**CSE 5382:** Secure Programming
Spring 2015
1/18/2015

**Instructor(s):** Dr. Ben Calloni, P.E., CISSP, OCRES, CEH

**Office Number:** ERB 402

**Office Telephone Number:** 817-272-3785 (CSE Office) As an adjunct, I don't have a phone in my office. Contact me via email.

**Email Address:** ben.calloni@uta.edu

**Faculty Profile:** N/A

**Office Hours:** 5:50-6:50 PM Thursdays.

**Section Information:** CSE 5382-002

**Time and Place of Class Meetings:** Thursdays 7:00 PM to 9:50 PM Location: NH 112

**Description of Course Content:** This course is an introduction to methods of secure software design and development for upper-level undergraduate students and graduate students. Students will learn about the major security problems found in software today. Using this knowledge, they will work in teams to find these bugs in software, fix the bugs, and design software so that it has fewer security problems. Static analysis tools will be a core part of the class, but students will also be exposed to black box testing tools. Topics will include input validation, buffer overflow prevention, error handling, web application issues, and XML. Prerequisites: CSE 3310 and CSE 3320, or equivalent.

**Student Learning Outcomes:** The student should understand the principles necessary to develop secure software within the larger context of System Security Engineering. In addition the student will have the opportunity to tune an Open Source Software Static Code Analysis tool to assist in software development projects now and in the future.

**Required Textbooks and Other Course Materials:**
Secure Programming with Static Analysis
Paperback: 624 pages
Publisher: Addison-Wesley Professional (July 9, 2007)
Language: English
ISBN-10: 0321424778
ISBN-13: 978-0321424778

**Descriptions of major assignments and examinations:** The course is comprised of 8 major assignments: three exams including a Final; 5 project submissions generally in the form of a written report. The course project is actually a unified single project broken into 5 phases. Each phase builds on the prior. The course project will be completed in teams of 4 students each. The grade for each project will be assigned to each student on the team. For example a team's project #2 receives a grade of 92%, each student on the team will receive a 92%.

I do not intend to "teach the text"; students are expected to read and learn from the text on their own time. I will, however include key textual material in my presentations. Students should NOT assume that chapter subtopics included in lectures are to be given greater importance than others. In addition I will include other industrial experience in my lecture presentations and these slides will be uploaded to Blackboard following the class in which they are given. Exams will be taken from the material in the text book and from my lecture presentations.

**Attendance:** At The University of Texas at Arlington, taking attendance is not required. Rather, each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance.

As the instructor of this section, attendance is important, but it is not mandatory nor is it graded. Please note, however, that I will not simply be lecturing to a passive audience. In every class period, you will learn by actively participating. Therefore missing class meetings means missing out on learning opportunities that cannot be gained from the textbook.   Further since my class lectures will contain material that will be testable; it would be in the student's best interest to attend class.

One further note, since NH 112 is equipped with video recording capability, the university will video tape my lectures and will make them available on the Echo360 system.  I will make available the links via Blackboard Announcements.

**Other Requirements:** Each student is required to have a laptop with either: LINUX OS, MAC OS, or Windows OS (the ordering is alphabetical, not in order of preference.)  You will be required to install Open Source Software tools that will be needed to complete the course project(s).

Since projects are based around 4 member teams, you will need to coordinate time during the week to meet with other team members.  Arranging scheduled meeting times for each team will be left to each team.

**Grading**:

| First Exam | 15% |
|---|---|
| Midterm Exam | 18% |
| Final Exam | 22% |
| Course Project | (45%) |
| Part 1 | 5% |
| Part 2 | 8% |
| Part 3 | 10% |
| Part 4 | 10% |
| Part 5 | 12% |
| Total Grade | 100.00% |

Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (including the instructor and Graduate Teaching Assistant) if their performance drops below satisfactory levels; see "Student Support Services," below.

All exams will be administered during class as shown on the schedule (below) and will be taken via Blackboard.

All course projects will be submitted via Blackboard.  Specific instructions for each Project Part will be provided via Blackboard as well.

All grades will be maintained on the UTA electronic Blackboard (elearn.uta.edu) so students can see course scores.

**Make-up Exams**: Make up exams will be handled on a case by case basis.  Students need to inform the instructor as soon as possible via email, describing the reason for missing scheduled exams. If the instructor determines the exam can be made up, arrangements will be made.

**Expectations for Out-of-Class Study**: Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 6 hours per week of their own time in

course-related activities, including reading required materials, completing team projects, preparing for exams, etc.

**Grade Grievances**: Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current University Catalog. http://catalog.uta.edu/academicregulations/grades/#graduatetext

**Drop Policy:** Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance**. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (http://wweb.uta.edu/aao/fao/).

**Americans with Disabilities Act:** The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the *Americans with Disabilities Act (ADA)*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

**Title IX:** The University of Texas at Arlington is committed to upholding U.S. Federal Law "Title IX" such that no member of the UT Arlington community shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity. For more information, visit www.uta.edu/titleIX.

**Academic Integrity:** Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

> *I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.*
>
> *I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.*

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

**Electronic Communication:** UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at http://www.uta.edu/oit/cs/email/mavmail.php.

**Student Feedback Survey:** At the end of each term, students enrolled in classes categorized as "lecture," "seminar," or "laboratory" shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit http://www.uta.edu/sfs.

**Final Review Week:** A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

**Emergency Exit Procedures:** Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, which is located at the front, rear, and side of NH 112. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.


## Course Schedule

The following schedule is provided for the students in order to plan participation and study as needed. While I am very familiar with the topic, I am reading this course and using this text for the first time; thus I am preparing lecture notes as the course progresses.  It is highly likely that I will need to adjust topics and course lectures on an ongoing basis.  When that occurs, I will upload an updated version of the course schedule on Blackboard in the Syllabus link, and send out an announcement of the new schedule. Dates shown are when the student should have read the chapters. Projects and Exam 1 and 2 dates will remain constant.

| Class Date | Class Topics / Activities |
|---|---|
| 1/22/2015 | Introductions and Course overview. Project Discussion and Team Formation |
| 1/29/2015 | Introduction to TOIF |
| 2/5/2015 | System and Software Security Work on TOIF Installation |
| 2/12/2015 | Chapter 1: The Software Security Problem **Project Part 1 Due** |
| 2/19/2015 | Chapter 2: Introduction to Static Analysis **Exam 1** |
| 2/26/2015 | Chapter 3: Static Analysis as Part of the Code Review Process |
| 3/5/2015 | Chapter 5: Handling Input **Project Part 2 Due** |
| 3/12/2015 | **Spring Vacation** |
| 3/19/2015 | Chapter 6: Buffer Overflow |

| | |
|---|---|
| 3/26/2015 | Chapter 7: Bride of Buffer Overflow |
| 4/2/2015 | Chapter 4: Static Analysis Internals<br>**Project Part 3 Due** |
| **4/3/2015** | Chapter 8: Errors and Exceptions<br>**Exam 2** |
| 4/9/2015 | **Last day to drop classes (4 PM)** |
| 4/16/2015 | Chapter 9: Web Applications |
| 4/23/2015 | Chapter 10: XML and Web Services<br>**Project Part 4 Due** |
| 4/30/2015 | Chapter 11: Privacy and Secrets |
| 5/7/2015 | Chapter 12: Privileged Programs<br>**Project Part 5 Due** |
| 5/14/2015 | **Final Exam: 8:15-10:45p.m. NH 112** |

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. – Dr. Ben Calloni, P.E.

**Emergency Phone Numbers**: In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial 911.