20/506208146/this-doll-may-be-recording-what-children-say-privacy-groups-charge) Discussion: In light of what we've discussed this semester and what you know about the Internet of Things, discuss what security controls should be applied to secure the IoT and what new controls might be needed. (1 week)
Trends, the future, roadmaps	27	The past and future of Information Security, with particular attention to what's changing and what's not and how well we can predict future trends.	Read: Verizon data breach report 2009, plus the current Verizon data breach report Writing: pick two annual reports from the same source, three years apart (preferably one recent, one from three years ago). For the predictions made in the older report, which have come true, which haven't? Reflect on this and the ramifications for making plans for future security needs. 3 pages (1 week)
Summing up, loose ends	28	TBD	Writing: reflect on the main things you learned from this class. 4 pages (1 week)

From: Gable, Michael
Sent: Thursday, March 15, 2018 11:23 AM
To: Mughan, Anthony <mughan.1@polisci.osu.edu>
Cc: Guthrie, Emily J. <guthrie.186@osu.edu>
Subject: RE: Minor in Information Security, International Studies 3702 and 4702

Hi Tony,

Writing back regarding our phone conversation this afternoon. To summarize, you and Rich Meltz called me this morning to discuss this issue. You've worked with the CSE department to identify options to the prerequisite courses currently listed for CSE 2501 and 4471, and are prepared to enroll students in the Information Security minor that have met these alternative requirements into these courses with a manual prerequisite override. I believe you're also planning to make a note for your students that they will need to contact the appropriate advisors (Rich) to get into these CSE courses.

Considering you've made this agreement with CSE and all parties feel that the Information Security students can still succeed in the referenced CSE courses through these different prerequisites, this seems like something our office would support. Prerequisites are designed to make sure our students are prepared properly for new courses, so as long as everyone feels that your students can still succeed in these courses, we've met the ultimate goal. I would encourage you to monitor the success of your students in these courses moving forward to ensure that they are not struggling—if they aren't performing well, I would suggest you to revisit the situation with CSE.

I hope this helps! Please let us know if you have any questions or concerns.

THE OHIO STATE UNIVERSITY

Michael Gable
Sr. Assistant Registrar
University Registrar
540 Student Academic Services Building, 281 West Lane Avenue, Columbus, OH 43210
614-247-1694 Office
gable.24@osu.edu

From: Wenger, Rephael
Sent: Tuesday, March 20, 2018 4:56 PM
To: Mughan, Anthony <mughan.1@polisci.osu.edu>
Cc: Sivilotti, Paul <paolo@cse.ohio-state.edu>
Subject: RE: Concurrence

To whom it may concern,

This note confirms that the Department of Computer Science and Engineering has spoken extensively with International Studies about its proposed Information Security minor. The department reached two decisions.

One, there are prerequisites for the two CSE courses required in the minor (CSE 2501 and CSE 4471). The CSE dept has changed the prerequisites to these two CSE courses so that they conform with the prerequisites required for Information Security minors to take these courses. (The changes may not yet appear in the University Course Catalog.)

Two, CSE concurs with the two courses created specifically for this minor, IS 3702 and IS 4702.

- Rafe Wenger
CSE Associate Chair

Rephael Wenger, CSE Associate Chair and Associate Professor
The Ohio State U., Dept. of Comp. Sci. and Eng.
485 Dreese Lab, 2015 Neil Ave, Columbus, Ohio 43210-1277
Tel: (614) 292-6253. E-mail: wenger.4@osu.edu

The Ohio State University
College of Arts and Sciences

Information Security Minor (INFOSEC-MN)

International Studies, 33 Townshend Hall, 1885 Neil Ave., Columbus, OH 43210-1222
614-292-9657; http://internationalstudies.osu.edu

Information security is the study of the dynamic interaction between the nature of cyber threats to the security, integrity and availability of information and the diverse efforts that are made to counter them.

The information security minor gives students a multidisciplinary perspective on the sources of, and reasons for, cyber threats and the strategies undertaken to counter them, including the role of computers and computing as well as that of laws, regulations and information storage standards and practices. Students are also introduced to successes and failures in protecting information against cyber attack through the detailed analysis of real-world case studies as well to the broader social, economic and security context in which cyber threats arise.

The information security minor requires 16 hours of academic credit.

**The Required Courses in this minor have pre-requisites. Please consult with an International Studies advisor before enrolling in courses.*

Required Courses: (10 hours)
Computer Science and Engineering 2501 (*Contact an International Studies advisor for permission to enroll in this class.*)
International Studies 3702
Computer Science and Engineering 4471 (*Contact an International Studies advisor for permission to enroll in this class.*)
International Studies 4702

Critical Perspectives: choose two (6 credit hours minimum)
Communication 3332
Computer Science and Engineering 5351
Computer Science and Engineering 5473
International Studies 3700
International Studies 3701
International Studies 5191
Linguistics 3801
Linguistics 3802
Public Affairs 4000
Sociology 5525

Information Security minor program guidelines

Required for graduation No

Credit hours required A minimum of 16 credit hrs. 1000 level courses shall not be counted in the minor. At least 6 credits must be at the 3000 level or above**.**

Transfer and EM credit hours allowed
A student is permitted to count up to 6 total hours of transfer credit and/or credit by examination.

Overlap with the GE
A student is permitted to overlap up to 6 credit hours between the GE and the minor.

Overlap with the major and additional minor(s)
- The minor must be in a different subject than the major.
- The minor must contain a minimum of 12 hours distinct from the major and/or additional minor(s).

Grades required
- Minimum C- for a course to be listed on the minor.
- Minimum 2.00 cumulative point-hour ratio required for the minor.
- Course work graded Pass/Non-Pass cannot count on the minor.
- No more than 3 credit hours of coursework graded Satisfactory/Unsatisfactory may count toward the minor.

X193 credits No more than 3 credit hours.

Minor approval The minor must be approved by the academic unit offering the minor.

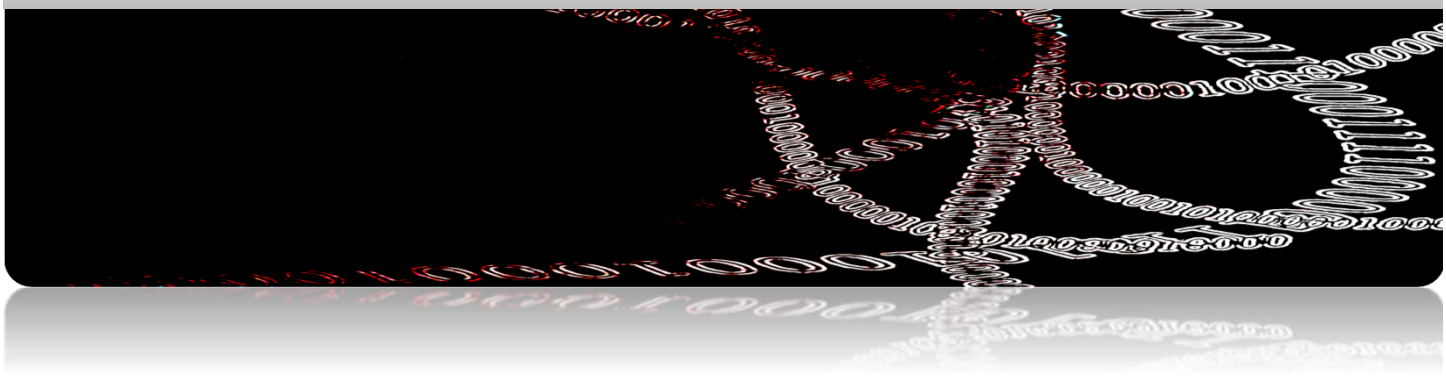
Filing the minor program form The minor program form must be filed at least by the time the graduation application is submitted to your college office.

Changing the minor Once the minor program is filed in the college office, any changes must be approved by the academic unit offering the minor.

College of Arts and Sciences
Curriculum and Assessment Services
154 Denney Hall, 164 W. 17th Ave.
http://artsandsciences.osu.edu

Information Security Minor

International Studies • The Ohio State University • 33 Townshend Hall • 1885 Neil Avenue • Columbus, OH • 43210-1222 • USA
Phone: 614-292-9657 • http://internationalstudies.osu.edu/



PREREQUISITES: Complete the following four courses:

1. Math 1151 (5) or 1161 (5)
2. COMPLETE ONE: CSE 1222 (3) or CSE 1223 (3) or CSE 2221 (4)
3. CCMPLETE ONE: CSE 2122 (3) or CSE 2123 (3) or CSE 2231 (4)
4. GE 2nd Writing Course (3)

1. REQUIRED FOUNDATION: 10 hours		Credits	Grade
CSE 2501	Social, Ethical and Professional Issues in Computing (1)		
	(*Contact an International Studies advisor for permission to enroll in this class*.)		
INTSTDS 3702	Herding Cyber Cats: Information Security Management (3)		
CSE 4471	Information Security (3)		
	(*Contact an International Studies advisor for permission to enroll in this class*.)		
INTSTDS 4702	Case Studies in Information Security (3) (preq. INTSTDS 3702 and CSE 4471)		

2. ELECTIVES (Choose 2): 6 hours		Credits	Grade
COMM 3332	Risk Communication (3)		
CSE 5351	Introduction to Cryptography (3)		
CSE 5473	Network Security (3)		
INTSTDS 3700	Introduction to Intelligence (3)		
INTSTDS 3701	Introduction to Homeland Security (3)		
INTSTDS 5191	Student Intern Program in International Studies (3)		
LING 3801	Code Making and Code Breaking (3)		
LING 3802	Language and Computers (3)		
PUBAFRS 4000	Public Policy Evaluation (3)		
SOC 5525	Global Criminology (3)		