

Syllabus

ITEC 3381 - Forensics Fundamentals

Quality Enhancement Plan (QEP) Applied Critical Thinking for Lifelong Learning and Adaptability



Applied Critical Thinking Statement:

This course has been authorized by UHCL as an Applied Critical Thinking (ACT) Course which means that in addition to learning about the specified course content, students will be engaged with some or all of the Elements of Thought and Universal Intellectual Standards of critical thinking. The objective of an ACT course is to develop the student's ability to become skilled at analysis and evaluation by applying a set of intellectual tools that may be effectively used across all disciplines (as well as to the student's personal life). Based on the Foundation for Critical Thinking model (<http://www.criticalthinking.org/>), critical thinking involves thinking for a *purpose*, asking *questions*, using *information*, applying *concepts*, drawing *inferences and conclusions*, identifying *assumptions*, anticipating *implications and consequences*, and recognizing *points of view*. The Universal Intellectual Standards that are applied to these Elements of Thought of critical thinking in order to develop Intellectual Traits include *clarity, accuracy, precision, relevance, depth, breadth, logic, significance, and fairness*.

Course Syllabus

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Office Hours:

9:00 am - 1:00 pm

May also be arranged as needed

Course Description (and how critical thinking is present)

This course will introduce and study the main concepts of digital forensics analysis. Computer Forensic Analysis requires good tools, and solid critical thinking skills. A good understanding of the forensics media is a prerequisite for constructing compelling and plausible conclusions. Data has to be correlated carefully, to make accurate and compelling claims about a computers' behavior. Critical thinking has to be practiced to understand the underlying problem, to collect relevant information (data), and to apply theory and concepts to make inferences through analysis in order to construct forensic conclusions without reasonable doubt.

One of the central questions in this class is “*How and where is data stored on storage media?*” In answering this question, this course will provide students with the knowledge needed to assess and re-construct usage on a device. This course will discuss search and seizure procedures, data storage methods, recognizing primary and extended partitions, reading file allocation tables, methods to recover deleted files, and sound digital forensics best practices.

Student Learning Outcomes(SLOs)

After completing this class, students will be able to:

1. *Clearly and accurately* identify and explain the *purpose* in collecting evidence in a forensically sound manner
2. Apply number systems *concepts* to *precisely* convert from a decimal number system to a binary and hexadecimal number system
3. Use and operate *relevant* components of the FTK Imager software to solve forensic *problems* (questions)
4. *Accurately* and *precisely* image data storage devices
5. Understand how *information* is stored in partitions for *relevant* forensics *inference*
6. Apply relevant forensics tool accurately to perform rudimentary investigations

The ACT SLOs are #1, #2 and #5.

Elements of Critical Thinking*

The elements of thought are as follows:

1. All reasoning has a purpose
2. All reasoning is an attempt to figure something out, to settle some question, to solve some problem
3. All reasoning is based on assumptions
4. All reasoning is done from some point of view
5. All reasoning is based on data, information and evidence
6. All reasoning is expressed through, and shaped by, concepts and ideas
7. All reasoning contains inferences or interpretations by which we draw conclusions and give meaning to data
8. All reasoning leads somewhere or has implications and consequences

* Paul, R., and Elder, L. (2009). Critical Thinking Concepts and Tools. Tomales, CA: Foundation for Critical Thinking. And - The Elements of Reasoning and the Intellectual Standards: Helping Students Assess Their Thinking by Richard Paul and

Texts & Readings

Textbook: **The Basics of Digital Forensics – A Primer for Getting Started in Digital Forensics**
(required) John Sammons
March 2012
Elsevier Science

Instructional Method

In this course, a 'student-centered' approach will be emphasized instead of the traditional teacher-centered approach. Students are expected to attend all classes, read related material and notes before class, work homework exercises, and participate in class discussion, problem solving and laboratory experiments

The University of Houston-Clear Lake and its staff are here to help students learn and achieve their academic goals. The instructor is expected to be prepared, to be punctual, to conduct appropriate classroom activities such as delivering lectures and promoting classroom discussions, to keep students informed of any changes in the course, to assist students generally in their efforts to learn the course material, and to evaluate student performance on assignments, on exams, and for the course as a whole.

The student is expected to be on time, to be prepared to participate in classroom activities and to make use of all available resources in order to learn about the topics covered in the course. Students should be conscientious and punctual about attending classes, reading the textbook and handouts, submitting assignments, taking notes, asking questions, studying the material, and preparing for examinations. Students should be self-reliant, honest, and courteous. If the student has any difficulties, problems, or conflicts, she/he should communicate with the instructor or the teaching assistant. If the teaching assistant is not responsive or helpful, students should contact the instructor for assistance. If the instructor is not responsive or helpful, students should contact the division chair.

Class Policies

Expect to spend 3-4 hours a week on this class.

- Class attendance is expected.
- No extra credit work will be given.
- Grade discrepancies will be discussed only within one week after the return of the graded assignments, quizzes and exams.
- Every student is expected to work on their assignments alone. Cheating will not be tolerated. Any student caught cheating or attempting to cheat will be given a zero on the assignment or the exam. Repeat offenders will be given an F for the course and may suffer expulsion from the university. All work must be your own. You may discuss the material in the course and help one another, however, I expect any work you hand in for a grade to be your own.

Plagiarism will result in, at best, an "F" for the assignment. A simple way to avoid inadvertent plagiarism is to talk about the assignments, but not to read each other's work or write solutions together.

- If you copy another student's work, or let another person copy your work, you will be in violation of the academic honesty policy that is stated in the UHCL catalog. Read the Plagiarism Article from <http://wso.williams.edu/~athoms/WW/3--PlagiarismHandout.pdf> and the UHCL Honesty Policy in the UHCL catalog (see UHCL website).
- Cell phones need to be turned off before coming to class.

Schedule

The course schedule can be found at the schedule link on the website.

Date	Topic	Reading Material
Aug 24	Computer Crime	Chap 1 & 7, Notes
Aug 31	Labs, Tools, and Processing a Crime Scene- Search and Seizure Procedures	Chaps 3 & 4, Notes
Sept 14	Number Systems	Chap 2, Notes , In-class Lab
Sept 21	Digital Storage	Chap 2, Notes , In-class lab
Sept 28	Exam 1	
Oct 5	Windows System Artifacts and FTK Imager	Chap 5, Notes
Oct 12	Partitioning, Boot Process and Imaging	Notes , disk image
Oct 19	Formatting FAT File Systems - FAT12 and FAT16	Notes , disk image
Oct 26	FAT32	Notes , disk image
Nov 2	Exam 2	
Nov 9	Antiforensics	Chap 6, Notes , Lab
Nov 16	Internet and Email Forensics	Chap 8, Notes
Nov 23	Network and Mobile Forensics	Chap 9 & 10, Notes , Video ,
Nov 30	Looking Ahead	Chap 11
Dec 7	Final Exam	

Assignments

Assignments are posted on my website. It is **your responsibility** to check the website regularly. The due date of assignments will be given with each assignment. All assignments are due at the beginning of class on the due date. **They will not be accepted at any later time.** (There is no drop box in which to submit your labs or assignments.) If a student is unable to come to class on a due date, it is the students' responsibility to submit the assignment to the instructor **by the due date and time.** Only the instructor will accept assignments. **Assignments handed to TA or any other person will not be graded.**

It is your responsibility to keep your assignments with original grade marks. You **NEED** to show the original marks in case you have a dispute with your grade.

Major Activities that Promote Critical Thinking:

There are classroom activities, comprising lectures, examples and individual and team classwork projects to cover each SLOs of the course, including the critical thinking elements and standards. These SLOs will be reinforced by custom designed homework assignments to strengthen the purposes, concepts and information relevant to forensic analysis in a clear and precise manner.

ACT SLOs Assessment

There are three assessment activities (AA) of critical thinking in the course. The evaluation of these activities is used to assess how well critical thinking is incorporated into the course. These assessments will be used as input to the UHCL Critical Thinking database for internal assessment of Critical Thinking, and will not affect your grade of the course.

The three ACT SLOs are assessed by the following assignments:

- SLO ACT #1:** HW #2 : Answer questions on forensically sound procedures and the admissibility of information in a court of law. This homework requires the students to have a precise conceptual understanding of the purpose in collecting evidence in a forensically sound manner.
- SLO ACT #2:** HW #4 : Completing a worksheet that converts information from decimal to binary to hexadecimal values and converting bytes to KB, MB, GB and TB. Students will have to use their knowledge of number systems to precisely convert values from decimal number systems to a binary and hexadecimal number system and vice versa.
- SLO ACT #5:** HW #7 : Use FTK Imager to analyze a FAT32 image. Students will look at an image and retrieve evidence. This homework requires students to have a precise understanding of how system and user information is stored on devices.

Assessment:

The instructor will assign a grade to the three assignments above by the quality, relevance and accuracy of the submitted works by comparing them to model solutions. Assessment results are tabulated by:

Excellent: 90% - 100%

Acceptable: 70% - 89%

Unacceptable: 0% - 69%

Overall, the course primarily assesses *connection* out of the four c's of the UHCL ACT Guideline.

Laboratory

There will be several labs that will be done in class, and also as homework assignments. The exams will also have lab components incorporated.

Quizzes

Quizzes on the previous class days' materials might be given after the question and answer session on **randomly** selected dates. These quizzes will be held at the beginning of class, and students are given 10 minutes to complete the quiz. It is the students' responsibility to come to class on time. If the student is late to class, he/she will be given whatever remaining time that there is for the quiz. If the student comes to class after the quiz is completed, he/she will get a 0 for that quiz. **There are no makeup quizzes.**

Exams

Exams will have laboratory components as well. There will be no makeup exams. According to UHCL rules, you CANNOT miss the final exam.

Assessment and Grading Criteria

The following is the weight (%) of each component used to calculate final course grade:

<i>Final Grade</i>	<i>Percent</i>
Assignments	25%
Quizzes	15%
Exam 1	20%
Exam 2	20%
Final Exam	20%

The following conversion scale will be used between the numeric and letter grades:

[90..100]	A			
[87..89.9]	B+	[83..86.0]	B	[80..82.9] B-
[77..79.9]	C+	[73..76.9]	C	[70..72.9] C-
[67..69.9]	D+	[63..66.9]	D	[60..62.9] D-
[0..59.9]	F			

Other Rules and Information

University Academic Honesty Policy: All UHCL students are responsible for knowing the standards of academic honesty. Please refer to the UHCL catalog and the student Life Handbook for the University Academic Honesty Policy. Plagiarism, that is, using research without citations, or using intellectual property without crediting the sources, will result in failure of the course. See the [UHCL academic honesty policy](#) for details.

Academic Integrity: Each student is expected to maintain the highest standards of honesty and integrity in academic and professional manners. The University reserves the right to take disciplinary action, up to and including dismissal, against any student who is found guilty of academic dishonesty or otherwise fails to meet these standards.

Access to Education: Qualified students with disabilities needing appropriate academic adjustments should contact the instructor as soon as possible to ensure your needs are met in a timely manner. For information on assistive technology available for student use and additional information on services available through Coordinator of Health Disabilities Services, Bayou 1402, telephone 281-283-2627. If you will require special academic accommodations, as specified by the Americans with Disabilities Act, please contact the [Disability Services Office](#) at 281-283-2627.

Collaboration: Collaborative work, such as studying or discussing course assignments and materials with other class members is encouraged.

Changes in Syllabus: The instructor may make necessary revisions of the syllabus. It is the student's responsibility to keep informed of any changes. All changes will be posted on the website.

Copyright: All materials in this course fall under copyright laws and should not be downloaded, distributed, or used by students for any purposes outside of this course.

6 Drop Rule: Students who entered college for the first time in Fall 2007 or later should be aware of the course drop limitation imposed by the Texas Legislature. Dropping this or any other course between the first day of class and the census date for the semester/session does not affect your 6 drop rule count. Dropping a course between the census date and the last day

to drop a class for the semester/session will count as one of your 6 permitted drops. You should take this into consideration before dropping this or any other course. Visit www.uhcl.edu/records for more information on the 6 drop rule and the census date information for the semester/session.

Other UHCL Policies : UHCL General Program Requirements on Withdrawals, Appeals, GPA, Repeated Courses etc. can be found at <http://www.uhcl.edu/XDR/Render/catalog/archives/125/06/>.
