

Cybersecurity Forensics CSSS-5230

S1 2021 Section 34 3 Credits 01/04/2021 to 03/05/2021 Modified 12/22/2020

Meeting Times

Wednesday Evenings, Zoom for Joint Base Anacostia-Bolling/Webster Gateway

6 pm EST/ 5 pm CST

Class will meet via Zoom - the link will be posted in WorldClassroom

Lecture/Hands-On

Note: This course requires computer that boots to one of the following, Windows 7, 8, 8.1, or 10 operating systems:

Many mainstream digital forensic tools are designed to run on Windows NTFS file system. As a result, the forensic software & tools for this course will not operate on Apple/macOS. This does not apply if you are using a Apple/Mac computer and have prior knowledge and currently running Windows in a virtual machine or Boot Camp with your Apple/Mac.

Contact Information

Instructor: Brian Dieckmann

Email: briandieckmann18@webster.edu

If you have any questions about the course or need assistance, please contact me by e-mail at any time. If you would prefer to speak over the telephone or ZOOM, leave me your telephone number in an e-mail and a good time to call or meet.

Description

The course covers methods and procedures for identification and recovery of damaged or erased digital data, tracing information access (web history, cookies, cache memory and internet source identification), determination of system vulnerabilities (e.g., TEMPEST), communication ports and computer system architectures and encryption methods, as well as incident monitoring and response.

Requisites

CSSS 5000 Introduction to Cybersecurity (3)

Outcomes

The student will:

- Summarize and demonstrate an understanding of the vocabulary of Cybersecurity forensics terms and phraseology.
- Acquire and differentiate a broad understanding of the Cybersecurity forensics, lab certifications, basic computer investigations, high tech corporate investigations, forensic methods, and a broad range of forensic tools.
- Demonstrate and differentiate a basic working knowledge of Cybersecurity forensics as well as an awareness of current targets, use of root cause analysis, data collection, extraction, preservation methods.
- Categorize the rules of evidence collection at crime scenes, and interpretation and documentation of evidence for legal proceedings.
- Specify the skills required in forensic analysis and validation, as well as detection of internal and external system vulnerabilities, and growing Cybersecurity off-shore or cloud threats.
- Compare and contrast the roles, responsibilities, policies, procedures, tools, report writing techniques, ethics and expert testimony of a Cybersecurity forensics technician or investigation operations manager.
- Inventory and analyze the basic knowledge required in the determination of critical Cybersecurity infrastructures, communications, detection and protection schemes, investigations, data evidence, standard and remote data recovery formats, analysis methods and tools, and potential threats and impacts.
- Produce graduate level research papers and practice oral presentation methods.

- Categorize the challenges of the Cybersecurity (MS) program and the importance of thinking about the capstone course in terms of their research focus or projects.
- Synthesize and integrate the learning experiences acquired throughout the MS in Cybersecurity program, apply critical thinking and evaluation methods of current and future topics relative to this major.

Required Textbook

Guide to Computer Forensics and Investigations

Author: Nelson, Phillips, Stewart

Publisher: CengageBrain

Edition: 6th

ISBN: 978-1337568944

Materials

Guide to Computer Forensics and Investigations

Author: Nelson, Phillips, Stewart

Publisher: CengageBrain

Edition: 6th

ISBN: 978-1337568944

This book is required and will be used in class for the hand on activities and case studies. Students may use the printed or electronic version.

Deliverables

Weekly assignments will be announced in class and posted to Webster University WorldClassroom

WorldClassRoom. These assignments will compliment the material covered in the previous classroom lecture and labs. The completed assignment will be due before the start of the next class.

Research Paper:

The topic should be presented to and approved by the instructor no later than the **3rd class** meeting. The paper should be a minimum of eight (8) to (12) pages in the body of the paper. This is exclusive of title, abstract, and references/bibliography. There are no oral or recorded presentations in the online section of this class.

Evaluation

Criteria

Assignments

All students are **required** to obtain an e-mail account and maintain access to Webster University **WorldClassRoom** during the course.

Type	Weight	Topic	Notes
Assignments	40%	Hands-On Projects & Case Projects	
Participation	20%	Class Discussions	
Research Topic & Paper	40%	Research Topic Proposal & Final Research Paper	

Breakdown

93-100: A

90-92 : A-

86-89 : B+

83-85 : B

80-82 : B-

70-79 : C

00-69 : F

 Schedule

When	Topic	Notes
Lecture/Lab Week #1	Understanding the Digital Forensics Profession and Investigations	Chapter 1
Lecture/Lab Week #1	The Investigators Office and Laboratory	Chapter 2
Lecture/Lab Week #2	Data Acquisition	Chapter 3
Lecture/Lab Week #2	Processing Crime and Incident Scenes	Chapter 4
Lecture/Lab Week #3	Working with Windows and CLI Systems	Chapter 5 Research Topic Due
Lecture/Lab Week #3	Current Digital Forensic Tools	Chapter 6
Lecture/Lab Week #3	Linux and Macintosh File Systems (OPTIONAL)	Chapter 7
Lecture/Lab Week #4	Recovering Graphic Files	Chapter 8
Lecture/Lab Week #5	Digital Forensics Analysis and Validation	Chapter 9
Lecture/Lab Week #5	Virtual Machine Forensics, Live Acquisitions, and Network Forensics	Chapter 10
Lecture/Lab Week #6	E-Mail and Social Media Investigations	Chapter 11
Lecture/Lab Week #6	Mobile Device Forensics	Chapter 12
Lecture/Lab Week #7	Cloud Forensics	Chapter 13
Lecture/Lab Week #7	Report Writing for High-Tech Investigations	Chapter 14
Lecture/Lab Week #8	Expert Testimony in Digital Investigations	Chapter 15
Lecture/Lab Week #8	Ethics for the Expert Witness	Chapter 16
Research Discussion Week #9	Chapters 1-16	Research Paper Submission ONLINE EVALUATION: https://evaluation.webster.edu - available weeks 8 & 9, posted in WorldClassroom as well

* Course Policies

IMPORTANT PLEASE TAKE NOTE:

The majority of assignments for this course will be directly from the book. We will be using Nelson, Phillips and Steuart, Guide to Computer Forensics and Investigations: Processing Digital Evidence **6th edition**.

ISBN-13 : 978-1-337-56894-4

You must have access to the internet & book(electronic or printed copy) to complete the assignments. You will need to install several software programs from the internet and case files when instructed to do so.

Minimum Computer Requirements:

- Computer that boots to Windows 7,8,8.1, Windows 10
- USB ports
- 6GB RAM (more is recommended, Minimum of 8GB for Windows 10 is generally recommended)
- An External USB (flash drive)
- VGA or higher monitor
- Mouse and keyboard

*****For additional details refer to xxii & xxiii of Nelson, Phillips and Steuart, Guide to Computer Forensics and Investigations: Processing Digital Evidence 6th edition

Please silence all cell phones during class (set to vibrate for emergency calls is acceptable). Even while meeting remotely a ringing phone can be distracting.

Students are not permitted to make recordings of classroom lectures using personally owned recording devices (e.g., smart phone, computer, digital recorder) unless prior permission from the instructor is obtained, and there are no objections from any of the students present in the class.

Supplementary information for the course is available at <https://worldclassroom.webster.edu> (<https://worldclassroom.webster.edu>). The Web site contains class notes, PowerPoint slides, class announcements, the course syllabus, test dates, and other information for the course.

Institutional Policies

Academic Policies

Academic policies provide students with important rights and responsibilities. Students are expected to familiarize themselves with all academic policies that apply to them. Academic policies for undergraduate students can be found in the Undergraduate Studies Catalog; graduate students should review the Graduate Studies Catalog.

Undergraduate Studies Catalog

The Undergraduate Studies Catalog contains academic policies that apply to all undergraduate students. The *academic policies and information* section of the catalog contains important information related to **attendance, conduct, academic honesty, grades, and more**. If you are an undergraduate student, please review the catalog each academic year. The current Undergraduate Studies Catalog is at:

<http://www.webster.edu/catalog/current/undergraduate-catalog/> (<http://www.webster.edu/catalog/current/undergraduate-catalog/>).

Graduate Studies Catalog

The Graduate Studies Catalog contains academic policies that apply to all graduate students. The *academic policies* section of the catalog contains important information related to **conduct, academic honesty, grades, and more**. If you are a graduate student, please review the catalog each academic year. The current Graduate Studies Catalog is at:

<http://www.webster.edu/catalog/current/graduate-catalog/> (<http://www.webster.edu/catalog/current/graduate-catalog/>).

Grading

The Grades section of the academic catalog outlines the various grading systems courses may use, including the information about the final grade reported for this class.

Undergraduate

<http://www.webster.edu/catalog/current/undergraduate-catalog/academic-policies.html#grading>
(<http://www.webster.edu/catalog/current/undergraduate-catalog/academic-policies.html#grading>).

Graduate

<http://www.webster.edu/catalog/current/graduate-catalog/academic-policies.html#grades>
(<http://www.webster.edu/catalog/current/graduate-catalog/academic-policies.html#grades>).

Incomplete

There are important policies that govern grades of Incomplete (I), including the circumstances under which Incomplete grades are granted, deadlines for completion, and consequences should the remaining course work not be completed. It is the responsibility of a student who requests an Incomplete to ensure that he/she understands and follows the policies.

Grade Appeals

Instructors are responsible for assigning grades, and student should discuss grade issues with the instructor. Policies and procedures for appealing grades are available in the appropriate catalog.

Academic Honesty Policy

Webster University is committed to academic excellence. As part of our Statement of Ethics, we strive to preserve academic honor and integrity by repudiating all forms of academic and intellectual dishonesty, including cheating, plagiarism and all other forms of academic dishonesty. Academic dishonesty is unacceptable and is subject to a disciplinary response. Students are encouraged to talk to instructors about any questions they may have regarding how to properly credit others' work, including paraphrasing, quoting, and citation formatting. The university reserves the right to utilize electronic databases, such as Turnitin.com, to assist faculty and students with their academic work.

The University's Academic Honesty Policy is published in academic catalogs:

Undergraduate

<http://www.webster.edu/catalog/current/undergraduate-catalog/academic-policies.html>
(<http://www.webster.edu/catalog/current/undergraduate-catalog/academic-policies.html>).

Graduate

<http://www.webster.edu/catalog/current/graduate-catalog/academic-policies.html>
(<http://www.webster.edu/catalog/current/graduate-catalog/academic-policies.html>).

As a part of the University commitment to academic excellence, the Academic Resource Center provides student resources to become better acquainted with academic honesty and the tools to prevent plagiarism in its many forms:

http://www.webster.edu/arc/plagiarism_prevention/ (http://www.webster.edu/arc/plagiarism_prevention/).

Statement of Ethics

Webster University strives to be a center of academic excellence. The University makes every effort to ensure the following:

- The opportunity for students to learn and inquire freely
- The protection of intellectual freedom and the rights of professors to teach
- The advancement of knowledge through scholarly pursuits and relevant dialogue

To review Webster University's statement of ethics, see the Undergraduate Studies Catalog and the Graduate and Studies Catalog:

Undergraduate

<http://www.webster.edu/catalog/current/undergraduate-catalog/overview.html#ethics>
(<http://www.webster.edu/catalog/current/undergraduate-catalog/overview.html#ethics>).

Graduate

<http://www.webster.edu/catalog/current/graduate-catalog/ethics.html> (<http://www.webster.edu/catalog/current/graduate-catalog/ethics.html>).

Contact Hours for this Course

It is essential that all classes meet for the full instructional time as scheduled. A class cannot be shortened in length. If a class session is cancelled for any reason, the content must be covered at another time.

Important Academic Resources

Academic Accommodations

Webster University makes every effort to accommodate individuals with academic/learning, health, physical and psychological disabilities. To obtain accommodations, students must identify themselves and provide documentation from a qualified professional or agency to the appropriate campus designee or the Academic ADA Coordinator at the main campus. The Academic ADA Coordinator may be reached at

314-246-7700 or disability@webster.edu (<mailto:disability@webster.edu>).

If you have already identified as a student with a documented disability and are entitled to classroom or testing accommodations, please inform the instructor of the accommodations you will require for this class at the beginning of the course.

Academic Resource Center

Additional support and resources may be accessed through the Academic Resource Center (ARC). Support and resources include academic counseling, accommodations, assistive technology, peer tutoring, plagiarism prevention, testing center services, and writing coaching. Visit www.webster.edu/arc (<http://www.webster.edu/arc>) or Loretto Hall 40 on the main campus for more information.

Student Success Portal

Webster University's Student Success Portal, powered by Starfish, is a communications tool to connect students with faculty members and campus support services. It allows faculty and staff members to communicate with you regarding academic achievements as well as areas where support may be helpful. You may use the portal to contact faculty and staff members for assistance and to arrange meetings. Activity in the portal will be communicated to your Webster University email account. The Student Success Portal is available via your course home page in WorldClassRoom or via Connections. Learn more about the Student Success Portal at <http://www.webster.edu/success/students.html> (<http://www.webster.edu/success/students.html>).

University Library

Webster University Library is dedicated to supporting the research needs and intellectual pursuits of students throughout the University's worldwide network. Resources include print and electronic books, journal articles, online databases, DVDs and streaming video, CDs and streaming music, datasets, and other specialized information. Services include providing materials at no cost and research help for basic questions to in-depth exploration of resources. The gateway to all of these resources and services is <http://library.webster.edu> (<http://library.webster.edu/>). For support navigating the library's resources, see <http://libanswers.webster.edu/> (<http://libanswers.webster.edu/>) for the many ways to contact library staff.

Drops and Withdrawals

Drop and withdrawal policies dictate processes for students who wish to unenroll from a course. Students must take proactive steps to unenroll; informing the instructor is not sufficient, nor is failing to attend. In the early days of the term or semester, students may DROP a course with no notation on their student record. After the DROP deadline, students may WITHDRAW from a course; in the case of a WITHDRAW, a grade of W appears on the student record. After the WITHDRAW deadline, students may not unenroll from a course. Policies and a calendar of deadlines for DROP and WITHDRAW are at:

Undergraduate

<http://www.webster.edu/catalog/current/undergraduate-catalog/enrollment.html>
(<http://www.webster.edu/catalog/current/undergraduate-catalog/enrollment.html>).

Graduate

<http://www.webster.edu/catalog/current/graduate-catalog/enrollment.html> (<http://www.webster.edu/catalog/current/graduate-catalog/enrollment.html>).

Academic Calendar - <http://www.webster.edu/academics/academic-calendar/> (<http://www.webster.edu/academics/academic-calendar/>).

Current tuition rates, policies, and procedures, including details of pro-rated tuition refunds, are available in the "Tuition, Fees, and Refunds" section of Webster's Academic Catalogs:

Undergraduate

<http://www.webster.edu/catalog/current/undergraduate-catalog/tuition.html>
(<http://www.webster.edu/catalog/current/undergraduate-catalog/tuition.html>).

Graduate

<http://www.webster.edu/catalog/current/graduate-catalog/tuition.html> (<http://www.webster.edu/catalog/current/graduate-catalog/tuition.html>).

Student Handbook and Other Important Policies

Student handbook and other non-academic policies may apply to you and may impact your experience in this class. Such policies include the student code of conduct, privacy, technology and communications, and more. Please review the handbook each year and be aware of policies that apply to you. The handbook is available at:

<http://www.webster.edu/student-handbook/> (<http://www.webster.edu/student-handbook/>).

Sexual Assault, Harassment, and Other Sexual Offenses

Webster University makes every effort to educate the community to prevent sexual assault, harassment, and other sexual offenses from occurring, and is committed to providing support to those affected when this behavior does occur. To access information and resources or to review the Policy on Sexual Assault, Harassment, and Other Sexual Offenses, visit:

<http://www.webster.edu/sexual-misconduct/> (<http://www.webster.edu/sexual-misconduct/>).

Research on Human Subjects

The Webster University Institutional Review Committee (IRB) is responsible for the review of all research on human subjects. The IRB process applies to all Webster University faculty, staff, and students and must be completed prior to any contact with human subjects. For more information on the IRB, visit:

<http://www.webster.edu/irb/index.html> (<http://www.webster.edu/irb/index.html>).

Course Evaluations

At the end of this course, you will have the opportunity to provide feedback about your experience. Your input is extremely valuable to the university, your instructor, and the department that offers this course. Please provide your honest and thoughtful evaluation, as it helps the university to provide the best experience possible for all of its students.

Important Technology Information

Connections Accounts

Webster University provides all students, faculty, and staff with a University email account through Connections. Students are expected to activate their Connections account and regularly check incoming University email. Students may choose to have their University email forwarded to an alternate email address. Connections account holders can call the Help Desk (314-246-5995 or toll free at 1-866-435-7270) for assistance with this setup. Instructions are also provided on the Information Technology website at:

<http://www.webster.edu/technology/service-desk/> (<http://www.webster.edu/technology/service-desk/>).

WorldClassRoom

WorldClassRoom is Webster's Learning Content Management System (LMS). Your instructor may use WorldClassRoom to deliver important information, to hold class activities, to communicate grades and feedback, and more. WorldClassRoom is available using your Connections ID at:

<https://worldclassroom.webster.edu/> (<https://worldclassroom.webster.edu/>).

Webster Alerts

Webster Alerts is the University's preferred emergency mass notification service, available free to current students, faculty and staff at all US campuses. By registering a valid cell phone number and email address, you will receive urgent campus text, voice mail and email communications. Valuable information concerning a range of incidents affecting you - from weather-related campus closures, class delays and cancellations, to more serious or life-threatening events - are immediately and simultaneously delivered through multiple communication channels. To register for Webster Alerts, visit:

<http://www.webster.edu/technology/services/webster-alerts/> (<http://www.webster.edu/technology/services/webster-alerts/>).

Campus Information

Due to the Education Centers not re-opening in the DC region for this term ***please*** meet via Zoom for the Spring 1 term.

Instructors will post the meetings in WorldClassroom/Canvas for students to log in each week (added security measure). On the left side with all the hyperlinks there will be one for Zoom.

We recommend Chrome for the browser and please mute yourself when not speaking, also only you are able to unmute yourselves in Zoom. If there are many participants it also might be wise to disengage video too (or if bad weather) if low band width messages continually appear.

Webster University - Joint Base Anacostia-Bolling:

Phone (202) 561-4382

bolling@webster.edu

Additional Items

Emerson Library: library.webster.edu

There is a live chat feature - home page, contact a librarian (middle of page, middle box): Chat with a librarian on left side (might have to scroll down a bit) - accessible 24 hours a day.

The WSBT subject librarian is:

Business & Management	Mary Anne Erwin	800-985-4279	maerwin@webster.edu
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Please use these excellent resources