Cristian Balan

Course Overview & Syllabus

Computer & Digital Forensics
Internship Program – FOR490-01
Fall 2008

The Computer & Digital Forensics internship program is intended to give students real-life, hands-on experience in their field of study, and to provide them with practical experiences using the knowledge learned during classes. It is also intended to show them the practice of computer forensics rather than just the "theory." The internship awards 3 credits.

STUDENT INFORMATION

- The student must be enrolled in a degree or certificate program at Champlain College.
- The student will work at least 120 hours at the host location. These hours may be performed within a given semester (e.g., 10 hours/12 weeks) or as a block of time (e.g., 3-4 work weeks); the internship period may be set during any time frame agreed upon by the student, internship coordinator, and the host organization.
- The student should expect to perform duties required within the host's accepted work environment (i.e., dress codes, work hours, etiquette, etc.).
- The student should not expect to be reimbursed for this work as he/she will be receiving three college credits. Some host organizations do, in fact, pay interns a salary but that is not a requirement for the host.
- The student should expect to obtain a positive experience, using knowledge learned in the class setting in the real world. It is also hoped the student will obtain new skills as well.
- The student will fill out a weekly time and information sheet to provide a log of what they are learning and observing, as well as tracking hours; this form should be signed by the host supervisor. Timesheets are to be submitted to the internship coordinator as soon as possible after the conclusion of the week's activities via mail, fax, e-mail, or in-person. *Part of the grade of the internship is the timeliness with which timesheets are submitted.*
- At the conclusion of the internship, the student will be asked to submit a 3-5 page, single-spaced reflection paper documenting what they learned during the internship. The idea here is to focus on the big picture; rather than indicate the learning of new technology tasks (e.g., how to user some new piece of software), this paper should focus on the whole internship experience as seen by the student:
    - What is the organization of the department or agency?
    - For what purpose was computer forensics performed?
    - Were there any technical or personnel policies or procedures that were particularly impressive and that you think you would emulate in other organizations in your career? Or, were there any that were so bad that you will avoid?
    - What do you think of the field *now* that you've been in it?
- The internship coordinator may periodically visit the student at his/her place of internship.

HOST INFORMATION

- The host should expect the student to have at least basic knowledge in the required field.
- The host should expect the student to behave as a professional: on time, neatly dressed, working the required hours, etc.
- The host should give the student work in his/her area of knowledge.
- The host should realize that there may be some time required to train the student in their system and processes.
- The host is not required to pay the student for time spent unless they so desire.
- The host and the student will mutually work out a schedule.
- If the student is currently an employee of the host, the internship should not be part of the student's current responsibilities. The student should be asked to participate in an area that will furnish a positive and new learning experience.
- If there are any questions or concerns about the student internship, the host should feel free to call on the faculty member responsible for the internship to obtain his/her support and help.
- The host should assign a supervisor for the intern who will be expected to monitor the intern's work and progress.
- At the conclusion of the internship, the supervisor will be asked to provide some brief feedback to the internship coordinator to assist is assigning a grade.

ADDITIONAL INFORMATION

- If a student sets up their own internship site, it will be their responsibility to have the host supervisor contact the faculty member overseeing the internship. There has to be a mutual understanding of the goals and objectives of internships, in general, and this internship, in particular.
- Before an internship can commence, there must be a written statement agreed to by the faculty advisor, student, and internship host that provides the following information (this need not be a formal proposal; an informal e-mail will suffice):
    - The duties that the intern will have
    - Any necessary prerequisite knowledge
    - The internship supervisor and contact information
    - Approximate schedule
    - Goals and objectives of the internship

STUDENT REQUIREMENTS IN A NUTSHELL:

- The internship must be approved by the internship coordinator.
- The intern must meet with the internship coordinator and provide all necessary host site and supervisor information **before** the internship starts.
- The internship duration is 120 hours at the host site.
- Timesheets must be submitted at agreed-upon intervals (usually weekly) so that the internship coordinator does not lose track of any of the interns. Electronic submission of timesheets (even if the hours are 0) is acceptable (with signed paper copies to follow).
- The intern must stay in *weekly contact* with the internship coordinator in person, via phone, or via e-mail.
- The intern will submit a "reflection paper" at the end of the internship and have a final wrap-up meeting with the internship coordinator.

Course outcomes:

Upon completion of this course, students will be able to:

- Analyze a real-world computer forensics operation, including the choice of hardware and software, operational procedures, and relationship with management, users, law enforcement, and other external agencies.
- Describe an organization's professional "workplace requirements" and how you complied with them, including expectations about attendance, dress, attitude, skills, self-reliance, teamwork, ethics, and general professionalism.
- Describe the personal lessons learned, such as good and/or bad digital forensics practices that were observed and your perspective on the industry.
- Relate what the experience taught about the real-world computer forensics environment in written and verbal form.

This course also addresses the college's core competencies in the following way:

- *Oral/written communication:* Digital forensics professionals must be able to effectively communicate in both written and verbal form. This course requires weekly written reports as well as a final written report and meeting to review the internship process. Communication with on-site managers, colleagues, and other agencies within the purview of the internship experience will vary by internship location.
- *International awareness:* International issues are not specifically addressed in the internship, although some internship venues and/or incidents might involve global issues.
- *Technology:* This field experience will utilize the technologies taught in courses throughout the program.
- *Critical Thinking:* Any digital forensics investigation necessitates analysis and puzzle solving. The internship program puts the intern in a position to see the everyday, real-life issues that occur with the examination of computers and/or networks, and helps the intern to learn how to critically think to solve problems and to find out-of-the-box and innovative problem solutions. The intern also learns how to apply everyday ethics and judgment to the examination. The internship final paper requires that the student critically assess the work experience.

Instructor contact information:

Cristian Balan

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URL: *digitalforensics.champlain.edu*

http://www.nycomputernetworks.com/df

Texts and supplementary resources:

N/A

Attendance, Homework, and Grading:

Grading:

Grades will be calculated roughly as follows:

- Evaluation by host site: 50%
- Completing appropriate number of hours: 10%
- Maintaining weekly/biweekly communication with internship coordinator/timesheets: 15%
- Final Portfolio: 15%
- Final Presentation: 10%

I will use the College's standard numerical scale for calculating final grades:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
93+	90	87	83	80	77	73	70	67	63	60	59-

Academic Honesty Policy

The Champlain College Student Handbook (*The Rudder*) describes the College's Academic Honesty policy. If the instructor suspects that a student has plagiarized or otherwise cheated on an assignment — i.e., to either actually or attempt to knowingly give, receive, or use work that is not your own — the instructor can give a 0 on that assignment.

This is not to suggest that the college or the program discourages your collaboration with students and others; in fact, we encourage as much collaboration as possible. The point of this policy is that work that you submit as your own *has* to be your own! If you work with another person or other resource that helps you learn an answer to something, that's fine — but what you turn in should be in your own words and clearly demonstrate **your** understanding. If you're unsure, indicate on your paper that you worked with others.

Don't cheat; there's no margin in it!! If you have a problem, talk to me instead.

This course along with the syllabus has been adapted from Gary Kessler, Director of the Center for Digital Forensics and Professor of Digital Forensics at Champlain College and it is being used with permission.

Applicability of Core Competencies

The Champlain College faculty and administration have committed that our curricula will address these seven critical core competencies:

- Technology
- Critical and Creative Thinking
- Global Awareness
- Oral Communication
- Written Communication
- Quantitative Literacy
- Ethical Reasoning

This course addresses these competencies as outlined below.

Technology:This course covers basic concepts related to computers and networks, the application of this technology to law enforcement and information security incident response, and the relationship of current laws to this technology. Analysis of the contents of computers and network traffic is a growing field affecting business, government, the military, education, and more. This course discusses a wide range of issues related to computer, network, and telecommunications technologies, including hardware, operating systems, software, network applications, and communication protocols.

Critical and Creative Thinking: Due to the broad and highly technical nature of computer and network forensics, the ability to think critically must become second nature to its practitioners. While there are some well-defined processes and procedures for the forensic analysis of computers, every scenario is slightly different and forensic computing remains as much art as it is science. By discussing and analyzing various real and hypothetical case scenarios, students will learn how to determine what needs to be analyzed, what evidence is being sought, what tools are most applicable to the task at hand, and the most efficient way to perform the analysis.

In any computer examination, the individual component must be understood as well as the big picture. Computers are examined as part of a larger investigation; the very nature of this business is critical thinking.

And there is more. A digital forensics examiner must analyze someone else's computer in the context of some event and think like that other person. Everything done on a computer or on the Internet leaves a trace; the digital forensics professional has to find those traces — and that means being able to think like the Bad Guy.

Critical thinking is reinforced by homework assignments and classroom discussions. Rather than focus on bare "facts," the homework and class meetings focus more on how the subject matter integrates with other things that student know and will learn in the future. We also examine how students attitudes change as their level of knowledge — and responsibility — changes.

Global Awareness: International awareness is not a major focus of this course and, in fact, there are few aspects of computer forensics that are geography-specific. The technology is relatively universal and, therefore, the technical solutions are universal. Laws, however, vary country-by-country so that actions that are illegal in some countries are legal in others (such as unleashing a virus). Although not emphasized, the course does describe some of the geographical, political, and cultural differences as they apply to legal aspects, privacy expectations, and cooperation between law enforcement agencies from different countries.

Oral and Written Communication: Computer forensics is a part of the overall criminal justice process and can be made totally useless if the investigator cannot effectively communicate forensics findings both in written form (such as a report or other affidavit) and verbal form (such as a deposition or court testimony). These skills will extend those learned in other classes by use of papers, student presentations, and the demonstration of proper computer forensics techniques.

The digital forensics professional must be able to communicate to many audiences on many levels:

- Communication with peers and managers at the technical level. This requires an understanding of computer, networking, and security concepts, as well as the proper vernacular.
- Communication with attorneys, judges, juries, and users, generally at a non-technical level. A successful technologist must be able to communicate the technical findings in an understandable and compelling way. This is often the most challenging portion of a professional's development.
- Communication with individuals at all levels within an organization with all levels of understanding. This includes upper management and supervisors to peers and subordinates, ranging from the technophobe to the technophile.

This course will provide students with ample opportunity to practice their communication skills through the weekly homework assignments and classroom discussions, but even more so through the research project that is part research paper, part oral presentation, and part presentation graphics. All assignments include grammar and composition as a component of grading.

Quantitative Literacy: Digital forensics professionals have to be able to analyze patterns of activity to differentiate between normal and abnormal activity, as well as to find information within the context of an investigation. Most of the information on computers and networks involves numbers and symbols, and the computer/network analyst needs to be able to find the events that are pertinent to a case — both incriminating and exculpatory. This course will provide students with ample opportunity to practice quantitative literacy through the weekly homework assignments and classroom discussions.

Ethical Reasoning: The use of networks and information often requires ethical considerations — e.g., how to employ individuals' private information that is stored on a computer or Web site, adherence to usage polices and the law, and how to respond to a potentially unethical request by a supervisor. Furthermore, computer forensics managers are involved in the discovery of information that can be used as evidence against them — or to support them. The responsibility

of the computer forensics examiner is high and ethical behavior is a key element in one's credibility. Ethical reasoning is specifically addressed in this course.

Students with Disabilities

If you believe that you have a disability requiring accommodations in this class, please contact the Coordinator of Support Services for Students with Disabilities as soon as possible. After you receive your accommodation form, please see me so I can work with you to implement them in a timely fashion.

Contact: Allyson Krings, Coordinator of Support Services for Students with Disabilities (Hauke 007i, 802-651-5961, krings@champlain.edu)

Course calendar: (Subject to change but you will be notified of changes…)

This course work and meetings times are in support of your efforts to document your internship experience. We will meet every two weeks on a regular basis to discuss your progress in creating a portfolio and documenting your internship experience.

Week/Lecture No. (Start Date)	Topic	Reading*	Assignment
1 (9/2)	Introduction and Syllabus		Introduction Discussion – where did you complete your internship?
2 (9/8)			
3 (9/15)	.		
4 (9/22)			
5 (9/29)			
6 (10/6)			
7 (10/13)			**MID-TERM**
10/13	**October Recess – there are classes on Tue 10/14 – it is a Monday schedule**		
8 (10/20)			
9 (10/27)			
10 (11/3)			
11 (11/10)			
12 (11/17)			
13 (11/24)	Thanksgiving Break NO class on Wed 11/		

14 (12/01)	STUDENT PRESENTATIONS	
15 (12/08)	STUDENT PRESENTATIONS	**FINAL EXAM**

COMPUTER & DIGITAL FORENSICS INTERNSHIP WEEKLY REPORT

Student/Intern: _____

Firm: _____

Week of: _____

Supervisor Name: _____ Signature: _____

DAILY TIME LOG

DAY	TIME WORKED	NUMBER OF HOURS
Sunday	_____ to _____	_____
Monday	_____ to _____	_____
Tuesday	_____ to _____	_____
Wednesday	_____ to _____	_____
Thursday	_____ to _____	_____
Friday	_____ to _____	_____
Saturday	_____ to _____	_____
TOTAL HOURS:		_____

What were your responsibilities or duties on the job this week (after the first report, list only new tasks added and/or those deleted):

_____
_____
_____

What new knowledge or skill did you learn on the job this week?

_____
_____
_____

What difficulties occurred or what mistakes did you make on the job? What corrective action did you take?

_____
_____
_____

In what area(s) could you use help in performing your job better?

_____
_____
_____