

**ICT 351 Section 001 [SPRING 2021] [MWF@ 4 PM, LCLI, Room 312; Friday: online]**

## **Technology Security**

**Instructor:** Sherali Zeadally  
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**Email:** szeadally@uky.edu  
**Office Phone:** 859-218-2299  
**Office hours:** Monday and Wednesday 3:00 to 4:00 PM  
Friday: 12 to 2 PM  
or by special appointment  
NOTE: given the COVID-19 situation, we will have all meetings **online** for office hours.

**Preferred method of contact:** Email  
I usually respond as soon as possible. Maximum: 12 hours any day of the week including weekends/holidays.

### **Course Description**

This course presents an introduction to the various technical and administrative aspects of Information Security and Assurance. We cover the foundation for understanding 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.

### **Prerequisites**

Some knowledge of computer networks and operating systems would be useful.

### **Course Objectives**

- Be able to explain basic terminologies and definitions used in information security.
- Develop a strong understanding of various types of attacks, attackers, and hardware/software defense solutions that can protect assets from attacks.
- Develop an understanding of access control fundamentals and authentication techniques.
- Gain a basic understanding of security protocols, techniques, tools and technologies that are deployed to protect different types of assets.
- Be able to apply the fundamentals of security management (identity management, change management, etc.), security audit principles and practices, and procedures involved in handling security incidents.
- Gain an understanding of vulnerability assessment techniques and tools, system security assessment, and be familiar with various security scanning tools.

## Relevant Reference Textbooks

- M. Ciampa, Security + Security Guide to Network Security Fundamentals, 6<sup>th</sup> edition, ISBN 9781337288781.
- T. Howlett, Open Source Security Tools, ISBN 0-321-19443-8, Pearson Education Ltd.

Lecture notes will be provided to all students on a weekly basis throughout the semester.

## Grading Parameters

3 projects	30%
3 quizzes	30%
Midterm exam	20%
Final exam	20%

## Course Grading

- [90% - 100%] = **A (Exceptional Achievement)**  
[80% - 89%] = **B (High Achievement)**  
[70% - 79%] = **C (Average Achievement)**  
[60% - 69%] = **D (Below Average Achievement)**  
[0% - 59%] = **E (Failing)**

## Tentative Course Topics

All lectures slides will be posted on Canvas.

Tentative topics to be covered in this course include:

Week 1	Information security terminologies, computer security laws
Week 2	
Week 3	Attackers and types of attacks
Week 4	Malware types
Week 5	Fundamental security principles

Week 6	Access control techniques and authentication methods
Week 7	
Week 8	Security policies, physical security
Week 9	Firewalls: types, topologies, rules
Week 10	Intrusion detection/prevention systems, Incident handling
Week 11	Cryptography
Week 12	Digital certificates
Week 13	Wireless Security
Week 14	Security management
Week 15	Vulnerability assessment: policies, procedures, tools

Lecture notes cover important materials that need a thorough understanding by the students. Homework assignments are intended to reinforce the material in the text and will often require external materials outside the book to be consulted. Quizzes will help ensure students stay up to date with the materials being taught.

### Submission of Assignments

1. All assignments, homeworks, and project reports must be typed and printed. All submitted works will be done online on Canvas.
2. All times specified for submission deadlines are Eastern Standard Time (EST).
3. All submitted work must be typed [12 point, Time Roman, single line spacing, 1 inch margins] using **Microsoft WORD (.doc, .docx, .rtf)** and be thoroughly spellchecked and free of grammatical mistakes.
4. All sources used during the preparation of all submitted works must be clearly identified in a separate list of ordered [e.g., [1], [2], [3], etc.] references (in a **Reference** section placed after the main document). These references must be cited within the text of the submission where appropriate. Please avoid using Wikipedia, blogs, white papers as direct sources for cited references in your submitted papers or reports.
5. Late assignments are only acceptable under exceptional circumstances or if the instructor has been notified ahead of time. For all other cases, submissions handed in after the submission deadline will be assessed with a penalty of 5% per day.

### Group Work and Collaboration

All assignments should be undertaken individually. For projects requiring group work, detailed instructions will be outlined in the project description. When group work is performed, each member of the group must state his/her contributions very clearly and all members of the group must agree on each member's contributions before the start of the project and inform the instructor (in writing) about the expected efforts of each member of the group.

### **Face Covering/Distancing Policy**

- In accordance with University guidelines, students **must wear UK-approved face coverings in the classroom** and academic buildings (e.g., faculty offices, laboratories, libraries, performance/design studios, and common study areas where students might congregate). If UK-approved face coverings are not worn over the nose and mouth, students will be asked to leave the classroom.
- Students **should complete their daily online wellness** screening before accessing university facilities and arriving to class.
- Students should not move chairs or barriers in classrooms and should socially distance at all times, leaving a six (6) foot radius from other people. Masks and hand sanitizer can be found {specific location in building} if needed.
- Students should leave enough space when entering and exiting a room. Students should not crowd doorways at the beginning or end of class.
- The instructor may choose to remove a mask when pedagogically necessary at the front of the classroom and behind a clear barrier. The instructor's mask will be replaced when it is no longer necessary to have it removed, or when the class meeting is complete.

### **Class Recording Notification**

The University of Kentucky Student Code of Conduct defines Invasion of Privacy as using electronic or other devices to make a photographic, audio, or video record of any person without their prior knowledge or consent when such a recording is likely to cause injury or distress.

Video and audio recordings by students are **not permitted during the class unless the student has received prior permission from the instructor**. Any sharing, distribution, and or uploading of these recordings outside of the parameters of the class is prohibited. Students with specific recording accommodations approved by the Disability Resource Center should present their official documentation to the instructor.

### **Classroom Policy**

**All** electronic equipment must be either **switched off** or in **silent mode** before the start of each lecture. Please kindly avoid sleeping, eating, talking (unless permission is granted by the instructor) etc. once the lecture has started. Students should refrain from disruptive behavior such as entering the classroom late or departing before the end of the lecture without the instructor's permission. For more information on prohibited student conduct,

students are advised to consult the UKY's Code of Student Conduct (<http://www.uky.edu/studentconduct/code-student-conduct>).

## Attendance Policy

This class is a community whose success depends on everyone's participation, and it is vital for you to attend class in order to be successful. Attendance will be taken at the beginning of class. If you miss this, it is your responsibility to let me know you arrived late. If you are absent on a day when an assignment is due, you will be allowed to hand in or make up that work **only** if the absence is **officially excused**. You will be asked to provide official written documentation for excused absences the next time you are in class in order for your absence to be excused. If you know ahead of time that you will be absent from class with an excused absence, please discuss this with your instructor and turn in any assignments ahead of time. Excuses for university-sponsored activities must be made *prior* to such absences. For any emergency situation that arises, **email your instructor** as soon as you know about the situation when possible. **No make-up work is available for in-class exercises or quizzes unless approved in advance by your instructor.** Students have one week to complete a missed assignment or quiz due to an excused absence upon their return without penalty.

## Excused Absences

Students need to notify the professor of absences prior to class when possible. *Senate Rules 5.2.4.2* defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, (e) interviews for graduate/professional school or full-time employment post-graduation, and (f) other circumstances found to fit "reasonable cause for nonattendance" by the professor.

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Two weeks prior to the absence is reasonable, but should not be given any later. Information regarding major religious holidays may be obtained through the Ombud (859-257-3737, [http://www.uky.edu/Ombud/ForStudents\\_ExcusedAbsences.php](http://www.uky.edu/Ombud/ForStudents_ExcusedAbsences.php)).

In situations where a student's total EXCUSED absences exceed 1/5 (or 20%) of the class periods scheduled for the semester, students are strongly encouraged to withdraw (take a "W") from the class as per university policy. If a student has excused absences in excess of one-fifth of the class contact hours for that course, the student shall have the right to receive a 'W', or the Instructor of Record may award an 'I' for the course if the student declines to receive a 'W.'

Per *Senate Rule 5.2.4.2*, students missing any graded work due to an excused absence are responsible: for informing the Instructor of Record about their excused absence within one week following the period of the excused absence (except where prior notification is

required); and for making up the missed work. The professor must give the student an opportunity to make up the work and/or the exams missed due to an excused absence, and shall do so, if feasible, during the semester in which the absence occurred.

### **Verification of Absences**

Students may be asked to verify their absences in order for them to be considered excused. *Senate Rule 5.2.4.2* states that faculty have the right to request “appropriate verification” when students claim an excused absence because of illness, or death in the family. Appropriate notification of absences due to University-related trips is required prior to the absence when feasible and in no case more than one week after the absence.

### **Academic Integrity**

Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the following website: <http://www.uky.edu/Ombud>. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

*Senate Rules 6.3.1* (see <http://www.uky.edu/Faculty/Senate/> for the current set of *Senate Rules*) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work, which a student submits as his/her own, whoever that other person may be. Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone.

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas, which are so generally and freely circulated as to be a part of the public domain.

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

### **Accommodations due to disability**

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. It is located on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407. You can reach them via phone at (859) 257-2754 and via email at [drc@uky.edu](mailto:drc@uky.edu). Their web address is <http://www.uky.edu/DisabilityResourceCenter>.

Policies concerning academic integrity, excused absences and academic accommodations due to disability are available online at:  
<https://ci.uky.edu/sis/sites/default/files/policies.pdf>

### **Non-Discrimination Statement and Title IX Information**

The University of Kentucky faculty are committed to supporting students and upholding the University's non-discrimination policy.

Discrimination is prohibited at UK. If you experience an incident of discrimination we encourage you to report it to Institutional Equity & Equal Opportunity (IEEO) Office, 13 Main Building, (859) 257-8927.

#### **Acts of Sex- and Gender-Based Discrimination or Interpersonal Violence**

If you experience an incident of sex- or gender-based discrimination or interpersonal violence, we encourage you to report it. While you may talk to a faculty member or TA/RA/GA, understand that as a "Responsible Employee" of the University these individuals MUST report any acts of violence (including verbal bullying and sexual harassment) to the University's Title IX Coordinator in the IEEO Office. If you would like to speak with someone who may be able to afford you confidentiality, the Violence Intervention and Prevention (VIP) program (Frazee Hall – Lower Level; <http://www.uky.edu/StudentAffairs/VIPCenter/>), the Counseling Center (106 Frazee Hall, <http://www.uky.edu/StudentAffairs/Counseling/>), and the University Health Services (<http://ukhealthcare.uky.edu/uhs/student-health/>) are confidential resources on campus.

## TECHNOLOGY INFORMATION & RESOURCES

Distance Learning Students are expected to have a minimum level of technological acumen and the availability of technological resources. Students must have regular access a computer with a reliable Internet connection and audio capabilities. Internet Explorer 7 (IE) or Firefox 2.x are the recommended browsers for those using a Windows-based PC. Those using Firefox 3.x may encounter problems with assignment uploads. Those using an Apple computer with MAC OS X (10.5.x) may use Firefox 3.x or Safari 3.x.

Please be certain that your computer and/or browser allow you to view Adobe Reader documents (.pdf). Microsoft Office and other software products are free for students: <http://download.uky.edu/>.

As your instructor, I am your first go-to person for technology problems. If you need more immediate assistance, please contact UKIT.

### **Information Technology Customer Service Center (UKIT)**

<http://www.uky.edu/UKIT/>; 859-218-4357

### **Library Services & Distance Learning Services**

<http://www.uky.edu/Libraries/DLLS>

- Carla Cantagallo, DL Librarian
- Local phone number: (859) 257-0500, ext. 2171; long-distance phone #: (800) 828-0439 (option #6)
- Email: [dllservice@email.uky.edu](mailto:dllservice@email.uky.edu)
- DL Interlibrary Loan Service:  
[http://www.uky.edu/Libraries/libpage.php?lweb\\_id=253&llib\\_id=16](http://www.uky.edu/Libraries/libpage.php?lweb_id=253&llib_id=16)

For more resources about online classes and student resources, visit <http://www.uky.edu/ukonline/>

The School of Information Science has a page with a comprehensive list of technology resources here: <http://ci.uky.edu/sis/students/techtips>

### **Military Members and Veterans**

We recognize the complexities of being a member of the military community and also a student. If you are a member of the military or a military veteran or dependent, please inform your instructor if you are in need of special accommodations. Drill schedules, calls to active duty, mandatory training exercises, complications with GI Bill disbursement, and other unforeseen military and veteran related developments can complicate your academic life. If you are aware of a complication, we will work with you and put you in contact with university staff members who are trained to assist you. Please contact the Coordinator of the

University of Kentucky Veterans Resource Center at (859) 257-1148 for additional assistance. Visit <http://www.uky.edu/veterans> for more available resources.

### Course calendar

<b>Lecture material, homework assignments, quizzes, projects, exams</b>	
Lecture material	Posted <b><i>weekly</i></b> on Canvas
Quiz 1	February 15, 2021
Project 1	February 22, 2021
Quiz 2	March 5, 2021
Project 2	March 17, 2021
<b>Mid-term exam</b>	<b>March 22, 2021</b>
Quiz 3	April 14, 2021
Project 3	April 19, 2021
<b>Final exam</b>	<b>Based on university exam schedule</b>

As mentioned earlier in the syllabus, all assignments and project reports must be submitted electronically by the date and time due.

**NOTE:** Please contact me as early as possible to make the appropriate arrangements in case you cannot take the exams on the dates specified above.